



Making San Francisco Bay Better

January 3, 2012

Mr. Christopher Huitt  
California State Lands Commission  
100 Howe Avenue, Suite 100  
Sacramento, CA 95825

**SUBJECT:** San Francisco Bay and Delta Sand Mining Draft Environmental Impact Report;  
State Clearing House No. 2007072036, CSLC DIER No. 742

Dear Mr. Huitt:

Thank you for the opportunity to comment on the revised San Francisco Bay and Delta Sand Mining Revised Draft Environmental Impact Report (DIER), dated November 2011. In addition, the staff appreciates the extension of the comment period until January 3, 2012. As described in the document, the California State Lands Commission (CSLC) previously granted mineral extraction leases to enable the continuation of sand mining of construction-grade sand from certain delineated areas of Central San Francisco Bay (Central Bay) and Suisun Bay as well as the western Sacramento-San Joaquin River Delta (Delta) area. These leases were valid for a 10-year period with an option to apply for new leases for an additional 10 years. The initial ten-year period expired on June 30, 2008. The CSLC is allowing the continuation of sand mining, however on a month-to-month basis pending the completion of the environmental review and permitting process.

The DIER was prepared to examine the potential environmental effects of the proposed new leases and continuing sand mining for an additional ten-year period. The proposed project includes the CSLC's issuance of new ten-year leases for aquatic sand mining of up to 1,840,000 cubic yards (cy) annually at six parcels, some of which have two or three components, for a combined total of 3,643 acres in Central San Francisco Bay, Suisun Bay, and Suisun Channel. The DIER considered many project alternatives but analyzed the four most viable ones. The first alternative is the no action alternative under which the CSLC would not issue new mining leases. The second alternative is the Long-term Management Strategy Management Plan Conformance Alternative that would require sand mining to comply with temporal and spatial restrictions on dredging contained in the *Long-term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region Management Plan (LTMS)*, adopted in 2000. The third alternative is the Clamshell Dredge Mining Alternative, which would use a clamshell dredge rather than hydraulic dredge for mining of sand from the floor of the Bay and Delta. The fourth alternative is the Reduced Project Alternative that would reduce the proposed project volumes in all the lease areas to a level equivalent to baseline mining volumes, limiting mining to 1,426,650 cubic yards (cy) annually.

The San Francisco Bay Conservation and Development Commission's (Commission) jurisdiction includes all tidal areas of the Bay up to the line of mean high tide (up to five feet above mean sea level or the upper edge of marsh vegetation in marshland), all areas formerly

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50 California Street, Suite 2600 • San Francisco, California 94111 • (415) 352-3600 • Fax: (415) 352-3606 • info@bcdc.ca.gov • www.bcdc.ca.gov

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subject to tidal action that have been filled since September 17, 1965, and the shoreline band, which extends 100 feet inland from and parallel to the Bay shoreline. All of the parcels are within either the Commission's Bay jurisdiction or Suisun Marsh Protection Act jurisdiction. Therefore, Commission permits are required for sand mining activities within each of the lease areas, including Middle Ground Shoal (Tidelands Lot 39). Although the Commission itself has not reviewed the DIER, the staff comments discussed below are based on the Commission's law, the McAteer-Petris Act, the Commission's *San Francisco Bay Plan* (Bay Plan), the Suisun Marsh Preservation Act (Marsh Act), the Suisun Marsh Protection Plan (Marsh Protection Plan) and the Commission's federally-approved coastal management plan for the San Francisco Bay, pursuant to the amended federal Coastal Zone Management Act (CZMA).

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**General Comments**

**Timing and Baseline.** While the Commission staff appreciates the challenges of drafting a comprehensive California Environmental Quality Act (CEQA) review of a project such as this, Commission Staff is concerned that the period of time in completing this review has exceeded the CEQA Guideline § 15108, which required that a final EIR be certified "within one year of the date when the lead agency accepted the application as complete," subject to a one time 90 day extension with the consent of the applicant. The primary reason for this concern is the use of the date of issuance of the Notice of Preparation (NOP) to determine baseline conditions. Because four years has passed during preparation of the DEIR, baseline conditions have changed and these changes should be considered as a part of the baseline. To avoid an ad hoc and artificial baseline that may bias the CEQA analysis, the baseline should include the five years proceeding the issuance of the first DEIR, through 2010 as this information is readily available. The volumes of the last few years have been low due to the economic situation, but are more characteristic of past mining activities and current mining activities that are not represented by the building boom of the early 2000's.

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In developing the baseline volumes, CSLC included mining on the Central Bay lease area formerly held by CEMEX because sand mining had occurred in this area during the years considered (X through X). However, CSLC did not include CEMEX's mining on the Carquinez Strait or Middle Ground Shoal lease, which was authorized during the same period. Please explain the rationale for including one lease but not the other two leases held by CEMEX in determining baseline volumes.

A-3

**Project Purpose.** The basic project purpose has changed since Commission staff's meetings with the CSLC. Our understanding was the basic project purpose was to mine sand for the construction industry and that the basic project purpose was subsequently changed to read: "to obtain renewal of all necessary permits and approvals necessary to continue mining sand at an economically viable level in the San Francisco Bay for the next ten years." Please explain the rationale for this change and how the different wording of the project purpose influences how the CEQA analysis is constructed.

A-4

**Area of Analysis.** As discussed with the CSLC staff and the project consultants, the area of impact considered in the document, the hydrodynamic modeling and sediment transport analyses should include the San Francisco Bar and the nearshore San Francisco littoral cell, including Ocean Beach. Work conducted by the U.S. Geological Survey (USGS) has shown through modeling and analysis of multibeam data that the sediment transport from the Central Bay and San Francisco littoral cell (nearshore coast) is connected. This implies that some of the sand that is in the Central Bay might be feeding the nearshore coast of California, including Ocean Beach. Over the last five years, Ocean Beach has experienced serious coastal erosion that

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might be related to the reduction in sand transport out of the Bay due to sand mining within the Bay system. Therefore this connection and the cumulative impacts it represents should be carefully and thoroughly examined as part of this analysis.

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**Areas of Known Controversy.** There are several new studies regarding the coastal sediment supply and the connection to the Central Bay sand beds completed by the USGS, specifically work done by Patrick Barnard, Bruce Jaffee and Daniel Han. The analysis provided by Coast Harbor Engineering (CHE) diverges from the findings of the USGS, potentially due to the boundary conditions and assumptions made in the modeling analysis. The work completed by the USGS is peer reviewed and vetted through the scientific process. Because this area of controversy is significant in determining the actual impacts of the proposed project and the alternatives, the Commission staff strongly requests that the work by CHE also be vetted through peer review, and that peer review include appropriate members of the USGS geology and coastal process team. Furthermore, the research done by the USGS should be described in detail and included in your analyses.

A-6

**Partitioning of Potential Impacts.** While Commission staff understands the rationale for grouping impacts into sections required by CEQA, there is concern that impacts to habitat due to loss of sand may be overlooked or only partially addressed. Because sandy habitat by its nature has a lower diversity and richness of species does not make it less valuable for the species that have specifically adapted to that habitat. The removal of the habitat and function may significantly impact species to a degree not well understood at this time. Staff did not find a satisfactory discussion in this document of this impact. This is likely due to the partitioning of impacts between bathymetry, biology, geomorphology and hydrology, all important factors in habitat.

A-7

**Characterization of Commission Laws and Policies.** The Bay Plan and Marsh Protection Plan and their policies are characterized differently in each section of the document. While it is likely that this came about due to separate authors for each section, the plans and policies should be accurately and consistently characterized throughout the entire document. The most complete and accurate policy descriptions are located in the Land Use and Recreation section of the document. Further, the Commission is responsible for implementation of the CZMA, therefore, this federal law should be included in the regulatory setting analysis of each section. The Commission also issues permits for projects in the primary management zone of the Suisun Marsh under the Marsh Act.

