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BIOLOGICAL ASSESSMENT OF EELGRASS IN THE VICINITY OF A PROPOSED ROCK GROIN AND WITHIN THE SALINAS DE SAN PEDRO SALT MARSH AT CABRILLO BEACH

15 July 2008

Essentia Management Services
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Subject: Biological Assessment of Eelgrass in the Vicinity of a Proposed Rock Groin and within the Salinas de San Pedro Salt Marsh at Cabrillo Beach in San Pedro

Attention Ms. Whitney Fiore:

In preparation of the San Pedro Waterfront EIR/EIS, biologists from MBC Applied Environmental Sciences conducted surveys for eelgrass (*Zostera marina*) within the Salinas de San Pedro salt marsh and lagoon and in the vicinity of the proposed footprint of a rock groin that would be utilized to stabilize the entrance to the lagoon (Attachment 1).The surveys were conducted on 9 July 2008 between 1100 and 1430 hours to determine whether the construction of a proposed rock groin along the offshore berm protecting the salt marsh and re-contouring, dredging to -4 ft MLLW, and removal of an island in the middle of the Salinas de San Pedro salt marsh would potentially impact eelgrass.

METHODS

Eelgrass protocols designed to determine potential impacts to eelgrass beds and provide consistent mitigation requirements are described in the Southern California Eelgrass Mitigation Policy (Revision 11, August 30, 2005) (NMFS 1991) promulgated by National Marine Fisheries Service (NMFS) and California Department of Fish and Game (CDF&G). Survey protocols for eelgrass are not proscribed as they are based on the amount of area to be surveyed, but generally about 20% of the area is visually surveyed at a minimum.

Offshore Eelgrass Bed. Using a systematic approach, MBC biologist-divers surveyed the offshore area seaward of the berm protecting the Salinas de San Pedro salt marsh to a distance of at least 20 m beyond the area of potential effect (APE) of the groin placement project. Biologist-diver teams swam the inshore edge parallel to the protective groin of the salt marsh and the south edge of the eelgrass bed adjacent to the Cabrillo Beach launch ramp and recorded global positioning system (GPS) coordinates of the edge at intervals of about 10 m to exactly locate the eelgrass coverage. The offshore edge of the APE was also surveyed along with the north edge of the site to beyond the APE. As visibility was greater than 2 m, each transect (the biologist looking on both sides of the transect line) covered more than a 4-m swath. Within the roughly rectangular survey area, biologists conducted numerous transects criss-crossing the area resulting in a coverage of about 50% or more of the APE area. In addition, density measurements were conducted by counting the number of turion blades (eelgrass shoots) within 20 randomly placed 0.25-m^2 quadrats. The number of transects through the area were also in excess of the 20% requirement for a Caulerpa survey of the APE (as required by the *Caulerpa* Surveillance Level Criteria). This would be necessary at least 30 days prior to any dredging, rock placement,

or other construction work in the water to insure that any infestation of *Caulerpa taxifolia* that might be present and potentially disturbed in the APE would not be missed.

Salinas de San Pedro Salt Marsh. In the salt marsh, eelgrass was surveyed in the same manner as the offshore bed. As there was no indication that eelgrass may be present within the salt marsh, an initial reconnaissance survey was conducted to determine its presence. The reconnaissance survey confirmed the presence of eelgrass and therefore a more comprehensive survey was initiated. The survey determined the area and densities of eelgrass within the lagoon of the salt marsh using line transects, measuring tapes, and GPS. Within the lagoon area and surrounding the kidney shaped island (which measured about 33 m in length by 16 m wide), biologists conducted numerous transects measuring the eelgrass coverage within the lagoon. In addition, density measurements were conducted by counting the number of turion blades within 8 randomly placed 0.25-m^2 quadrats. Although, visibility was relatively poor within the lagoon (0.25 to 1 m), the number of transects throughout the area were sufficient to exceed the 20% requirement of a survey of the APE required by the *Caulerpa* Surveillance Level Criteria.

SURVEY RESULTS

The subtidal survey was conducted on 9 July 2008. Sea conditions in the harbor and lagoon were flat throughout the day and winds were at 3-5 kn out of the south. Sampling occurred between 1100 and 1430 hrs. On that day, the tide rose from a low of +1.2 ft mean lower low water (MLLW) at 0843 hr to a high of +4.9 ft MLLW at 1544 hr. Underwater visibility ranged from 0.25 to at least 2.5 m.

