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STAFF RECOMMENDATION
ON CONSISTENCY DETERMINATION

Consistency Determination No.	CD-109-98
Staff:	MPD-SF
File Date:	8/27/1998
45th Day:	10/11/1998
60th Day:	10/26/1998
Commission Meeting:	10/15/1998

FEDERAL
AGENCY:

U.S. Navy

PROJECT
LOCATION:

West of I-5, Camp Pendleton Marine Corps Base, San Diego Co., and offshore waters in the Southern California Bight (Exhibits 1-3)
(Note: the specific locations of the offshore transmissions and areas of operations are classified)

PROJECT
DESCRIPTION:

Advanced Deployable System (ADS) acoustic undersea surveillance system tests (Exhibits 2-5)

SUBSTANTIVE
FILE
DOCUMENTS:

See page 17.

EXECUTIVE SUMMARY

The Navy has submitted a consistency determination for its Advanced Deployable System (ADS) Ocean Tests. The ADS is a primarily a passive acoustic monitoring system designed to detect, locate, and report surface vessel and submarine activities in littoral (nearshore) marine environments. The Navy proposes to install several hundred miles of underwater cables and listening devices, connect the cables to a shoreside facility on Camp Pendleton, and, to test the system, perform various active acoustic tests from ships in various locations in the Southern California Bight. Active acoustic tests

would include 1,344 hours of active tests (104 hours of pulsed sounds and 1,240 hours of continuous sounds) for up to 56 days of active (and a total of 265 days of active and passive) testing over the 3-year test period. The cables and other equipment would be removed at the conclusion of the tests. The sound levels would range from 130-170 dB (decibels) for the continuous sounds and 120-175 dB for the pulsed sounds. The tests would also include light bulb implosions, and noise would also occur from vessel positioning systems. The location and frequency of the sounds are considered "classified" by the Navy, although general frequency ranges have been provided (see page 10).

The Navy has identified 120 dB as an impact threshold for impacts from continuous noise on marine mammals. The Navy commits to avoiding exposure of marine mammals to sounds exceeding this threshold. The Navy will visually inspect the area during active transmissions, which will be halted if any mysticete (baleen whale) approaches within 320 meters (i.e., the > 120 dB area; see chart, p. 12) during maximum continuous sound transmissions (170 dB). For other marine mammals (e.g., odontocetes (toothed whales) and pinnipeds), the Navy states they are less sensitive to noise in this frequency range, and this area need only be cleared if a mammal is within in the >120 dB area for over ½ hour. For pulsed noises, the Navy considers a greater threshold applicable, and the Navy commits to ceasing pulsed transmissions when an animal is within 10 meters of the source. The Navy has also committed to: (1) no nighttime transmissions > 140 dB; (2) special restrictions for reduced-visibility weather conditions (e.g., fog); (3) avoiding transmissions within the Channel Islands National Marine Sanctuary (including waters 1 mi. beyond the Sanctuary boundary) and within 3 miles of all other islands; (4) avoiding all areas shallower than 200 ft. (60 meters) (again, including around islands); (5) avoiding transmissions within 0.5 miles of diving activities; and (6) monitoring and reporting to the Commission the mammal sightings and avoidance measures taken. The Navy also points out that the noise levels are comparable to common noises emitted regularly in the marine environment (e.g., typical shipping noises).

For operational purposes the Navy states it cannot commit to avoiding either the gray whale migration period or the migration path itself. Nevertheless, with the avoidance and mitigation measures incorporated into the project, the noises will avoid significant adverse reactions or physiological effects on marine resources. Nearshore marine resources will be protected because the cable laying through nearshore waters will avoid kelp beds and other sensitive habitat (Exhibit 9). Onshore, the cable trenching through the surf zone and beach will avoid the snowy plover nesting period. Finally, ideally the project may lead to implementation of passive acoustic monitoring systems, which could possibly benefit marine resources, in the event they were to replace or reduce military reliance on active, high-intensity, acoustic monitoring systems. The project is consistent with the marine resource, environmentally sensitive habitat, commercial and recreational fishing and diving policies (Sections 30230, 30240, 30234, 30234.5, 30213 and 30220) of the Coastal Act.

Concerning other issues raised, access and recreation impacts would be minimal, and the onshore support facilities will be located in a developed portion of Camp Pendleton and will avoid adverse visual effects. The project is therefore consistent with the public access and view protection policies (Sections 30210-30212 and 30251) of the Coastal Act.

STAFF SUMMARY AND RECOMMENDATION

I. Project Description. The Navy proposes to test an acoustic monitoring system called the Advanced Deployable System (ADS) in the marine environment of southern California, between Point Conception and the U.S.-Mexican border (Exhibit 1). The system includes the following activities: establishment of a shore station, deployment of the system, inspection and operation of the system, and retrieval of the system. The location of the onshore and nearshore portions of the system are as shown in Exhibits 1-3; however the Navy has "classified" both the location and frequency of the offshore system and ship-based active acoustic transmissions. The Navy states the classified status is needed "... to ensure the safety, security, and integrity of the ADS program and equipment" (Exhibit 11, p. 3). The Navy describes the need for the system as follows:

Purpose and Need

ADS was created in response to the Navy's Mission Needs Statement for Undersea Surveillance in Littoral Waters. The Mission Statement identifies the need to provide undersea surveillance capability, cites shortfalls of current systems to furnish this capability, and identifies additional capabilities being explored by the ADS Program Office. Surveillance requirements include the ability to:

- *detect, locate, and report submarines and surface shipping;*
- *provide a worldwide, flexible, and tailored response;*
- *bring tactical forces into contact with threat submarines; and*
- *gather operational and technical intelligence.*

Unlike the Navy's "LFA" system (Low Frequency Active Sonar, an *active* acoustic surveillance system), the proposed ADS is designed to function as a passive acoustic undersea surveillance system to detect, locate, and report surface vessel and submarine activities in the littoral, or nearshore marine environment. The general components of the system are depicted in Exhibits 4 & 5 (these figures are for illustration purposes only; configurations can vary). Once the system is deployed, underwater sounds are received by listening devices (hydrophones), which convert the sound signals to electronic signals (and ultimately optical signals). These are then amplified in a pressure vessel and transmitted via internode cable to the next series of hydrophones, and, ultimately, connected through a shore cable to a shore station on Camp Pendleton (Exhibits 2-3) for recordation, processing, and analysis.

