

San Francisco Bay Conservation and Development Commission

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April 10, 2015

TO: Commissioners and Alternates

FROM: Lawrence J. Goldzband, Executive Director (415/352-3653; larry.goldzband@bcdc.ca.gov)
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SUBJECT: Staff Recommendation for BCDC Permit Application No. 2013.004.00; Hanson Marine Operations' Application for Sand Mining from Central San Francisco Bay
(For Commission consideration on April 16, 2015)

Recommendation Summary

The staff recommends approval of BCDC Permit Application No. 2013.004.00, to Hanson Marine Operations (Hanson Marine) for sand mining from Central San Francisco Bay, which, as conditioned, will authorize the following activities:

Mining up to 1.141 million cubic yards (million cy) of construction grade sand annually for ten years from 2,601 acres of Central San Francisco Bay subtidal sand shoals and State Lands Commission parcels PRC 709.1, 2036.1, 7779.1, and 7780.1, for a total of 11.41 million cy using a hydraulic drag arm dredge (Exhibits A and B). In addition, the project would include "peak year" mining volumes up to 1.395 million cy in any given year as long as the total does not exceed of 11.41 million cy over the ten-year lease period. Sand would be offloaded and sold at various upland facilities throughout the Bay Area.

Staff Recommendation

The staff recommends that the Commission adopt the following resolution:

I. Authorization

A. **Authorized Project.** Subject to the conditions stated below, the permittee, Hanson Marine Operations (Hanson Marine), is granted permission to do the following:

Location: In Central San Francisco Bay, at Point Knox, Alcatraz, and Presidio Shoals (PRC 709.1, 2036.1, 7779.1, and 7780.1), between the Golden Gate Bridge, Angel Island and the northwestern San Francisco waterfront, in the City and County of San Francisco and Marin County (Exhibit A).

Description: In the Bay

1. Mine up to 1.141 million cy of construction grade sand annually over a ten-year period for a total of 11.41 million cy, as described in Table 1 below from submerged lands in Central Channel using a hydraulic dredge; and
2. "Peak year" mining volumes up to 1.395 million cy in any given year are authorized, provided that a rolling average of no more than 1.141 million cy is maintained, and not more than a the total of 11.41 million cy over the ten year authorization is mined.

Within the Shoreline Band

1. Place the mined sand at any authorized sand yard, authorized projects within the Commission's jurisdiction, or other upland yard not requiring new Commission authorization.

Table 1. Volumes Authorized by Lease Area and Parcel

Central Bay Leases	Annual Average Permit Volume	Peak Year Volume	Total 10-Year Total Volume
Presidio Shoals (PRC 709.1)	170,000 cy	235,000 cy	11,410,000 cy
Point Knox Shoal South (PRC 2036.1)	360,000 cy	450,000 cy	
Point Knox Shoal (PRC 7779.1)	484,000 cy	550,000 cy	
Alcatraz South Shoal (PRC 7780.1)	127,000 cy	160,000 cy	
Central Bay Leases Total Volume	1,141,000 cy	1,395,000 cy	

- B. **Application Date.** This authorization is generally pursuant to and limited by the application dated February 20, 2013, including the revised application dated April 6, 2015, all accompanying and subsequently submitted correspondence and exhibits, subject to the modifications required by conditions hereto.
- C. **Deadlines for Commencing and Completing Authorized Work.** Work authorized herein must commence prior to December 1, 2015, or this permit will lapse and become null and void. All work authorized herein must be diligently pursued to completion and must be completed within by April 26, 2025, unless an extension of time is granted by amendment of the permit.

II. Special Conditions

The authorization made herein shall be subject to the following special conditions, in addition to the standard conditions in Part IV:

- A. **Sand Mining Operations.** To minimize impacts to fish, pelagic organisms, and benthic biota, all sand mining authorized herein shall be performed using the “moving or stationary pothole” mining method, involving a tugboat and a hopper barge with a maximum capacity of 2,400 cubic yards, equipped with a 15,000 gallons per minutes (gpm) suction dredge equipment. The drag head shall have a six-inch grizzly attached to the end of the dredge head and all external vent pipes or intake pipes shall be outfitted with positive barrier fish screen, with opening not greater than 1.75 mm at all times. In the event that new equipment is used, the permittee shall provide Commission staff and the Resource Agencies, including NOAA National Marine Fisheries (NMFS), US Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and the San Francisco Bay Regional Water Quality Control Board (Water Board), with a description of the new equipment and pump capacity for re-evaluation of potential entrainment effects.
- B. **Permit Duration.** The work authorized herein shall be completed by April 26, 2025, after which time this permit will become null and void unless the authorization for sand mining is extended or increased through an amendment to this permit.
- C. **Volume Limits on Mining.** As authorized by this permit, Hanson Marine, shall mine not more than 11.41 million cy of sand over ten years from four lease areas (PRC 709.1, 2036.1, 7779.1, and 7780.1) in Central San Francisco Bay as depicted on Exhibit B. The annual volume mined from each lease area shall be limited to the volumes shown in Table 1, including peak year volumes as needed to meet market demand. However, the mining volume will be averaged on an annual basis (rolling average), maintaining a volume average of 170,000 cy per year from PRC 709.1 (Presidio Shoals); 360,000 cy per year from PRC 2036 (Point Knox Shoal South); 484,000 cy per year from PRC 7779.1 (Point Knox Shoal); and 127,000 cy per year from PRC 7780.1 (Alcatraz South Shoal) over the ten year period.
- D. **Monitoring Mineral Resource Impacts.** The permittee shall monitor changes to Bay bathymetry and mining activity as follows:
 1. The permittee shall monitor the changes to Bay bathymetry through bathymetric change analysis, utilizing multibeam surveys of the lease area and an adjoining control areas. Two multibeam surveys of the lease areas shall be completed between January 1 and June 1, 2018 and January 1 and June 1, 2023, consistent with the previously required five-year surveys. The bathymetric change analysis shall be conducted by surveying of the lease area and control areas using the same methodology of the original multibeam survey conducted in January 2014, at five year intervals.

2. By October 1, 2018 and October 1, 2023, the permittee shall submit to Commission staff a written report and analysis including: (a) the multibeam survey of the lease area, (b) an analysis of the changes in bathymetry, areas of depletion, accretion or other trends; (c) a discussion of the findings, and (d) a quality control analysis completed by an independent third party.
 3. The permittee shall continue to use and maintain an automatic Global Positioning System (GPS) tracking system on all barges used during mining operations authorized herein. The permittee shall provide “mining track lines” to Commission staff on a quarterly basis as described in Special Condition II-H.
- E. **Protection of Habitat, Fish and Wildlife and Associated Habitat.** The permittee shall implement the following measures as specified in the final Biological Opinions, from NMFS, USFWS and the CDFW’s 2014 amended Incidental Take Permit (ITP) and the conditions herein, to reduce potential impacts to and mitigate for “take” of listed species, and reduce the potential impacts to fish, other aquatic organisms and wildlife.
1. **Minimization Measures**
 - a. **Buffer Zones.** In order to minimize impacts to shallow water habitat and sensitive rocky subtidal habitat, the permittee shall not mine within 200 feet of any shoreline, and within 250 feet of any area with depths less than minus 9 feet Mean Lower Low Water (MLLW).
 - b. **Fish Screens on Intake Vents.** At all times during sand mining operations, the permittee shall maintain and operate the fish screens installed on the external vent pipes consistent with CDFW and NMFS criteria to exclude juvenile and adult fish from entrainment during mining events. The permittee shall visually inspect the fish screen following each mining event to verify screen integrity, remove any impinged debris and record any fish impinged on the screen, and report the findings as described in Special Condition II – E2(b) and (c). If the screen is damaged, sand mining shall cease until the screen is either repaired or replaced.
 - c. **Pump Priming and Clearing Depth.** Priming and clearing of the suction pipe and pump shall only occur when the suction head is as close to the bottom as possible and no more than three feet above the substrate.
 - d. **Water Volume Limitation.** Pursuant to the amended CDFW ITP, dated October 20, 2014, and the conditions herein, the total annual water diversion from sand mining shall be restricted to 170 acre feet (af) and the permittee shall keep a log of water diversion. Sand mining shall cease each year once the total annual water diversion limit of 170 af is reached.
 2. **Monitoring Biological Impacts**
 - a. **Designated Biologist.** Pursuant to the CDFW ITP, and the conditions herein, the permittee shall designate a biologist to educate sand mining personnel on the potential impacts of sand mining on the Bay’s natural resources and how those

impacts can be avoided, and to conduct monthly monitoring of the covered activities, which will assist in minimizing or avoiding the incidental take of listed species and the disturbance of their habitat. The permittee shall ensure that its sand mining personnel, including contractors, receive training on recognizing longfin smelt during regular operations and equipment observation. The training will include awareness of environmentally sensitive areas to avoid and areas that require special precautions to avoid impacts to longfin smelt and salmonids.

- b. **Compliance Monitoring.** The designated biologist shall conduct monthly compliance inspections to assist in minimizing and avoiding the “take” of listed species and to confirm that only covered activities are taking place. The designated biologist, or permittee’s representative, shall prepare a written summary of these compliance inspections, and provide them as part of the quarterly reports.
 - c. **Notification of take or injury.** The permittee shall notify CDFW, NMFS (as appropriate) and the Commission staff immediately if a covered species is taken or injured due to a sand mining activity or found dead or injured in the vicinity of sand mining activity. A written report of the incident shall be submitted within 5 days to NMFS and CDFW and the Commission staff.
3. **Mitigation for Biological Impacts.** The permittee shall provide the following mitigation for impacts of the mining activity.
 - a. **Take of Listed Species.** To compensate for take of listed species, including longfin smelt and salmonids, and pursuant to the requirements of NMFS and CDFW, the permittee has purchased 0.017 acres of freshwater habitat mitigation credits at Liberty Island Conservation Bank in Yolo County.
 - b. **Essential Fish Habitat.** To compensate for impacts to Essential Fish Habitat (EFH) in Central and Suisun Bay, the permittee shall contribute \$83,500.00 to CalRecycle’s Estuary Clean Up Project by December 31, 2016. The permittee shall coordinate with Cal Recycle, NMFS and Commission staff regarding the distribution of the funds.
- F. **Water Quality.** The permittee shall:
1. Maintain, in good standing, a Water Quality Certification and Waste Discharge Requirements (WQC/WDR) for the life of this permit, and operate mining activity in accordance with those requirements. In the event that the WQC/WDR is suspended or revoked during the authorization period of this permit, the permit shall be suspended until such time that the WQC/WDR is reinstated or the duration of this authorization expires.

2. Undertake the Self Monitoring Program as described and required in the WQC/WDR and submit a copy self monitoring reports to Commission staff within 30 days of its completion and submission to the Water Board for review and approval. Commission staff will provide comments within 45 days of receipt of these reports.
3. Cease mining operations immediately whenever violations of WQC/WDR requirements are detected through the Self Monitoring Program. The permittee shall notify the Water Board and BCDC staff immediately by telephone and email whenever violations are detected. Operations shall not resume until alternative methods of compliance are provided and a corrective action plan that provides alternative methods of compliance are developed by the permittee is agreed to by the Water Board and Commission staff.

G. Studies to Improve Scientific Understanding of Sand Mining Impacts. In order to increase the understanding of the physical and biological system, and the potential impacts of sand mining on them, the permittee shall participate as needed in the following scientific studies.

