

February 8, 2019

Application Summary **Potrero Power Plant Remediation of Off Shore Contaminated Sediment**

(For Commission consideration on February 21, 2019)

Number: BCDC Permit Application No. M2017.005.03
Date Filed: December 17, 2018
90th Day: March 18, 2019
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Summary

Applicants: Pacific Gas and Electric Company (PG&E); California Barrel Company, LLC (CBC); and the Port of San Francisco (Port)

Location: Along the southern San Francisco waterfront, at the Potrero Power Plant formerly occupied by PG&E located at 1201 Illinois Street between 22nd and 23rd Streets, and at the adjacent Pier 70 property, between 20th and 22nd Streets, in the City and County of San Francisco (Figure 1).

Proposed

Project: PG&E is conducting the project under a Voluntary Cleanup Agreement with the San Francisco Regional Water Quality Control Board (Water Board). The co-applicants are proposing to complete the remediation of the Potrero Power Plant and Pier 70 shoreline by removing or isolating legacy contaminants in intertidal and subtidal sediments. Studies have shown that the level of contamination in the target areas has bioaccumulated in marine wildlife and is high enough that it could negatively impact humans exposed to the sediment through wading and swimming. The Commission has previously authorized portions of the site remediation project that have been completed.

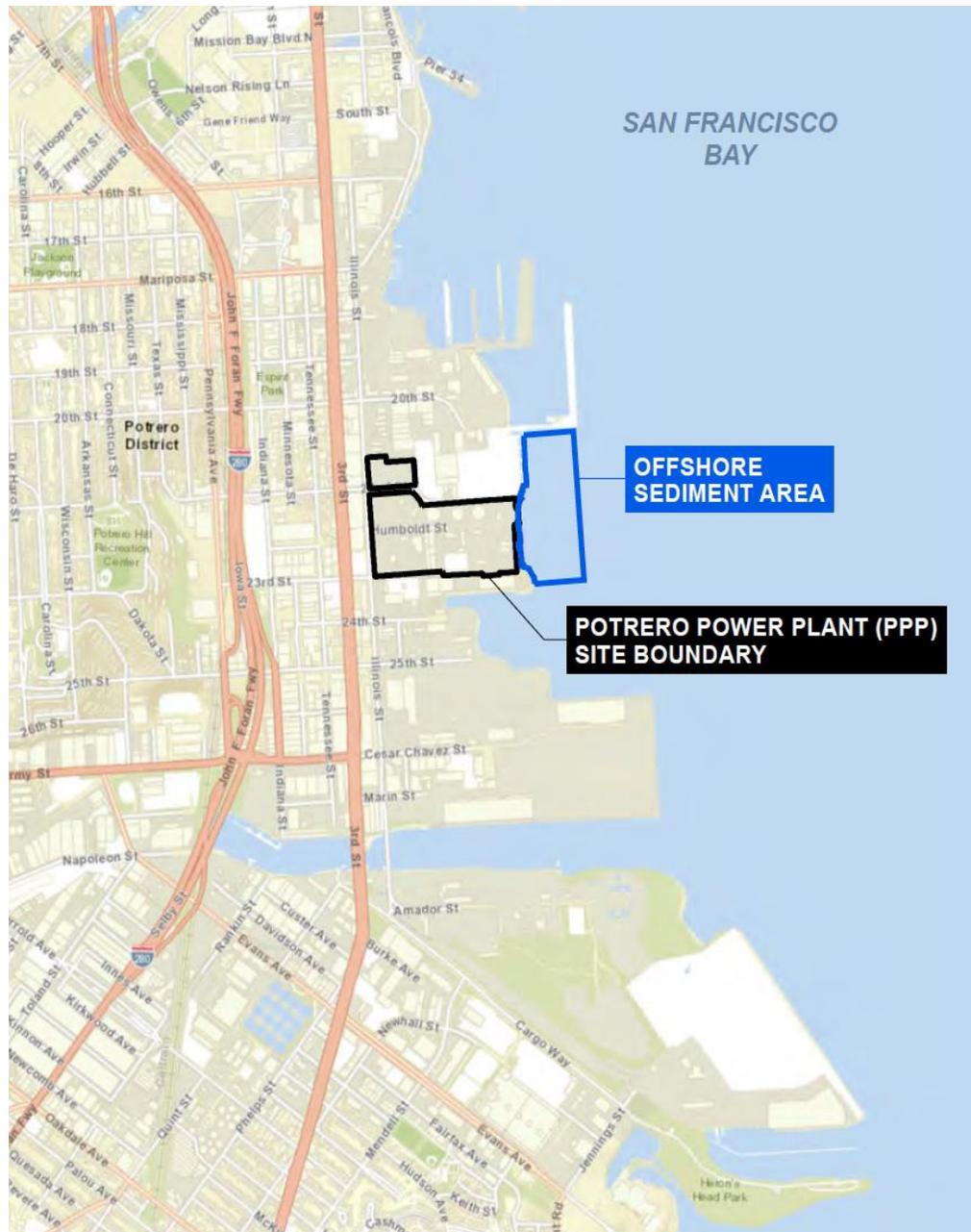


Figure 1: Site Location

The proposed project involves remediating Bay and shoreline sediments contaminated with PAHs. PAHs are a class of chemicals that occur in coal, crude oil and gasoline and can be produced when these materials, as well as wood and garbage, are burned. Several of the PAHs and some specific mixtures of PAHs are considered to be cancer-causing chemicals.¹ In aquatic environments PAHs can

¹ Polycyclic Aromatic Hydrocarbons (PAHs) Factsheet, 2009. https://www.epa.gov/sites/production/files/2014-03/documents/pahs_factsheet_cdc_2013.pdf

bind with sediment particles, which then become a potential sources of PAHs that are released under specific conditions. Because PAHs are moderately persistent in the environment, and can be bio-accumulated, sediment-dwelling and filtering organisms are most susceptible to contamination.²

The selection of remedial response areas was designed by an interagency group lead by the Water Board and comprised of the BCDC, U.S. Army Corps of Engineers (USACE), National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW), and the Environmental Protection Agency (EPA) to avoid and minimize impacts to the environment while remediating potential negative effects of PAHs to wildlife and humans. The remediation elements would include: (1) mechanical dredging areas of contaminated sediment; (2) excavating and replacing riprap; (3) capping the dredged and excavated areas with both chemical and physical isolation materials to prevent further contact of residual PAHs into the Bay; (4) treating the PAHs in place in a portion of the subtidal area; (5) constructing a temporary pier and transfer system; and (6) processing the dredged and excavated material at an upland site outside of the Commission's jurisdiction with the addition of cement to absorb excess water. Once the materials are processed, they will be trucked to an appropriate landfill for disposal also outside the Commission's jurisdiction.