Offshore. Eelgrass was found growing from the -1 ft MLLW area to at least the -5 ft MLLW area (offshore limit of survey) offshore of the berm that protects the outer edge of the salt marsh. A diagrammatic representation of the eelgrass that was found growing offshore is presented in Attachment 2. On the map, only the inshore area of eelgrass and eelgrass growing on the south side of the launch ramp are actual limits of eelgrass growth. The northern and offshore boundaries on the map are limits of the survey and not boundaries of eelgrass growth as it grows well beyond the survey area boundaries. Eelgrass coverage within the APE varied in density within the offshore area of the berm (generally greater in shallow and less offshore) ranging from 24 to 408 turions per m^2 and averaged 180 per m^2. Eelgrass turions were relatively short at about 1 ft (0.3 m) in height in the inshore area to -3 ft MLLW and becoming larger to 2 ft (0.6 m) tall in deeper depths to at least the -5 ft MLLW depth range. Coverage was not 100% and large holes were found within the search area; however, eelgrass was present within a portion of the footprint of the proposed rock groin and in the area where the entrance would be re-contoured and in the buffer area surrounding both areas. Although there was a clear delineation on the inshore edge of the eelgrass, widely scattered patches of eelgrass were found inshore of the edge and growing almost up to the berm. Over all, the seaward 120 ft of the approximately 220 ft by 25 ft groin would directly cover about 3,000 ft^2 (0.07 acre) of the eelgrass beds. Additionally the area re-contoured at the entrance to the salt marsh lagoon and at the base of the rock groin would cover an area about 40 ft by 8 ft for a loss of 320 ft^2 (0.01 acre). A construction buffer zone around the groin of 33 ft (10 m) on either side of the rock groin would potentially impact another 10,900 ft^2 (0.25 acre) for a total offshore potential impact area of approximately 14,200 ft^2 (0.33 acre).

Salt Marsh Lagoon. Within the lagoon, patches of eelgrass (0.1 m^2 to 3 m^2) were found growing in the entrance channel and on the sides of the channel, while within the main portion of the lagoon area, and especially surrounding the island, where relatively sparse but contiguous eelgrass beds grew (Attachment 2). Eelgrass turions were tall at 3 to 4 ft (1 to 1.2 m), but were found in low density ranging from 24 to 120 turions per m^2 and averaging 69 turions per m^2. Eelgrass was patchily distributed but extended from the island in a southerly direction at least 19 m, and was contiguous from distances varying from 5.5 to 12 m to the east of the riprap stabilizing the subtidal footprint of the island, from 2.5 to 10 m to the west of the island, but only

about 2 m in a northerly direction from the island. Eelgrass was found growing from the subtidal berm surrounding the island to the rocky subtidal berm stabilizing the slope of the salt marsh on the east side of the island, but was relatively distant from the shore on the west side. Eelgrass was depth limited within the lagoon, and was not found deeper than -2 ft MLLW; most of the area on the north side of the island was deeper than this and, consequently no eelgrass was found in that location. The total projected area of eelgrass impact within the lagoon was 3,262 ft^2 on the east side of the lagoon island, 1,678 ft^2 on the west side, 4,776 ft^2 on the south side, and 375 ft^2 on the north side of the island for a total potentially impacted area of 10,091 ft^2 (0.23 acre) around the island, and a small additional impact of about 100 ft^2 (0.002 acre) from small patches within the entrance channel resulting in a total impact of 0.234 acre within the salt marsh lagoon boundaries.