A-8

**Detailed Comments**

The specific comments contained herein pertain to the individual chapters and sections of the DEIR. The same comments are applicable to the Executive Summary. However, Commission staff did not comment specifically on the Executive Summary to avoid unnecessary repetition.

**2.0 Project Description.** The second paragraph of the Project Objectives, Purpose and Need section indicates that the DIER examined the potential environmental impacts of the proposed project for a 10-year period. As stated in the Description of Proposed Project section, the mining of sand within the Central Bay and Delta has occurred for more than seven decades. Therefore given this history, the DIER should consider a planning horizon greater than 10 years, such as 20 years, so that the long-term environmental effects of sand mining could be better understood and re-evaluated every 10 years when CSLC re-issues leases. In addition, the document should state whether or not the three years of additional mining that has occurred on a month to month

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basis since 2008 will be included in the ten-year lease potentially provided by CSLC at the close of the CEQA process.

**Project History.** Including some additional historical context in this area would be useful for understanding the trajectory of mining activities. Specifically, some historic context would help explain why there was a sharp increase in mining activities in the mid and late 1990's. This is important because prior to this period in time, sand mining activities in the Bay were considerably smaller in scale.

**Figure 2-12 and Table 2-2.** Figure 2-12 and Table 2-2 should reference the volumes and trips averaged from the years used for the baseline development, not sand mining years 2002-2003.

**3.0 Alternatives and Cumulative Impacts.** A fifth alternative that includes a reduced volume of sand mining conducted within the environmental work windows set forth in the LTMS Management Plan should be evaluated. This alternative would reduce the number of organisms entrained by sand mining activities by reducing the volume and timing of sand mining, thereby reducing the overall risk to aquatic organisms.

Similarly, the analysis should evaluate whether the sand mining specifically at Middle Ground and Suisun leases could be substituted for mining in the Suisun and Sacramento federal channel. The Dredged Material Management Office (DMMO) and the US Army Corps of Engineers have extensive data on the grain size for sediment in the Suisun federal channel. Further, sand miners have proposed this option as well in the past in meetings and have submitted applications to the Commission for the work.

In Section 3.2.2, page 3-4 and 3-5, Import of Sand Alternative, the DEIR does not include a discussion regarding the aggregate that is currently imported to the Bay Area by CEMEX and Hanson Aggregates from British Columbia. It is the Commission staff's understanding that such vessels transport gypsum and other aggregate to areas in British Columbia from other parts of the world and then return with glacier sand that is sold and used in San Francisco Bay. This way, they take advantage of an otherwise empty ship heading south from Canada. Because CEMEX is currently importing all sand that was previously mined from San Francisco Bay until 2008, it is clearly a viable option. This alternative needs further examination.

Staff recognizes the Climate Change issues facing the importation of sand alternative. However, it is unclear how an aggregate company can import any sand into the Bay Area given the Climate Change analysis presented in environmental impacts (Section 4.5) section of this document. Please clarify the rationale for eliminating this alternative due to climate change policies and the current practices.

**LTMS Management Plan Conformance Alternative.** The LTMS Management Plan does not cover sand mining as it was not evaluated in the LTMS Environmental Impact Statement/ EIR process and is not navigational dredging. Both here and throughout the document, language regarding this alternative should be stated as "conformance with the LTMS Management Plan's environmental work windows," as it appears the alternative is only referring to that portion of the LTMS program. Further, this appears to assume that the proposed project will be covered by the LTMS programmatic biological opinions. This is incorrect because this project will need to be independently evaluated by the resource agencies to determine if, given the location and equipment type, the same work windows would be appropriate.

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In Section 3.3.2, page 3-9 (lines 3-8), the process for receiving an incidental take permit from the California Department of Fish and Game (CDFG) is incorrect. The process described is to receive a waiver from the CDFG to dredge during the restricted period for Pacific herring spawn. Pacific herring are not a listed species, but rather a species of special concern due to the importance of San Francisco Bay as spawning habitat. The waiver described is specific to the herring work window.

A-17

**Clamshell Dredge Mining Alternative.** On page 3-13, (lines 22-23) it states that clamshell dredging would produce more turbidity than hydraulic mining. The basis for this statement is unclear as the amount of fine sediment contained in the sand beds is the same whether it is clamshell or hydraulic dredging. If the hydraulic mining did not include overflow of the fine grain sediments, this assertion could be correct, however, because overflow does occur during the whole period of mining, it is likely that the basis for the statement is incorrect. Further, if clamshell mining were required the sand would likely need to be "washed" at the shoreside facility, which would require a waste discharge permit from the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB). This additional permitting process would likely reduce fine grain sediments resuspended in the Bay, thereby improving water quality.

A-18

**Cumulative Impacts.** In Section 3.5.1 Cumulative Impacts Projects Study Area, the study area should have included the nearshore coast and San Francisco littoral cell (Figure 3-4). Unless this area is included, the analysis would not take into account the recent work by USGS's Patrick Barnard that has determined the sediment from the Central Bay has net outward flow and potential impact associated with decreasing that sediment supply at Ocean Beach.

A-19

Table 3-3 should state that the Oakland 50-foot deepening project has been completed and the installation of the TransBay Cable has been completed.

A-20

**Reduced Project Alternative.** Please explain the basis for determining that this alternative would be sustainable and would substantially lessen the potential impacts of the proposed project given that the mining activity over the past ten years has caused erosion of the Bay floor beyond that of areas adjacent to the lease areas. In addition, please provide the basis for determining the volume at which this alternative was set.

A-21

**4.0 Environmental Analysis.** The significance criteria discussion on page 4-3 states: "According to CEQA Guidelines section 15382, a significant effect on the environment means...a substantial, or potentially substantial, adverse change in any of the physical conditions with the area affected by the project..." In work by the USGS, a potential significant change in Bay bathymetry has been documented due to sanding mining activities in the lease area. However, the method in which this environmental analysis has been partitioned, this change in bathymetry is not recognized. Further, due to the limited scope of the designated area of impact, changes the volume of sediment transported to other areas of the littoral cell are also not acknowledged.

A-22

**4.1 Biological Resources.** In the description of environmental concerns related to longfin smelt, the DEIR should note that longfin smelt move into cooler deeper waters during the summer months, which would likely put them in further risk of entrainment from sand mining operations in deep water during the summer months. In the description of environmental concerns related to least tern and brown pelican, there should be a discussion of whether or not sand mining, particularly the turbidity plume, would impact the foraging abilities of these endangered species since they identify their prey from the air. This information should be further analyzed and included in the discussion of potential impacts.

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In 2009, the CDFG raised concerns over potential entrainment of state-listed longfin smelt in hydraulic dredges, particularly the Essayons. The Essayons is the USACE hydraulic hopper dredge that maintains federal channels along the West Coast of the United States, including San Francisco Bay. The Essayons' method of dredging and equipment type is similar to sand mining equipment and techniques. As a result of these concerns, the USACE completed monitoring of the Essayons' dredging activities in 2011. The results of the monitoring found that the Essayons did entrain longfin smelt and Delta smelt when dredging in areas of know inhabitanance. Further, the Essayons also entrained large species of fish, of particular note, bottom dwelling sharks, which have similar habits of the listed green sturgeon. This ability to entrain both listed species and species that could be considered surrogates for listed species can provide useful data for this analysis. Further, as a result of this new information the USFWS and NMFS may reopen the previously issued biological opinions regarding sand mining (comment also relevant for page 4.1-50 (lines 12-19)).