1. **Sand Budget, Transport and Mining Effects.** The permittee shall contribute up to \$960,168.00 towards scientific studies to increase the understanding of the following: (a) the San Francisco Bay sand budget; (b) sand transport into the Bay from the Delta and local tributaries; and to the outer coast (San Francisco Bar and Ocean Beach); (c) the amount and type of sand available for use; (d) and the impacts of mining on the sand resource. This funding will be combined with funding from Lind Marine and Suisun Associates for a total of \$1.2 million to create a technical advisory committee and an to independent science panel and to implement the studies.
 - a. **Funding for Sand Studies.** Pursuant to the schedule below, the permittee shall deposit \$960,168.00 for sand transport and budget studies described above, into the Coastal Trust Fund held by the California State Coastal Conservancy, which will be dispersed plus the interest for the purpose of conducting scientific studies that achieves the goals outlined above.

Funding Schedule:

- (1) \$240,042.00 by December 31, 2015;
- (2) \$240,042.00 by December 31, 2016;
- (3) \$240,042.00 by December 31, 2017; and
- (4) \$240,042.00 by December 31, 2018

If the deposits have not been made as scheduled above, this permit will be suspended until the deposits have been made.

- b. **Technical Advisory Committees and Independent Science Panels.** In order to accomplish the above-described studies, the Commission's Executive Director in consultation with the permittee and others, such as the California Ocean Science Trust, shall appoint a Sand Studies Technical Advisory Committee (SSTAC) and Independent Science Panel (ISP) to guide the studies to completion. The SSTAC shall consist of the permittee's representative, regulatory and resource agency representatives as appropriate, and an independent study coordinator. The SSTAC, in consultation with the ISP, will identify the management questions that will be addressed by the studies and monitor study progress and results. The ISP will consist of independent scientists with expertise in the studies being considered and will be supported by the study coordinator. The ISP will recommend the type and scope of studies needed to address the management questions, as well as review (1) the study plans for their ability to address the management questions and (2) study results, conclusion and recommendations. The study coordinator will finalize the study plans collaboratively with the ISP and work with the Coastal Conservancy to contract for and manage the studies.
2. **Benthic Ecology and Mining Effects.** The permittee shall contribute up to \$220,000.00 towards scientific studies to increase the understanding of the San Francisco Bay benthic ecology and effects of sand mining on that ecology, pursuant to the NMFS' 2015 biological opinion, dated January 26, 2015, and the conditions herein, for the authorized project. The benthic study shall be conducted in the following manner:
 - a. A Benthic Ecology Technical Advisory Committee (BETAC) shall be developed, including one permittee representative, members of the regulatory and resource agencies, as appropriate, and representatives from the scientific community with expertise applicable to assessing benthic communities, and impacts associated with multiple disturbance events. The BETAC will develop the study purpose and management questions.
 - b. In collaboration with the permittee, the BETAC will develop, a project statement of work by October 31, 2015 and submit that statement of work to the Commission, Water Board and NMFS staff for review and approval. The statement of work shall include management questions to be studied, study objectives, general requirements, contract management, contractor qualifications, deliverables, schedule and evaluation factors of the study.
 - c. Once approved, the statement of work will be distributed widely to the scientific community as a request for proposal (RFP), for a minimum of one month and a maximum of four months.
 - d. The proposals will be reviewed and selected by the BETAC based on evaluation factors described in the statement of work, and select a qualified researcher(s)/contractor(s) will be selected within six months of completing the statement of work.

- e. The selected researcher(s)/contractor(s) shall provide quarterly updates to the BETAC, until the study is complete.
 - f. A draft report shall be provided to the BETAC within three months of study completion for review and comment.
 - g. The final report must be submitted by March 31, 2018, for review and consideration by the BETAC, the Commission, the Water Board and NMFS staff.
3. **Water Effluent and Mining Effects.** By June 30, 2015, unless modified by the Water Board, the permittee shall implement a water quality effluent study, in accordance with and as described in the Water Board's WQC/WDR dated January 21, 2015. The effluent study shall characterize overflow toxicity, suspended sediment levels, conventional and toxic pollutant concentrations, the spatial and temporal extent and magnitude of the overflow plume at depth and the surface in comparison to existing conditions. In addition, the study shall be reflect and be representative of the permittee's mining areas, as well as tidal and seasonal variations.

The permittee shall submit to Commission staff the results of the Water Board approved Sampling and Analysis Plan for review and consideration not more than 60 days after data collection, but not later than June 30, 2017, and concurrently with submission to the Water Board. The Commission staff shall review and provide comment on the document within 60 days of receipt of the report.

4. **Study Reports and Review.** In October 2016, the permittee shall provide a report to the Commission, the status of the mining activity, mining effluent study, and the progress of the TAC and study work plans. In October 2018, the permittee, shall provide a report to the Commission on the change analysis of the 2018 multibeam survey, the benthic study, and status of the sediment studies. The permittee shall work with the Commission staff to determine whether and when additional updates are needed as well as any adjustments to the study timelines and associated due dates described below.

The permittee shall provide the above-described studies to the Commission staff, the Water Board, the USFWS, NMFS, CDFW and the USACE for review and approval not later than the following:

- a. **Bathymetric Surveys and Change Analysis.** The first survey and report shall be provided not later than October 1, 2018. The second survey and report shall be provided not later than October 1, 2023.
- b. **Sand Budget and Transport Studies.** The permittee, in coordination with the TAC and the IPS, shall provide the findings in report form with recommendations for further consideration not later than October 1, 2020 or later date as established by the TAC.
- c. **Benthic Ecology Study.** The findings from this study shall be provided in a report form, with recommendations for further consideration not later than March 31, 2018.

- d. **Effluent Study.** The results of the Sampling and Analysis Report shall be provided not later than June 30, 2017.
- H. **Mining Activity Reporting.** For the duration of the authorization, the permittee shall provide to the Commission the following written reports according to the described schedule regarding the mining activity. The report shall be on company letterhead and include the name of the permittee, the date of the report, the permit number, and the signature of an authorized representative verifying the accuracy of the report, for the life of the authorization.
1. **Quarterly Reports.** Beginning on July 31^{, 2015}, and within 30 days of the end of each quarter thereafter (March 31st, June 30th, September 30th and December 31st) of each year until 2025, the permittee shall provide the following in writing to BCDC:
 - a. The start and end dates of the reporting period;
 - b. The quantity of sand mined during the preceding quarter in cubic yards per month, the total volume for the quarter and the cumulative total for the permit year;
 - c. The number of mining episodes that took place during the preceding quarter;
 - d. The name and registration number of each dredge used during the preceding quarter;
 - e. The location(s) where the sand was deposited for resale during the preceding quarter, including the company name(s) and sand yard address(es);
 - f. The approximate amount of usable remaining sand (in cubic yards) and the total remaining sand for the mineable lease area down to minus 90 feet MLLW and how this volume was calculated;
 - g. Any collisions, near collisions or other navigation problems or conflicts encountered during the quarter's sand mining operations, including any conflicts in use of an area with recreational or commercial fishing vessels; and
 - h. The mining locations, including track lines with the start and end point of each mining event that took place during the proceeding quarter mapped on the most current available NOAA chart, including a scale and a north arrow, with the boundaries of the lease overlaid on the chart. The tracking data, including latitude and longitude of the mining event will be provided in csv (electronic spreadsheet) format. The track lines should differentiate between the traveling or maneuvering periods of a mining episode and the actual sand mining periods. The mining episode recording equipment must meet the minimum reporting accuracy of ten feet during all loading and transportation operations, and shall record position at a maximum time interval of 10-seconds while within 2,000 feet of the lease area, and at one minute intervals otherwise. These plots and the raw data from the automated system shall also be made available for

electronic download from an interagency accessible ftp site and by compact disc. If the information is provided via the internet by the required report date, the compact disc copy can be provided in a timely manner after the required reporting date.

2. **Annual Report.** By April 30th of each year, beginning in April 2016, the permittee shall submit a summary report of the activities of the previous year. The annual report shall include:
 - a. A summary of the above quarterly report information and discussion of any anomalies, trends, or other additional findings;
 - b. The annual rolling average to date for the Central Bay lease areas;
 - c. A written summary of compliance inspections;
 - d. The current status of the implementation of each mitigation measure;
 - e. An assessment of the effectiveness of each minimization and mitigation measure in reducing impacts;
 - f. The total annual water diversion from sand mining as described in the amended CDFW ITP specifications for reporting;
 - g. A description of any take of listed species, including type and number; and
 - h. The status of the studies and any interim findings.
3. **Report acceptance.** When the above listed reporting requirements are also required by the U.S. Army Corps of Engineers, the Water Board, NMFS, USFWS and/or CDFW, Commission staff will accept the reports written for the other agencies provided that all of the information required by this authorization is included in either of the submitted report(s). If all the required information is not provided in the above submitted reports to the other agencies, a supplement can be provided to the Commission with the additional information required by this permit.
 - I. **Modification or Revocation of Permit.** This authorization may be modified, suspended or revoked if, at any time during its effective life, it is determined by or on behalf of the Commission, as described in 14 CCR Section 10261, through the monitoring reports, study of sand mining and its effects on physical or biological resources, or new information, that the authorized activities are resulting in (1) substantial depletion of sand such that the sandy deep water habitat is not being conserved, and/or (2) significant adverse impacts to Bay resources are occurring that cannot be avoided or mitigated unless the permittee requests and agrees to amend this authorization to include measures that the Commission or the Executive Director finds will avoid or fully mitigate for the significant adverse impacts caused by this activity.

- J. **Observe and Inspect Operations.** Observers, researchers, and members of the Resource and Regulatory Agencies, including Commission staff, shall be allowed to come aboard the dredge to observe the sand mining operations and to gather information on any effects hydraulic sand mining may have on mineral or aquatic resources. In addition, the representatives from the regulatory and resource agencies shall be allowed to inspect the captain's logs for each mining episode, equipment, yards and practices.
- K. **Vessel Traffic Safety, Oil Spills and Hazardous Materials.** Sand mining operations shall comply with the Operating Procedures for the Vessel Traffic Safety System of San Francisco Bay, monitored by the U.S. Coast Guard, to avoid any hazard to commercial or military navigation and to prevent potential oil or other hazardous materials from entering the Bay. In addition, the permittee shall:
1. Inspect on a daily basis and maintain equipment operated within the Bay or channels to prevent leaks of contaminants or hazardous materials into the Bay.
 2. If required by the CDFW's Office of Oil Spill and Response (OSPR), maintain and implement a plan, reviewed and approved by OSPR, demonstrating that adequate measures are in place to prevent and respond to accidental releases of hydraulic fluids, solvents, oils, and other hazardous materials, and provide a copy of the approved plans to Commission staff.
 3. Notify Commission staff immediately by telephone and e-mail whenever a release of petroleum products or toxic chemicals to waters of the State occurs as a result of sand mining activity. The notification should identify the nature of the spill, describe the action necessary to remedy the condition, and specify a timetable, subject to the modifications of the Water Board and the Commission, for remedial actions.
 4. Immediately stop and, pursuant to pertinent state and federal statutes and regulations, arrange for repair and clean up by qualified individuals of any fuel or hazardous waste leaks or spills at the time of occurrence, or as soon as it is safety allows.
- L. **Property Interest.** The current State Lands Commission lease is valid until December 31, 2022. Written documentation of the lease renewal shall be submitted to the Commission's office within 30 days of the issuance of the renewal. In the event that the permittee fails to obtain a new lease or prior to the expiration of the existing lease, and/or holdover status is not established, this permit shall become null and void.
- M. **Surface Mining Reclamation Act (SMARA).** The Department of Conservation has approved the mining reclamation plan for this site and has a copy of it on file. The approved Reclamation Plan is incorporated herein by reference, and all the conditions will become conditions of this amended permit.