To test and evaluate the capabilities of the system, the Navy needs to use both active and passive acoustic transmissions, which the Navy describes as follows:

ADS ocean test activities would require a maximum of 24 shipboard personnel (16 scientists and 8 crew) and 30 shore station personnel for installation, operation, and retrieval of the system. The proposed tests would occur over a 3-year period. Once the system has been deployed, the maximum number of days of operation for all four tests would be approximately 265 days; however, tests would not occur continually. ADS ocean test activities would incorporate both active and passive acoustic testing. Although ADS is an inherently passive system, artificial low frequency active acoustics must be introduced into the ocean environment to enable testing the system over its full range. A maximum of 1,344 hours (56 days) of active acoustic testing is proposed over the 3-year period. The capability of the system and the hydrophone sensors would also be tested by listening passively to shipping traffic in the area. During active acoustic testing of the system, a sound projector would be deployed from a test vessel. Data processing would take place at the shore station. Table 1 provides a summary of each of the four proposed ADS ocean tests.

Table 1. Summary of ADS Ocean Tests

Key Test Parameters	Test 1 Multinode Test (MNT)	Test 2 Development Test-ID	Test 3 Integrated Deployment Test (IDT)	Test 4 All Optical Deployable System (AODS)
TEST CHARACTERISTICS				
Maximum Test Period	70 days	150 days	15 days	30 days
Number of Test Vessels	2	2	2	2
Nodes/Fingers	4/1	20/5	1/1	3/1
Total Length of Cable	130 km	550 km	50 km	150 km
Remotely Operated Vehicle	Yes	Yes	Yes	Yes
Battery Type	Lithium	Lithium	Alkaline	Alkaline
Maximum Number of Batteries	4	20	1	3
Shore Station	Yes	Yes	Yes	Yes
Wet-end Inspection and Repair ¹	Yes	Yes	Yes	Yes
Component Retrieval ²	Yes	Yes	Yes	Yes
ACOUSTIC PARAMETERS				
Maximum Active Acoustic Testing	480 hours	720 hours	48 hours	96 hours
Pulsed Sound Source				
Total Number of Hours of Operation	32 hours	48 hours	8 hours	16 hours
Source Level	120-175 dB	120-175 dB	120-175 dB	120-175 dB
Frequency Range	20-1,000 Hz	20-1,000 Hz	20-1,000 Hz	20-1,000 Hz
Signal Duration	0.25 to 10 seconds	0.25 to 10 seconds	0.25 to 10 seconds	0.25 to 10 seconds
Range of Time between Pulses	1.75 seconds to days	1.75 seconds to days	1.75 seconds to days	1.75 seconds to days
Continuous Sound Source				
Total Number of Hours of Operation ³	448 hours	672 hours	40 hours	80 hours
Continuous Source Level Range	130-170 dB	130-170 dB	130-170 dB	130-170 dB
No. of hours at no greater than 130 dB	298 hours	344 hours	10 hours	40 hours
No. of hours at no greater than 170 dB	150 hours	328 hours	30 hours	40 hours
Frequency Range	20-1,000 Hz	20-1,000 Hz	20-1,000 Hz	20-1,000 Hz
Light Bulb Acoustic Tests				
Number of Lightbulb Tests	32	96	16	48
Duration of Pulse for Lightbulb Tests	1.8 ms	1.8 ms	1.8 ms	1.8 ms
Time between Implosions	20-30 minutes	20-30 minutes	20-30 minutes	20-30 minutes

¹ Wet-end inspection and repair would occur only as required.

² Plastic clips used to hold shells together in canister would not be retrieved (5 for Test 1, 30 for Test 2). No clips are used for Tests 3 and 4.

³ The total hours for continuous sound source do not represent constant transmission since some time would elapse between sound source operations.

As stated above, active acoustics would be used during the system's proposed testing, using the following four principal sound sources: test vessels; an acoustic positioning system; imploding lightbulbs; and a towed sound source projector. The Navy describes these as follows:

Test Vessels. *Two test vessels would be used as part of the proposed activities; however, only one vessel would be deployed at any given time. The test vessels would have deck lights which would provide visibility from between 150-300 ft (46-91 m) at night.*

Acoustic Positioning System. *The acoustic positioning system is a commercially available projector/hydrophone and would be used to "interrogate" acoustic beacons. The positioning system would produce brief, high-frequency repetitive pulsed chirp sounds with a sound source level of 196 dB reference 1 micro Pascal meter (re 1 μ Pa-m [the water reference standard]) at a repetition rate up to once per second. The frequency would be 15-18 kHz [kilohertz], and the pulse duration would be about 80 ms [milliseconds]. The 80 ms "pulse" actually consists of eight 1.2 ms chirps separated by 10 ms gaps, so the actual transmission time is 9.6 ms per "pulse." The acoustic positioning system on the ROV and TDV would reply to each interrogation signal with a sound source level of 183-186 dB re 1 μ Pa-m in the same frequency band as the interrogator signal. The positioning system would only be used for approximately 30 days during deployment and repair of the system.*

Lightbulbs. *A simple system consisting of imploding lightbulbs to generate acoustic signals would be used during the acoustic testing portion of all ADS ocean tests. The operation would consist of lowering standard, off-the-shelf lightbulbs (for example, a 2.5-inch diameter General Electric 40625/W 40-watt globe) to a specified depth and breaking the lightbulbs, thus creating a short duration impulse on the order of 2 ms. For the ADS ocean tests, a mousetrap would be used to implode the lightbulb. ... Each lightbulb would be encased in nylon to facilitate retrieval and to ensure that no glass shards are released into the water. This system is often used as a cost-efficient means to provide a sound source.*

Towed Sound Source. *A U.S. Navy Underwater Sound Reference Detachment sound projector (model J15-1) is proposed for use during the proposed ADS ocean tests. According to its specifications, this projector is capable of transmitting tonals at sound source levels shown in Table 2.*

Table 2. Underwater Sound Source Levels for Sound Projector

Frequency	J15-1 Sound Source Levels at 3 amps			
	100 Hz	400 Hz	700 Hz	1,000 Hz
dB re 1 μ Pa at 1 meter from sound source	175	171	169	163

The Navy states:

The towed source would have two modes of operation: a pulsed mode and a continuous mode. The maximum amount of time proposed for all four tests for pulsed sound source testing is 104 hours. Maximum proposed continuous sound source testing in 1,240 hours (692 hours at no greater than 130 dB and 548 hours at no greater than 170 dB). A support vessel would be used to tow a sound source at various depths and distances from the hydrophone array to test its listening capabilities. The sound source would be towed at speeds up to 2-7 mph (2-6 knots). The maximum sound source level would be 175 dB in waters deeper than 200 ft (60 m). No sound source levels would occur in waters 60 m (200 ft) or less in depth.

Onshore on Camp Pendleton the Navy proposes a temporary shore station for receiving, processing, displaying, and storing the data received. The station would be located within a previously disturbed area adjacent to the Marine Corps Tactical Systems Support Activity (MCTSSA) facility (Exhibits 2-3). The site already has adequate road access and parking; however the Navy will need to grade the approximately $\frac{1}{2}$ acre area. Other improvements at the site include: (1) upgrading the existing access road; (2) installing security fencing around the proposed site; and (3) constructing a concrete slab to accommodate the support vans.