Issues Raised: The staff believes that the application raises four primary issues: (1) whether the proposed project is consistent with the McAteer-Petris Act and the San Francisco Bay Plan ("Bay Plan") policies on allowable fill of the Bay; (2) whether the project is consistent with the Commission's water quality and dredging policies; (3) whether the project is consistent with the Bay Plan policies on fish, other aquatic organisms and wildlife, tidal flats and subtidal areas; and (4) whether the project is consistent the Bay Plan policies on climate change.

² A review on polycyclic aromatic hydrocarbons: Source, environmental impact, effect on human health and remediation. Hussein I. Abdel-Shafy^a Mona S.M. Mansour^b. [Egyptian Journal of Petroleum Volume 25, Issue 1](#), March 2016, Pages 107-123

Project Overview

Site History. The project area has a long history of industrial use beginning in the mid-1800s. A portion of the Potrero Power Plant property was used as a sugar refinery during 1887-1949, when the raw sugar was delivered by barge and processed on site. PG&E acquired property north of the sugar refinery and between 1870-1930 operated a manufactured gas plant. PG&E purchased the sugar refinery site and later, between 1900-1999, PG&E operated a steam electric power plant. In 1999 Southern Energy purchased the Potrero Power Plant site from PG&E, and after several subsequent property transactions, the California Barrel Company, LLC (CBC) purchased the property in 2016³ with plans for mixed-use development in the future. Former PG&E structures, remnants of wharves and piers, and a sloped riprap revetment along the shoreline remain on the site.

During the late 1800s through the mid 1900s, the Pier 70 property was used for industrial uses as varied as machine shops, foundries, steel works and blacksmiths. In the 1940s the site was converted to a ship yard where vessels were manufactured, maintained and repaired. At that time four shipways were constructed upland on the property and extended into the Bay. These shipways had large foundations made of concrete piers and wood pilings sunk deep in the offshore sediment to support the marine rails used to build and repair the ships. In the 1970s the offshore marine rails were abandoned and the slipways on the concrete piers were filled and paved. The wooden structure that supported the rails remains buried under Bay sediment and will not be removed. The Pier 70 property was more recently used as a drydock and ship repair yard, with metal recycling, car parking and a self-storage facility also occupying portions of the site. The Port has partnered with FC Pier 70, LLC to redevelop the property into a mixed-use development and is currently in the permitting phase of the project (BCDC Permit Application No. 2018.008.00). The site is fenced off and closed to the public while preparation for the upland for development is underway.

³ Remedial Action Plan, Haley& Aldrich, Inc. December 2017 pg i

In 2009 the Executive Director, on behalf of the Commission, authorized PG&E to complete the *interim remedial measure* (IRM) on the Potrero Power Plant property through issuance of Amendment No. One to BCDC Permit No. M1994.019.00. The IRM included the removal of contaminated sediment and soil from the Bay and shoreline band, the placement of a reactive core mat over the new surface, the use of clean filter rock and riprap covering the reactive core mat. This installation was to stabilize and limit erosion of the shoreline, minimize shoreline exposure of polycyclic hydrocarbons (PAHs) and the enhance shoreline appearance.⁴ Because the IRM was designed as a provisional measure and covered only a small portion of the shoreline, it has been redesigned and would be removed, replaced and expanded as part of this application.

In 2017, the Executive Director, on behalf of the Commission, through BCDC Administrative Permit No. M2017.005.00, authorized PG&E to replace riprap; to remove an existing steel sheet pile bulkhead and its 70 wooden piles and replace it with a sheet pile wall; to excavate contaminated soils and place clean fill in several locations in the shoreline band; and to install groundwater monitoring wells. Most recently, Amendment No. Two authorized the removal of approximately 80 creosote piles and a steel bell, and the placement of a small amount of sand to backfill holes left by the pile removal. Work authorized in Amendment No. Two and Amendment No. Three, if authorized by the Commission, would occur simultaneously, and would complete the remediation project by the first quarter of 2020.

⁴ Completion Report Shoreline Interim Remedial Measure, Potrero Power Plant, San Francisco, California, July 2010. AMEC Geomatrix, Inc. Oakland California