- N. **Hold Harmless and Indemnify.** The permittee shall hold harmless and indemnify the Commission, all Commission members, Commission employees, and agents of the Commission from any and all claims, demands, losses, lawsuits, and judgments accruing or resulting to any person, firm, corporation, governmental entity, or other entity who alleges injuries or damages caused by work performed in accordance with the terms and conditions of this permit. This condition shall also apply to any damage to property that is alleged to be caused as a result of some action or lack of action by the Commission developing from the processing of and issuance of this permit.
- O. **Liability for Costs and Attorneys Fees.** The permittee shall reimburse the Commission and the State of California, through the Office of the Attorney General, in full for all costs and attorneys fees incurred by the Commission and the State of California, through the Office of the Attorney General, in connection with the defense of this permit in a judicial challenge to the permit brought by a party other than the permittee against the Commission, its officers, employees, agents, successors. Reimbursement for attorneys fees and costs shall include: (1) any court costs and attorneys fees that a court orders the Commission to pay in connection with a successful challenge to the permit, and (2) attorney fees and costs incurred by the Commission and the State of California, through the Office of the Attorney General, in defense of the permit in a judicial challenge to the permit. Notwithstanding these reimbursement requirements, the Commission retains complete authority to independently conduct and direct its defense of the permit in any judicial challenge to the permit. The permittee's obligation to reimburse the costs and attorneys' fees incurred by the Commission shall terminate if the Commission, in exercise of its independent authority, takes a position in the litigation that is adverse to the permittee.

III. Findings and Declarations

This authorization is given on the basis of the Commission's findings and declarations that the work authorized herein is consistent with the McAteer-Petris Act, the *San Francisco Bay Plan* (Bay Plan), the California Environmental Quality Act (CEQA), and the Commission's amended coastal zone management program for San Francisco Bay for the following reasons:

- A. **Natural Resources.** The Bay Plan Subtidal Areas policy 1 states, "[a]ny proposed filling or dredging project in a subtidal area should be thoroughly evaluated to determine the local and Bay-wide effects of the project on: (a) the possible introduction or spread of invasive species; (b) tidal hydrology and sediment movement; (c) fish, other aquatic organisms and wildlife; (d) aquatic plants; and (e) the Bay's bathymetry. Projects in subtidal areas should be designed to minimize and, if feasible, avoid any harmful effects." Subtidal Areas Policy 2 states, "[s]ubtidal areas that are scarce in the Bay or have an abundance and diversity of fish...and wildlife (...sandy deep water or underwater pinnacles) should be conserved. Filling, changes in use; and dredging projects in these areas should therefore be allowed only if: (a) there is no feasible alternative; and (b) the project provides substantial public benefits."

Similarly, the Bay Plan policies on Fish, Other Aquatic Organisms and Wildlife policies state, “[t]o assure the benefits of fish, other aquatic organisms and wildlife for future generations, to the greatest extent feasible, the Bay’s...tidal flats, and subtidal habitat should be conserved, restored and increased.” The policies also state that specific habitats that are needed to conserve, increase or prevent the extinction of any native species, including special status species, should be protected.

The Bay Plan policies on Tidal Marsh and Tidal Flats also seek to protect both habitat and wildlife. Policy 1 states, in part, that “tidal flats should be conserved to the fullest possible extent” and that “dredging projects that would substantially harm...tidal flats should be allowed only...if there is no feasible alternative.” Policy 2 states that “[a]ny proposed...dredging project should be thoroughly evaluated to determine the effect of the project on...tidal flats, and designed to minimize, and if feasible, avoid any harmful effects.” The Bay Plan policies on Recreation state, in part that “[s]andy beaches should be preserved, enhanced, or restored for recreational use...”

The project authorized by this permit involves the mining of approximately 1.141 million cubic yards of sand annually, with “peak year” mining of not more than 1.395 million cubic yards, on a rolling average basis, from four State Lands Commission tidelands parcels between Angel Island, Alcatraz Island and the Golden Gate Bridge in Central San Francisco Bay. The total project would be limited to the extraction of up to 11.41 million cubic yards of sand over a ten-year period of time.

Originally, the permittee requested mining of up to 1.54 million cy per year for a total of 15.4 million cy over ten years. But through discussions with the regulatory and resource agencies, examination of the scientific record, and discussions with Commission staff as described below, the permittee agreed to reduce the project volume to 1.141 million cy of mining annually, a level similar to the environmentally superior alternative that was included in the State Lands Commission Final Environmental Impact Report (FEIR).

The four lease areas, PRC 709.1 (Presidio Shoals); PRC 2036 (Point Knox Shoal South); PRC 7779.1 (Point Knox Shoal); and PRC 7780.1 (Alcatraz South Shoal) consist of one to three parcels per lease, and together total 2,601 acres in size. Equipment limitations in Central Bay limit the mining activity to areas with depths between minus 20 feet MLLW and minus 90 MLLW. One lease parcel (PRC 7779 North), located in Raccoon Strait, is not currently mined because the sand shoals are too deep for mining equipment to access the sand. In addition, buffer zones along shorelines and rocky habitat ensure that mining occurs offshore of Central Bay islands.

Mining activity is not uniformly distributed throughout the lease area, but is rather concentrated in areas with the desired grain size of sand. Analysis of mining tracking over three years showed that consecutive mining activity impacts between 19 and 37 acres of the lease area using a three-meter in width mining track.¹ Consecutive mining

¹ NMFS Analysis of Sand Mining Disturbance and Recommendations for Tracking Data Format and Benthic Study Process 2014.

activity would likely result in loss of habitat function due to inability of the site to recover from impacts between mining events. Some recovery could occur in the remaining acreage even with impacts from mining activity. Conversely, the permittee has stated that it would only mine the volume of sand that was demanded by the market, and any remaining volume would not be mined as the company lacks the ability to stock pile sand due to its limited shore side sand yards.

1. **Physical and Biological Effects.** Bay Plan policies direct the Commission to thoroughly evaluate the project's local and Bay-wide effects on the physical and biological resources of the Bay and minimize potential harm.
 - a. **Physical Resources.** The project, as described, includes removal of up to 11.41 million cy of sand from 2,601 acres of subtidal sandy deep water shoals over ten years. Potential project impacts include changes to sediment dynamics, including sediment transport and erosion, water currents and velocity, and salinity.

Sand in Transport. Sand enters the estuary from several sources, including the Delta, local tributaries, coastal bluffs and cliffs, and the Pacific Ocean via the Golden Gate. The sand transport appears to be confined to the high-energy deep water channels. Within these channels there are large underwater dunes, and shoals made up of smaller sand "ripples." Current research indicates that, since 1998, Suisun Bay, San Pablo Bay and Central Bay are in an erosional state due to reduced sediment supply from the Delta.²

Recent mineralogy and biogenic/anthropogenic provenance studies completed by researchers at the US Geological Survey (USGS), have reinforced the primary pathway for sand in the Bay from the Sacramento and San Joaquin rivers, through Central Bay to the outer coast.³ The contribution of the local tributaries to Central Bay and coastal areas, however, is not well understood. In reviewing the available scientific literature, it appears that sand supply to the Bay, and thereby the coast, may be limited. Water control structures in the Delta, flood control channelization and other sand sinks, limit annual flow variability, with the exception of years with very high precipitation sufficient to move large volumes of sand.

The proposed project includes mining up to 1.141 million cy of sand annually. This volume of mining would appear to appear to be more than all of the sand estimated to enter the system from the Delta annually, Therefore, the additional sand volume would either be relic sand or sand already in transit in the Bay system and to the coast.

² Schoellhamer, "Sudden Clearing of Estuarine Waters upon Crossing the Threshold from Transport Supply Regulation of Sediment Transport as an Erodible Sediment Pool Is Depleted: San Francisco Bay, 1999," *Estuaries and Coasts* 34, no. 5 (2011)

³ Barnard et al. 2013; McGann et al. 2013.

Relic Sand. Relic (bedded) sand makes up the majority of deep deposits in Central Bay. This sand was likely deposited over thousands of years. A seismic refraction survey through Central Bay by the USGS identified bedrock at varying depths, and overlying sediment between 0 to 100 meters thick with the largest area being less than 30 meters thick, but there are no comprehensive surveys or data sets that show the actual depth, grain size or quality of the sediment between the sand shoals and the bedrock.⁴

In the permittee's 1999, "due diligence" review of the lease areas, coring samples showed wide-ranging differences in grain sized from fine clay to gravel, both laterally and by depth across the lease areas. Overall, these cores depict a deep sand bed that is not homogenous, but rather has a mix of sediments, with the majority being sand of differing grain size. In the early 2000s, the San Francisco Airport Expansion Project estimated that there was at least 60 million cy yard of sand available at depths down to 90 feet MLLW in areas that overlapped somewhat with the sand mining lease areas. The grain size or quality of this sand is unknown.

Analysis. The Bay Plan Subtidal Policy 1 directs the Commission to thoroughly analyze the projects effects on tidal hydrology and sediment transport as well as Bay bathymetry. The FEIR provided analysis of potential impacts to tidal hydrology and sediment transport. The project evaluated in the FEIR was 2.02 million cubic yards of mining activity annually for ten years in both Central and Suisun Bays. The reduced project alternative, also the environmental superior alternative, allowed mining of up to 1.426 million cubic yards per year for ten years for all lease areas.

The authorized project described herein (Central Bay leases only) would allow mining up to 1.141 million cy averaged annually with allowances for peak mining years of up to 1.395 million cy in any year, so long as the average of 1.141 million cy was maintained, and the total volume does not exceed 11.41 million cy over ten years. While the FEIR, did not contemplate peak year mining, the total authorized volume in this permit is within the environmentally superior alternative's total volume, and allows for years with less mining activity and some years with more mining activity to adjust to market demand. In addition, this authorization further reduces mining activity on lease parcels within the transport pathway for sediment to the outer coast.

To assess the potential project effects on tidal hydrology, salinity and sediment transport, FEIR relied on a qualitative as well as quantitative numerical model. Impacts were evaluated by comparing the existing condition with two project-condition scenarios. The model results were intended for use qualitatively to help evaluating the relative magnitude of change.⁵ The model found little

⁴ USGS 1967-68 Acoustic Profiling and 1997 USGS Bathymetry, Chin et al. 2000

⁵ FEIR, 2012, pg. 4.3 - 33

change to tidal hydrology or salinity outside the lease areas. The simulations indicated that the changes in sand transport patterns during both ebb and flood currents; and net transport are limited to the lease areas and areas immediately adjacent to the lease areas.

As explained above, the Central Bay sand shoals are largely dependent on bedded and sand transported from the Delta and local tributaries and to a lesser extent on sand coming from the outer coast.⁶ According to the FEIR and USGS, approximately five to fifteen percent of the sand mined from the lease areas (1997 through 2008) is being replaced by natural processes.⁷ The FEIR also found that since the proposed mining can be expected to further deepen the mining holes within the lease areas, there is the potential that these holes will attract and trap more sediment in the future.⁸ The FEIR states that since the mined areas are not being replenished at an appreciable rate, the effects on sand transport beyond the lease area are minimal. In letters to the Commission from San Francisco Bay Keeper and the California Coastal Commission, these organizations argue that modeling did not include all sand inputs into the system and important known transport mechanisms within the Central Bay. Special Condition II-G(1) is included to herein to provide information to better understand the sand transport system.

Bay Bathymetry. Mining removes sand from the Bay bottom altering its bathymetry as shown in multibeam surveys first completed in 1997, again in 2008 and most recently in 2014. The USGS and the FEIR bathymetric change analysis and found that that Central Bay sand shoals are erosional, with some mined areas showing depressions of over two meters in depth, and the net loss of sand five times greater within mining lease boundaries compared to non-lease areas.⁹ During the ten year period of the study, 13.5 million cubic yards of sand were mined from Central Bay; within mining lease boundaries, approximately five percent of this was replaced by natural processes.¹⁰ The period of the highest mining also corresponded to a period of notable bathymetric change and erosion in the mining areas within the leases¹¹.

