NOBLE
CONSULTANTS, INC.

August 15, 2002 806-02

Mr. Simon A. Poulter
Vice President
Padre Associates, Inc.
5450 Telegraph Road
Suite 101
Ventura, CA 93003

RE: Fourth Interim Report of Findings
Mobil Seacliff Oil Piers Beach Monitoring Program

Dear Mr. Poulter:

INTRODUCTION

This letter report presents the fourth annual interim findings for the Mobil Seacliff Oil Piers Beach monitoring program from March 2001 to February 2002. This monitoring program is being conducted on behalf of ExxonMobil Global Remediation. The purpose is to measure variations in sand levels over the beach and to report significant wave events that have occurred during this period that may result in beach profile changes.

The original Mobil Seacliff Oil Piers were constructed in the 1930's and consisted of three pile supported access trestles that led to small offshore drilling wharfs. The piers were demolished between January and September 1998 after their functional purpose was no longer required[1]. In approving the demolition of the piers, the California Coastal Commission imposed a 5-year beach monitoring program (1998-2002) to observe potential shoreline changes adjacent to the Oil Piers before, during, and after the pier demolition work. The monitoring program consists of monthly beach profile surveys at the site for the first two years and quarterly surveys for the remaining three years.

This fourth year beach monitoring program consists of quarterly beach profile surveys and review of nearshore wave climate within the subject site. Repetitive surveys of the beach were performed at eight profile transect lines established within a 3,300-foot shoreline segment that includes the beach locations adjacent to and within the area of the Mobil Seacliff Oil Piers. The shoreline distance between adjacent transects range from 400 feet to 450 feet. The surveys extend from the toe of the existing riprap revetment to the approximate Mean Low Lower Water (MLLW) line. The quarterly surveys were performed by Fugro West, Inc. and were scheduled during the time of lowest tide to maximize the opportunity to measure elevations to the Mean Lower Low Water line. Pacific Weather Analysis conducted the meteorological review by referral to daily deep ocean wave measuring buoy data and meteorological charts. The wave event information was then summarized to correlate wave activity with the extent of any observed

[1] First Interim Report of Finding, Mobil Seacliff Oil Piers Beach Monitoring Program, prepared by Noble Consultants Inc., April 9, 1999.

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beach changes. The following sections describe the wave climate, survey results and interpretive analysis for the period from March 2001 to February 2002.

WAVE CLIMATE

Within Southern California Bight, wave climate is generally categorized into two distinguished patterns for summer and winter. During summer months (June to October), waves mostly consist of local wind swell generated by northwesterly winds along the California coast and southwesterly swells associated with extratropical cyclones of the southern hemisphere. Waves occurring during the winter months (December to March) are generated predominantly by extratropical cyclones of the northern hemisphere. Wind swells are occasionally present but exist only as a secondary wave train.

Below is a description of the wave conditions that occurred during the last monitoring year. Wave descriptions are grouped in months corresponding to the four beach profile survey dates.

March-April 2001

During these two months, strong northwest winds and heavy rains were recorded. In March, strong northwest winds in the outer Santa Barbara Channel accounted for several days of medium to high wind swells. The roughest wave conditions occurred on March 9 when strong westerlies prevailed in the Santa Barbara Channel. The heaviest rainfall of nearly 4 inches occurred between March 4 and 6. In April, rough seas occurred on the 7th and the 21st following strong westerlies and heavy rain falls. The last rainfall recorded was on April 20 at about one half inch.

May-August 2001

During these four months, wave conditions were benign and southern hemisphere swells were minimal although some relatively large swells did occur in May. Strong northwest winds occurring in the outer channel from June 10 to 12 accounted for the highest wind swells of the summer. The month of July was foggy and cold with brisk sea breeze.

September-October 2001

Wave climate continued to be benign throughout September and October. Moderate wind swells were observed for a duration of five days in late September. Low swells, generated from Hurricane Gil that arrived on September 8, were the only tropical storm swells observed during the 2001 season.

November 2001 to February 2002

Typical weather patterns normally observed in winter were confined in November and December only for the 2001-2002 winter season. Even during these two months, only a moderate amount of rainfall was recorded, approximately three inches in November and two inches in December, respectively. However, intense Pacific storms did generate medium to high swells. Wave breakers of 12 and 14 feet in the project area occurred on November 21 and December 21, respectively. In December, occurrence of wind swells was well above normal during which strong westerlies consistently prevailed in the outer channel and even extended into the eastern

channel for four days. Consequently, short period wind swells were also well above normal for the month.

A dramatic shift in the weather pattern occurred during the second week of January as a high pressure system intensified over the eastern half of the Pacific resulting in a storm track far to the north. The high-pressure weather pattern continued throughout the rest of the winter season with minor interruptions. This resulted in the third driest January to March period in 138 years of record for Santa Barbara. Following a moderately high west swell observed on January 8 through 9, the northwest swells had little effect toward the project site, as these swells were mostly sheltered by the mainland and channel islands. Waves were predominantly short period wind swells. The only day of strong westerlies occurred on February 17 in the eastern end of the channel and there were no southeasters recorded.

BEACH SURVEYS RESULTS

During this fourth monitoring year, four additional beach surveys were conducted. These surveys occurred on April 4, August 7, and October 15 of 2001 and January 9 of 2002. This brings the total number of surveyed beach profiles to thirty two (32). Vertical controls and transect baseline locations used were originally established during the first survey on January 28, 1998. The first survey is regarded as the baseline condition for comparison with all other surveys. Figure 1 shows the general locations and orientations of the eight-beach profile transects. Figures 2 through 9 show the four new survey profiles at each transect location. The following trends are noted at this time:

Survey profiles taken at Transects 1, 2, 3, 4 and 5 showed the typical seasonal variation in sand levels. The project beach was wider during the summer months (August and October) than that of the winter months (January and April). The October survey had the highest sand level followed by August and then April ones. The January survey had the least amount of sand.