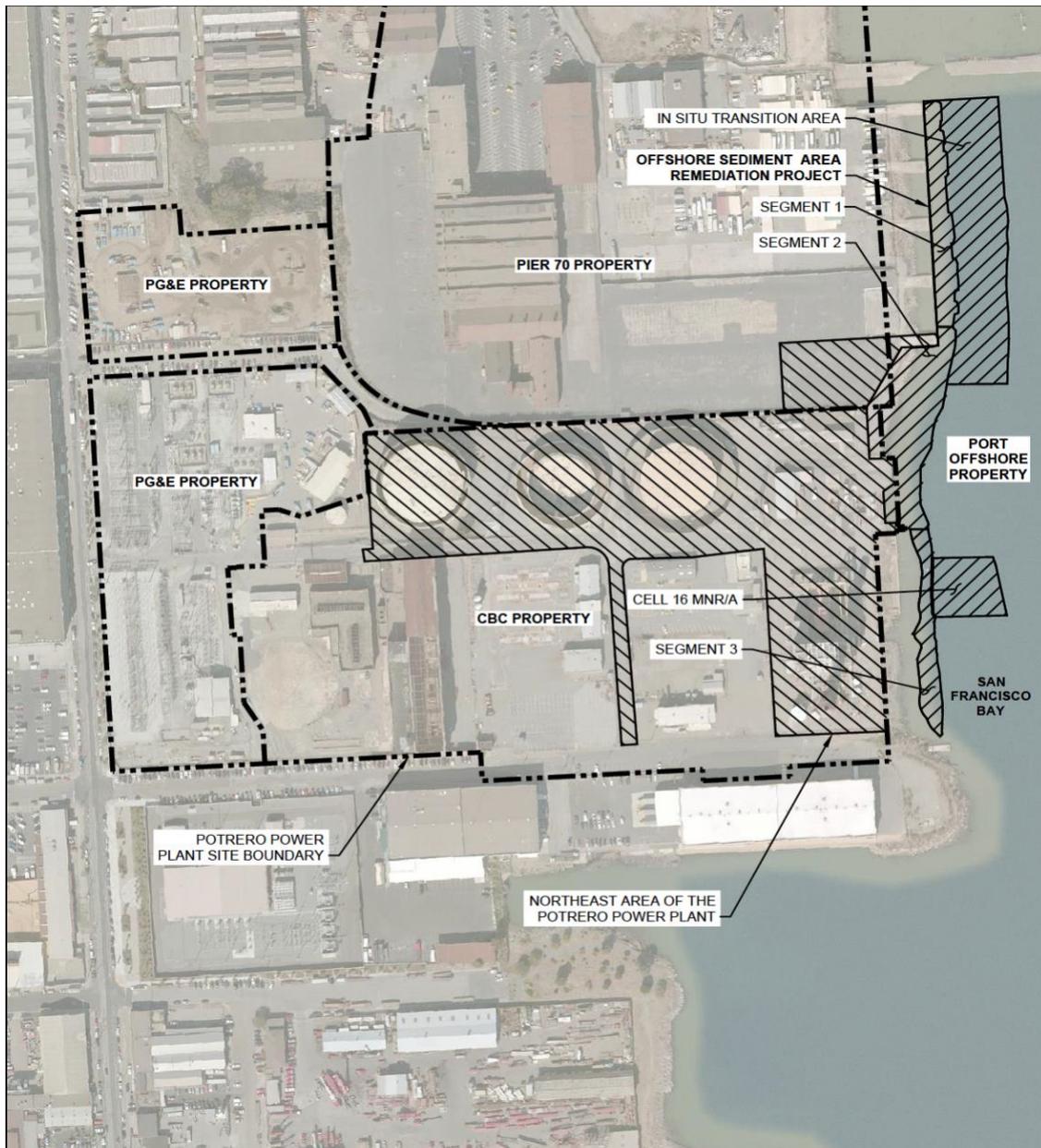


Figure 2: Site Plan

Project Overview. The Regional Water Quality Control Board's (Water Board) approved Remedial Action Plan⁵ required PG&E to remediate three former manufactured power plant sites along the San Francisco shoreline; this project would be the first to be remediated. PG&E and the Port entered into a license agreement to perform environmental investigations and remediation at the Potrero Power Plant and the Pier 70 properties. The initial investigations indicated that there are high concentrations of PAHs in the surface and subsurface sediments

⁵ Notice of Determination, Regional Water Quality Control Board, January 2017.

along the Potrero Power Plant and Pier 70 property shoreline. In 2015, PG&E conducted refined studies to identify the levels and locations of the contaminants offshore of the properties, the evaluation of alternatives in the Feasibility Study⁶ identified preferred solutions⁷, which were approved by the Water Board. The proposed project before the Commission is the preferred solution for this portion of the required remediation.

The project goal is to mitigate the potential exposure of fish and other aquatic organisms to PAHs and the potential harmful exposure of humans to the contaminated sediments in accessible wading areas.⁸ To accomplish this goal, the applicants propose to remove contaminated sediments in intertidal and subtidal areas along the shoreline. The contaminated sediment will be dredged, and the exposed sediment surface then capped with either reactive or physical isolation materials including the riprap revetment along some sloped areas, which would prevent the underlying contaminated sediment from contacting sensitive receptors (humans or aquatic species). Other areas would be directly treated with activated carbon or allowed to accrete naturally. To facilitate the transfer of the sediment from dredge scows to shoreside drying facilities, the applicants would construct a temporary access pier on the Potrero Power Plant property or an equivalent alternative transload system such as the use of water-based equipment. Once processed to remove the free water, the contaminated sediment would be trucked to an appropriate landfill for disposal. A temporary access road would also be constructed along the shoreline between the Potrero Power Plant and Pier 70 properties to allow vehicle access from the shoreline to the processing areas. The temporary infrastructure would be removed upon project completion.

The offshore project area is divided into three zones: the Nearshore Zone, Transition Zone, and Ambient Area. The Ambient area is the reference site for the remediation and is located offshore of the Nearshore and Transition Zones (Figure 3).

⁶ Feasibility Study, Offshore Sediment Area, Potrero Power Plant Site, San Francisco, CA, Haley & Aldrich, Inc. 2014a

⁷ Remedial Action Plan, Offshore Sediment Area, Potrero Power Plant Site, San Francisco CA, Haley & Aldrich, Inc. December 2017

⁸ Remedial Action Plan, Offshore Sediment Area, Potrero Power Plant Site, San Francisco CA, Haley & Aldrich, Inc. December 2017