After the FEIR was completed, an additional multibeam change analysis was completed by the USGS as a result of a BCDC permit condition. Between 2008 and early 2014, the opposite trend was observed: Central Bay gained more sand than it lost. Mining volumes during this period were 2.2 million cubic yards, which is significantly less than the 13.5 million cy mined between 1997 and 2008. Due to noise in the data, it is not possible to directly estimate the volume

⁶ Barnard et al., 2013

⁷ CHE 2009 [FEIR Appendix G]

⁸ FEIR, 2012, pg. 4.3 -30

⁹ Barnard and Kvitek, 2010

¹⁰ Fenical et al., 2009.

¹¹ Barnard and Kvitek. 2010.

of sand that replenished naturally. However, we can compare lease areas to non-lease areas; accumulation was 79 percent faster outside of mining leases compared to inside lease boundaries.¹² It is unknown why the overall patterns of sand gain and loss were different between these two time periods.

The FEIR found that: (1) the reported mining volumes are approximately equal to the measured erosion from 1997 to 2008; (2) net bottom erosion due to sand mining has largely been contained within the lease and immediately adjacent areas; (3) it appears that sand mining in Central Bay is not likely to cause measurable sediment depletion in areas outside the mining areas within the proposed ten year mining period; (4) the project can be expected to further deepen the mining holes, and there is the potential that these holes will attract and trap more sediment in the future; and (5) analysis should be performed prior to subsequent issuance of leases for mining these areas.¹³

The authorization to mine up to 11.41 million cy over the next ten years is roughly equivalent to that which occurred between 1997 and 2008 where the multibeam surveys first detected the erosional areas within the leases. This could be expected to have similar effects over the next ten year period, potentially changing Bay bathymetry an additional two meters, depending on how the mining is conducted.

Bed Forms. Bay bathymetry also describes the shape of the Bay bottom and how it relates both to sediment movement and habitat features. Sand shoals can be flat, rippled or large waves and can be described as underwater sand dunes that have both crests and troughs. The shape is specific both to grain size and the hydrology that creates them. Larger features are found in higher energy areas, where calmer waters produce flatter, less distinct shoals. Sand mining activity changes the wave form and the grain size of the mined area.¹⁴ Recent studies have shown that sand crests are shorter and flatter, and the grain size is smaller than would be predicted in this area given the existing tidal hydrology.¹⁵ What this means to the overall sediment transport and tidal hydrology of the area is unknown at this time.

Bay Beaches The Bay Plan Recreation policies state that “[s]andy beaches should be preserved, enhanced, or restored for recreational use...consistent with wildlife protection.” Historically, the west side of San Francisco had broad beach and dune systems, and the east side of Central Bay had many beaches.¹⁶ Though the Bay shoreline has been altered, some sandy beaches still exist, and provide shoreline protection, habitat, and recreational opportunities. Little is known about the transport dynamics to beaches and therefore, it is difficult to

¹² Patrick Barnard, *Draft Report: Bathymetric Change Analysis for West-Central and Suisun Bay, 2008-2014* (U. S. Geological Survey, 2014).

¹³ FEIR pg 4.3 -29/30

¹⁴ SLR EIR

¹⁵ Barnard, 2014

¹⁶ R. Olmstead and N. Olmstead, *Ocean Beach Study: A Survey Of Historic Maps And Photographs* (City of San Francisco, California, February 23, 1979., n.d.); EcoAtlas, California Wetlands Monitoring Workgroup (CWMW), accessed June 27, 2014, <http://www.ecoatlas.org>.

assess the project's potential impacts to them. East Bay beach sand have been described as being supplied by both local cliff-derived soils and subtidal Central Bay sand.¹⁷ However, there is no current data or studies that connect sand mining with any erosion of Bay beaches. The reduction in mining authorized along the Bay's western beaches may reduce potential impacts to Crissy Field or Lands End. Additional transport information is needed to determine if this conclusion is substantiated. With sea level rise, increasing amounts of sand will likely be needed to prevent erosion and to allow the landward migration of Bay beaches, as well as supplying the outer coast beaches that protect infrastructure and development.¹⁸

Tidal Flats. The Bay plan requires that the Commission thoroughly evaluate dredging projects to determine the effect of a project on tidal flats. Unfortunately, even less is known about how sand transport to and from these areas affects tidal flats. A review of the available research did not identify information about tidal flats beyond discussions of mudflats adjacent to marshes.

The Outer Coast. Sand transport continues from the Bay to the San Francisco Bar and then south along the coast. Examination of the bathymetric record of the Bay shows that it has shrunk both in height and diameter, and migrated approximately 1 kilometer towards the shoreline.¹⁹ This overall reduction is likely due to reduced sediment supply (as a result of hydrologic modifications upstream, mining, and dredging), and reduced tidal flows (due to historic filling, diking, and sedimentation of the Bay), resulting in reduced levels of sediment exiting the Bay.²⁰ The reduction in the Bar has effectively resulted in more sand accumulating on northern Ocean Beach, and less to southern Ocean Beach, likely exacerbating erosion to the south.²¹ Modeling has demonstrated that changes to the Bar affect wave energy reaching the shoreline, with northern Ocean Beach being protected, and southern Ocean Beach being more exposed.²² These changes help explain recent accretion at Baker Beach, Crissy Field, and northern Ocean Beach, and partially explain erosion at southern Ocean Beach. Though there are many large and small scale factors affecting sand supply and transport in the Bay system, removing sand from sandy shoals, particularly those along the northwest San Francisco waterfront such as Presidio Shoals that have a net transport to the outer coast, potentially affects sand

¹⁷ Hein, Mizell, and Barnard, "Sand Sources and Transport Pathways for the San Francisco Bay Coastal System, Based on X-Ray Diffraction Mineralogy."

¹⁸ Barnard et al., 2013

¹⁹ Kate L. Dallas and Patrick L. Barnard, "Anthropogenic Influences on Shoreline and Nearshore Evolution in the San Francisco Bay Coastal System," *Estuarine, Coastal and Shelf Science* 92, no. 1 (2011): 195–204.

²⁰ K. L. Dallas and P. L. Barnard, "Linking Human Impacts within an Estuary to Ebb-Tidal Delta Evolution," *Journal of Coastal Research Special*, no. 56 (2009): 713–16.

²¹ Jeff E. Hansen, Edwin Elias, and Patrick L. Barnard, "Changes in Surfzone Morphodynamics Driven by Multi-Decadal Contraction of a Large Ebb-Tidal Delta," *Marine Geology* 345 (2013): 221–34.

²² Dallas and Barnard, 2011

supply to the Bar and outer coast beaches.²³ The FEIR found that, based on certain “worst case hypothetical mining scenarios,” mining 20 million cy of sand at Central Bay would likely contribute only 0.2 to 0.3 percent of the annual observed erosion of the Bar over a 10-year period.²⁴ “Due to the conservative assumptions incorporated in the model, the Project’s actual reductions in sediment supplies at the Bar were expected to be less than the modeling results and deemed immeasurable.” However, the FERI further stated, “[i]f the overall reduction in sediment supply in the Bay-Delta system is the cause, or a contributing cause, of the erosion of the San Francisco Bar, it would be reasonable to conclude that the [sand mining] Project could make a considerable contribution to this process. A final statement in the FEIR states that “research may shed additional light on the causes of erosion of the San Francisco Bar.” This authorization includes further reduction of mining volumes on the southern parcels of PRC 709 (south) and PRC 7780 (south), the two lease areas with net transport seaward as determined by separate analysis of both the USGS and CHE.

The Bay Plan Subtidal Areas policies state, “projects in subtidal areas should be designed to minimize and, if feasible, avoid any harmful effects.” This authorization will allow mining up to 1.141 million cy of sand from the Central Bay annually, with peak mining years of 1.395 million cy, for a total of not more than 11.41 million cy over a ten-year period. The permittee has amended the application to reduce the project volume from the original request of 1.54 million cy per year for a total of 15.4 million cy over ten years. This is a reduction of the overall mining request of 399,000 cy per year and 3.99 million cy over ten years, which will reduce impacts to Bay bathymetry and bedforms, because less mining is authorized. In addition, the applicant has agreed to reduce mining activity further on the two lease areas that are in the direct net transport to the outer coast, further reducing potential impacts to the San Francisco Bar and Ocean Beach. Further, due to the on demand nature of the mining activity and the limited stockpiling capability of the company’s sand yards, sand would only be mined on an “as needed basis.” The on demand nature and the revised volumes minimize the potential impacts to the physical system.

In addition to reducing the authorized volume of sand mining, Special Condition II-D(1) and (2) requires multibeam surveys and change analysis every five years to further assess mining impacts on bathymetry. Special Condition II-G requires the formation of a TAC and studies directed at better understanding the

²³ Patrick L. Barnard et al., “Integration of Bed Characteristics, Geochemical Tracers, Current Measurements, and Numerical Modeling for Assessing the Provenance of Beach Sand in the San Francisco Bay Coastal System.”; Patrick L. Barnard et al., “Sediment Transport Patterns in the San Francisco Bay Coastal System from Cross-Validation of Bedform Asymmetry and Modeled Residual Flux.”

²⁴ Scott Fenical et al., *Technical Report: Analysis of Impacts of Sand Mining in the San Francisco Bay on Sediment Transport and Coastal Geomorphology in San Francisco Bay, Suisun Bay, and Outside the Golden Gate*, 2013.

²⁴ Scott Fenical et al., *Technical Report: Analysis of Impacts of Sand Mining in the San Francisco Bay on Sediment Transport and Coastal Geomorphology in San Francisco Bay, Suisun Bay, and Outside the Golden Gate*, 2013.

physical system and the impacts from this and other sand mining projects have on the system. Special Condition II-G(4) requires that the Commission be updated regarding the progress of the TAC and the conclusions of their scientific findings. Special Condition II- I is a reopener clause that allows the Executive Director to modify, suspend or revoke this permit if significant adverse impacts are identified that cannot be minimized or mitigated.

- b. **Biological Resources.** The Commission's Subtidal Areas and Fish, Other Aquatic Organisms and Wildlife, Tidal Marsh and Tidal Flats policies, in summary state that sandy deep water habitat for native species, should be protected and conserved, particularly habitat areas essential for the survival of special status species. As with the physical impacts, the policies require the Commission to thoroughly evaluate the project impacts and to minimize harmful effects. When listed species may be affected, the policies require the Commission to consult with the appropriate resource agencies and the permittee to obtain "take" authorization.

Potential biological impacts associated with this project include: removal of the habitat; entrainment and impingement of native species; potential "take" of listed species; and increased suspended sediments, which may cause respiratory issues and behavioral changes. Entrainment occurs when an organism cannot swim or escape from the mining equipment and is sucked into the equipment. Impingement occurs when an organisms is trapped against a screen or some piece of equipment and cannot swim away.

NMFS defines habitats as "those waters or substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Because the project occurs subtidally, "habitat" in this analysis of the sand mining's impacts on Bay species is considered both to the sandy-bottom substrate of Central Bay floor and the overlying open water community. Sandy deep water habitat areas only account for about eight percent of the Bay floor, and are thus considered relatively "scarce in the Bay." The sandy deep water shoals in Central Bay are even more unique in that they occur in an area that is marine in nature, rather than brackish waters of other parts of the Bay, but are more sheltered than the environment of the outer coast. Sand is often considered a poor habitat for many benthic organisms, but there are some species that are specifically adapted to transitory environments and can survive in these dynamic environments.

Benthic Community. Organisms living within or on top of the sandy substrate would likely be impacted by the proposed project through direct removal of the top-layer (biologically active layer) of the benthic community, prey loss, habitat removal and fragmentation, or smothering of organisms by large debris disposed overboard during the mining operations. Disturbance and alteration of habitat from mining tracks may persist over time,²⁵ as shown in the 1997, 2008

²⁵ NMFS Biological Opinion. 2015

and 2014 multibeam survey of the mining area. These physical alterations include changes to grain size, shape of the sand shoals, and depth.²⁶ Biologically, the mining activities may cause changes in species composition, biomass, and diversity of the benthic community, but this is not well understood.

