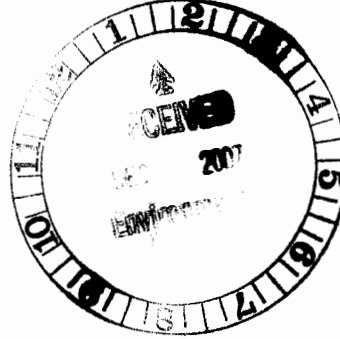


## **Merkel & Associates, Inc.**

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December 4, 2007

M&A #07-046-01

Eileen Maher  
San Diego Unified Port District  
P.O. Box 120488  
San Diego, CA 92112

### **Re: Derelict fishing gear removal at popular fishing points in San Diego Bay**

Dear Eileen:

This letter reports the findings of the program to search for and remove derelict fishing gear at popular shore-based fishing spots in San Diego Bay (**Figure 1**). The search and removal effort was funded by a Port of San Diego (Port) Environmental Advisory Committee Grant as part of the San Diego Port District's Environmental Stewardship Program.

Merkel & Associates, Inc. (M&A) surveyed 8 popular fishing sites (**Figure 1**) on November 5-6, 2007. The results of the preliminary site surveys were provided to the Port in a letter report dated November 9, 2007. The preliminary survey was used to prioritize the survey sites and to allocate resources based on localized abundance of derelict fishing gear.

The fishing gear removal was performed by teams of divers searching structures at or near the fishing location and cutting debris free with knives and shears. Removed debris was placed in temporary holding bins underwater and stored until the bin was full. Full bins were brought to the surface and emptied into trashcans kept on board the support boat. All removed fishing gear was taken to the M&A office where it was weighed, photographed, and sub-sampled for constituent weights before being discarded.

Between November 8 and November 26, 2007, M&A divers searched for and removed derelict fishing gear items that posed a threat to wildlife and beneficial uses of San Diego Bay. Most of the removal effort was spent at the Embarcadero South Fishing Pier and the Shelter Island Fishing Pier. Both of these sites have artificial reef structures that were heavily entangled with monofilament and associated fishing gear.

Prior to, and during, the removal effort outreach was performed to notify bay users of the project and how it would temporarily affect usage of the cleanup site. The week prior to the removal effort, notices were posted at each site to notify users of the upcoming project. The notices emphasized the need for the project and informed the users of temporary closures while divers worked to remove abandoned fishing gear.

During the removal effort an M&A staff member stood on the adjacent shoreline or fishing pier and interacted with users and interested parties. Interaction typically consisted of notifying people of what was happening, offering a handout describing the project, and asking fishers to modify their activities during the removal effort to prevent snagging any of the team members. At no time was a

complete closure of a fishing location required. Typically, fishers were simply asked to move to one end of the fishing location while work was performed at the other end.

The removed fishing gear is summarized in **Table 1**. Divers removed an estimated 4,361 pounds of fishing gear and associated debris at all 8 sites during the removal effort. Shelter Island Fishing Pier resulted in the greatest amount of removed fishing gear. A total of 3,631 pounds of debris was removed over 8 days at Shelter Island. At the Embarcadero Marina Park South, 570 pounds was removed during two days. The remaining 160 pounds was removed from all other sites combined.

Sub-samples taken from the removed fishing gear were divided into monofilament, tackle and lead, and biological waste (mostly shells and seaweed). The divided sub-samples were weighed to determine the relative proportion of the removed mass that belonged to each category. Additionally, the sub-sampled monofilament was measured and weighed to determine the approximate length of monofilament removed based on the weight removed. The sub-sampling effort estimated the approximate removal of 1,526 pounds of lead and tackle as well as 698 pounds of monofilament (**Table 1**). The removed monofilament was estimated to total 647 miles in length.

Qualitatively, the project has resulted in tremendous benefit to the beneficial uses of San Diego Bay. During the effort, one large lobster was found dead from entanglement and another was cut free from monofilament. Additionally, the reef structures at Embarcadero Marina Park South and Shelter Island Fishing Pier were dramatically changed through this effort. Prior to the gear removal, it was difficult to identify the openings in the reef structures at the Shelter Island Fishing Pier. It was only after removal of monofilament that the removal team learned that the reef structures were made of concrete pipe. Thus, the pipes that were intended to provide shelter for fish and invertebrates were essentially eliminated as habitat because their openings were blocked. The team noted that fish began to occupy openings in the reefs after the gear was removed.