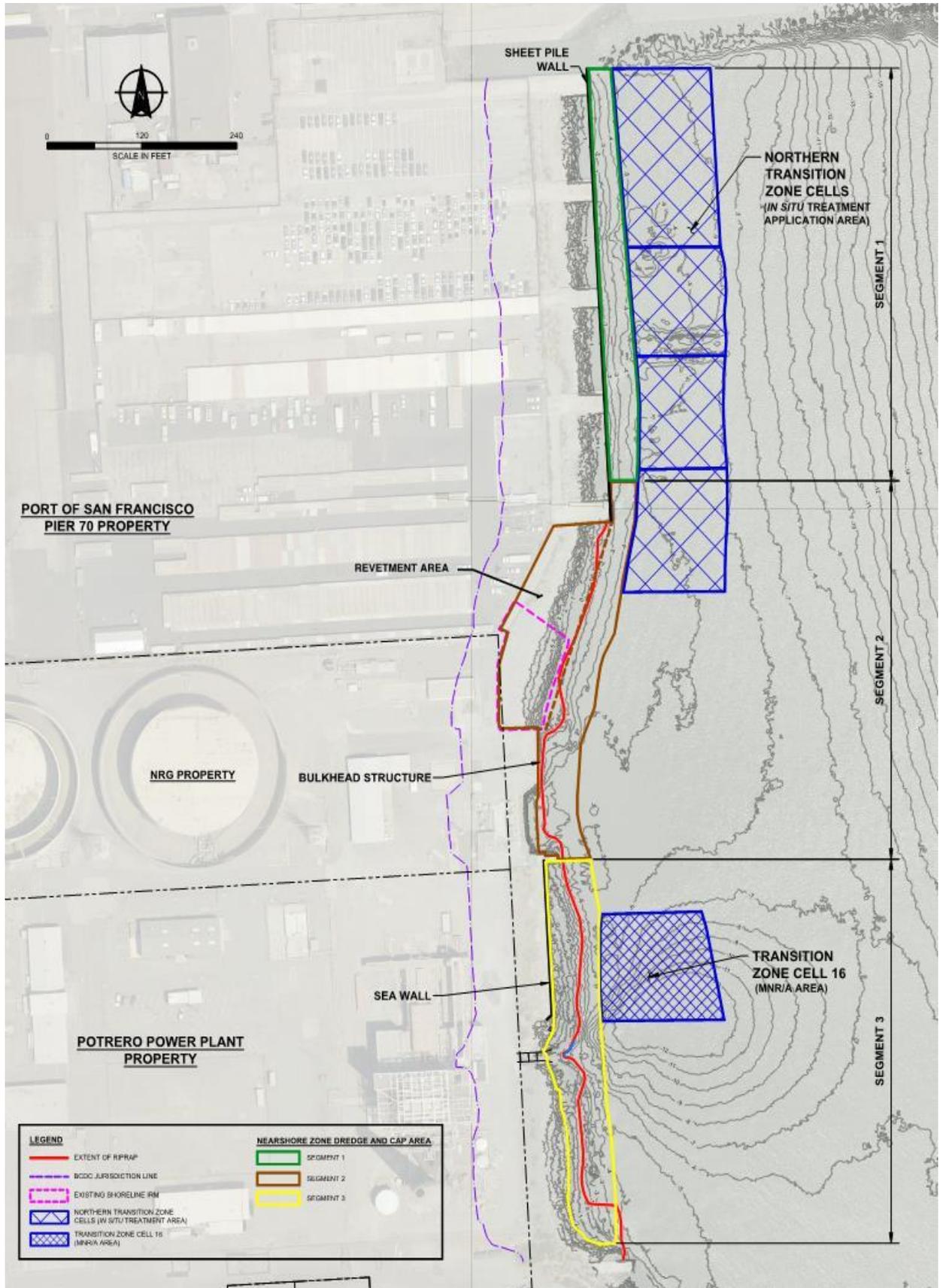


Figure 3: Project Zones and Segments

The Nearshore Zone extends 50-75 feet from the shoreline and within the footprint of historic wharves (removed during the first half of the 20th century). This area contains a variety of wood and concrete debris, and has the highest PAH concentrations in the surface sediments. The Nearshore Zone is further divided into three segments, each one with specific remediation actions and requirements.

- Segment 1 is the most northern segment and is located along the Pier 70 shoreline, bayward of the concrete piers and sheet pile wall.
- Segment 2, to the south extends along Pier 70 and Potrero Power Plant shoreline and includes intertidal areas, uplands and the previously authorized IRM.
- Segment 3 is the southernmost segment, extending along the CBC shoreline and contains a seawall and intertidal areas.

The Transition Zone extends from the Nearshore Zone another 100-150 feet bayward and has lower PAH concentrations than the Nearshore Zone but higher than the San Francisco Bay ambient conditions. The portion of the Transition Zone requiring remediation is located adjacent to Segment 1, and partially to Segment 2. Another portion, Transition Zone Cell 16, is located adjacent to Segment 3.

Project Description

Project

Details: The applicants, PG&E, CBC and the Port, propose to remediate contaminated Bay intertidal and subtidal areas, and the shoreline by dredging and excavating contaminated sediment and riprap; capping and isolating the dredged and excavated areas; treating some contaminants in place; and replacing in-kind the materials excavated from the shoreline by conducting the following activities:

In the Bay:

Removal of Contaminated Sediment, Riprap and Pile-Supported Fill

Nearshore Zone – Segment 1

1. Mechanically dredge approximately 1,486 cy of contaminated sediments and riprap, to a depth of minus 2 to 3 feet (ft) Mean Lower Low Water (MLLW) within an approximately 20,324 sq ft area.

Nearshore Zone – Segment 2

1. Mechanically dredge and excavate approximately 4,608 cy of contaminated sediments and riprap, to a depth of minus 5 to 7 ft MLLW within an approximately 25,621 sq ft area; and

2. Remove an existing sheetpile bulkhead and approximately 70 piles, corresponding to approximately 489 cy of solid fill within an approximately 220 sq ft area.

Nearshore Zone – Segment 3

1. Mechanically dredge and excavate approximately 1,351 cy of contaminated sediments and riprap, to a depth of minus 2 to 3 ft MLLW within an approximately 14,950 sq ft area.

Placement of Remediation and Capping Materials

Nearshore Zone – Segment 1

1. Place, use, and maintain in-kind approximately 275 cy of sand and 225 cy of aggregate within an approximately 20,324 sq ft area as part of the physical isolation cap over the dredged areas.

Nearshore Zone – Segment 2

1. Place, use, and maintain in-kind approximately 503 cy of sand within an approximately 20,352 sq ft area and 579 cy of aggregate within an approximately 31,278 sq ft area as part of the erosion protection over the reactive cap;
2. Place, use, and maintain in-kind approximately 242 cy of intermediate aggregate within an approximately 3,563 sq ft contaminated area as part of the reactive cap revetment toe for contaminated sediment;
3. Place, use, and maintain in-kind approximately 1,158 cy of reactive material (such as an aggregate, bentonite and activated carbon blend) for the reactive cap, over an approximately 31,278 sq ft contaminated area;
4. Place, use, and maintain in-kind approximately 281 cy of filter rock within an approximately 9,292 sq ft contaminated area as part of the reactive cap revetment under riprap;
5. Place, use, and maintain in-kind approximately 900 cy of riprap within an approximately 9,292 sq ft contaminated area to replace existing shoreline protection as part of the reactive cap revetment;
6. Place, use, and maintain in-kind a reactive core mat over an approximately 31,278 sq ft contaminated area as part of the contaminated reactive cap – or – alternatively, dredge an additional 377 cy of sediment to deepen the area by another 6 inches and place a ½-foot thick sand/Organoclay mixture (377 cy) over an approximately 20,352 sq ft contaminated area and a reactive core mat over an approximately 10,972 sq ft area.
7. Place, use, and maintain in-kind approximately 503 cy of sand over the aggregate erosion protection as part of the reactive cap, within the approximately 53,033 sq ft contaminated area, to repair erosion should it occur.

Nearshore Zone – Segment 3

1. Place, use, and maintain in-kind an approximately 229 cy layer of sand and 229 cy layer of aggregate within an approximately 12,357 sq ft area as part of the erosion protection over the dredged areas.

Northern Transition Zone

1. Place, and use approximately 458 cy of activated carbon as the in situ treatment material (in a single treatment event) within an approximately 74,245 sq ft in the Northern Transition Zone. A second treatment event of the same quantity (458 cy) in the same area (74,245 sq ft) may be required as an adaptive management method based on long-term monitoring data made available after construction.

Temporary Infrastructure

1. Construct a temporary 20-foot-wide by 128-foot-long transload deck structure supported by approximately twenty-eight, 2-foot-diameter piles, resulting in approximately 261 cy of temporary solid fill covering approximately 88 sq ft and temporary cantilevered fill over approximately 2,560 sq ft. This optional transload deck would be constructed from the edge of the Potrero Power Plant property to the offshore areas. The temporary deck would be removed upon completion of the project.

In the 100-foot shoreline band:

Removal of Contaminated Sediment and Riprap in Segment 2

1. Excavate approximately 2,692 cy soil and existing riprap from within an approximately 12,600 sq ft area of the upland shoreline.