Regarding the direct impacts to the habitat from mining, the NMFS has analyzed three years of mining data and found that between 19 and 37 percent of the lease areas in Central Bay, leaving the remaining 63 to 81 percent of the lease areas either in a natural state or one where recovery can occur. Further, the permittee has stated that the benthic community (those animals living within the sand) can quickly recover either through emigration into the mined footprint or via spawning or settling of similar organisms in the water column and near by undisturbed areas. The FEIR included a benthic study, which examined the impacts of mining to the benthic community. The FEIR stated that changes to the benthos from mining activities, “do not appear to last more than a few years and do not appear to result in any detectable changes in infaunal composition or forage suitability.”²⁷ In its 2015 biological opinion, NOAA stated that the study was limited in sample size and duration. Additionally the scientists participating in BCDC’s Sand Mining Science Panel stated that little know about how fish and other organisms in the Bay utilize sandy deep-water habitats and shoals, and therefore this issue should be studied.²⁸ As part of this authorization, Special Conditions have been included to study the impacts to the benthic community from mining activity and the rate of recovery in areas that have been mined.

Commercially important species such as California halibut, English Sole and other flat fish as well as the juvenile Dungeness crab occur on the sandy bottom and utilize subtidal sand wave formations in the Bay.²⁹ The FEIR included analysis of CDFW status and trend data and an entrainment model assessment to estimate entrainment of prevalent species by sand mining operations. These entrainment estimates represented between <0.1% and 0.6% of the estimated Central Bay regional abundance index for each species. Based on similar fish entrainment studies from hydraulic dredging activities in the Pacific Northwest, it is evident that certain species such as Pacific sand lance are typically entrained in large numbers. Since the completion of the entrainment study, several minimization measures have been added that will likely avoid or substantially reduce entrainment of juvenile and adult open water fish species. These minimization measures include reduced mining volumes, the installation of a positive barrier fish screens on the mining equipment and specificity regarding priming and clearing of the pumps within three feet of the substrate.

²⁶ BCDC Sand Mining Science Panel. 2014

²⁷ SLC Sand Mining Environmental Impact Report, 2012, p. 41-44

²⁸ BCDC Sand Mining Science Panel. 2014.

²⁹ Subtidal Habitat Goals Report. 2010, NMFS Biological Opinion 2015

Along with bottom dwelling fish, the sandy habitat is home to macro invertebrates such as crabs and shrimp. Sand mining activities in San Francisco Bay are estimated to lead to the loss of less than 0.1% of the total annual crab harvest. Under the originally proposed project of 2.04 million cy, an estimated 1.2 million shrimp would be entrained during sand mining activities Bay wide,³⁰ with Blacktail shrimp estimated to be the most frequently entrained species in Central Bay. Along with fisheries, these invertebrates are important prey items for fish and other wildlife. Reduced mining volumes would reduce potential entrainment of these macro invertebrates.

Open Water Community. In addition to the Bay bottom, the project has potential impacts to the open water community through potential entrainment and impingement through the water intake (vent) pipe, and the creation of a fine grain sediment discharge plume, which can persist for approximately 3-4 hours after completion of the mining activity, until fully dissipating to background levels. Direct impacts to the open-water communities resulting from increased water column turbidity may include: impacts to visual foraging, susceptibility to predation and interference with migratory behavior,³¹ delayed hatching, and physiological impacts, including clogged gills or eroded gill and scales.³² Indirect impacts to important open-water species within the Bay may occur from a loss of benthic prey items or decreased productivity resulting from turbidity impacts to the planktonic and aquatic plant communities, which form the base of many food webs in the estuary. NMFS found that the likelihood of fish exposure to the elevated turbidity levels in the overflow plume on any given day would be low since there is a minimum of one full tidal cycle between mining events. Additionally the size of the overflow plume is relatively small compared to the amount of adjacent open-water areas in Central Bay.³³

Impacts to water column species associated through entrainment and impingement from the water intake pipes are limited to plankton, fish eggs and larval fish because the permittee has installed a positive barrier fish screen that limits entrainment of larger organisms, including adult and juvenile fish. In addition, the permittee is required to minimize entrainment of native and listed species from the water column by implementing the best management practice of priming hydraulic pumps within three feet of the Bay floor. This measure does not reduce entrainment of bottom dwelling organisms, but as discussed above, the predicted number of entrained individuals accounts for only a small portion of the total population within the Central Bay and would not likely

³⁰ *Ibid.*

³¹ NOAA NMFS. 2015. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation

³² SLC FEIR

³³ *Ibid.*

cause significant reductions in the populations of these bottom-dwelling species³⁴. However, some bottom-dwelling fish, crabs, shrimps and other organisms may be important prey items for listed species.³⁵

Essential Fish Habitat. NMFS determined the proposed project would have impacts on Essential Fish Habitat (EFH). The proposed project's potential long-term impacts on habitat utilization by certain species, recruitment back into the disturbed areas, direct removal of prey items for fish, impacts to foraging behavior and recovery of the benthic community is not well understood³⁶. While the FEIR benthic study found no significant difference in the biological community composition between recently mined sites and unmined sites,³⁷ as described above, the study was limited and is not considered by NMFS or Commission staff to be conclusive as to potential impacts. Studies from areas outside San Francisco Bay have examined recovery times after a benthic disturbance and identified that recovery can take months to years and that the disturbance of the biological community and physical changes to the habitat may result in loss of ecological function for the community³⁸. Additionally, mining events often reoccur within the same areas of the mining leases and thus the temporary impacts from a single mining event would be considered a chronic impact³⁹.

As part of the negotiations with NMFS, the permittee has agreed to fund a benthic study to better assess impacts from the mining event and this study is required herein. In addition, NMFS recommended that (1) an alternative source of sand be developed to minimize sand mining volumes extracted from the Bay to minimize benthic disturbance; (2) additional support or funding be contributed by the applicant to CalRecycle's efforts to remove anthropogenic debris from the Bay, which restores more natural habitat areas for fish; and (3) that the annual cumulative mining from Hanson Marine and Lind Marine not exceed the SLC EIR baseline volume (average from 2002-2007) to reduce impacts to EFH.

Federal and State Listed Species. The San Francisco Estuary has been designated as critical and essential habitat for many special status species of fish under the federal Magnuson-Stevens Act and the state and federal Endangered Species Acts. The listed species that occur in Central Bay include the endangered Sacramento River Winter-run Chinook salmon (*O. tshawytscha*); threatened Central Valley steelhead (*Oncorhynchus mykiss*); Central Valley Spring-run Chinook (*O. tshawytscha*); the green sturgeon

³⁴ Ibid

³⁵ NMFS Biological Opinion 2015

³⁶ NMFS Biological Opinion

³⁷ AMS Study 2009, SLC EIR

³⁸ NMFS Biological Opinion

³⁹ Ibid.

(*A. medirostris*); and longfin smelt (*S. thaleichthys*) and either live within or migrate through the project area. In addition, Pacific herring, a species of special concern spawn on hard substrates within Central Bay.

NMFS, the USFWS and the CDFW all consulted on this project and issued biological opinions (NMFS, USFWS), and incidental take permit (CDFW). The federal agencies determined that the project would adversely impact Delta smelt, salmonids and green sturgeon, but concluded the project would not jeopardize the continued existence of these species. CDFW made a similar determination for salmonids and longfin smelt in its incidental take permit. While the USFWS included Central Bay in its consultation, the requirements and recommendations of the biological opinion were specific to the Suisun Bay mining activities. Although the resource agencies agree that the project is likely to impact species and their habitat in the short-term, they also agree that project's long-term impacts on habitat utilization, recruitment back into the disturbed areas, direct removal of prey items for fish, changes to foraging behavior and recovery of the benthic community is not well understood.⁴⁰ The scientists participating in BCDC's Sand Mining Science Panel (2014) acknowledged that little is known about how fish and other organisms in the Bay utilize sandy deep-water habitats and shoals.⁴¹

To reduce potential impacts, the permittee has worked with the resource agencies to identify and implement a number of best management practices and minimization measures that were then incorporated into the biological opinions and incidental take permits. These measures and best management practices are also incorporated in the Commission's special conditions herein.

As compensatory mitigation for these impacts to listed species, NMFS and CDFW concurred that the purchase of mitigation credits at Liberty Island Conservation Bank would mitigate for take of listed species. Liberty Island Conservation Bank has been identified by the resource agencies as suitable compensatory habitat for the purchase of credits to fully mitigate for unavoidable impacts to smelt species and salmonids. The permittee has purchased the 0.017 acres of mitigation credits at Liberty Island as required by the NMFS biological opinion, incidental take permit and Special Condition II-E(3)(a).

In addition to impacts to listed species, the NMFS review under the Magnuson Stevens Conservation and Fisheries Management Act, also determined the project would have adverse effects on Essential Fish Habitat due to the removal of the substrate; destabilization and slumping of shallow water habitat areas adjacent to the mining area; removal of potential food prey items for species normally feeding on the benthic organisms, and increased turbidity, but as these impacts and the potential recovery is not well understood, NMFS has

⁴⁰ NMFS Biological Opinion. 2015 pg 47

⁴¹ *Ibid.*

required that the permittee provide funding to conduct a benthic study to evaluate the impacts of mining activities on species composition, densities, biomass of dominant taxa, species diversity, and impacts to substrate grain size, this requirement is incorporated in the Special Conditions herein.

Consistent with Bay Plan policies on Subtidal Areas, Fish, Other Aquatic Organisms and Wildlife, Tidal Marshes and Tidal Flats, and Recreation policies regarding beaches, the following minimization measures have been incorporated into this authorization.

To reduce impacts to the Bay bathymetry and sand transport the permittee has amended the application for the proposed project to further reduce the volume of sand mined over the ten-year period by approximately 4 million cy. In addition, the permittee has agreed to further reduce mining on the two lease parcels that research has shown contribute to sand transiting along the western shore of Central Bay and outer to the coastal beaches via the San Francisco Bar. This minimization of mining volume would reduce impacts to Bay bathymetry and the outer coast, and potentially Bay beaches. In addition, Special Condition II-E-1 limits mining to areas that are at least 200 feet from any shoreline, which further protects shallow water habitat and beaches that occur within the lease areas.

In order to both track mining activities and understand the potential impacts to Bay bathymetry and habitat, Special Condition II – D includes regular bathymetric change analysis of the Central Bay using multibeam surveys. Special Condition II-H requires quarterly and annual reporting on mining activities, including volumes mined and electronic documentation of where the mining has occurred. This both insures that mining occurs on the lease areas and outside of buffer zones, and provided the basis for further analysis of changes to Bay bathymetry and habitat.

Bay Plan policies require that projects that affect Subtidal Habitat be minimized to the extent feasible. This project affects both habitat and species that live in and move through the project area, as well as those that utilize adjacent areas as described above. The permittee has agreed to and incorporated a number of minimization measures into the project to reduce impacts to both habitat and species. These minimization measures have been included in the Special Condition section of this authorization as follows. Special Condition II-E (1)(a) limits mining to areas that are deeper than minus 9 feet MLLW and further than 200 feet from any shoreline. Special Condition II-E (1)(b) it requires that the permittee maintain and operate with fish screens installed on the water intake pipes, and inspect them regularly for entrained or impinged species, as well as damage to the screen. Special Condition II-E(1)(c) limits pump priming to within three feet of the Bay floor and will help minimize the entrainment of pelagic fish species. These minimization measures reduced impacts both to shallow water habitat and entrainment of listed fish species, however it will not likely prevent

the entrainment of many mobile and non-mobile, bottom-dwelling, fish and invertebrate species living in the deeper Bay floor. To reduce entrainment of fish and other bottom dwelling species on the surface of the sand, the permittee has stated that the equipment is maintained in the substrate during mining activities to the extent feasible.