Survey profiles taken at Transects 6, 7 and 8 exhibited a slightly different pattern than that of the other profiles. Although the October and January profiles still showed the highest and lowest sand levels, respectively, a wider beach was measured in April than that in August. This pattern was also observed during the third monitoring year.

At the exposed revetment toe locations, the sand levels for Profiles 5 and 6 were at approximately +13 feet, MLLW with little variation for the entire year. The remaining profiles showed seasonal fluctuations of the sand level with the highest elevation of about +10 feet, MLLW at the exposed revetment toe for Profiles 3, 4 and 7. Profiles 1 and 8, exhibiting the most denuded beach condition within this quasi-pocket beach, had the highest sand level of +5 feet and +7 feet, MLLW, respectively, at the exposed revetment toe.

INTERPRETIVE ANALYSIS

Figures 10 through 15 plot the temporal variations in sand levels for the +0, +5, and +9 feet, MLLW elevations for all surveyed profiles since January 28, 1998. Figures 16 through 18 illustrate the three positions of the surveyed profiles relative to the January 28, 1998 beach

conditions for the same elevations. A positive change indicates accretion whereas a negative change indicates erosion. For the +9 feet, MLLW line, profiles 1, 2 and 8 are not included because the beach elevations for most of the conducted surveys are below +9 feet, MLLW. Profiles 1 and 8 were also not included in Figures 12 and 13 of the +5 feet, MLLW line for the same reason. Data gaps also appear on Profile 2 for the +5 feet, MLLW line (see Figure 12) and on Profiles 3, 4 and 7 for the +9 feet, MLLW line (Figures 14 and 15). Figure 19 shows aerial photographs taken prior to the pier demolition in August 1995 and during this monitoring year in October 2001. Based upon a preliminary assessment of all data collected from January 1998 to February 2002, the following general comments may be made at this time:

The 32 repetitively surveyed profiles present a typical configuration of a quasi-pocket beach where the beach remains narrow at both ends (Profiles 1 and 8) and wide in the middle sections (Profiles 4, 5 and 6) throughout the four years of the monitoring period.

Seasonal variations in beach conditions are also apparent for the fourth year, as the winter profiles are more depleted when compared to the summer profiles. The October profiles (a summer condition) had the highest sand levels and widest beach. Whereas, on the contrary, the January profiles (a winter condition) shows the most denuded conditions.

The preliminary results obtained from a regression analysis for the 32 surveyed beach profiles indicate that the shoreline segment from Profiles 2 through 7 are experiencing a sand loss, while Profiles 1 and 8 are experiencing a slight gain on sand levels (see Figures 10 through 15). As illustrated in these figures, the slope (m) of a first-order approximation represents the estimated degree of the retreating or advancing. The higher the value of the slope is, the more significant the retreating or advancing trend would likely be.

There appears to be a retreating trend during the surveyed profiles during the past four years. A comparison of the aerial photograph taken in October 2001 and a historical one (August of 1995) indicates that the current beach conditions are not at an all-time-denuded state (see Figure 19). Although the beach widths are comparable for the two respective summer aerial views, the extent of the quasi-pocket beach is vastly different. The 2001 summer photograph shows the northern quasi-pocket beach extending the shoreline length approximately for another 400 feet. It should be noted that the main source of sand supply within the Ventura County is the fluvial sediment delivered from rivers, streams and creeks. The annual fluvial delivery depends strongly on the winter meteorological condition within the region. More fluvial sediment is delivered to the coastal zone during a wet year, while little fluvial delivery is expected in a drought period. Based upon the regular field observations conducted at Surfer's Point where the Ventura River is the sole sand supply source, the beach was at the most advancing condition after the 1997-98 El Nino year and has continuously retreated ever since as a direct consequence of the reduced fluvial sediment supply from the Ventura River in recent years. Therefore, the observed beach depleting condition in the past four years within the Oil Piers monitoring area may be partially attributed to the drought condition since the 1997-98 El Nino year.

SUMMARY

The following assessments are provided at this time:

1. As noted in the first three interim reports dated April 9, 1999, June 29, 2000[2] and June 26, 2001[3] respectively, the subject beach exhibits a typical seasonal change in beach width where winter ones are narrower than summer ones. The trend was muted in the second year; however during the last two years this similar seasonal variation was observed again.

2. Within this quasi-pocket beach, sands from the middle segment of the beach are being transported and deposited to either end. As a result, the shoreline shows a retreating trend throughout the entire beach (profiles 2 through 7) except for the east and west side which shows a slight accumulation (profile 1 and 8).

3. Although there appears to be an overall loss in the volume of sand at this site, historic photographs (see Figure 19) show that the present site condition is not at its most depleted state.

This concludes our fourth year interim report to the ExxonMobil Seacliff Oil Piers monitoring program.

Sincerely,

NOBLE CONSULTANTS, INC.

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CCL/TLS/ts

Encl. Figures 1-19

[2] Second Interim Report of Finding, Mobil Seacliff Oil Piers Beach Monitoring Program, prepared by Noble Consultants Inc., June 29, 2000.

[3] Third Interim Report of Finding, Mobil Seacliff Oil Piers Beach Monitoring Program, prepared by Noble Consultants Inc., June 26, 2001.