In addition to the shore station, a cable is needed to connect an offshore junction box to the shore station site (see schematic, Exhibit 4). Cable installation would require trenching across the beach and into the surf zone to bury the cable. The cable would be laid and buried at low tide about 6 ft. deep through the intertidal zone. The trench across the beach would be a maximum of 250 ft. long and 2 ft. wide. From the beach, the cable would then be laid on the ground (uncovered) until it reached an existing distribution box and conduit. At that point, the cable would be placed in the 4-inch conduit and run through to the proposed shore station (Exhibit 3).

II. Status of Local Coastal Program. The standard of review for federal consistency determinations is the policies of Chapter 3 of the Coastal Act, and not the Local Coastal Program (LCP) of the affected area. If the LCP has been certified by the Commission and incorporated into the CCMP, it can provide guidance in applying Chapter 3 policies in light of local circumstances. If the LCP has not been incorporated into the CCMP, it cannot be used to guide the Commission's decision, but it can be used as background information. The San Diego County LCP has not been incorporated into the CCMP.

III. Federal Agency's Consistency Determination. The Navy has determined the project consistent to the maximum extent practicable with the California Coastal Management Program.

IV. Staff Recommendation:

The staff recommends that the Commission adopt the following motion:

MOTION. I move that the Commission concur with the Navy's consistency determination.

The staff recommends a **YES** vote on this motion. A majority vote in the affirmative will result in adoption of the following resolution:

Concurrence

The Commission hereby **concurs** with the consistency determination made by the Navy for the proposed project, finding that the project is consistent to the maximum extent practicable with the California Coastal Management Program.

V. Findings and Declarations:

The Commission finds and declares as follows:

A. Marine Resources/Environmentally Sensitive Habitat. Section 30230 of the Coastal Act provides:

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30240 provides:

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade such areas, and shall be compatible with the continuance of such habitat areas.

Marine mammals rely on sound for communication, orientation, and detection of predators and prey. In reviewing the Navy's "LFA" research (Phases I and II, CD-95-97 and CD-153-97 respectively), the Commission noted: (1) the growing evidence that anthropogenic sounds can disturb marine mammals (Richardson et al 1995); (2) that observed mammal responses to such sounds include silencing, disruption of activity and movement away from the source; and (3) that sound carries so well underwater that animals "... have been shown to be affected many tens of kilometers away from a loud acoustic source." The Commission agreed with the Navy in reviewing those research projects that there was a critical need for continuing research to expand the knowledge base concerning human noise impacts on marine mammals.

In its consistency determination the Navy analyzed a variety of effects on the entire spectrum of marine mammals and other species in the Southern California Bight. Effects analyzed included both physical and acoustic effects on marine resources. Physical effects include: physical releases through discharges, leakage, breakage, and corrosion of materials involved; cable trenching activities through the surf zone; cable laying and placement on the seafloor. These effects would be minor, and the Navy will avoid cable laying during sensitive time periods (e.g., snowy plover nesting season) and will avoid cable placement on sensitive rocky or kelp bed habitat (Exhibit 9)).

The major issue raised by the project is its potential acoustic effects, particularly on marine mammals, and more particularly on gray whales. The gray whale is currently only found in the North Pacific (Rice et al., 1984). The southbound migration period for the gray whale generally begins in October and continues through February, and the northward migration occurs from February through April. North of Point Conception the gray whales migrate nearer to shore; south of Point Conception to Mexico their migration path is broader and is depicted generally as shown in Exhibit 8. For operational purposes the Navy states it cannot commit to avoiding either the gray whale migration period or the migration path itself.

Gray whales are a concern for a number of reasons, including the fact that: (1) mysticetes (baleen whales) are more likely to be affected by the towed sources' frequencies than odontocetes (toothed whales); (2) the sources could operate during the gray whale migration period and directly within the migration path (Exhibit 8); and (3) preliminary results from the Navy's Phase II LFA research have, at a minimum, confirmed the validity of the previously established notion that continuous noises greater than 120 dB can cause gray whales to deviate from their migration paths. The proposed tests using continuous noise up to 170 dB could clearly include sounds loud enough to trigger gray whale avoidance behavior.

Other mysticete whale concentration areas are shown in Exhibit 7, and Exhibit 10 contains a complete list of marine mammal species in the area, including population estimates and seasonal commonalities. Concerning impacts to marine mammals in general, the Navy states:

Marine Mammals

Issues of concern related to marine mammals include the potential for (1) changes in behavior due to impacts of underwater noise associated with the proposed ocean tests, (2) attraction/ingestion/entanglement / collisions, and (3) chemical contamination. Of these, most attention is devoted to acoustic issues because marine mammals rely on hearing for foraging and communication. The main noise-producing aspects of the proposed tests are vessel operations, towed source operations, the use of an acoustic positioning system, and lightbulb implosions.

The potential impacts of test activities are analyzed for three groups of marine mammals: mysticetes (baleen whales), odontocetes (toothed whales, dolphins and porpoises), and pinnipeds (seals and sea lions). Activities associated with the proposed tests will have essentially no impact on mustelids (sea otters), given their extremely low numbers in the proposed test area, their restricted/coastal distribution in both the proposed and alternative test area, and their habit of resting (rafting) at the surface with their ears above the water roughly 50 percent of the time.

Potential Acoustic Impacts

Potential acoustic impacts of ADS ocean test operations on marine mammals vary with hearing capabilities of each major group (Table 3). For example, mysticete whales may hear noise from both the project vessels and the towed sources. However, maximum source levels for pulsed sources (175 dB re 1 μ Pa-m) and continuous sources (170 dB) are such that the area ensonified to levels above 160 dB and 120 dB is comparatively small. Thus it is possible, but unlikely, that mysticete whales would be affected by vessel or towed source noise. Mysticetes would not likely hear the acoustic positioning system at all (Ketten 1994), and lightbulb implosions are too brief to pose a problem. It is unlikely that odontocetes or pinnipeds would be affected by either vessel or towed source noise due to comparatively poor hearing at frequencies less than or equal to 1 kHz. Both groups may hear and respond to the acoustic positioning system, but limitations on operations and small area of intensive ensonification make effects on pinnipeds and odontocetes unlikely. As for mysticetes, lightbulb implosions pose no risk. ...

Table 3. Potential Impacts of ADS Ocean Tests Acoustic Sources on Marine Mammals

Marine Mammal	Acoustic Source (dominant frequencies)			
	Vessels (< 1kHz)	Towed Sources (50-1000 Hz)	Acoustic Position (15-18 kHz)	Light Bulbs (130-876 Hz)
Mysticetes	possible	possible	unlikely	N/A
Odontocetes	unlikely	unlikely	possible	N/A
Pinnipeds	unlikely	unlikely	possible	N/A
Sea otters	unlikely	unlikely	unlikely	N/A

Note:

N/A = not applicable due to brevity of signal

The Navy maintains that the acoustic impacts from the proposed project "...are not predicted to result in a "take" by harassment of any marine mammal, based on the definitions contained in the Marine Mammal Protection Act (MMPA)."¹ The Navy states that historical National Marine Fisheries Service (NMFS) interpretation is that minor changes in behavior do not constitute harassment under the MMPA, and that:

Furthermore, since the 1994 MMPA amendments were adopted, the NMFS has not expressed an interest in requiring take permits for vessels and associated acoustics, or for common vessel devices that employ active acoustics such as fish finders.