Special Condition II - E(2) includes requirements for a designate biologist, a worker education program, and monitoring of the minimization measures and potential “take” of species to ensure compliance with this authorized as conditioned.

- c. **Mitigation.** The Commission’s policies on Mitigation state that “[p]rojects should be designed to avoid adverse environmental impacts to Bay natural resources such as...fish, other aquatic organisms and wildlife habitat, subtidal areas...or tidal flats. Whenever adverse impacts cannot be avoided, they should be minimized to the greatest extent practicable...and measures to compensate for unavoidable adverse impacts to the natural resources of the Bay should be required.” Additionally, Bay Plan Mitigation Policy 2 states in part, “[i]ndividual compensatory mitigation projects should be sited and designed within a Baywide ecological context, as close to the impact site as practicable, to: (1) compensate for the adverse impacts; (2) ensure a high likelihood of long-term ecological success; and (3) support the improved health of the Bay ecological system...” Bay Plan Mitigation Policy 6 states, “[m]itigation should, to the extent practicable, be provided prior to, or concurrently with those parts of the project causing adverse impacts.”

The impacts to Bay resources from the proposed mining activity would include impacts specific to the lease areas as well as potential impacts beyond the lease boundaries. As previously discussed in this recommendation, the potential impacts that cannot be avoided all together from this project include: (1) entrainment of special status and native species through the suction pipe; (2) entrainment of the eggs or larval stages of special status and native species through the screened water intake pipe; (3) temporary increases in suspended sediment loads; (4) degradation of sandy habitat by removal of prey and benthic invertebrates; and (5) degradation of habitat through bedform disruption and modification of substrate, both in changes in the grain size of the sand and sand wave formation.

In addition, potential impacts beyond the lease boundaries include reduction in sand supply to the system, including Bay shoals, the San Francisco Bar and potentially southern Ocean Beach. Other impacts may include impacts on the population of fish and other organisms that may live both within and outside the lease area.

Compliance with Special Condition II – E(1)(b) of this permit, reduces the project impacts to juvenile and adult threatened and endangered species through the installation of a fish screen. The NMFS and CDFW review identified, potential “take” of listed species and mitigation has been required. Impacts to EFH for Pacific Groundfish, Pacific Coast Salmon, and Coastal Pelagic species, as determined by NMFS, cannot be further reduced or minimized due to the nature of the mining activity and direct removal of prey items, displacement of preferred forage species and habitat disturbance, and therefore mitigation for EFH impacts is required.

The policies provide that, when compensatory mitigation is necessary, it should be coordinated with all affected local, state, and federal agencies having jurisdiction or mitigation expertise to ensure, to the maximum practicable extent, a single mitigation program that satisfies the policies of all the affected agencies.” These policies allow the Commission to use mitigation banking provided that any credit or resource bank is recognized pursuant to written agreement executed by the Commission. The listed species impacted by this project include longfin smelt, and salmonids. According to the Resource Agencies, it is difficult to develop habitat for these species as mitigation, so it is appropriate to use an established mitigation bank.

Liberty Island Conservation Bank has been established, and according to the Resource Agencies provides appropriate habitat for both the longfin smelt and salmonids. While it is at considerable distance from the authorized project and its associated impacts, it is currently the only site available at this time. Special Condition II-E(3)(a) requires the purchase of 0.017 mitigation credits at Liberty Island Conservation Bank as compensatory mitigation for the “take” of longfin and salmonids during the authorized project in accordance with the biological opinions and incidental take permit for this project. The permittee has purchased the required credit.

To address the impacts of sand mining to EFH in Central Bay, the permittee proposed and Special Condition II-E(3)(b) requires the permittee to provide \$83,500.00 to CalRecycle’s Estuary Clean-Up Program. The funds will be used to remove creosote pilings and/or the marine debris and abandoned vessels Bay. It has yet to be determined if the funds will be used in Central Bay or another Bay location, however, because it will occur within the Bay, it is likely to benefit habitat and fish species through restoration of subtidal habitat to a more nature state.

- d. **Feasibility Analysis and Public Benefits.** Subtidal Areas Policy 2 states, “[s]ubtidal areas that are scarce in the Bay or have an abundance and diversity of fish...and wildlife (...sandy deep water or underwater pinnacles) should be conserved. Filling, changes in use; and dredging projects in these areas should therefore be allowed only if: (a) there is no feasible alternative; and (b) the project provides substantial public benefits.”

As described above, the permittee has reduced the volume of sand requested for mining both annually and over ten years in order to conserve the resource and the habitat. As conditioned herein, the authorized project will minimize potential impacts through best management practices and required minimization measures, and impacts to listed species and EFH will be mitigated. In reviewing three years of mining track lines (2010 through 2013), NMFS estimated that between nineteen and thirty-seven acres of the lease are consecutively mined annually, and other areas are less frequently mined. In estimates from the permittee, they state that mining affects between two and twenty-five percent of the lease area in any year, there by conserving a minimum of seventy-five percent of project area. In reviewing the mining track lines it is clear that mining activities is concentrated in certain portions of Central Bay, particularly in Parcel 2036, 7779 west and 709 north. These areas represent the majority of the mining activity and the subsequent impacts to Bay bathymetry. If mining continues to be focused in these areas, the remaining parcels would be less affected and have a greater measure of conservation of the resource. This is further reinforced by the permittee's agreement to reduce mining on the western most lease parcels to conserve sand in transit to the outer coast.

In addition, the sand shoals appear to be fairly deep, though the actual quantity and quality of the sediments below the surface are not known. The required studies will investigate the physical processes that govern sediment transport, and the types and quantity available will further inform this discussion in the future. In addition, if the studies show that the project is not conserving the resource, the Commission has the ability to reopen the permit pursuant to Special Condition II-I of this authorization.

In determining whether there are feasible alternatives to the proposed project, there are several factors the Commission can consider. The term "feasible" as employed under the California Environmental Quality Act (CEQA) the word means "capable of being accomplished in a successful manner within a reasonable period of time taking into account economic, environmental, legal, social and technological factors."⁴²

Sand is a basic component of the construction industry and is used as an ingredient in concrete for buildings, roadways and infrastructure projects, as well as asphalt. It is also used as fill material for trenches and other backfill needs. The state legislature has also determined in the Surface Mining and Reclamation Act of 1975 ("SMARA"), that "the extraction of minerals is essential to the continued economic well-being of the state and to the needs of the society." Further, in the California Geological Survey report regarding California aggregate 50 year projects of supply and demand, it established that the Bay Area has a significant need for aggregate to support the construction industry.

⁴² CEQA Guidelines, § 15364; Pub. Resources Code, § 21061.1

While this document does not fully describe the sand needs specifically, it does depict an overall short fall in aggregate resources in comparison to the predicted demand over fifty years. Bay sand mining can provide a portion of sand consumed by the construction industry in the Bay Area.

In its application, the permittee provided a feasibility analysis as well as a discussion of the public benefits of the project and considered three alternatives to mining sand from the Bay. In two of the alternatives, they analyzed total replacement of Bay sand from either land-based quarries or imported sand from British Columbia. The permittee owns and operates quarries locally and within the region and a quarry in British Columbia from which they have imported sand to the Bay Area. Currently, there are other companies that import sand to the Bay Area from local quarries, and other sources as well as British Columbia.

In examining the potential for complete replacement of Bay sands with local/regional quarries, imported sand from British Columbia, or a combination of the two, several factors can be considered. Total replacement of sand would increase the amount of greenhouse gases and other emissions into the atmosphere, simply due to the greater distance traveled and fuel expended in the process. No application to the Bay Area Air Quality Management District (BAAQMD) or the California Air Resources Control Board (CARB) has been made for such activities, and therefore, their position. However, given the dire climate change predictions based on total greenhouse gas emissions, it is important to reduce production of these gases wherever possible. In the FEIR, the total replacement of Bay sands with imported sands was eliminated as an alternative based on this issue. In addition to the increase in emissions, providing sand from local quarries has potential to increase truck traffic when the point of delivery is further than that of the shore side sand yards. In these instances, roadways may also experience greater congestion and wear and tear over time. In the permittee's feasibility analysis there is a discussion of the limited volume of sand available from the land based quarries and the rock content that is inherent in the sand production. Further, some types of sand that can be mined from the Bay is not available from British Columbia and local quarries. Given these considerations, particularly the potential increase in greenhouse gases, complete replacement of Bay sands with sand from other sources appears to be infeasible at this time.

While complete prohibition or further reduction of mining volumes would eliminate or reduce impacts from the project, the policy includes consideration of feasible alternatives and public benefits of using Bay resources. In order to find this project consistent with these Bay Plan policies, the Commission can consider environmental impacts outside of its immediate authority and balance these considerations with impacts to the Bay. In discussion with the permittee, the Commission staff has determined that it is feasible to reduce the volume of sand mined from the Bay, thereby reducing potential impacts.

In examining the historic mining record for this lease area and permittee, the minimum and maximum ten-year mining average was 497,234 cy and 1,187,915 cy, respectively. The minimum and maximum fifteen-year mining average was 540,317 cy and 1,055,452 cy annually, respectively. As discussed, the permittee has reduced the requested mining from the maximum historic mining volume in an effort to reduce impacts and to conserve the resource. The FEIR reviewed a reduced volume alternative, which was based on the average mining volume over the past five years, considered baseline. Through the alternatives review, the FEIR found the reduced project alternative to be the environmentally superior alternative and included minimization and mitigation measures that have been incorporated herein and described above.

In considering whether a further reduced mining volume is feasible, presently there is not enough information know about the resource or the potential impacts to specify the ideal volume to be mined sustainably. In considering the limited information, the Commission has determined that an effective strategy is to develop additional studies to provide the information needed to better identify the appropriate mining level. The permittee has agreed to fund studies to assist in developing this knowledge. The studies and funding levels are described further in this document.

The Subtidal Area policies also require the Commission to consider whether the project has an important public benefit that can be balanced against impacts to the Bay. Sand mined from this lease area is used in the construction industry as an ingredient in asphalt, concrete, back fill for trenching and other purposes. The public benefits of the proposed project and include the ability to use a local resource close to the end users, and is easily transport in large quantities by water. In delivering the sand to sand yards close to users, truck traffic is significantly reduced. When truck traffic is reduced, wear and tear on roadways is reduced and emissions from the trucks are also reduced, emitting less greenhouse gases into the atmosphere. Further, the production of land-based sand is a more resource intensive process, using energy and water to process quarried sand.

In addition, the sand is used in building and maintaining public and private roadways, bridges and buildings providing both infrastructure and jobs for the local economy. Local sand, while insufficient to support the full aggregate demand, helps fulfill regional demands and address shortfalls in land based permitted reserves. In addition, the rent and royalties charged by the State Lands Commission generates funds for the State.

In recognition of the reduced sand supply to the Bay and coast, it is important to consider other potential sources of sand. In the future, consideration should be given to whether these leases will remain viable, and whether other activities, such as mining sand from the federal channels where maintenance dredging occurs, or diversifying the business so that recycled materials may be used as a substitute for Bay sands over time.

For the reasons described above, the Commission finds that the project as conditioned, conserves the resource to the extent feasible, minimizes harmful effects to habitat and species, has no feasible alternative at this time, and provides a substantial public benefit and therefore is consistent with the Bay Plan policies on Subtidal Areas; Fish, Other Aquatic Organisms and Wildlife; Tidal Marshes and Tidal Flats; and Mitigation.