A-24

On page 4.1-28, the discussion on invasive species should include a discussion of the potential for sand mining barges to transport invasive clams or other non-native species to different parts of the Bay, particularly the offloading sites.

A-25

The title for Table 4.1-5 should read "A Subset of Applicable San Francisco Bay Plan Policies" not "polices."

A-26

On page 4.1-36 (line 12) the National Marine Fisheries Service (NMFS) and the US Fish and Wildlife Service (USFWS) should be included in coordination with the USACE on the Fish and Wildlife Coordination Act.

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The existing permit condition related on page 4.1-38 (lines 19-20) has been shown via the monitoring of the Essayons in 2011 (discussed above) to entrain listed longfin and Delta smelt and therefore would not be appropriate avoidance or mitigation measures.

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BCDC should be included on page 4.1-40 (line 4) because this is also a BCDC permit condition of all sand mining permits.

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Similarly, on page 4.1-33, (line 31-33), the DEIR states that habitats discussed in the Suisun Marsh Preservation Act do not occur within the sand mining lease areas. The Marsh Act and the Marsh Protection Plan include protection of waterways within the Marsh. Sand mining within the Suisun Channel is regulated, in some cases, only by the Marsh Act and Protection Plan. In the case of Middle Ground Shoal, sand mining is regulated by the Bay Plan and the Marsh Act and Protection Plan. This information should be included in all sections to which it relates.

A-30

Section 4.1, page 4.1-39 does not analyze the effects to least tern, an endangered species that is a visual forager in San Francisco and Suisun Bay. Any potential impacts to this species should also be considered and discussed.

A-31

In discussing the impacts for BIO-3, the document states in line 35 and 36 that impacts associated with entrainment of biota from the soft substrate is considered a short term impact. In other parts of the document it states that the benthic community would take between one and ten years to reestablish and that sand mining appears to take place in the same areas over time and up to 25% of the lease area. Therefore, this impact appears to be a permanent impact because the biota would not have time to recover between mining events that are repetitious over ten years. Therefore, the significance level of this impact should not be less than significant.

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The analysis on pages 4.1-48 through 4.1-49 for Impact BIO – 7 lacks sufficient detail to determine impacts to common and managed aquatic species. In addition, nowhere in the analysis are sharks and rays discussed. Many of these species are bottom dwelling and can be entrained in hydraulic dredges as shown by the monitoring of the Essayons.

A-33

Impact BIO-8 includes the statement that “The project would result in a significant impact to delta smelt and longfin smelt. . .impacting *adult* life stages...”[emphasis added]. The proposed project has the potential to impact all life stages of Delta smelt and longfin smelt in the Suisun Bay and Channel lease areas. This potential should be reflected in the impact statement and the analysis.

A-34

Impact BIO-9 and related minimization and mitigation efforts appear to focus on listed salmonids and do not appear to provide any protections for the listed green sturgeon. Please explain how these measures reduce potential impacts to green sturgeon.

A-35

Impact BIO-10 should include potential impacts on Dungeness crab migration and movement. Kathy Hieb of CDFG should be contacted to gain further understanding of migratory patterns of Dungeness crabs through Central Bay.

A-36

The document states that the applicants would need to apply for and receive a California Department of Fish and Game (DFG) incidental take permit after the CSLC lease is issued. However, the Commission’s policies prevent it from acting on a project that “takes” a listed species without receiving an incidental take permit from the appropriate agency. Therefore, the Commission would not be able to issue sand mining permits prior to the applicants receiving an incidental take permit.

A-37

**4.2 Mineral Resources.** The Mineral Resources section narrowly evaluates the potential loss of available sand and construction aggregate within the proposed sand mining areas. The DIER states that there is no significant impact from sand mining to the mineral resources in the project area. However, Impact MIN-2 describes that sand mining could deplete the amount of sand available for future mining. The Mineral Resources Section should include a discussion on how the depletion of the sand resource might increase the erosion of coastal areas, including the San Francisco Bar adjacent to the San Francisco Bay, as recent USGS studies have suggested.

A-38

Page 4.2-7 (lines 31-32) incorrectly states that the Bay Plan does not explicitly address mineral resources. The Bay Plan does include a set of policies on shell deposits and their use.

A-39

Page 4.2-9 (lines 21-22) states that the volume of available sand is not known. However, the sand mining industry has providing the volume of available sand at each lease area as part of their reporting requirements. This analysis should include an analysis of the reported volumes and determine if an estimated volume is truly not available.

A-40

On page 4.2-9/10 (lines 34-35 and 1-4) the document discusses whether or not continued sand mining would result in an impact to mineral resources from depletion. There is evidence that this resource is already being depleted, and further mining of this area would exacerbate the depletion of the resource. Both Dr. Bruce Jaffee and Dr. Barnard have written studies that suggest that the Central Bay is in an erosional state that is being exacerbated by sand mining.

A-41

**4.3 Hydrology and Water Quality.** The Hydrology and Water Quality section of the DIER explains the known sediment dynamics, current bathymetry, and water and sediment quality within the project area. In describing the bathymetric changes to the Bay, the document should reference the most current work by the USGS and other researchers. The discussion includes volumetric changes but does not discuss the changes in depth that have occurred throughout the Central Bay. Furthermore, it should be included that the morphology of Central Bay has been

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extensively modified by excavation and borrow pits. These changes are more relevant as they reflect changes in habitat and habitat function. This comment is also pertinent to the discussion on pages 4.3-29 through 31.

The modeling efforts referenced in the Hydrology and Water Quality Section and explained in Appendix G indicate that the Central Bay and Middle Ground deep channel mining sites are not experiencing replenishment of sediment once it is removed, naturally or by sand mining. The modeling described in Appendix G also indicated that net bottom erosion due to sand mining has largely been contained within the lease and immediately adjacent areas and that sand mining in Central Bay is not causing measurable sediment depletion in areas outside the mining areas, such as the San Francisco Bar, Ocean Beach or other areas. These conclusions are based on data summarized in Figures 4-37, 4-38 and 4-39 that show the sand bed change differences between the two proposed sand mining scenarios in the Central Bay and Suisun Bay. Based on these figures, most of the sand bed changes are focused in the vicinity of the sand lease areas; however, the figures do not analyze other areas, such as Ocean Beach or the San Francisco Bar that may be affected by the proposed project.

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The DIER does not include a discussion of potential long-term effects from sand mining to the region, because of its short planning horizon compared to the timeframe in which sand beds are developed. It is important to recognize that the sediment moving through the system will likely be deposited in deeper areas created by mining events rather than moving through the system. This could cause less sediment to move to other areas within and outside of San Francisco Bay.

A-43

Please clarify whether the numerical modeling done for this project included bedload transport, as that is the most relevant mode of transportation for sand-sized particles (Page 4.3-32). In Figure 4.3-4, the modeling domain is unclear as drawn it suggests that the model included the nearshore outer coast while the text states otherwise. Please clarify the actual domain or boundaries of the model. In addition, please state the actual changes in flow demonstrated by the modeling on page 4.3-33. It is unclear what is meant by "immediate vicinity of the sand mining leases" on page 4.3-34 (lines 14-15).

A-44

The analysis provided by CHE appears to be in conflict with analysis provided by the USGS. Unless the conflict of analysis can be rectified, it is difficult to determine potential impacts. This section does not adequately describe the magnitude and extent of changes in sediment transport therefore the level of significance of impact cannot not be determined. Further the conclusion provided states that potential impacts to the San Francisco Bar and outer coast are speculative, when other studies suggest otherwise. With this in mind, the Commission staff highly recommend the CSLC undertake peer review of the modeling and bathymetric analysis provided in this document.