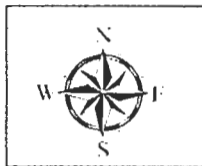
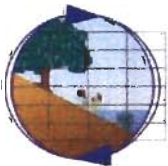
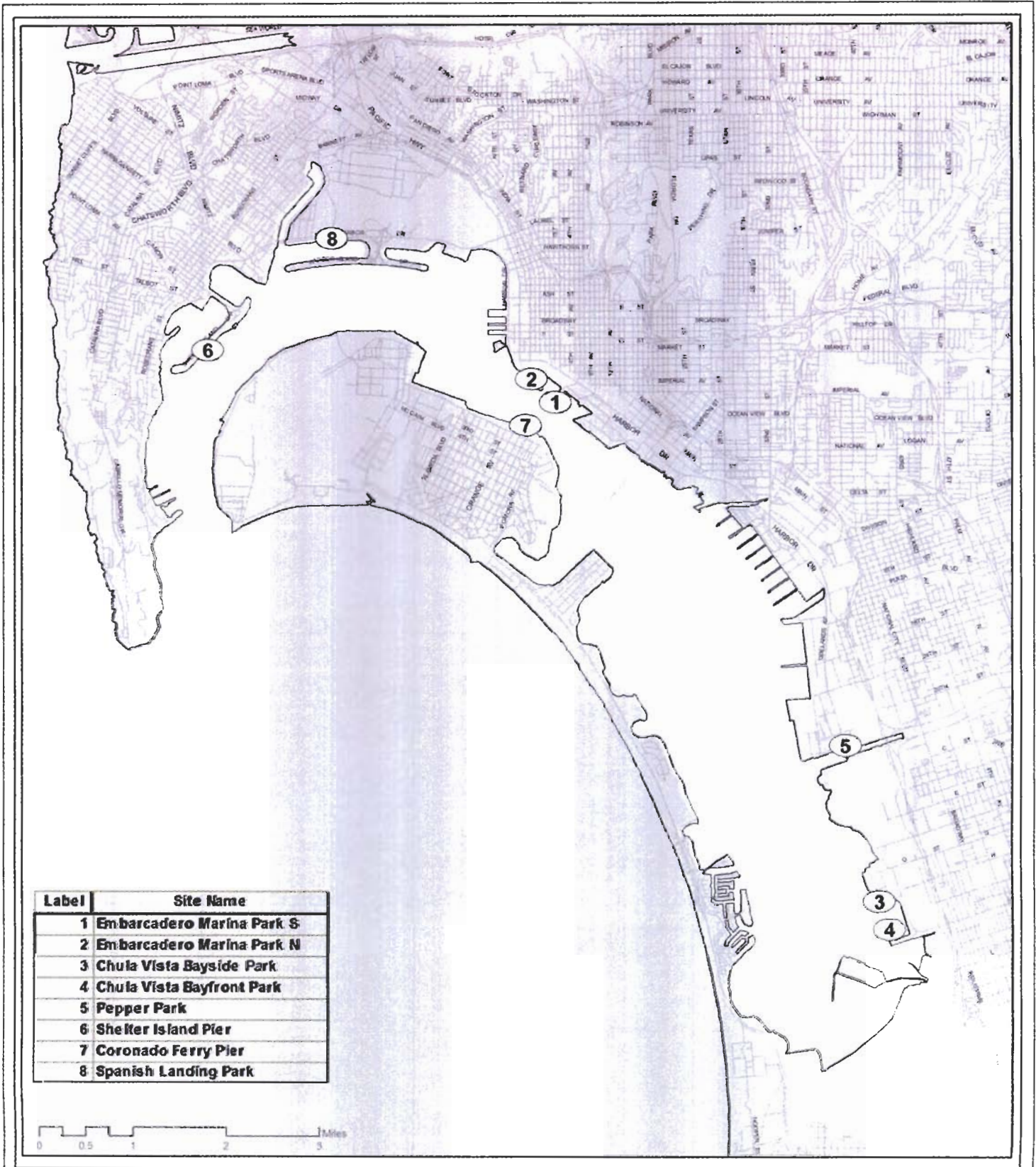
A CD is included with this letter. The CD contains video footage of the Shelter Island Pier reef structures before and after the removal effort. It also contains video footage at the Embarcadero Marina Park South reef structures prior to the removal effort. Additionally, the CD contains underwater images of debris items at each target site, as well as images showing the debris removed each day. A few notable photos are included at the end of this document.

It has been a pleasure working on a project that has made an obvious improvement to recreational and wildlife uses of San Diego Bay. If you have any questions regarding this letter or the included materials, please contact me at (858) 560-5465.

Sincerely,



Robert Mooney, Ph.D.  
Senior Biologist



**Derelict Fishing Gear Cleanup**  
**Port of San Diego Environmental Stewardship Program**  
 Public Fishing Locations, San Diego Bay, California

**Figure 1**

Table 1. Summary of fishing gear debris removed from 8 popular fishing sites in San Diego Bay. Estimates were based on sub-samples of debris that were separated into constituents to estimate their contribution to the total debris removed.

Project Site	Date	Removed Debris (lbs.)	Estimated Tackle & Lead (lbs.)	Estimated Monofilament (lbs.)	Estimated Monofilament (miles)
<i>Shelter Island Pier</i>	11.12.07	334	117	53	50
	11.14.07	780	273	125	116
	11.15.07	595	208	95	88
	11.16.07	350	123	56	52
	11.19.07	462	162	74	69
	11.20.07	780	273	125	116
	11.21.07	250	88	40	37
	11.26.07	80	28	13	12
	11.08.07	245	86	39	36
	11.09.07	325	114	52	48
<i>Embarcadero Marina Park South</i>					
<i>Embarcadero Marina Park North*</i>					
<i>Pepper Park*</i>					
<i>Spanish Landing Park*</i>					
<i>Coronado Ferry Landing Pier*</i>					
<i>Chula Vista Bayside Park*</i>					
<i>Chula Vista Bayfront Park*</i>	11.13.07	160	56	26	24
<b>Totals</b>		<b>4,361</b>	<b>1,526</b>	<b>698</b>	<b>647</b>

\*Collected gear was combined for these sites and reported under Chula Vista Bayfront Park.