- e. **Water Quality.** The Commission's Bay Plan Water Quality Policy 1 states, "Bay water pollution should be prevented to the greatest extent feasible..." Water Quality Policy 2 states, "Water quality in all parts of the Bay should be maintained at a level that will support and promote the beneficial uses of the Bay as identified in the San Francisco Bay Regional Water Quality Control Board's Water Quality Control Plan, San Francisco Bay Basin and should be protected from all harmful or potentially harmful pollutants. The policies, recommendations, decisions, advice and authority of the State Water Resources Control Board and the Regional Board, should be the basis for carrying out the Commission's water quality responsibilities."

The waters of the Bay are an important primary element⁴³ of the habitat for various listed and native species in the San Francisco Estuary and therefore should be maintained at a level adequate to protect Bay resources. The salinity and turbidity of the Bay waters influences the distribution of organisms living in the estuary, as well as those transiting through portions of the Bay along their migratory routes. Different species are adapted to tolerate different salinity ranges and turbidity levels. The water (habitat) quality needs for different Bay species are also dependent upon the salinity and suspended sediments in the water column. The permitted project will likely deepen parts of the lease area, but according to the modeling study in the FEIR, the impacts to water quality from deepening would likely be limited to small salinity changes in the deepened areas.

The short-term increase in suspended sediments and turbidity during the permitted mining activities may have a variety of impacts to species inhabiting the water column. For instance, the increased turbidity may be beneficial for some species such as potentially enhancing feeding success and predation avoidance. However, high turbidity levels may also lead to physiological and behavioral impacts to other Bay species. There may be additional impacts to migration, respiration, feeding, etc. The material that would be mined mostly

⁴³ USFWS Biological Opinion. 2014.

consists of sandy material, with a small amount of fine-grained material and is believed to be free of contaminants due to its low carbon content, and generally contains less than ten percent fine sediments, which are responsible for increased turbidity and contaminant loading.⁴⁴

The Water Board reviewed the project and determined that the project is not likely to result in “water quality less than the prescribed policies.”⁴⁵ They further determined that the effluent from mining the shoals would have at least a 10:1 dilution for any particular “characteristics” of concern and that the discharge would not cause a nuisance to the Bay.⁴⁶ On January 21, 2015, the Water Board issued its Final Order for the Waste Discharge requirements and included a Self-Monitoring and Reporting Program (SMP) that required Hanson to perform a study to evaluate the discharge effluent and receiving water quality.

The effluent and receiving water study would “characterize the overflow effluent toxicity and composition (suspended sediment, conventional pollutant, and toxic pollutant concentrations), the spatial and temporal extent of the overflow plume in the receiving water based on the magnitude of suspended sediment concentrations within the plume, and would compare overflow plume suspended sediment concentrations to background (ambient) conditions.”⁴⁷ The study would also be designed to capture the seasonal and tidal variation in the discharge and water quality of the receiving waters.

The Water Board provisioned the waste discharge requirements and water quality certification with a reopener clause that would allow the project to be reassessed if the study indicates that there are adverse impacts to water quality or beneficial uses of the receiving waters, or if new regulations or policies, are adopted during the permitted period. Special Condition II – G(3) is included herein, both requiring the effluent study and that the results of the study be provided to Commission staff so impacts to Bay waters can be further analyzed. In the event that the study determines there are significant impacts to water quality or beneficial uses of the Bay waters, such as habitat for fish and aquatic wildlife, Special Condition II – I gives the Executive Director the ability to modify the permit to reduce impacts, reopen or revoke the permit if significant impacts are identified and the permittee does not agree to appropriate project modifications.

For the reasons described above, the Commission finds that the project is consistent with its law and policies on Water Quality.

⁴⁴ SLC FEIR

⁴⁵ SFRWQCB Final Order. 2015.

⁴⁶ *Ibid.*

⁴⁷ *Ibid.*

- C. **Scientific Knowledge.** The Bay Plan Subtidal Areas Policy 5 states, “The Commission should continue to support and encourage expansion of scientific information on the Bay's subtidal areas, including: (a) inventory and description of the Bay's subtidal areas; (b) the relationship between the Bay's physical regime and biological populations; (c) sediment dynamics, including sand transport, and wind and wave effects on sediment movement; (d) areas of the Bay used for spawning, birthing, nesting, resting, feeding, migration, among others, by fish, other aquatic organisms and wildlife; and (e) where and how restoration should occur. Similarly, the Bay Plan's Dredging and Tidal Marsh and Tidal Flats policies call for increasing scientific understanding of impacts from projects to the Bay's sediment system, as well as habitat impacts. As discussed above, there are a number of unknowns regarding the sand supply to the Bay; the magnitude of sand mining impacts on sand transport; replenishment of sand resources in the lease and surrounding areas; bathymetric change in and around the lease areas; and the resource availability. Additionally, further research is needed to better understand the potential impacts of sand mining on the ecology of sand shoals; benthic organisms; recovery of the community after the mining activities; and the associated food web.

Data collected to date indicates that the sediment supply to the Bay is decreasing and is not replenishing sand extracted or leaving the system. Further information and understanding of the sand system, including the amount of sand entering the Bay, the amount of sand available for mining, and the supply of sand in transit to the San Francisco Bar and coastal beaches is critical for management of the resource. Special Condition II-G(1) has been added to this permit to provide funds for studies and the coordination of a SSTAC that, in consultation with an independent science panel, will develop resource management questions and prioritize studies to inform these questions. The SSTAC will be involved in the review of the design of the studies in addition to a review of the results and analysis conducted. The TAC and ISP will provide input to the Commission staff on how to allocate the \$1.2 million dedicated to the planning, design and execution of studies. Special Condition II-G(4) of this permit ensures that the Commission will be briefed on regarding the progress of studies and/or the results after the completion of the studies.

The ability to track the changes in the bathymetry of the Bay over time is important for understanding the impacts of the permitted project on mineral resources within the Bay, as well as potential changes in tidal hydrology and sediment movement. Special Condition II-D of this permit requires regular multibeam bathymetric surveys, which will then be compared with prior surveys to evaluate the change in the Bay's bathymetry over time and identify potential impacts from the authorized project. Two surveys will be conducted over the permit period, conducted five years apart from the previous survey. Reports on bathymetric surveys will be submitted to Commission staff for review.

The way that depth changes, substrate and hydrological changes caused by the permitted sand mining may impact the overall utilization of habitat by certain species or habitat functions and is not well understood. Subtidal Areas Policy 5 (b) and

(d) requires increased scientific understanding of the relationships of biological organisms to the subtidal areas of the Bay. Additionally, this policy also requires expansion of knowledge on distribution and habitat utilization of various parts of the Bay by different species. Special Condition II-G(2) requires the permittee to provide funds for the development and implementation of a benthic study, which will utilize various techniques, to assess sand mining activities on benthic habitats in Central San Francisco Bay. According to Special Condition II – G(2)(g), all benthic studies must be completed and the final report submitted by March 31, 2018 and the permittee shall present the findings to the Commission for further consideration.

Subtidal Areas Policy 5 (d) requires the expansion of knowledge of areas of the Bay used for spawning, feeding, migration, etc. The authorized project will result in the discharge water and fine-grained material overboard the mining vessel during operations. This discharge will result in the creation of an overflow effluent plume. Special Condition II – (G)(3) has been incorporated into this permit and requires the permittee to conduct and report the findings of an effluent study, which will to characterize the effluent and receiving water quality. The study will specifically address the overflow plume toxicity and composition; spatial and temporal distribution in the receiving waters; and the magnitude of the suspended sediment concentrations within the plume as compared to background levels. This will provide the Commission with specific information regarding the extent of localized increases in suspended sediment and the potential impacts to species of the Bay.

Special Condition II – F(2) requires that the permittee submit a copy of the final effluent study report within 60 days of completing data collection. This condition will ensure timely delivery of the study results to Commission staff for review. If the Water Board determines that the effluent has harmful effects and the conditions of the SMP or the WDR/WQC need to be changed, the permittee shall notify Commission staff.

At the conclusion of each study the permittee shall provide a briefing to the Commission on the study findings and potential next steps. In this way, the Commission will have the opportunity to discuss the outcomes of the study, have a better understanding of the resource and the potential impacts of the project and future authorizations.

For all the reasons listed above, the Commission finds that the project is consistent with the Commission's law and policies related to the expansion of scientific information about the Bay's subtidal areas and potential impacts from this project.

- D. **Dredging.** According to the McAtteer-Pertis Act section 66664.4, "Dredging means the extraction of sand, mud or other materials from San Francisco Bay, its tributaries, the delta, or coastal state waters." The permitted project for sand mining activity uses hydraulic dredging equipment and in its methodology is considered analogous to dredging within San Francisco Bay. The Bay Plan Dredging Policy 2 states that "[d]redging should be authorized when the Commission can find: (a) the permittee has demonstrated that the dredging is needed to serve a water-oriented use or other important public purpose, such as navigational safety; (b) the materials to be dredged

meet the water quality requirements of the San Francisco Bay Regional Water Quality Control Board; (c) important fisheries and Bay natural resources would be protected through seasonal restrictions established by the California Department of Fish and Game, the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service, or through other appropriate measures; (d) the siting and design of the project will result in the minimum dredging volume necessary for the project....”

The sand mining authorized herein serves an important public purpose by providing a local source of sand to the Bay Area construction industry: reducing greenhouse gas emissions, truck traffic, and impacts to Bay Area roadways. The sand mining authorized herein is obtained from a local source and transported by barge, and therefore is a water oriented industry. Demand for aggregate is expected to increase as the State’s population continues to grow and infrastructure is maintained, improved, and expanded. The California Geological Survey predicts that the 50-year demand for all aggregate (including sand, crushed stone, and gravel) in the South San Francisco Bay and North San Francisco Bay Regions will be approximately 1,902,000,000 tons.⁴⁸ Currently, there is a substantial shortfall in total amount of permitted aggregate reserves to meet this demand; local land-based aggregate reserves contain enough permitted resources to last only through 2023 in the North Bay and through 2023 to 2032 in the South Bay. The projections described above are for supply and demand of all aggregates. Of this total aggregate demand, about 25 percent is forecast for use in high strength concrete (Portland Concrete).

As described above, the Water Board issued a WQC/WDR for the authorized project on January 21, 2015. The WQC/WDR requires the permittee to comply with specific wastewater dilution ratios, mining of only non-hazardous materials, and does not allow discharge of pollutants or other materials that would cause a nuisance or adversely affect beneficial uses of the Bay, including increased turbidity and deleterious impacts to wildlife. Additionally, Special Condition II - F is consistent with the provisions of the WQC/WDR.

Regarding seasonal work windows for this activity, the permittee received biological opinions and an incidental take permit from the Resource Agencies. In their review of the project, the Resource Agencies did implement seasonal mining limitations in Central Bay for this activity. The authorized project as conditioned is consistent with all requirements of the Resource Agencies.

The siting and design of the project will result in the minimum amount of mining necessary to achieve the project goal, as discussed above in the feasibility section. The permittee reduced both the annual and total project volume to be mined over a ten-year period in response to staff and Commission concerns about impacts to both the mining resources themselves and wildlife present in the project area. This authorization provides the permittee with the flexibility to exceed the annual mining volume limit to address high demand years in the Bay Area Market, as long as the total mined over ten years remains under 11.41 million cubic yards over ten years. Maintenance of an

⁴⁸ Clinkenbeard, *Aggregate Sustainability in California*.

overall rolling average that is 1.141 million cy annually, will also constrain the number of peaks over the ten-year period and limit impacts of mining the “full” peak volume over a few consecutive years in a row, further limiting impacts from the authorized project. Additionally, the permittee does not have capacity at their offloading yards to stock-pile sand and other aggregates and will only mine sand if the market demands such volume, thus minimizing the amount of mining that could occur in any given year. The authorized ten-year volume is the same as the environmentally superior alternative in the State Lands Commission FEIR and in the conservation recommendations by NMFS.