A-45

**4.6 Air Quality.** This section alludes to the fact if ships travel long distances with cargo they will contribute unnecessary green house gases to the environment. While this is a true statement, it is unclear to staff how the CSLC can determine an activity that is ongoing is not possible due to potential increases in green house gases from a change in practice that will occur regardless of the action of CSLC. The DIER should further explain and estimate, with numerical values, the emissions associated with the alternatives. It should also clarify that importation of sand from British Columbia is already taking place, use actual emissions from the activity and compare that with the propose project.

A-46

**4.7 Land Use and Recreation.** In the Commission section of Table 4.7-3 Land Use and Recreation, the Water Related Industry and Other Uses of the Bay and Shoreline policies of the Bay Plan should be included in this section. These policies should be analyzed in the impact assessments section and especially as they relate to potential conflicts and/or inconsistencies. It should be

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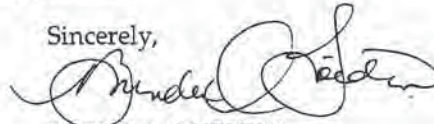
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noted that Commission staff does not necessarily agree with the assertion of "consistent" with Bay Plan policies as described in Table 4.7-3.

**7.0 Mitigation Monitoring Program.** Table 7-1 needs to be updated to clarify that the Commission would be unable to issue a permit for sand mining prior to the DFG issuing an incidental take permit for the project. Similarly, if NOAA or USFWS determined that sand mining, as proposed, would "take" federally listed species beyond what was previously authorized, or new information has been developed, an incidental take permit from the federal agencies would be needed prior to issuance of a BCDC permit.

Thank you for providing staff with the opportunity to review the San Francisco Bay and Delta Sand Mining Draft EIR. We recognized the importance of this project and appreciate the efforts of the State Lands Commission and Environmental Sciences Associates, Coast Harbor Engineering and Marine Science Associates in its preparation. Please feel free to contact me at (415) 352-3623 or email me at [brendag@bcdc.ca.gov](mailto:brendag@bcdc.ca.gov) if you have any questions regarding this letter or the Commission's policies and permitting process.

Sincerely,



BRENDA GOEDEN  
Sediment Program Manager

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## **RESPONSE TO COMMENT SET A: BAY CONSERVATION AND DEVELOPMENT COMMISSION**

- A-1** This comment provides general acknowledgements and reviews the Bay Conservation and Development Commission's (BCDC's) jurisdiction and permitting authority. Where applicable, the Final Environmental Impact Report (EIR) was modified to include this information (please see response A-8).
- A-2** Please see Master Response 2, Baseline Used in the Analysis.
- A-3** Information provided to the California State Lands Commission (CSLC) by BCDC indicates that a small amount of sand, less than 50,000 cubic yards annually, was mined by RMC-CEMEX from Middle Ground Shoal during the baseline period (2002-2007). The volume mined from this area during the baseline period is excluded from the baseline because: 1) the Carquinez Strait parcel formerly leased to RMC-Cemex (PRC 5733) is located at considerable distance from both of the other lease areas; and 2) no new lease is being considered for this area. CSLC records indicate approximately 200,000 cubic yards of sand was mined from PRC 5733 from 2002 through 2007.
- A-4** The Project objective, which appears in EIR Section 1.0, Introduction (see Part III of this Final EIR), was provided by the Project Applicant. The Project objective is identical to that stated in the 2010 Draft EIR and 2011 Revised Draft EIR. The Project objective is used in formulating and evaluating Project alternatives, and may be used by the CSLC and other agencies in deciding whether to approve the Project.
- A-5** Figure 4.3-4 in EIR Section 4.3, Hydrology and Water Quality, shows that the numerical modeling domain extends significantly offshore and includes the San Francisco Offshore Bar (Bar), Ocean Beach area, and shoreline along the city of Pacifica. The complete modeling domain is shown in Figure D-7 in EIR Appendix G. Figure MR1-1 in Master Response 1, Project Impacts on Sediment Transport and Coastal Morphology, provides an example of the modeling domain used.
- A-6** Please see Master Response 1, Project Impacts on Sediment Transport and Coastal Morphology.
- A-7** As part of the analysis conducted pursuant to the California Environmental Quality Act (CEQA), a characterization and assessment of benthic infaunal communities inhabiting Bay and Delta sand mining leases was conducted. As part of this characterization and assessment, infaunal communities inhabiting recently dredged and non-dredged locations, as well as control/comparison sites that exhibited similar water depths (bathymetry), sediment composition (geomorphology), and hydrologic conditions were sampled and evaluated. The

objectives of the benthic infaunal assessment were “... to (1) characterize benthic communities inhabiting sand mining leases and unmined control sites, (2) identify differences between communities inhabiting mining leases and control sites, and (3) obtain a better understanding of the effects of sand mining on benthic communities in Central San Francisco Bay and the western Delta and their rates of recovery following sand mining events” (Appendix F, page v). The results of this site-specific benthic infaunal study, as well as peer-reviewed and non-published studies, were the basis of the assessment on the potential effects of sand mining on soft bottom habitat infaunal communities.

**A-8** The commenter raises a concern that the Bay Plan and Suisun Marsh Protection Plan (Marsh Plan) are not characterized consistently throughout the EIR. Differences in how these Plans are described do exist between environmental issue sections and are to be expected due to the differences in relevance of the Plans’ provisions to the particular analysis sections; for example, the land use section covers land use plans and policies and, therefore, presents a more comprehensive summary of these provisions than sections focused on other environmental topic areas. However, a review of the summaries of the Bay Plan and Marsh Plan in the EIR finds that the characterizations of relevant policies and provisions are generally consistent and fairly characterize the Plans’ provisions.

To ensure that BCDC’s responsibilities under the federal Coastal Zone Management Act are appropriately characterized, the descriptions of BCDC responsibilities are revised as follows:

Section 1.3, Permits, Approvals, and Regulatory Requirements, is revised as follows:

- *Bay Conservation and Development Commission*: BCDC is charged with the protection and enhancement of San Francisco Bay. The McAteer-Petris Act (California Gov. Code, § 66632, subd. (a)) requires the issuance of a BCDC permit for any activity that extracts materials from San Francisco or Suisun Bays. The BCDC makes a determination of consistency with applicable BCDC policies, including the Subtidal Areas policy and the Fish, Aquatic Organisms and Wildlife policy, as part of authorizing permits that regulate sand mining within the estuary. BCDC is also the federally-designated state coastal management agency for the San Francisco Bay segment of the California coastal zone. This designation empowers BCDC to use the authority of the federal Coastal Zone Management Act to ensure that federal projects and activities are consistent with the policies of the Bay Plan and state law.

Section 4.4.2, Regulatory Setting, in Section 4.4, Hazards and Hazardous Materials, is also revised as follows:

**San Francisco Bay Conservation and Development Commission (BCDC).** BCDC is responsible for carrying out the provisions of the

San Francisco Bay Plan, (Bay Plan) and, as the federally-designated state coastal management agency for the San Francisco Bay segment of the California coastal zone, has authority under the federal Coastal Zone Management Act to ensure that federal projects and activities are consistent with the policies of the Bay Plan and state law. The Bay Plan which includes Navigational Safety and Oil Spill Prevention findings and policies that recognize the importance of navigational safety to the region's water related industries, that marine accidents can result in spills...

Similarly, Section 4.7.2, Regulatory Setting, in Section 4.7, Land Use, is revised as follows.

*San Francisco Bay Conservation and Development Commission*

The San Francisco Bay Conservation and Development Commission (BCDC) is the federally designated State CZM agency for the San Francisco Bay segment of the California coastal zone (NOAA 2009; BCDC 2011b). As such BCDC has authority under the Coastal Zone Management Act to ensure that federal projects and activities are consistent with the policies of the Bay Plan and state law. BCDC regulates all filling and dredging within San Francisco Bay (including San Pablo and Suisun Bays and sloughs and certain creeks and tributaries that are part of the Bay system) and development within 100 feet of the shoreline....