Placement of Remediation and Capping Materials in Segment 2

1. Place, use, and maintain in-kind approximately 307 cy of filter rock as part of the cap for contaminated sediment under riprap, within approximately 12,600 sq ft of shoreline;
2. Place, use, and maintain in-kind a reactive core mat over an approximately 12,600 sq ft contaminated area in of shoreline; and
3. Place, use, and maintain in-kind approximately 1,012 cy of riprap within an approximately 12,600 sq ft contaminated area to replace existing shoreline protection as part of the containment cap.

Temporary Infrastructure

1. Establish temporary working areas and construct temporary roadways over an approximately 20,056 sq ft area on the upland portion of CBC and Pier 70 properties as part of construction activities. This includes the placement and removal of approximately 2,229 cy of road construction materials. The temporary roadway and work area would be removed upon project completion.

The dredging and capping activities proposed within the shoreline band would result in a net decrease of approximately 1,373 cy of permanent solid fill over an approximately 12,600 sq ft area.

Proposed

Fill: The proposed project would result in the placement of 7,279 cy of fill related to capping and remediating of the contaminated dredged and excavated areas in the Bay and Shoreline Band. The construction of the temporary infrastructure necessary for the project would result in the placement of 88 sq ft (261 cy) of solid fill (piles) and 2,560 sq ft of cantilevered fill for the construction of the transload deck in the Bay, and the 20,056 sq ft of roadway and work staging areas in the Shoreline Band. The temporary fill would be removed at the end of the project.

SUMMARY OF PROJECT CUT AND FILL QUANTITIES			
Description	BCDC Bay	BCDC Shoreline Band	Totals
Disturbance Area (SF)	127,277	12,600	139,877 SF
Pile Removal (SF)	220		-220 SF
Dredge/Excavate (In-Place CY)	8,100	2,692	-10,792 CY
Fill (CY)	5,960	1,319	7,279 CY
Temporary Fill* (SF)	2,648	20,056	22,704 SF
*Temporary fill will be removed when project is complete			

Public

Access: The project will not result in required public access at the sites. However, the Port and the developer, FC Pier 70, LLC, have applied to the Commission for a permit to redevelop the Pier 70 property with mixed-use housing, businesses and open space, including an extension of the San Francisco waterfront public access.

CBC also plans to redevelop the former PG&E Potrero Power Plant property into a mixed-use development in the future. Public access would be included in these development plans and would be specific to the proposed designs and construction plans. Currently, the Potrero Power Plant property is an industrial private property and is fully fenced to prevent public access due to it being an active construction site with contaminants that could be harmful to human health.

Schedule and Cost:

It is anticipated that the final phases of the remediation project, including the previously authorized bulkhead and pile removal, would commence in April 2019 and conclude in January 2020. The estimated project cost is \$20,000,000.

Staff Analysis

Issues Raised: The staff believes that the application raises four primary issues: (1) whether the proposed project is consistent with the McAteer-Petris Act and the San Francisco Bay Plan (“Bay Plan”) policies on allowable fill of the Bay; (2) whether the project is consistent with the Commission’s water quality and dredging policies; (3) whether the project is consistent with the Bay Plan policies on fish, other aquatic organisms and wildlife, tidal flats and subtidal areas; and (4) whether the project is consistent with the Bay Plan policies on the climate change.

1. **Allowable Fill.** The Commission should determine whether the proposed project is consistent with the McAteer-Petris Act sections and relevant San Francisco Bay Plan policies regarding fill in the Bay.
 - a. **Applicable Policies.** The Commission may allow fill only when it meets the requirements identified in Section 66605 of the McAteer-Petris Act and the San Francisco Bay Plan policies on Fills in Accord with the Bay Plan. The McAteer-Petris Act states, in part, that: (a) “further filling of the San Francisco Bay should be authorized only when public benefits from fill clearly exceed public detriment from the loss of water area and should be limited to water oriented uses...or minor fill for improving shoreline appearance and public access to the Bay”; “(b) fill in the Bay should be authorized only when no alternative upland location is available”; “(c) area authorized to be filled should be the minimum necessary to achieve the purpose of the fill”; “(d) the nature, location, and extent of any fill should be such that it will minimize harmful effects to the bay area, such as, the reduction or impairment of the volume, surface area or circulation of water, water quality, fertility of marshes or fish or wildlife resources, or other conditions impacting the environment...”; “(e) that public health and safety and welfare require that fill be constructed in accordance with sound safety standards which will afford reasonable protection to persons and property against hazards of unstable geologic or soil conditions or of flood or storm waters”; “(f) fill should be authorized when the filling would, to the maximum extent feasible, establish a permanent shoreline”; and “(g) fill should be authorized when the applicant has such valid title to the properties in question that he or she may fill them in the manner and for the uses to be approved.”
 - b. **Proposed Bay Fill.** The project proposes to remediate intertidal and subtidal sediments impacted by legacy PAHs. This involves removing the contaminated sediments and placing a physical and/or reactive cap on top of the post-dredge surface. The Bay fill would result from the placement of approximately 6,000 cy of treatment, capping, and erosion control materials over a 127,277 sq ft area. The layers integrated in the cap design include placement of sand, aggregate and riprap over sediment or the reactive cap layer depending on the different shoreline segments.

In order to access the dredged sediments and transfer them upland for processing, temporary infrastructure would to be constructed. A transload deck cantilevered above approximately 2,650 sq ft of Bay and approximately 20,000 sq ft of roadway and work areas would be built upland in the Shoreline Band, all of which would be removed once the project is completed.

While this project proposes to add fill in the Bay for remediation activities, it provides a public benefit as the clean materials would replace contaminated sediments and would reduce continued exposure of PAHs to Bay sediments and water.

- c. **Alternative Upland Location and Minimum Amount of Fill Necessary.** The remediation would take place in intertidal and tidal zones where the contaminants are concentrated, therefore there is no upland alternative location for the proposed project. The project proposes to remove approximately 10,800 cy of PAH contaminated sediments and riprap from the Bay and along the shoreline and dispose of the materials outside of the Commission's jurisdiction. The approximately 7,279 cy of clean capping materials are designed to isolate the remaining contaminated sediments at the bottom of the exposed dredged areas in the Nearshore Zone. The cap will cover only the areas exposed by dredging or excavation. The 458 cy of activated carbon that would be placed in the Transition Zone is designed to integrate into the surface sediments and bond with PAHs to decrease their bioavailability and therefore would result in a very thin layer of fill over 74,245 sq ft that would further protect the Bay. The removed riprap would be reused or replaced in-kind as shoreline protection. Therefore, the proposed fill is the minimum amount necessary to prevent further contact of the contaminants with sediment and Bay waters
- d. **Effects on Bay Resources.** The proposed remediation project would improve Bay water and sediment quality as well as the intertidal and subtidal habitat within the project area. By removing sediments with high PAH concentrations and covering the exposed surface with a reactive cap containing activated carbon that would further bind PAHs in porewater. The placement of physical isolation caps either above the reactive cap or directly onto the post-dredge surface to protect the areas from erosion, the project minimizes potentially bioavailable chemicals from contact with Bay waters and sediments. The use of activated carbon to treat surface sediments in the areas of lower PAH concentrations would improve water and sediment quality as well as subtidal habits without the need to dredge.
- e. **Safety Standards of the Permanent Shoreline.** As part of the final remediation activities, the project proposes to replace and improve a shoreline revetment along a 21,368 sq ft section of the intertidal area in Segment 2 of the Nearshore Zone. The revetment, constructed in 2010 to withstand a 50-year storm, must be removed to allow dredging of its subsoils and to place the reactive cap and erosion control system. The proposed new revetment would be built to 100-year storm criteria and with riprap covering the entire shoreline of Segment 2.