The Navy notes that:

... [A]lthough the behavioral responses of marine mammals to low-frequency anthropogenic noise has been the focus of recent study (e.g., Clark et al. 1998; Tyack 1998), there as yet are no firm conclusions as to specific noise levels that constitute "take" by harassment, as defined by MMPA. Based on the best available data, it seems that potential marine mammal reaction to the noise-producing elements of the ADS tests would be minimal.

The Commission notes that however NMFS is currently in the process of conducting workshops and attempting to revise its procedures concerning threshold levels triggering "take" permits. As of the date of this writing, NMFS had not commented on the Navy's conclusion that a "take" permit was unnecessary for the ADS project. (Any additional input from NMFS will be reported at the Commission's October 15, 1998, hearing for this project).

¹ For purposes of NMFS review under The Marine Mammal Protection Act of 1973 (MMPA) and, for endangered marine mammals, the Endangered Species Act (ESA) of 1973, and their respective amendments, which prohibit taking (including harm and mortality), unless under permit or authorization or exempted from the provisions of these Acts.

The Navy concludes that significant impacts to marine mammals would not occur as a result of the proposed ocean tests, that all potential impacts are expected to be below the threshold requiring incidental take authorization, and that the tests would be consistent with Coastal Act marine resource and sensitive habitat protection policies. At the same time the Navy has committed to including certain avoidance and minimization measures in the tests to further minimize concerns. These would include visual searches for mammals and avoidance/cessation/delays in certain situations, ramp-up of the towed sound sources, lowered nighttime sound levels, and exclusion areas around the Channel Islands Sanctuary, other islands, and areas shallower than 200 ft. According to the Navy, these measures are included because they "... would not have an overall adverse impact on ADS ocean test activities and they provide additional assurance that there would be no significant impacts on marine mammals." These measures are summarized in chart form below and further described in the subsequent text:

Table 4. Mitigation Measures for Marine Mammals during ADS Ocean Tests Acoustic Transmissions

Acoustic Source		Watch Type ¹		Operations Curtailed
Continuous	Pulsed	Visual	Dedicated	
≤ 130 dB		√		Any marine mammal within 33 ft (10 m)
131-140 dB			√	Mysticetes within 33 ft (10 m)
141-170 dB ²			√	Mysticetes within 940 ft (320 m) and pinnipeds or odontocetes within 940 ft (320 m) for more than 0.5 hour
	160-175 dB	√		Any marine mammal within 33 ft (10 m)
	Lightbulb implosions	√		[None needed]

¹A visual or dedicated watch will begin 20 minutes before the start of any acoustic transmission and will continue for the duration of the transmission.

²Acoustic transmission during daylight hours only.

For further details on these measures, the Navy elaborates:

For the proposed ADS ocean tests, two types of visual searches for marine mammals would be conducted: (1) a visual watch by the ship personnel, and (2) a dedicated watch by personnel specifically trained in marine mammal identification. A visual watch of waters within 0.6 miles (1 kilometer [km]) of ADS support vessels would be conducted at least 20 minutes before and continue during any pulsed or continuous sound source transmission.

For continuous sound source, a visual search by ship personnel would be conducted at all times during transmission of 130 dB and lower. Operations would be curtailed only if marine mammals approach within 33 ft (10 m) of the towed sources during continuous sound transmission.

When active acoustics involve continuous sound source transmission greater than 130 dB, a dedicated watch by at least two personnel would be conducted. During continuous sound source transmission between 131 and 140 dB, operations would be curtailed if mysticetes (baleen whales) are sighted within 33 ft (10 m) of the ship. Continuous sound source transmission between 141 and 170 dB would be conducted only during daylight hours and would be halted if mysticetes are seen within 940 ft (320 m) of the ship.

Because pinnipeds (seals and sea lions) and odontocetes (toothed whales: dolphins, porpoises, etc.) do not have good hearing below 1 kHz, transmissions between 141 and 170 dB would continue unless these animals remain with 940 ft (320 m) of the sound source for periods greater than one-half hour. If pinnipeds or odontocetes remain near the continuous source over one-half hour, transmissions would be stopped.

The Navy has also committed to "ramp-up procedures" to allow any marine mammals near the sound source during the onset of test operations the opportunity to move away before being exposed to maximum levels. This process entails transmission levels being increased gradually, or ramped-up, from an overall level less than or equal to 140 dB to the desired operating level, at a rate not exceeding 6 dB per minute.

In analyzing received level thresholds the Navy differentiates between pulsed and continuous noises, stating: "Two received levels (160 dB and 120 dB) have been used in the past to define radii for potential "zones of responsiveness" for mysticetes to pulsed and continuous noise, respectively (Richardson et al. 1995; Richardson 1997)." Using a distance formula assuming even spherical spreading loss ($20 \log r$), the Navy states a 175 dB pulsed source level will drop to 160 dB at 19 ft. (6 m) from the source. When the continuous sound source is transmitting at 170 dB, the range of ensonification to 120 dB will extend 940 ft. (320 m) from the source (see chart below).

Predicted Received Sound Levels Relative to Distance from Sound Source

Source Level	Received Sound Source Levels		
	120 dB	140 dB	160 dB
175 dB (pulsed)	1,800 ft. (560 m)	184 ft. (56 m)	20 ft. (6 m)
170 dB (continuous)	940 ft. (320 m)	105 ft. (32 m)	10 ft. (3 m)

Thus, the Navy has defined 120 dB as an impact threshold for impacts from continuous noise on marine mammals and has committed to avoiding exposure of marine mammals to sounds exceeding this threshold. A 320 meter radius around the maximum continuous sound source (170 dB) will be visually inspected by trained personnel, and transmissions will be halted if any mysticete (baleen whale) approaches closer than 320 meters. For other marine mammals (e.g., odontocetes and pinnipeds), which the Navy states are less

sensitive to noise in this frequency range (< 1 kHz), this area need only be cleared if the mammals are in the area for over $\frac{1}{2}$ hour. For pulsed noises, the Navy considers a greater threshold applicable (i.e., 160 dB), and the Navy commits to ceasing pulsed transmissions when an animal is within 10 meters of the source. In addition, the Navy has committed to: (1) no nighttime transmissions greater than 140 dB; (2) special restrictions for reduced-visibility conditions (e.g., fog); and (3) monitoring and reporting to the Commission the mammal sightings and avoidance measures taken. For night and other reduced-visibility situations, respectively, the Navy states (Exhibit 11, p. 2):

Given that the ship's deck lighting illuminates beyond this [140 dB] range, we would be able to continue to perform a visual search at night. Continuous source level transmissions in low visibility weather will be limited to low transmission levels such that the visual search requirement does not exceed the visibility.