- A-9** The comment correctly notes that that the proposed Project is for mining leases for a period of 10 years. Considering that the proposed Project consists of mining the lease parcels for 10 years, the EIR appropriately considers the impacts of the proposed level of mining over that period. Consistent with CEQA requirements, past and potential future sand mining are considered as cumulative projects in the analysis of cumulative impacts (please see Table 3-3 in Section 3.0, Alternatives and Cumulative Projects).
- A-10** A brief history of sand mining in San Francisco Bay and Delta is provided in Section 2.2.2, Project History, in EIR Section 2.0, Project Description.
- A-11** As stated in Section 2.3.3, Characteristics of Mining Events, in Section 2.0 of the EIR, the Applicants compiled data from mining events that took place between March 2002 and February 2003, and reported this information in the 2004 sand mining study prepared by Hanson Environmental (2004). This information is described in EIR Section 2.0, Project Description, and summarized in Table 2-2 and Figure 2-12. Such information is not available for the entire baseline period.
- A-12** The commenter's suggested alternative is noted. As described in EIR Section 3.0, Alternatives and Cumulative Projects, eight alternatives that could potentially reduce Project impacts were evaluated for conformance with the Project objective. Of these, four were eliminated from further consideration because they were determined to be infeasible, and the EIR evaluated the other four, including

the No Project Alternative. According to State CEQA Guidelines section 15126.6, subdivision (a):

An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation.

The analysis presented in the EIR meets this standard, by considering alternatives that would alter the timing, volume, and technology used in order to address identified impacts; the alternative suggested in this comment combines elements of two of these. Note that the CSLC is not restricted to considering approval of only the Project as proposed, or one of the alternatives as presented in the EIR, but also may select different Project elements, including levels of allowable sand mining, from the range considered in the alternatives analysis.

- A-13** The commenter suggests another alternative, substituting mining of federal shipping channels for mining at Middle Ground Shoal and Suisun Bay. Such an alternative is considered in Section 3.0, Alternatives and Cumulative Projects, but rejected as infeasible.
- A-14** As noted in the discussion in Section 3.2, Alternatives Eliminated from Full Evaluation, the Import of Sand Alternative does not meet the Project objective and was eliminated from further consideration. Potential reduction in greenhouse gas (GHG) emissions associated with the importing of sand related to use of ships for transport of other bulk materials to the source of imported sand is considered speculative. GHG and other air emissions associated with import of sand, in the context of the No Project and Reduced Project alternatives, is discussed in Section 4.5.5, Impacts of Alternatives in Section 4.5, Air Quality.
- A-15** As stated in the response to Comment A-14, the Import of Sand Alternative does not meet the Project objective and was eliminated from further consideration. As noted in comment A-14, import of sand is already occurring.
- A-16** The CSLC staff concurs that the Long Term Management Strategy Management Plan (LTMS Plan) does not cover new dredging projects. The EIR does not state or imply that the LTMS Plan covers sand mining. The description of the LTMS Plan Conformance Alternative clearly indicates that this alternative would require sand mining operations to comply with the temporal and spatial restrictions (i.e., the environmental work windows) that apply to dredging in the LTMS Plan. The name of the alternative appropriately captures the fact that it relates to LTMS requirements. Therefore, no change is needed to the name of this alternative. The description of the LTMS Plan Conformance Alternative does not imply that this alternative would be covered by existing LTMS biological opinions.
- A-17** The referenced text of the Revised Draft EIR in Section 3.3.2, Long-Term Management Strategy (LTMS) Management Plan Conformance Alternative

Description, on page 3-9 of Section 3.0, Alternatives and Cumulative Projects, is deleted.

- A-18** Potential water quality impacts of the Clamshell Dredge Mining Alternative are discussed in Section 4.3.5, Impacts of Alternatives, and Section 4.3, Hydrology and Water Quality. The discussion notes that the water quality impacts of Clamshell Dredge Mining would be about the same as for the Project, and would be less than significant.
- A-19** Please refer to the response to Comment A-5, above, and to Master Response 1, Project Impacts on Sediment Transport and Coastal Morphology.
- A-20** EIR Table 3-3 states that the Oakland Navigation Improvement (-50 Foot) Project was completed in 2009 and the Trans Bay Cable was completed in 2010.
- A-21** The commenter's reference to the "sustainability" of the Reduced Project Alternative is unclear: the EIR does not state that this Alternative is sustainable. The potential impacts on sediment transport of this alternative are discussed in Section 4.3.5, Impacts of Alternatives, in Section 4.3, Hydrology and Water Quality. As discussed in Section 3.3.4 in Section 3.0, Alternatives and Cumulative Projects, the maximum mining levels in the Reduced Project Alternative are based on the baseline used in the EIR analysis.
- A-22** Please see Master Response 1, Project Impacts on Sediment Transport and Coastal Morphology.
- A-23** As noted by the commenter, longfin smelt move into cooler, deeper waters in the San Francisco Bay-Delta during the summer months. Longfin smelt are rarely found in waters higher than 22° C, are predominantly found in the middle and lower portions of the water column, and are known to migrate vertically in the water column in search of prey. The positioning of longfin smelt in the middle and lower portions of the water column potentially increase their risk of entrainment which is reflected in the higher estimated entrainment figures presented in the EIR analysis (Section 4.1.1., Environmental Setting, Fish and Invertebrate Entrainment Background, in Section 4.1, Biological Resources, pages 4.1-24 through 4.1.28).

The second part of Comment A-23 states that the EIR does not analyze project effects to California least tern and brown pelican foraging areas. Section 4.1, Biological Resources, considers that numerous bird species forage in aquatic habitat near proposed activities, and states that no project impacts are expected to marine bird species or their foraging areas. The potential impact is discussed in Impacts BIO-1 and BIO-3. Please see also the response to Comment A-31.

- A-24** The 2011 entrainment monitoring study for delta and longfin smelt conducted by the U.S. Army Corps of Engineers (ACOE) aboard the hydraulic hopper dredge *Essayons* documented the entrainment of both longfin and delta smelt and other fish and invertebrate species, including some brown smoothhound and one spiny

dogfish shark (AMS et al. 2011). All of the entrained sharks ranged between 6 and 24 inches in length. Although the entrainment of these individuals shows that hydraulic dredging, as conducted by the ACOE on the *Essayons*, is capable of entraining large, bottom dwelling fish, it does not unequivocally indicate that the same occurs during aggregate sand mining. There are differences in equipment and operational procedures that introduce uncertainty into the comparison.

For example, pump volumes and flow rates can vary substantially between the different operations. These have a direct effect on potential entrainment of fish species. Sand mining operators also equip each suction head with a “grizzly” (a metal grid with 6-inch openings that covers the intake opening of the drag head). The intent of the grizzly is to limit the entrainment of larger objects. Juvenile green sturgeon are typically in excess of 3 feet in length when arriving in the Delta from their spawning ground on the upper Sacramento river, and larger when heading upstream to spawn as mature adults. There is little chance of these fish being entrained by sand mining operations. Additionally, green sturgeon are documented to forage in shallower areas of the Bay-Delta than where the sand miners dredge sand. The U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS) may reopen their Biological Opinions regarding the potential effects of suction dredging on listed species, in light of the new data from the *Essayons* monitoring study.

Please see also response to Comment A-35 for additional information on green sturgeon habitat use and movements in the Bay-Delta.