Further, the physical isolation caps (an erosion protection layer of sand and aggregate) would cover the reactive cap in Segment 2 in the Nearshore Zone and would be placed on the newly dredged surfaces in Segments 1 and 3 in the Nearshore Zone. These protective layers have been designed to resist movement and erosion due to tidal and wave forces of a 100-year storm.

- f. **Valid Title.** California Barrel Company, LLC holds title to the former PG&E Potrero Power Plant property. The Port of San Francisco owns the Pier 70 property and waterfront and offshore areas per the Burton Act. PG&E holds a license agreement (License L-14749 dated July 14, 2009 through its Seventh Amendment dated December 7, 2018), from the Port of San Francisco to perform the proposed remediation in the offshore areas.
2. **Water Quality and Dredging Policies.** The Commission should determine whether the proposed project is consistent with its applicable laws and policies regarding Water Quality and Dredging:
- a. **Applicable Water Quality Policies.** The Bay Plan policies on Water Quality state, in part that “Bay water pollution should be prevented to the greatest extent feasible. The Bay’s tidal marshes, tidal flats, and water surface area and volume should be conserved and, whenever possible, restored and increased to protect and improve water quality.” The policies also state that “[w]ater 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.” Finally, the policies state that “[w]hen approving a project in an area polluted with toxic or hazardous substances, the Commission should coordinate with appropriate local, state and federal agencies to ensure that the project will not cause harm to the public, to Bay resources, or to beneficial uses of the Bay.”
- b. **Proposed Remediation.** The proposed project is one of the three remediation projects to be conducted by PG&E as described in the Water Board approved Remediation Action Plan (2018) and the first one to be undertaken. The project would result in the removal and treatment of PAH contaminated sediments that have been shown to bioaccumulate in the benthic invertebrates in the sediments, which are fed upon by fish and can further biomagnify up the food chain. The project’s goal is to eliminate these harmful effects by removing sediments containing high concentrations of PAHs from the Bay, capping the disturbed areas with remaining contaminants to prevent additional water and sediment pollution, and to neutralize the PAHs on subtidal sediment surfaces. To that end, the site was thoroughly evaluated with the oversight of the Water Board, EPA, NMFS, CDFW, USACE, and BCDC, who have agreed with the proposed remediation.

To achieve these goals, PG&E, the Port and CBC propose to dredge the areas with the highest concentration of PAHs (Segments 1, 2 and 3 of the Nearshore Zone) between the sediment at the surface and down to between 3 and 7 feet in various areas. To minimize the movement of the lower concentrations of PAH in the newly exposed areas a cap consisting of activated carbon and/or sand and aggregate would be installed, with the final elevation of 6 to 12 inches below the existing mudline in order to allow natural accretion to take place and renew habitat in the top layer of sediment (Figure 4).

The concentration of contaminants in Segments 1 and 3 of the Nearshore Zone were sufficiently low and would only require a physical isolation cap. In these Segments, a 6-inch thick layer of aggregate will be placed on the post-dredge surface as erosion protection overlain by a 6-inch thick layer of sand as a bioturbation promotion layer. In the areas within Segment 1 where the submerged marine rails remain, the dredge depth will be shallower, to approximately 12 inches, and the sand cap approximately 2 to 6 inches thick to allow for bioturbation as well.

The elevated levels of contamination found in Segment 2 of the Nearshore Zone was determined to require a reactive chemical cap in addition to the physical isolation cap. In this area a reactive core mat would be placed on the post-dredge surface and topped with 12 inches of reactive material, a combination of aggregate, bentonite clay and active carbon. The reactive layer would be covered by a 6-inch layer of aggregate and sand to an elevation of approximately 12 inches below mudline to protect the cap from erosion and allow the restoration of native sediment and recolonization by marine organisms. The activated carbon and reactive core mat are regularly used in remediation projects in marine environments and have been approved by the Water Board for this project.