Concerning the monitoring and reporting, the Navy has agreed to inform the Commission of all sightings and avoidance measures taken. The Navy will not divulge specific ship location, as this information is classified; however the Navy may be able to declassify that information sometime after the tests are completed, in which case it would provide the ship location information to the Commission. The Navy has agreed to provide the monitoring information at the conclusion of each of the four phases of the tests (see p. 4 for the four test phases).

In addition, while the Navy states that for operational reasons it cannot commit to avoiding either the gray whale migration period or the migration path itself, the Navy is willing to commit to avoiding transmissions within: (1) all areas shallower than 200 ft. (60 meters); (2) the Channel Islands National Marine Sanctuary (including waters 1 mi. beyond the Sanctuary boundary); and (3) 3 mi. around San Nicolas, San Clemente, and Santa Catalina Islands (Exhibit 6). Concerning the first of these, one of the interesting lessons from the Navy's Phase II LFA research is that if the source is located between the gray whales and the shoreline (i.e., shallower waters) it will have a greater impact than the same level source when located on the seaward side of the whales.

Finally, the Navy also analyzed effects on marine fish species, stating, for the towed sound sources:

The sound source would generate sound levels below 175 dB. A sound source of 180 dB is the established threshold found to cause reduced catchability of fish or hearing damage to fish (Hastings et al. 1996).

The Navy considers the effects on fish from the other noises (e.g., vessel positioning systems, vessel sounds, and lightbulb implosions) to be minimal.

Commission Conclusion: Marine Resources. As noted in its actions involving Navy LFA and Scripps ATOC² acoustic research activities, the Commission remains concerned over the lack of reliable information regarding the effects of underwater sounds on the marine environment. At the same time the Commission must consider the fact that the ADS test sound levels would be comparable to common existing, and for the most part unregulated, noise emitters such as ship traffic. In reviewing Navy LFA research the Commission noted that vessels, in some cases with poorly-maintained engines: "... may range from 150-160 dB for outboards and other small vessels, to 185-200 dB for supertankers and large container ships (Richardson et al., 1991) which can cause potentially disturbing noise for many kilometers (Tyack, 1989)." Exhibits 12 & 13 show a broader comparison of natural and human-induced underwater sounds. The Commission also notes that, in comparing Navy ADS testing with Navy LFA and Scripps ATOC activities, those activities did trigger NMFS "take" and/or "scientific research" permits, whereas the Navy maintains the proposed tests do not. Finally, the Commission needs to weigh the Navy's commitments for additional avoidance and minimization measures, as described above, to minimize marine mammal exposures. Considering all these factors, the Commission concludes that the acoustic aspects of the proposed tests would not cause significant adverse reactions or physiological effects on marine resources.

For non-acoustic impacts, the Commission finds that: (1) nearshore marine resources will be protected because the cable laying through nearshore waters will avoid kelp beds and other sensitive habitat; and (2) onshore, the cable trenching through the surf zone and beach will avoid the snowy plover nesting period. The Commission further hopes that, overall, the proposed testing might further military reliance on passive acoustic monitoring systems. Such an outcome could even benefit marine resources, in the event these passive systems were to replace or reduce the need for active high-intensity acoustic monitoring systems. The Commission concludes that, with the commitments the Navy has incorporated into the project, the project is consistent with the marine resource and environmentally sensitive habitat policies (Sections 30230 and 30240) of the Coastal Act.

B. Commercial and Recreational Fishing. Section 30230 of the Coastal Act, quoted on page 7 above, provides for the protection of economically (as well as biologically) significant marine species. Section 30234 provides that: "Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded." Section 30234.5 provides that: "The economic, commercial, and recreational importance of fishing activities shall be recognized and protected."

² Scripps Institution of Oceanography, Acoustic Thermometry of Ocean Climate (ATOC) Project and Marine Mammal Research Program (MMRP), CC-110-94/CDP 3-95-40.

The Navy states:

Although facilities serving the commercial fishing and recreational boating industries would not be affected under the proposed action, commercial fishing and recreational boating activities could be affected by the proposed ocean tests. Some recreational and commercial fishing vessels would potentially be restricted from entering open waters within a 1-mile-radius of the proposed tests during the test periods. A NOTMAR [Notice to Mariners] would be provided to these vessels 48 hours in advance, which would allow the boats to select alternate destinations without substantially affecting their activities. In addition, the proposed tests would be temporary and would not result in long-term access restrictions to open water areas; therefore, impacts to commercial and recreational fishing would not be significant.

The Navy regularly conducts various military testing throughout the Pacific Missile Test Range and, on a short term basis, excludes commercial and recreational activities during these activities. The proposed activity is similar to these types of past activities, and the Navy states that for any particular operating area, the tests would be relatively short term. Thus, given the short term nature of the tests in any one location, combined with the fact that the maximum sound levels are comparable to common ship noises in the affected area, the Commission finds that the project will minimize adverse effects on commercial and recreational fishing in the area. The Commission concludes that the project is consistent with Sections 30234 and 30234.5 of the Coastal Act.

C. Public Access and Recreation. Sections 30210-30212 of the Coastal Act provide for the maximization of public access and recreational opportunities, with certain exceptions for, among other things, military security needs and public safety. Section 30213 provides that "Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided." Section 30220 provides that: "Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses."

The proposed tests involve both onshore and offshore components, with onshore activities potentially affecting beach use and offshore activities potentially affecting recreational diving and boating. Concerning onshore impacts, in reviewing Marine Corps consistency determinations for activities on Camp Pendleton the Commission has recognized that many portions of the base are off limits to the public for both public safety and military security reasons. The Commission typically accepts these restrictions unless a proposed new project would generate burdens on public access, in which case further analysis would be needed. The Navy states:

Under the proposed action, public access to the shoreline would not be affected. The construction of the proposed shore station and installation of the shore landing cable would be implemented on federal property at

MCB Camp Pendleton. Public access to the shoreline is currently restricted at MCB Camp Pendleton in the interest of public safety and military security. The proposed action would not interfere with existing beach access at any public beach within the identified project footprint area.

Implementation of the proposed action would potentially affect public access to coastal waters (e.g., commercial fishing, recreational fishing, and sport diving boats); however, access restrictions would be minimal. During proposed testing periods, commercial and recreational boating activities would be temporarily restricted within 0.5 mile of the test location. To minimize potential impacts to public access, the proposed ocean tests would be sited to avoid major shipping lanes and heavily utilized military operational areas. Also, a Notice to Mariners (NOTMAR) would be issued 48 hours before commencement of tests to give regular boat traffic ample notice prior to testing in a given area. The proposed access restrictions would not prevent recreational access to any public shoreline area or cause unnecessary hardships for commercial fishing operations. Therefore, impacts to public access would not be significant.