- A-25** This issue of import of invasive species is of particular concern for the Delta mining leases where the Asian clam, *Corbula amurensis*, is observed to dominate the benthic infauna. During sand mining dredging, most of the clams entrained with the sand are re-deposited back onto the seafloor, since their size exceeds the screens on the dredge barge, and they become part of the discharge of “overs.” Clams that are smaller than the screens are transported to the offloading site where they likely die, and become a component of the sand product. Also, since the sand mining barges never leave the San Francisco Bay-Delta, they pose little threat of transporting non-native species into or out of the Bay-Delta. As a result, no significant risk is posed by the sand mining barges potentially distributing or increasing the spread of this species.
- A-26** The text concerning the San Francisco Bay Plan/McAteer-Petris Act in Section 4.1.2, Regulatory Setting (in Section 4.1, Biological Resources), which refers to Table 4.1-5, states that the table lists a subset of relevant Bay Plan policies.
- A-27** At the commenter’s suggestion, the referenced text of Section 4.1.2, Regulatory Setting, of Section 4.1, Biological Resources, is revised as follows:

### *Other State Policies and Regulations Regarding Waters of the U.S. and Wetlands*

State regulation of activities in waters and wetlands resides primarily with the CDFG and the State Water Resources Control Board (SWRCB). BCDC has similar authority for wetlands within San Francisco Bay, and the California Coastal Commission has review authority for wetland permits within its planning jurisdiction. The CDFG provides comment on ACOE, NMFS, and USFWS permit actions under the Fish and Wildlife Coordination Act. The SWRCB, acting through the nine Regional Water Quality Control Boards (RWQCBs), must certify that an ACOE permit action meets State water quality objectives (Clean Water Act § 401).

**A-28** The recent fish entrainment study conducted aboard the ACOE hydraulic hopper barge *Essayons* in 2011 documented the entrainment of both longfin and delta smelt by hydraulic dredging associated with maintenance of navigational channels in the Bay-Delta (AMS et al. 2011). As suggested by the commenter, this finding poses some doubt to the validity of the assumption that when the suction head of a hydraulic dredge is located within 3 feet of the Bay seafloor, that entrainment of smelt is prevented. How effective this measure is in preventing entrainment of smelt is unknown and was not assessed in the *Essayons* monitoring effort. In total, portions of 228 dredge hopper loads were monitored offshore of Richmond and Point Pinole and in Suisun Bay, of which 13 loads entrained either delta or longfin smelt or both (AMS et al. 2011). Because of operational restrictions, monitoring occurred for only few minutes during each hopper load, allowing for less than 0.5 percent of total volume of dredged material to be sampled. There was also no concurrent sampling of fish adjacent to the dredge. As a result, the effectiveness of the permit requirement to keep the suction head near the Bay floor when pumping water is unknown.

**A-29** In response to the comment, the text of Section 4.1.4, Impact Analysis and Mitigation, in Section 4.1, Biological Resources, is revised as follows:

- Water depth limitation to avoid sensitive habitat: in Central Bay, sand mining occurs in relatively deep water (from 30 to 90 feet). Within the region of Middle Ground Shoal and Suisun Bay, sand mining typically occurs in waters 15 to 45 feet deep. Due to equipment constraints, such as the barge and tug draft and the suction drag head minimum operation depth (due to pipe length and angle during operation), sand mining cannot occur in shallow water areas. For instance, Applicants cannot practically mine in areas with less than 20 feet of water or in areas with depths greater than approximately 80 feet of water. In addition to equipment constraints, all recently issued ACOE and BCDC mining permits prohibit sand mining within 200 feet of any shoreline. The permits also prohibit sand mining within 250 feet of any water having a depth of 9 feet or less (mean lower low water [MLLW]), or 30 feet (MLLW), depending on the location in the estuary (USFWS 2006).



**A-30** The commenter describes provisions of the Suisun Marsh Protection Plan (SMPP) and Suisun Marsh Preservation Act (SMPA) and limitations of mining site regulation under the San Francisco Bay Plan. The discussion of the SMPP and SMPA cited in this comment (under *Suisun Marsh Protection Plan [SMPP] and Suisun Marsh Preservation Act* in Section 4.1.2, Regulatory Setting, in Section 4.1, Biological Resources) provides a general discussion, consistent with this comment:

Although no *marsh or wetland* habitats occur within the Delta sand mining leases, *the channels where sand mining Suisun Channel and Middle Ground Shoal are identified as critical waterways for the preservation and enhancement of the Suisun Marsh and therefore fall within the jurisdiction of the SMPP.* (Emphasis added.)

To provide further clarification, the discussion of the San Francisco Bay Plan/McAteer-Petris Act in Section 4.1.2, Regulatory Setting in Section 4.1, Biological Resources, is revised as follows:

Specific San Francisco Bay Plan policies relative to these resources and activities are presented in Table 4.1-5. A portion of the project area in Suisun Marsh is outside the jurisdiction of the Bay Plan (please refer to Figure 4.7-1 in Section 4.7, Land Use); that easternmost portion of parcel PRC 7781 (East) is regulated under the Suisun Marsh plan and statute described below, but not under the Bay Plan.

In addition, in Table 1-3 in Section 1.0, Introduction, footnote 5 is added as shown below:

**Table 1-3. Permits Associated with Project Sand Mining Sites**

Agency	Parcels							
	Presidio Shoals <sup>1</sup>	Point Knox South <sup>2</sup>	Point Knox Shoal <sup>2</sup>	Alcatraz South Shoal <sup>3</sup>	Suisun Associates	Private Leases Grossi Middle Ground		
<b>CSLC</b>	709.1	2036.1	7779.1	7780.1	7781.1			
<b>ACOE</b>	24305S	2441N	24997N	23573S	25041N	24996N (Hanson)	25653N (Hanson)	24913N (Jerico)
<b>BCDC</b>	4-77.17	5-80	12-94.5	M98-19.4	M99-7.4 <sup>5</sup>	10-90(M)	10-90(M)	16-78
<b>SMGB<sup>4</sup></b>	4	4	4	4	4	4	4	4
<b>RWQCB</b>	Regional Board Order No. 95-177, as Amended by Order No. 00-048 (applies to all parcels)							

<sup>1</sup> Lease covers Alcatraz North Shoal, Point Knox North, and Presidio Shoals.

<sup>2</sup> Referred to in the Notice of Preparation as Point Knox.

<sup>3</sup> Referred to in the Notice of Preparation as Alcatraz.

<sup>4</sup> The SMGB has approval authority over the reclamation plans prepared pursuant to SMARA for the sand mining sites. SMGB adopted resolution 2005-02 in February 2005, approving the reclamation plans for 10 marine sand mining leases in the Central Bay, Suisun Bay and western Delta. The SMGB approval of the reclamation plans for the current Central Bay, Suisun Bay and Delta sites is limited to the term of the leases that expired in 2008.

<sup>5</sup> The easternmost portion of PRC 7781.1 is outside the jurisdiction of BCDC and therefore not covered by M99-7.4. (Please refer to Figure 4.7-1 in Section 4.7, Land Use, for a map showing the jurisdictional boundary at PRC 7781.1.)

Source: CSLC 1998; ACOE 1999, 2001, 2002, 2004, BCDC 2008, 2009b; NOAA 2004; SFBRWQCB 2000

- A-31** Known California least tern nesting areas are discussed in the EIR, with the conclusion that nesting sites do not occur near any of the mining leasehold sites (please see page 4.1-2 in Section 4.1, Biological Resources). The EIR also considers that numerous bird species forage in aquatic habitat near proposed activities (please see pages 4.1-8 to 4.1-9) and evaluates potential impacts, concluding (in Impacts BIO-1 and BIO-3) that no project impacts would be expected to marine bird species or their foraging areas (please see pages 4.1-40 and 4.1-42 to 4.1-44).