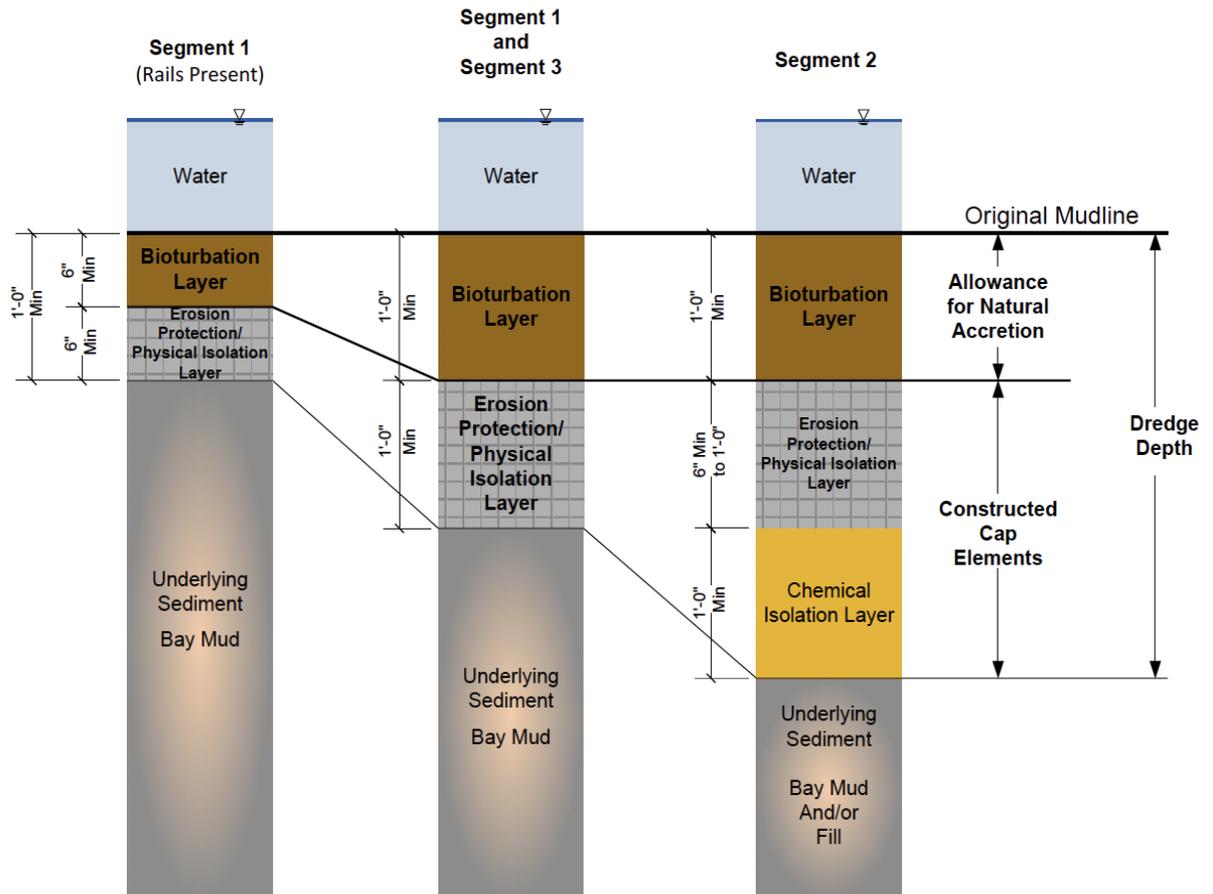


Figure 4: Conceptual Cap Profiles by Segments for Submerged Areas

The Transition Zone contains lower PAH concentration than the Nearshore Zone but still higher than the San Francisco Bay ambient concentrations. As a result, the northern portion of the Transition Zone would not be dredged, but instead would be treated with approximately 2 inches of activated carbon across the area to bind the PAHs in the sediment, decreasing their bioavailability.

An additional area within the Transition Zone, Cell 16 also exhibited PAH concentrations above Bay ambient concentrations. This area is far deeper than other portions of the site due to scour from a former cooling water outfall pipe and is now highly depositional. As a result, no dredging is needed, and the proposed remediation measure is to allow natural sedimentation to take place in order to contain the PAHs over time. PG&E and the Port believe this is appropriate due to the highly accretive nature of this part of the site.

In the Water Board's April 4, 2018 Water Quality Certification, it authorized the necessary dredging, capping, upland sediment processing and disposal activities as well as the construction of a temporary dock to allow transfers of sediment from barge to truck. The water quality certification also requires minimization measures such as monitoring turbidity control systems and sequencing work to allow areas to return to ambient conditions before dredging other sections and preventing any construction materials or waste from entering the Bay, as well as a variety of best management plans.

A Risk Management and Monitoring Plan (RMMP) will be prepared, reviewed, and approved before the commencement of remediation. The RMMP would include bathymetric surveys of the capped areas, evaluation of cap integrity, monitoring for erosion and deposition of sediment for a 5-year period. The RMMP would also include regular monitoring of bioaccumulation and bioavailability of PAHs over time. The results would be compared Bay ambient conditions. Monitoring of the capped areas and the activated carbon treated subtidal areas after completion of the project would allow the applicants to gauge the success of the remediation and apply adaptive management techniques if needed.

- c. **Applicable Dredging Policies.** The Bay Plan policies on Dredging state, in part that dredging should be authorized when the commission can find that “[D]redging and dredged material disposal should be conducted in an environmentally and economically sound manner;” and that “[t]he siting and design of the project will result in the minimum dredging volume necessary for the project.” The policy adds that “[t]he materials to be dredged meet the water quality requirement of the San Francisco Bay Regional Water Quality Control Board;” and that “[t]he quality of the materials disposed of is consistent with the advice of the San Francisco Water Quality Control Board.”
- d. **Proposed Dredging and Disposal.** The proposed project includes dredging of 8,100 cy of contaminated sediments, and excavation of 2,692 cy of soil and riprap in the Nearshore Zone. The dredging would be done with mechanical dredges using environmental buckets and silt curtains to limit the loss of sediment to the water

column. Absorbent booms will also be deployed during dredging to further minimize the drifting of suspended sediments away from the contaminated areas. In areas where the use of an environmental bucket is not feasible, diver assisted dredging may be used.

The proposed dredge footprint and design depths were developed based site investigations, including sediment quality analysis. This analysis determined the locations of elevated concentrations of PAHs and the depth at which they exist and can be remediated. The sediment that would be dredged was tested for potential impacts on water quality, species, and to identify disposal options. The results indicated that the PAHs concentrations were too high to be acceptable at a beneficial reuse site. Further analysis determined that management of the contaminated sediment would be best achieved through upland disposal.

The water quality certification requires the dredged sediments be taken upland for processing and disposal. The dredged sediment would be transferred from barge to truck using the temporary transload deck and moved to the processing location outside the Commission's jurisdiction. Once processed the dredged materials would be trucked to an upland disposal site outside of the Commission's jurisdiction.

3. **Natural Resources Policies.** The Commission should determine whether the project is consistent with its laws and policies regarding Fish, other Aquatic Organisms and Wildlife, Tidal Flats and Subtidal Areas.
 - a. **Applicable Fish, Other Aquatic Organisms and Wildlife Policies.** The Bay Plan policies on Fish, Other Aquatic Organisms and Wildlife state, in part, that "to assure the benefits of fish, other aquatic organisms and wildlife... to the greatest extent feasible, the Bay's tidal marshes, tidal flats and subtidal habitat should be conserved, restored and increased;" and that "the Commission should consult with the California Department of Fish and Game [Wildlife] *sic* and the U.S. Fish and Wildlife Service or the National Marine Fisheries Service whenever a proposed project may adversely affect an endangered or threatened plant, fish, other aquatic organism or wildlife species...and give appropriate consideration of [their] recommendations in order to avoid possible adverse impacts of a proposed project on fish, other aquatic organisms and wildlife habitat."
 - b. **Habitat Remediation and Protection of Species.** A stated goal of the proposed project is to mitigate the potential exposure of fish and wildlife to PAHs that have bioaccumulated in bottom dwelling organisms in high concentrations. To accomplish this goal, the project would remove contaminated sediments in intertidal and subtidal areas along the shoreline and treat the surface of subtidal sections of the project area exhibiting lower concentrations of PAHs. In preparation for the project the applicants contacted California Department of Fish and Wildlife (CDFW) and the U.S. Army Corps of Engineers (USACE) which entered into an informal consultation with the National Marine Fisheries Service (NMFS) on the applicants' behalf in 2018. Both CDFW and NMFS concur with USACE that the project is not likely to adversely affect Pacific herring, longfin smelt, steelhead and green sturgeon if the following measures are taken during the proposed work:

- The dredging, disposal and surface treatments would take place during the environmental work windows of June 1 through November 30;
- Mechanical dredges with environmental buckets would be used to conduct the dredging, and diver assisted dredging would be used in areas not accessible with a bucket (Segment 1 near the submerged marine rails);
- Turbidity curtains and floating booms would be deployed during dredging, with the potential use of block nets to exclude longfin smelt near divers if needed;
- Pile driving during the construction of the temporary transload deck would be conducted with a vibratory hammer. If an impact hammer is needed due to refusal at the site, the applicant would use bubble curtains acceptable to NMFS as a means to mitigate for increased underwater noise; and
- A Storm Water Pollution Prevention Plan would be developed and implemented by the applicants.