In addition, the Navy has made the following commitment to protect recreational divers:

Regarding diver safety, a notice to mariners will be published prior to each proposed test. In addition, if dive flags or dive boats are spotted within 0.5 miles of the support vessel, active acoustic operations will be curtailed.

In reviewing LFA Phase I research (CD-95-97), the Commission concluded that Navy avoidance of exposing divers to sounds exceeding 130 dB would be adequate, based in part on advice and research from the Navy's Bureau of Medicine and Surgery. Concerns have been raised to the Commission that a swimmer exposed to sound levels around 125 dB during Navy LFA acoustic research in Hawaii experienced adverse reactions (Exhibit 14). However, in this case, maximum sound levels from both the continuous (170 dB) and pulsed (175 dB) sources would attenuate to below 130 dB (and even 120 dB) within the 0.5 mile radius the Navy has committed to avoiding (see chart, p. 12).

The Commission concludes that proposed project will not generate onshore burdens on public access and recreation and is consistent with the public access and recreation policies (Sections 30210-30212) of the Coastal Act. The Commission also concludes that the offshore operations will minimize, and where necessary avoid, adverse effects on recreational boating and diving in the Southern California Bight, and that the project is consistent with Sections 30213 and 30220 of the Coastal Act.

D. Public Views. Section 30251 of the Coastal Act provides:

The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. ...

The Navy states:

Implementation of the proposed action would not affect the existing visual quality of coastal areas. Development of the proposed shore station and associated facilities would occur adjacent to existing development at the MCTSSA facility. The proposed shore station structure would be visually compatible with the character of the surrounding development and would not result in the alteration of natural land forms. The proposed test cable would not be a visually prominent feature in the area it is placed above ground and would be entrenched along the open beach area. Vessel activity associated with the proposed ADS tests would be compatible with existing boating activities in the coastal waters. Therefore, the scenic and visual qualities of the coastal areas would be protected under the proposed action and visual impacts would not occur.

The onshore support facilities would be located seaward of I-5, the main public thoroughfare through Camp Pendleton affording scenic coastal public views. However the facilities would be sited within an existing developed area and would not be visible from I-5. Therefore the Commission agrees with the Navy that these facilities would not affect existing scenic public views and that the project is consistent with Section 30251 of the Coastal Act.

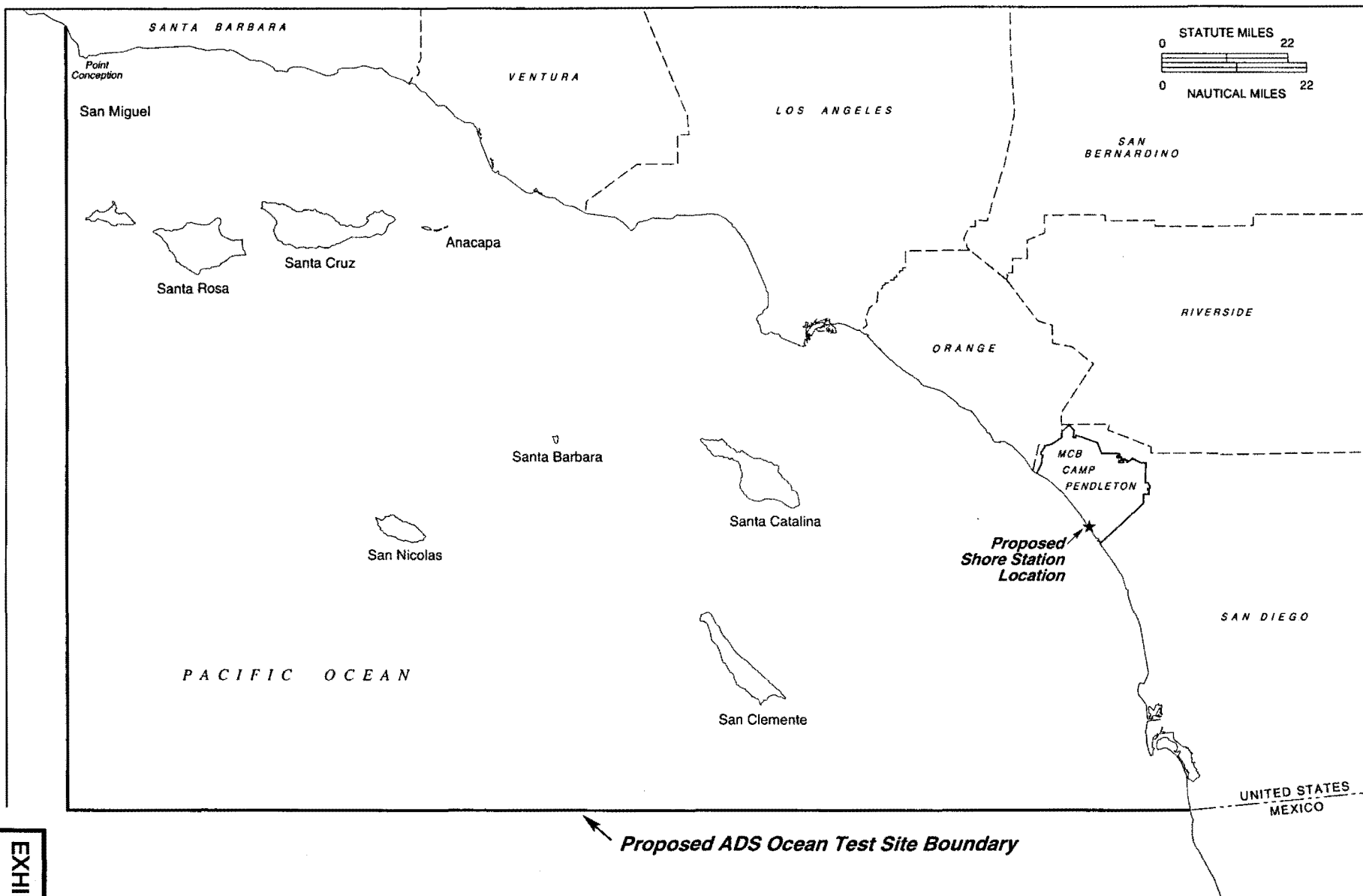
VI. SUBSTANTIVE FILE DOCUMENTS:

1. Low-frequency Sound and Marine Mammals: Current Knowledge and Research Needs, Committee on Low-frequency Sound and Marine Mammals, Ocean Studies Board, Commission on Geosciences, Environment, and Resources, National Research Council, March 21, 1994.
2. Consistency Determinations No. CD-95-97 and CD-153-97 (Navy, Low-Frequency Active (LFA) Sonar, Phases I and II).
3. Draft Environmental Assessment for Low-Frequency Sound Scientific Research Program in the Southern California Bight, September/October 1997, National Marine Fisheries Service, June 1997.