The Montezuma Wetlands nesting area referenced in the comment is located within the larger Suisun Marsh complex, 1.7 miles northeast of the nearest open water in Honker Bay and 2.6 miles north of the PRC 7781 East leasehold. Given the extensive amount of tern foraging habitat that is available near the least tern nesting areas, the anticipated short-term, localized pulses in suspended sediments that would occur at relatively distant sand mining areas would not be expected to disrupt least tern feeding behavior or cause physiological stress to this species. Thus, the impact conclusions stated in the EIR remain valid.

- A-32** As indicated in the Impact BIO-3 discussion in Section 4.1, Biological Resources, there are many physical and biological factors that affect benthic infaunal recovery following a physical disturbance or change in habitat make-up. Numerous biological recovery studies conducted throughout the world, including the Great Lakes, along the Atlantic East Coast, the Gulf of Mexico, the Pacific West Coast, and in the North Sea (Nairn et al. 2001, Newell et al. 1998, Hammer et al. 1993), have collectively established many of the key environmental conditions that enhance or retard benthic infaunal recovery. Under the worst set of environmental conditions studied, the benthic infaunal community took approximately 10 years to recover to a community composition that was considered comparable to the pre-disturbance community in species diversity and productivity. In this particular case study (Wright 1997, cited in Hammer et al. 1993), a very large area of the seafloor was dredged after normal spring recruitment of infaunal larvae from the water column had occurred and the magnitude of the seafloor dredged affected migration into the dredged area by adult infaunal organisms. In addition, the organically rich surface sediment was replaced with coarser sediment that was much lower in organic material, which required time for the natural deposition of finer, organically enriched sediment to settle out to be able to support a benthic infaunal community comparable to what existed pre-disturbance. Finally, the location of the disturbed benthic community was in the Canadian Arctic where cold water, harsh conditions, and other physical and biological factors effectively combined to retard benthic infaunal recovery at this particular location. On average and excluding this one study,

benthic infaunal recovery following dredging or similar disturbance occurred within a few months to 3 years (Hammer et al. 1993).

- A-33** The discussion of entrainment of non-special status species and commercially-important invertebrate species under BIO-7 is brief, since a separate, detailed evaluation of fish and invertebrate entrainment effects was performed and is included in the EIR (Appendix F). Although sharks and rays are an important component of both the demersal and pelagic habitats of the Bay and Delta, they comprise a very small component of the fish population as reported by the monthly Interagency Ecological Program (IEP) trawl data. In the years 2000-2007, one species of shark and two species of rays were reported to represent <0.2 percent of all fish caught (CDFG 2000-2007). In part this is because most adult sharks and rays are able to detect and avoid the sampling nets, just as they are likely able to detect and avoid sand mining suction drag heads.

As discussed above in the response to Comment A-24, the recent 2011 entrainment monitoring aboard the ACOE hydraulic suction dredge *Essayons* was documented to entrain small sharks (brown smoothhound and dogfish) during maintenance dredging of Bay-Delta shipping channels near Richmond, Pinole and in Suisun Bay (AMS et al. 2011). The entrained individuals ranged in size between 6 and 24 inches and many were released back into the Bay-Delta alive. Operational differences between the *Essayons* maintenance dredging and sand mining, as conducted by the Applicants, can be assumed to reduce or prevent entrainment of fish larger than 6 inches in length or girth because of the use of “grizzlies” on the suction drag heads of the sand miners. Additionally, sizing screens, which are only a couple of inches in opening size, are used to reject any material or items larger than the openings. Any material or items larger than the sizing screens are returned to the Bay through the discharge pipe.

- A-34** In response to this comment, the text of Impact BIO-8 in Section 4.1, Biological Resources, is revised as provided below.

**Impact BIO-8: Regular operation of sand mining activities will cause entrainment and mortality of delta and longfin smelt.**

**The Project would result in a significant impact to delta smelt and longfin smelt as a result of entrainment and mortality during sand mining operations impacting ~~adult life stages of the delta smelt and longfin smelt~~ thereby exceeding the established significance level criteria thresholds (Significant, Class I).**

This revision does not change the analysis or alter the significance conclusions regarding project impacts on biological resources.

**A-35** As the commenter indicates, Mitigation Measures (MMs) BIO-9a and BIO-9b are primarily focused on reducing potential impacts to migrating salmon and steelhead in the Delta sand mining leases. As stated in the discussion of Impact BIO-9 in Section 4.1.4 (in Section 4.1, Biological Resources, page 4.1-54), "...the implementation of operational conditions required by NMFS and the USFWS would reduce Project impacts to green sturgeon and steelhead trout to less than significant...." Specifically, permit requirements require sand miners to do the following:

- Prime their dredge pumps and clear the dredge pipe with the end of the pipe (drag head) held at a height in the water column no greater than 3 feet from the bottom (NMFS 2006).
- Restrict their sand mining to relatively deep water (from 30 to 90 feet). Within the region of Middle Ground Shoal and Suisun Bay, sand mining typically occurs in waters 15 to 45 feet deep. Due to equipment constraints, such as the barge and tug draft and the suction drag head minimum operation depth (due to pipe length and angle during operation), sand mining cannot occur in shallow water areas. For instance, Applicants cannot practically mine in areas with less than 20 feet of water or in areas with depths greater than approximately 80 feet of water. In addition to equipment constraints, all recently issued ACOE and BCDC mining permits prohibit sand mining within 200 feet of any shoreline. The permits also prohibit sand mining within 250 feet of any water having a depth of 9 feet or less (mean lower low water [MLLW]), or 30 feet (MLLW), depending on the location in the estuary (USFWS 2006).

These operational requirements, coupled with the sand miners use of a "grizzly" (a metal grid with 6-inch openings covering the suction opening of the drag head), were determined to reduce the potential to entrain green sturgeon to less than significant without additional mitigation.

Recent scientific investigations focused on tracking the movements of green sturgeon through the Delta have indicated that green sturgeon, when moving through the Western Delta and Central Bay regions, exhibited two distinct swimming behaviors. The first, a meandering movement in shallow waters typically < 10 meters (< 33 feet) in water depth; and the second, a steady directional movement that was confined to the upper 20 percent of the water column and generally with the prevailing tidal current (Kelly et al. 2007). The operational requirement to keep the drag head within 3 feet of the Bay floor when actively pumping water would avoid entrainment of green sturgeon when they would be traveling in a steady directional mode (the second mode of movement described above). The dredging depth limitations/restrictions would similarly avoid entrainment of green sturgeon when foraging for food in the shallows of the Delta, as exhibited in the first mode of movement described above. Additionally, the presence of a "grizzly" on the suction drag head would prevent the entrainment of any fish with a length or girth greater than 6 inches, which most green sturgeon

inhabiting the western Delta and Central Bay would be expected to exceed, based upon capture and release data of green sturgeon in the western Delta and Bay (Kelly et al. 2007).