DISCUSSION

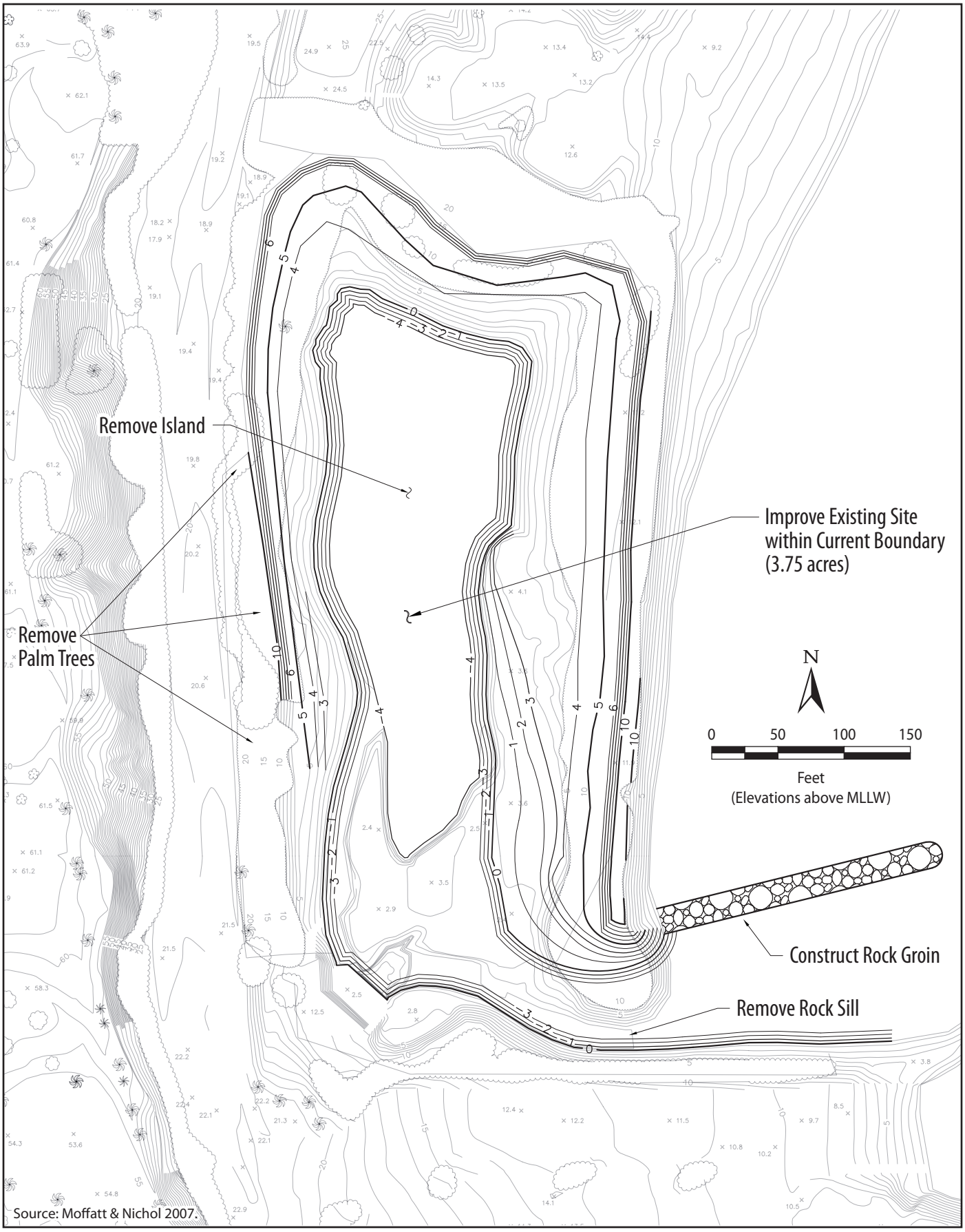
The salt marsh enhancement project as determined by this survey could permanently impact 0.08 acre of eelgrass in the offshore portion of the berm protecting the salt marsh lagoon by direct coverage from placement of the rock groin and re-contouring of the entrance channel. Additionally, construction activities placing the rock groin could also cause a short-term impact of about 0.25 acre for a total project impact outside of the lagoon of 0.33 acre when combining long-term and short- term impacts.

In the salt marsh lagoon area, the impacts would be the total removal of the island, re-contouring the slopes, and the deepening of most of the lagoon to -4 ft MLLW. Additionally, deepening the lagoon entrance would impact a small amount of eelgrass growing in the channel for a total impact of 0.23 acre. Although eelgrass currently only grows to about -2 ft MLLW within the lagoon, eelgrass offshore of the lagoon where currents and tidal movements are greater grows to at least -7 ft MLLW and during good years to -9 ft MLLW. Tidal flushing is currently hampered by flow through a narrow entrance and exit channel; this along with shoaling inside of the lagoon, results in the water in the main portion of the lagoon being not greatly influenced by tidal flows. Due to the calm water and relatively poor water exchange, delicate dinoflaggelates and diatoms (phytoplankton blooms) are able to grow undisturbed and contribute to turbid water conditions decreasing light and thereby photosynthesis below the blooms. Biologist-divers conducting the survey reported layers of yellow to green water (phytoplankton blooms) with no visibility below these layers. The result is that eelgrass can not establish beyond the -2 ft MLLW depth level with these conditions. The improvements proposed to the tidal flushing aspects of the lagoon could result in a long-term benefit to the eelgrass beds within the lagoon, resulting in better water quality, more visibility, less frequent plankton blooms, and eelgrass establishing itself deeper within the lagoon over a wider area than just the habitat provided by removal of the island. In addition to an eelgrass survey, the area was surveyed at a sufficient density to detect the presence of *Caulerpa taxifolia,* if it was present. No *Caulerpa* was observed in either the offshore or lagoon area.

Cordially,

MBC *Applied Environmental Sciences*

Michael D. Curtis
Senior Scientist



Source: Moffatt & Nichol 2007.

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Figure 3.3-5
Proposed Salt Marsh Mitigation Improvements


N
72 m
© 2008 Tele Atlas
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Pointer 33° 42.858' N 118°17.066' W elev 1 m
Streaming 100%
Eye alt 265 m