Although the project would impact essential fish habitat, NMFS agrees that the benefit resulting from removal of concrete and wood debris, contaminated sediments from the site, and the capping of the newly exposed surfaces outweigh the temporary detriments to the habitat.

Monitoring of the capped areas and the activated carbon treated subtidal areas after completion of the project would allow the applicants to gauge the success of the remediation and apply adaptive management at the site if needed.

- c. **Applicable Tidal Flats and Subtidal Areas Policies.** The Bay Plan policies on Tidal Flats and Subtidal Areas state, in part, that “any proposed filling... or dredging project should be thoroughly evaluated to determine the effect of the project on ... tidal flats subtidal areas and designed to minimize, and avoid any harmful effects.” The policies also states that “[A]ny... restoration project should include clear and specific long-term and short-term biological and physical goals, and success criteria, and a monitoring program to assess the sustainability of the project. Design and evaluation of the project should include an analysis of: (a) how the system’s adaptive capacity can be enhanced so that it is resilient to sea level rise and climate change; (c) localized sediment erosion and accretion; (d) the role of tidal flows; (g) the expected use of the site by fish other aquatic organisms and wildlife; (i) site characterization.” Further, “a minor amount of fill may be authorized to enhance or restore... habitat based on scientific ecological analysis and consultation with the relevant federal and state resources agencies and if the Commission finds that no other method of enhancement or restoration except filling is feasible.”
- d. **Proposed Protection of Tidal Flats and Subtidal Areas.** As described in more detail above, the proposed remediation project addresses the PAH contaminated sediments along the former Potrero Power Plant and Pier 70 shoreline. To further limit exposure to PAHs the dredged areas would be capped with reactive materials (Segment 2) and erosion protection material (Segments 1, 2 and 3). The surfaces of areas of lesser concentrations of PAHs would be treated with a thin layer of activated carbon to decrease the bioavailability of the chemical.

The minor amount of fill proposed would improve the conditions of the intertidal and subtidal habitat, including water quality and sediments, its use by fish and wildlife, as well as the public. The protective caps were designed to withstand significant currents and wave action occurring during a 100-year storm event, and subsequent erosion. Additionally, the placement of the caps at lower elevations than the existing mudline would allow accretion of fine sediment to restore the area to a more natural state and provide for colonization by invertebrates.

4. **Climate Change Policies.** The Commission should determine whether the proposed project is consistent with the McAteer Petris sections and relevant San Francisco Bay Plan policies regarding Climate Change.
 - a. **Applicable Climate Change Policies.** The Bay Plan policies on Climate Change state, in part, that “[U]ntil a regional sea level rise adaptation strategy can be completed, the Commission should evaluate each project on a case by case basis to determine the project’s public benefits, resilience to flooding and capacity to adapt to climate change impacts. The following specific types of projects have regional benefits... and should be encouraged, if their regional benefits ... outweigh the risk from flooding: remediation of existing environmental contamination and a natural resource restoration or environmental enhancement project.”
 - b. **Designing for Sea Level Rise.** The proposed project was designed to remediate a contaminated shoreline by removing impacted sediments and placing protective caps on the exposed surfaces. The project also includes the removal of old pilings, bulkheads and removing and replacing a previously placed riprap revetment. As discussed in the Tidal Flats and Subtidal Area section the capping system was designed to withstand currents and wave forces due to 100-year storms under current water elevations and projected sea level rise elevations.

The initial revetment was engineered and constructed to withstand a 50-year storm. Due to high levels of PAHs in the intertidal area this revetment must be removed to allow the dredging of some of its subsoils and the placement of a reactive cap and erosion control in its existing footprint. The proposed new revetment would be built to 100-year storm criteria and would cover the entire shoreline of Segment 2 and be constructed to an elevation ranging from 11 to 13 ft NAVD88. The riprap armoring of the revetment would protect the shoreline from tidal influence and wave action.

The impact of sea level rise was considered in the redesign of the revetment. The current still water level (mean high water) was calculated to be 5.3 ft NAVD88, and the future still water elevations were projected to be 6.2 ft NAVD88 in 2050 and 8.3 ft NAVD88 in 2100. Wave runup was calculated to be 2.8 feet for a 1-year storm and 5.6 feet for a 100-year storm. Based on these estimates the new revetment would be resilient to the wave runup generated by a current 100-year storm (10.9 ft NAVD88), but would be over-topped by 100-year storm wave runup by mid-century. The 11 ft NAVD88 elevation of the revetment was deemed suitable for the proposed project. It is anticipated that the future redevelopment of the Pier 70 and CBC properties would include an evaluation and potential raising of the shoreline in consideration of predicted sea level rise.

5. **Environmental Review.** Acting as lead agency, on January 4, 2018 the Regional Water Quality Control Board adopted the Initial Study/Mitigated Negative Declaration (2018) and the Mitigation, Monitoring and Reporting Program for the Remedial Actions in the Off-Shore Areas, Pacific Gas & Electric Company, Potrero Power Plant Site (2018).
6. **Relevant Portions of the McAteer-Petris Act**
 - a. **Section 66605**
 - b. **Section 66632**
7. **Relevant Portions of the San Francisco Bay Plan**
 - a. *San Francisco Bay Plan* Policies on Fill in Accord with the Bay Plan
 - b. *San Francisco Bay Plan* Policies on Water Quality
 - c. *San Francisco Bay Plan* Policies on Dredging
 - d. *San Francisco Bay Plan* Policies on Fish, Other Aquatic Organisms, and Wildlife
 - e. *San Francisco Bay Plan* Policies on Tidal Flats
 - f. *San Francisco Bay Plan* Policies on Subtidal Areas
 - g. *San Francisco Bay Plan* Policies on Climate Change