For all the reasons listed above, the Commission finds that the project is consistent with the Commission’s laws and policies related to dredging.

- E. **Navigation Safety and Oil Spill Prevention.** The Bay Plan’s Navigational Safety and Oil Spill Prevention Policy Two states that the Commission should ensure that marine facility projects are in compliance with oil spill contingency plan requirements of the CDFW Office of Spill Prevention and Response (OSPR), the U.S. Coast Guard and other appropriate organizations. As owners and/or operators of marine vessels operating in regulated waters of the State and often adjacent to or within federal navigational channels, the permittee is required to abide by maritime laws and best safety practices.

Specific to the sand mining activities, Provision 10 of the Water Quality Certification and Waste Discharge Requirements requires the permittee to maintain and implement a CDFW Office of Oil Spill Prevention and Response-approved plan that demonstrates that adequate measures are in place to prevent and respond to accidental release of hazardous materials. Additionally, the amended CDFW ITP requires that, as a mitigation measure, the permittee follow state and federal laws and regulations in regards to hazardous waste spills and clean up. The amended ITP also prohibits the storage and handling of hazardous wastes in the project area. These authorizations and their requirements insure the applicant will operate in accord with the required navigational safety and oil spill contingency plans..

For all the reasons listed above, the Commission finds that the project is consistent with the Commission’s laws and policies on Navigation Safety and Oil Spill Prevention.

- F. **Public Trust.** The Bay Plan policy on Public Trust states that “[w]hen the Commission takes any action affecting lands subject to the public trust, it should assure that the action is consistent with the public trust needs for the area....” The public trust is a common law doctrine that guarantees the right of the public to use the state’s waterways for navigation, commerce, fisheries, boating, recreation, natural habitat protection, and to preserve lands in their natural state for protection of scenic and wildlife habitat values. Public trust uses of public lands are generally limited to water dependent or water related uses, with some exceptions for ancillary structures necessary for the water dependent uses. Further, because public trust lands are held in trust for all citizens of the state, they must be used to serve statewide, as opposed to

purely local, public purposes.⁴⁹ The State Lands Commission is responsible for determining if a project proposed on sovereign land is consistent with the public trust. In issuing the lease for this project, the State Lands Commission determined that the project was consistent with public trust.

The State Lands Commission's finding that this project was consistent with the public trust use was challenged by Bay Keeper in 2014. Upon review, the Superior Court of the City and County of San Francisco upheld the State Lands Commission's finding. However, Bay Keeper has appealed this decision to the First District Court of Appeal. The Court of Appeal has not yet heard this appeal.

In completing its independent evaluation of the project, the Commission must determine if the project is consistent with the public trust needs, rather than the uses. Public trust needs include the same categories as the uses: navigation; commerce; fisheries; boating; recreation; natural habitat protection; and to preserve lands in their natural state for protection of scenic and wildlife habitat values. Sand mining is a water-oriented use in that sand is mined from the Bay and serves the important public purpose of supplying sand to the construction industry from a local source, reducing greenhouse gas and other emissions, truck traffic, impacts to Bay Area roadways, and infrastructure.

The project as conditioned does not interfere with the navigation, commerce, boating and fisheries needs of the area. The permit includes minimization measures such as further reductions in the volume of sand proposed for mining, specifically on the two lease parcels in the direct pathway to the outer coast to reduce impacts to habitat and sediment transport. This authorization will allow a larger volume of sand to remain in the system. In addition, there are several minimization measures that reduce impacts to fish and wildlife, and their habitat. The mining activity is further restricted in area by equipment limitations, and through the biological opinions, the incidental take permit and Special Condition II – E(1), which requires buffer zones from shorelines and other special habitat features, thereby minimizing harmful effects, and preserving adjacent habitat for wildlife uses. Finally, the funding dedicated to both the benthic and sand transport studies will assist the Commission and other Resource Agencies in the future in making resource decisions that impact the public trust needs of the Bay Area.

After balancing the various public trust needs of the area, the Commission finds that the project as conditioned is consistent with the Bay Plan policy on Public Trust.

G. Review Boards

1. **Sand Mining Science Panel.** A science panel of distinguished experts in the fields of geology, engineering, oceanography, marine and benthic ecology convened to discuss the currently available science about the transport of sandy sediment throughout the Bay Area to the outer coast and sandy shoal habitats. This panel discussed a series of management questions proposed by Commission staff regarding the current state of sandy sediment resources in the Bay, replenishment

⁴⁹ State Lands Commission Public Trust Policy: http://www.slc.ca.gov/About_The_CSLC/Public_Trust/Public_Trust_Doctrine.pdf

of sand in areas of extraction during mining events, habitat and species impacts, whether disturbance from mining has more of an impact on the biological community recovery than naturally occurring disturbances in the system, and potential monitoring that could be used to enhance understanding of sandy sediment resources, the communities that inhabit them, and the potential impacts of mining on the system. While the discussion was not conclusive, it informed this process and the management measures that are incorporated into a final permit authorization. An abridged transcript can be found at <http://www.bcdc.ca.gov/dredging/SandMiningSciPanAbridged.pdf>.

- H. **California Environmental Quality Act.** On October 19, 2012, the State Lands Commission ("SLC") certified a final environmental impact report (FEIR) for the project and adopted CEQA findings as part of associated project approvals. [Minute Item No. 101].

The SLC also adopted CEQA findings ("findings"), including mitigation measures and project alternatives that address environmental topics pertaining to activities subject to leases issued by the SLC or otherwise subject to the SLC's authority. Those include: biological resources including benthic ecology, hydrology and water quality including SF Bay bathymetry, and air quality. The SLC adopted mitigation measures and project alternatives addressing these topics, implemented through the associated and approved mitigation monitoring program and adoption of the Reduced Project Alternative with Increased Volume Option, and found that with these mitigation measures and alternatives the project would avoid or substantially lessen potentially significant effects as identified in the EIR, with the exception of impacts to air quality, climate change, and Delta and longfin smelt. For these impacts the SLC adopted a statement of overriding considerations.

The FEIR was challenged in 2012, and the Superior Court of the City and County of San Francisco upheld the SLC's certification of the FEIR. The Court's decision is currently on appeal, at the First District Court of Appeal. Section 21167.3(b) of CEQA and section 15233 of the CEQA Guidelines require that, in the event of a legal challenge to the adequacy of an EIR for a project for which a permit application is pending before the Commission, the Commission, in its capacity as a responsible agency, consider and act upon any such permit application. In the event that in the future a court invalidates the SLC's FEIR certification, and on the basis thereof directs the Commission to reopen its regulatory review, this permit action would be revisited.

In addition, as discussed above, the Commission has also adopted and incorporated into the proposed Commission permit special conditions that would substantially reduce to a level of insignificance all adverse environmental impacts associated with the project, including impacts related to biological resources including benthic ecology, physical resources including SF Bay bathymetry, and water resources and quality. For these impacts, the Commission finds pursuant to section 21080.5(d)(2)(A) of CEQA and section 15096(g)(2) of CEQA Guidelines that the proposed project, as conditioned, will avoid or substantially lessen all significant adverse environmental impacts, and that

consequently there are no alternatives or mitigation measures within the Commission's powers that would substantially lessen or avoid any significant effect the project would have on the environment. Accordingly, the Commission finds that the proposed project as conditioned is consistent with the requirements of CEQA.

- I. **Coastal Zone Management Act.** The Commission further finds, declares, and certifies that the activities authorized herein are consistent with the Commission's Amended Management Program for San Francisco Bay, as approved by the Department of Commerce under the Federal Coastal Zone Management Act of 1972, as amended.
- J. **Conclusion.** For all the above reasons, the Commission finds, declares, and certifies that, subject to the Special Conditions stated herein, the project authorized herein is consistent with the McAteer-Petris Act, the *San Francisco Bay Plan*, the Commission's Regulations, the California Environmental Quality Act, and the Commission's Amended Management Program for the San Francisco Bay segment of the California coastal zone.

IV. Standard Conditions

- A. **Permit Execution.** This permit shall not take effect unless the permittee executes the original of this permit and return it to the Commission within ten days after the date of the issuance of the permit. No work shall be done until the acknowledgment is duly executed and returned to the Commission.
- B. **Notice of Completion.** The attached Notice of Completion and Declaration of Compliance form shall be returned to the Commission within 30 days following completion of the work.
- C. **Permit Assignment.** The rights, duties, and obligations contained in this permit are assignable. When the permittee transfers any interest in any property either on which the activity is authorized to occur or which is necessary to achieve full compliance of one or more conditions to this permit, the permittee/transferor and the transferees shall execute and submit to the Commission a permit assignment form acceptable to the Executive Director. An assignment shall not be effective until the assignees execute and the Executive Director receives an acknowledgment that the assignees have read and understand the permit and agree to be bound by the terms and conditions of the permit, and the assignees are accepted by the Executive Director as being reasonably capable of complying with the terms and conditions of the permit.
- D. **Permit Runs With the Land.** Unless otherwise provided in this permit, the terms and conditions of this permit shall bind all future owners and future possessors of any legal interest in the land and shall run with the land.
- E. **Other Government Approvals.** All required permissions from governmental bodies must be obtained before the commencement of work; these bodies include, but are not limited to, the U. S. Army Corps of Engineers, the State Lands Commission, the Regional Water Quality Control Board, and the city or county in which the work is to be

performed, whenever any of these may be required. This permit does not relieve the permittee of any obligations imposed by State or Federal law, either statutory or otherwise.

- F. **Project must be Consistent with Application.** Work must be performed in the precise manner and at the precise locations indicated in your application, as such may have been modified by the terms of the permit and any plans approved in writing by or on behalf of the Commission.
- G. **Life of Authorization.** Unless otherwise provided in this permit, all the terms and conditions of this permit shall remain effective for so long as the permit remains in effect or for so long as any use or construction authorized by this permit exists, whichever is longer.
- H. **Commission Jurisdiction.** Any area subject to the jurisdiction of the San Francisco Bay Conservation and Development Commission under either the McAteer-Petris Act or the Suisun Marsh Preservation Act at the time the permit is granted or thereafter shall remain subject to that jurisdiction notwithstanding the placement of any fill or the implementation of any substantial change in use authorized by this permit. Any area not subject to the jurisdiction of the San Francisco Bay Conservation and Development Commission that becomes, as a result of any work or project authorized in this permit, subject to tidal action shall become subject to the Commission's "bay" jurisdiction.
- I. **Changes to the Commission's Jurisdiction as a Result of Natural Processes.** This permit reflects the location of the shoreline of San Francisco Bay when the permit was issued. Over time, erosion, avulsion, accretion, subsidence, relative sea level change, and other factors may change the location of the shoreline, which may, in turn, change the extent of the Commission's regulatory jurisdiction. Therefore, the issuance of this permit does not guarantee that the Commission's jurisdiction will not change in the future.
- J. **Violation of Permit May Lead to Permit Revocation.** Except as otherwise noted, violation of any of the terms of this permit shall be grounds for revocation. The Commission may revoke any permit for such violation after a public hearing held on reasonable notice to the permittee or their assignees if the permit has been effectively assigned. If the permit is revoked, the Commission may determine, if it deems appropriate, that all or part of any fill or structure placed pursuant to this permit shall be removed by the permittee or their assignees if the permit has been assigned.
- K. **Should Permit Conditions Be Found to be Illegal or Unenforceable.** Unless the Commission directs otherwise, this permit shall become null and void if any term, standard condition, or special condition of this permit shall be found illegal or unenforceable through the application of statute, administrative ruling, or court determination. Any uses authorized shall be terminated to the extent that the Commission determines that such uses should be terminated.