- A-36** The potential effect of sand mining entrainment of Dungeness crab is summarily discussed in Section 4.1, Biological Resources, under Impact BIO-7, and extensively analyzed in EIR Appendix E, which contains the Assessment and Evaluation of Fish and Invertebrate Entrainment Effects from Commercial Aggregate Sand Mining in San Francisco Estuary. Impact BIO-10 addresses the migration of fish as they move to or from their spawning, nursery, or foraging areas. It is well established that juvenile Dungeness crabs move from Central Bay into the shoals and inshore waters of San Pablo and Suisun Bay, returning to Central Bay and eventually out into the Pacific Ocean after 1 to 2 years, depending on age and sex (Baxter et al. 1999). The actual routes and pathways taken by both juvenile and sub-adult crabs through the Bay are unknown, although studies conducted in the Pacific Northwest suggest that they may rely heavily on the deeper water shipping channels where sand mining does not occur. The estimates for entrainment of Dungeness crab at all of the sand mining leases represented a relatively small percentage of adult crabs annually harvested, as discussed in Impact BIO-7.
- A-37** The CSLC staff acknowledges the policy of BCDC in this regard.
- A-38** The impact of the proposed sand mining on erosion within and outside the Bay is addressed in Impact HYD-2 in Section 4.3, Hydrology and Water Quality. Please refer to Master Response 1, Project Impacts on Sediment Transport and Coastal Morphology, regarding potential impacts associated with erosion of coastal areas. Please see also Master Response 3, Mineral Resources Impacts Significance Conclusions.
- A-39** In response to the comment, Section 4.2.2, Regulatory Setting, in Section 4.2, Mineral Resources, is revised as follows:

*San Francisco Bay Conservation and Development Commission*

BCDC administers the San Francisco Bay Plan (Bay Plan) and has permit approval authority over dredging operations in the waters of San Francisco Bay (including Suisun, San Pablo, Honker, Richardson, San Rafael, San Leandro and Grizzly Bays and the Carquinez Strait). Under Public Resources Code, section 66664.4, dredging is defined as “the extraction of sand, mud, or other materials from San Francisco Bay, its tributaries, the delta, or coastal state waters.” Other than policies pertaining to dredging and mining of shell deposits, the Bay Plan does not explicitly address mining or mineral resources.

- A-40** An estimate of available sand resources is provided in EIR Appendix G, Bathymetric and Hydrodynamic Study. CSLC staff is not aware of any comprehensive survey of sand volumes in San Francisco Bay and Delta.
- A-41** Please see Master Response 1, Project Impacts on Sediment Transport and Coastal Morphology, and Master Response 3, Mineral Resources Impacts Significance Conclusions.
- A-42** A general discussion of changes to Bay bathymetry and sediment dynamics is included in Section 4.3, Hydrology and Water Quality (please see “Sediment Dynamics” and “San Francisco Bay – Bathymetry and Morphology” in Section 4.3.1, Environmental Setting); in Impact HYD-2 in Section 4.3.4, Impact Analysis and Mitigation; and in the discussion of cumulative hydrology and water quality impacts in Section 4.3.6, Cumulative Projects Impacts Analysis. The cumulative impacts discussion references recent work by Dr. Barnard of the U.S. Geological Survey (USGS) and others. Please see also EIR Appendix G, Bathymetric and Hydrodynamic Study, Master Response 1, Project Impacts on Sediment Transport and Coastal Morphology, and the response to Comment I-6.

Figures 4-37, 4-38 and 4-39 in Appendix G of the EIR do not show the Bar and Ocean Beach areas because the modeling results show that changes in those areas would be negligible. The figures are focused only on the areas where the model shows discernible changes. Please see Master Response 1, Project Impacts on Sediment Transport and Coastal Morphology.

- A-43** As stated in the response to Comment A-9, the proposed mining leases that constitute the Project are for 10 years, and the EIR appropriately evaluates the impacts of project implementation over that period. The EIR also includes a cumulative impacts analysis that assumes past and future mining in the Bay and Delta. The potential for the holes or depressed areas created by mining to “trap” sediment moving through the system is addressed in Impact HYD-2, in Section 4.3, Hydrology and Water Quality. Please also see Master Response 1, Project Impacts on Sediment Transport and Coastal Morphology.
- A-44** Bedload transport and suspended sediment transport are both included in the LAGRSED numerical model. As shown in Figure 4.3-4 in Section 4.3, Hydrology and Water Quality, and as discussed in Impact HYD-2, the modeling domain did include the nearshore outer coast. Please see the response to Comment A-5. Please see also Master Response 1, Project Impacts on Sediment Transport and Coastal Morphology.
- A-45** Please see Master Response 1, Project Impacts on Sediment Transport and Coastal Morphology.

Regarding the commenter’s recommendation that CSLC staff undertake peer review of the modeling and bathymetric analysis, the study in Appendix G of the

EIR, which was performed by Coast & Harbor Engineering as a subcontractor to Environmental Science Associates (ESA), was reviewed by ESA's staff Hydrologist, Justin Gragg; Project Manager, Dan Sicular, Ph.D., and Senior Technical Advisor, Douglas Cover, P.E. Furthermore, upon the request of BCDC and CSLC staff, both Appendix G and the supplemental modeling and analyses performed for the Final EIR (see Master Response 1) were presented to USGS Coastal Geologist Patrick Barnard during the preparation of this Final EIR. Questions regarding the study raised by BCDC and others are addressed comprehensively in Master Response 1, and the supplemental modeling and analyses reported in Master Response 1 confirm the earlier modeling results.

The CSLC staff is aware that this is a controversial topic and that experts may still disagree on the effects of sand mining on coastal erosion. According to the State CEQA Guidelines section 15151:

Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure.

This EIR discloses and summarizes the main points of disagreement among experts. Please see Master Response 1, Comments A-6, A-42, A-43, H-12, H-13, I-4, and K-1, and the responses to these comments.

- A-46** The CSLC staff has not determined, nor does the EIR suggest, that "...an activity that is ongoing is not possible due to potential increases in greenhouse gases from a change in practice that will occur regardless of the action of CSLC."

The analysis of air quality impacts of alternatives examines and compares GHG and other air emissions associated with the potential for alternatives to result indirectly in increased import of sand from British Columbia, as well as increased supply from Bay Area quarries. Please see the discussion of the No Project Alternative and the Reduced Project Alternative in Section 4.5.5, Impacts of Alternatives. Trends in aggregate imports are also discussed in Section 4.2.1, Environmental Setting in Section 4.2, Mineral Resources.

- A-47** The findings and policies contained in the Bay Plan Policies sections referenced in this comment focus on the use of shoreline areas and port facilities. The Water Related Industries section recognizes the value of navigable, deep water sites as a unique and limited resource needed by water related industries, that expansion of water-related industry can be accommodated at existing water-related industries, and that there is competition by other industries with water-related industries for waterfront sites. Policies in the Bay Plan call for reserving sites designated for both water-related industry and port uses for such industries and uses. Policies also call for water-related industry and port uses to be planned to make attractive uses of the shoreline and to minimize air and water pollution to

the maximum extent possible. Other Uses of the Bay and Shoreline findings and policies state that uses of the Bay and its shores also include (in addition to those previously discussed in the Bay Plan) housing, public utilities, utilities unrelated to the Bay, refuse disposal sites, and other uses unrelated to the Bay. Policies provide that areas not reserved for a priority use may be used for any use (acceptable to the local jurisdiction) that uses the Bay as an asset and does not adversely affect the Bay.

While the proposed Project is undeniably a water-related industry, the Project consists of the continuation of sand mining under new leases of State lands and on a private parcel within the Bay and Delta. Existing sites would be used for the off-loading of sand, as described in the Project Description, and no changes are proposed to the off-loading sites or their operations. The purpose of CEQA is to disclose the physical effects of a proposed Project on the environment relative to existing conditions. Therefore the referenced sections of the Bay Plan are not relevant to the analysis of impacts presented in the EIR, and text changes are not warranted. The final determination of applicability of, and consistency with, Bay Plan policies is within the jurisdiction of the BCDC.

- A-48** The CSLC staff is cognizant of the BCDC policy regarding Incidental Take Permits (ITPs) and that BCDC's approval of new permits is required for the proposed Project to proceed. The Mitigation Monitoring Program tables in Section 7.0, Mitigation Monitoring Program, have been revised to reflect BCDC's permitting authority.