4. Consistency Certification CC-110-94/Coastal Development Permit Application 3-95-40, Scripps Institution of Oceanography, Acoustic Thermometry of Ocean Climate (ATOC) Project and Marine Mammal Research Program (MMRP).

5. Malme CI, PR Miles, CW Clark, P Tyack and JE Bird (1984) Investigations of the potential effects of underwater noise from petroleum industry activities on migrating gray whale behavior. Phase II: January 1984 migration. Bolt Beranek and Newman Report No. 5586 submitted to Minerals Management Service, U. S. Dept. of the Interior.

6. Malme CI, PR Miles, CW Clark, P Tyack and JE Bird (1983) Investigations of the potential effects of underwater noise from petroleum industry activities on migrating gray whale behavior. Bolt Beranek and Newman Report No. 5366 submitted to Minerals Management Service, U. S. Dept. of the Interior.



Proposed ADS Ocean Test Site Boundary

Proposed ADS Ocean Test Site

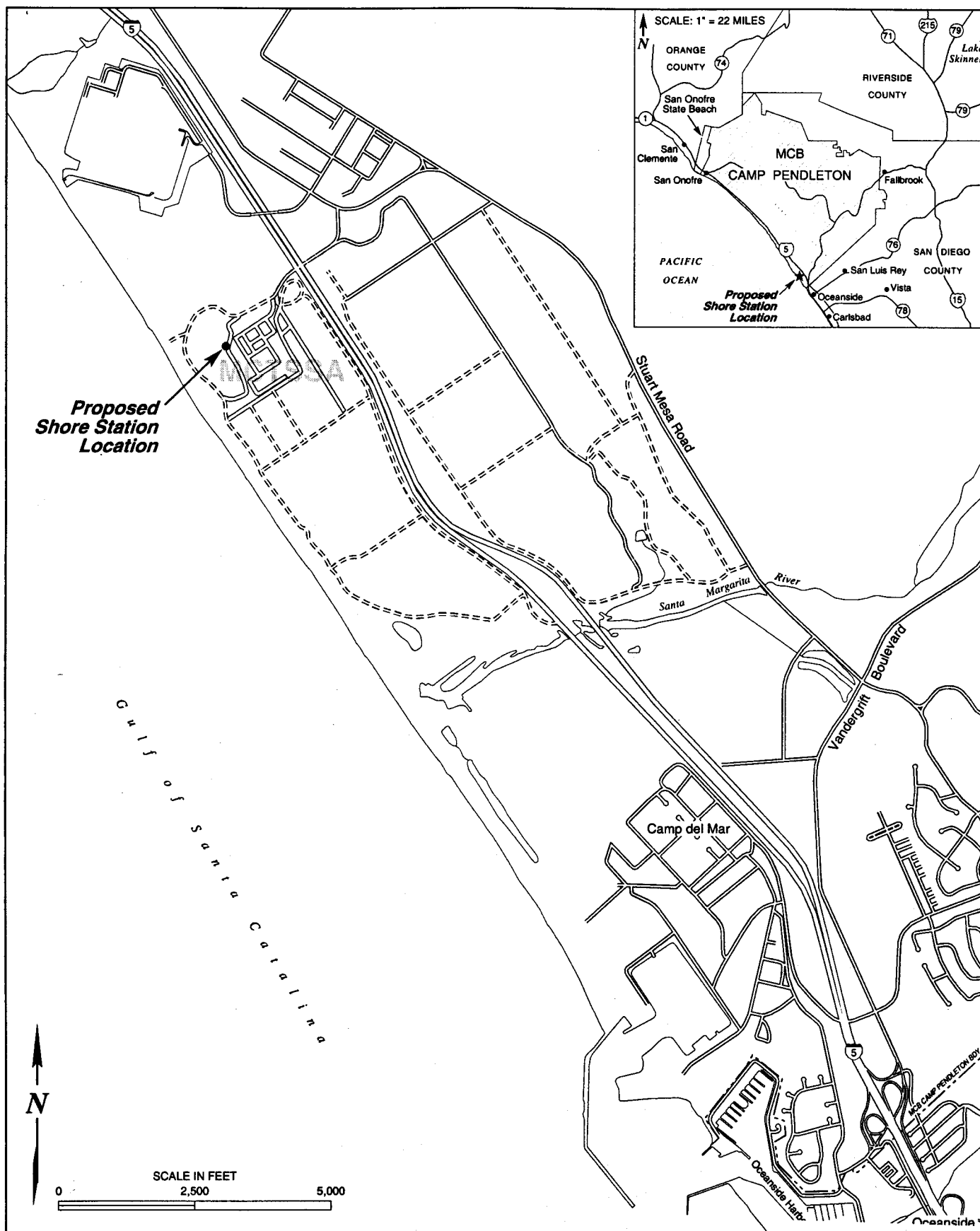
FIGURE

1

EXHIBIT NO. 1

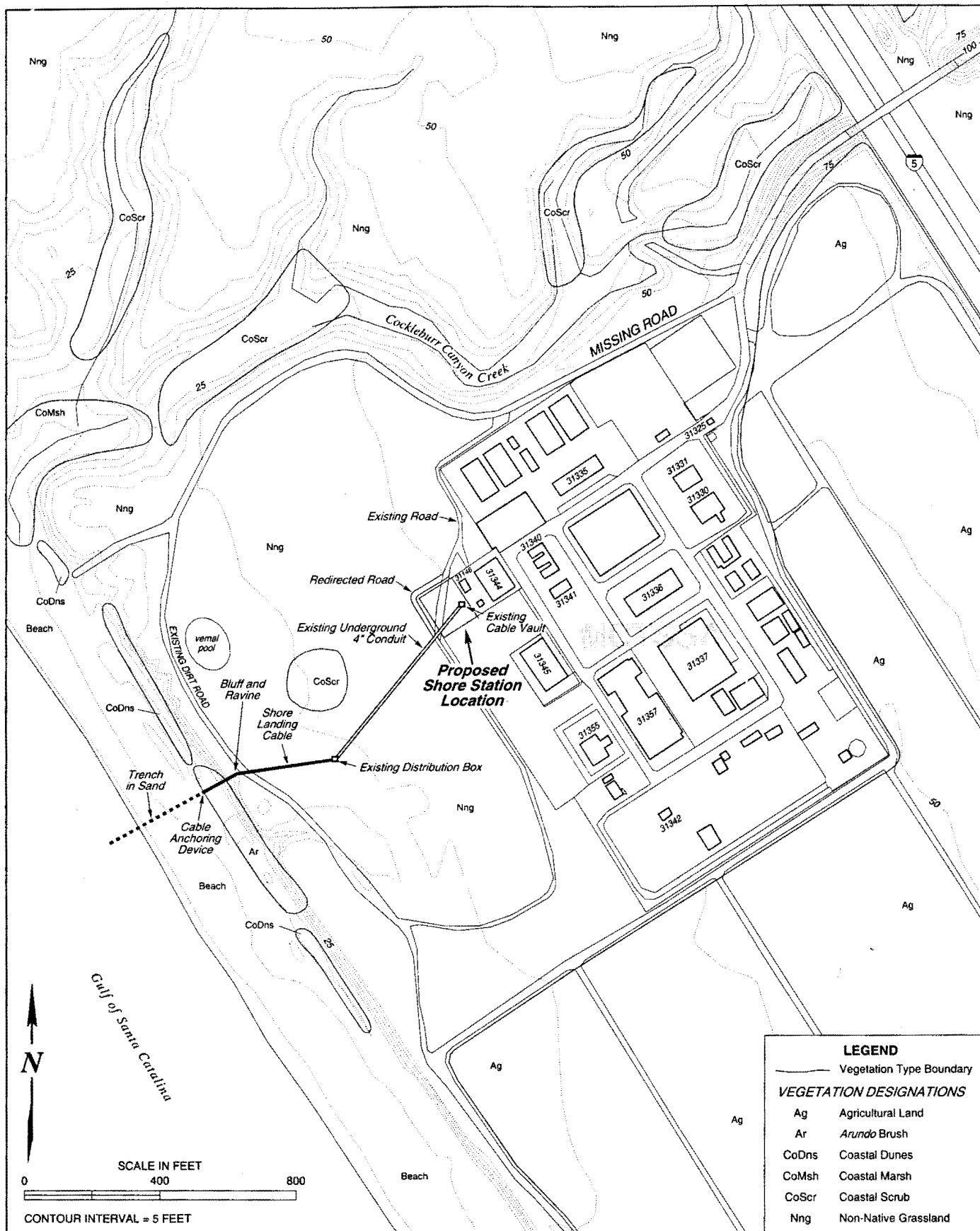
APPLICATION NO.

CD-109-98



**Proposed Shore Station Site Map
MCB Camp Pendleton, California**

EXHIBIT NO.	2
APPLICATION NO.	
CD-109-9P	

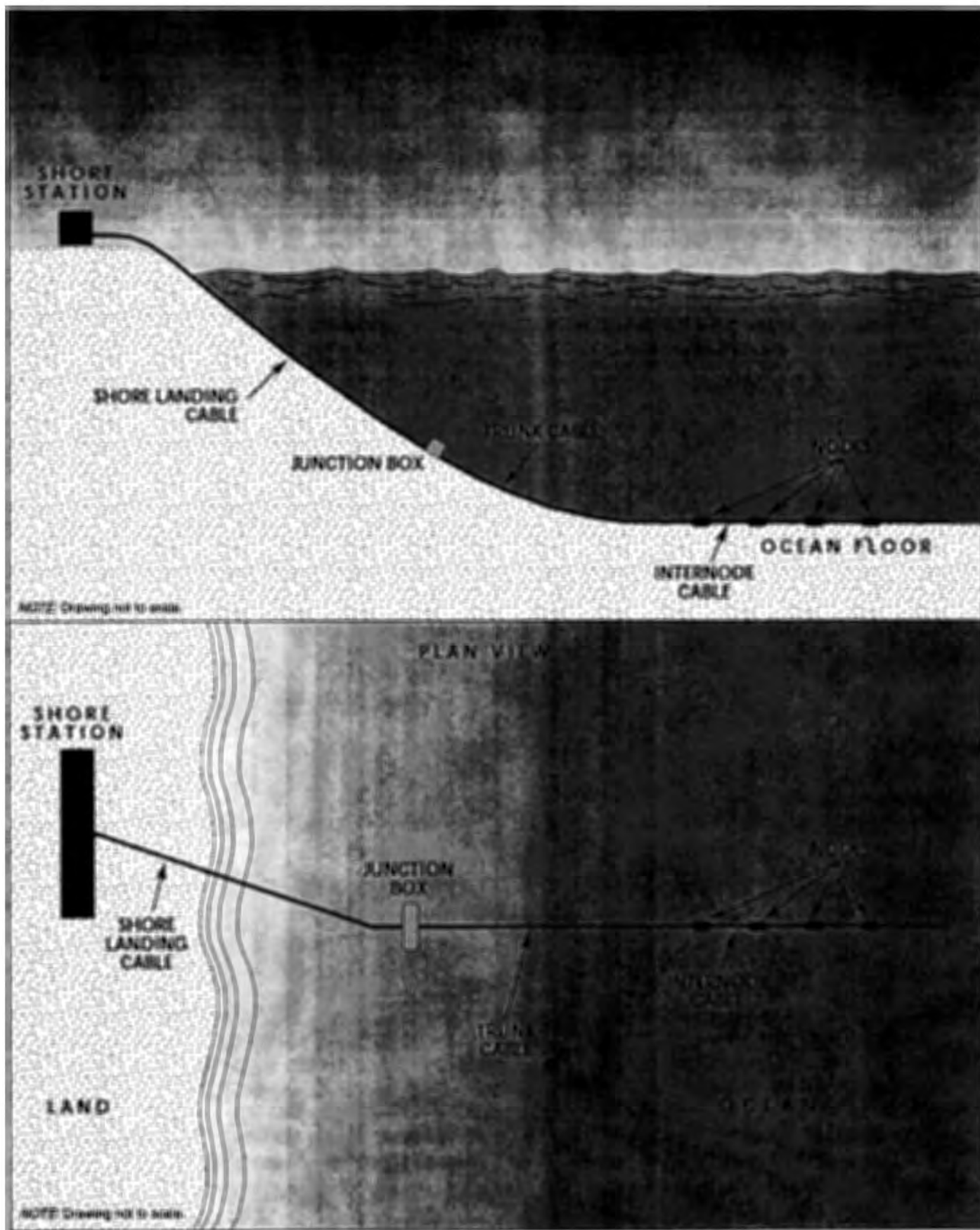


Proposed Shore Station Location Map
MCB Camp Pendleton, California

EXHIBIT NO. 3

APPLICATION NO.

CD-109-98



Advanced Deployable System Concept

EXHIBIT NO. 4
APPLICATION NO.

CD-109-98

SHORE
STATION

DEPLOYMENT, TEST, AND
RECOVERY VESSEL

TOWED DEPLOYMENT
VEHICLE

NODES

OCEAN FLOOR

Drawing not to scale.

PROCESS

- 1) Deploy cable (shown).
- 2) Connect cable to shore station.

Typical Deployment for ADS Ocean Test

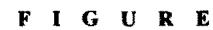
FIGURE

4

EXHIBIT NO. 5

APPLICATION NO.

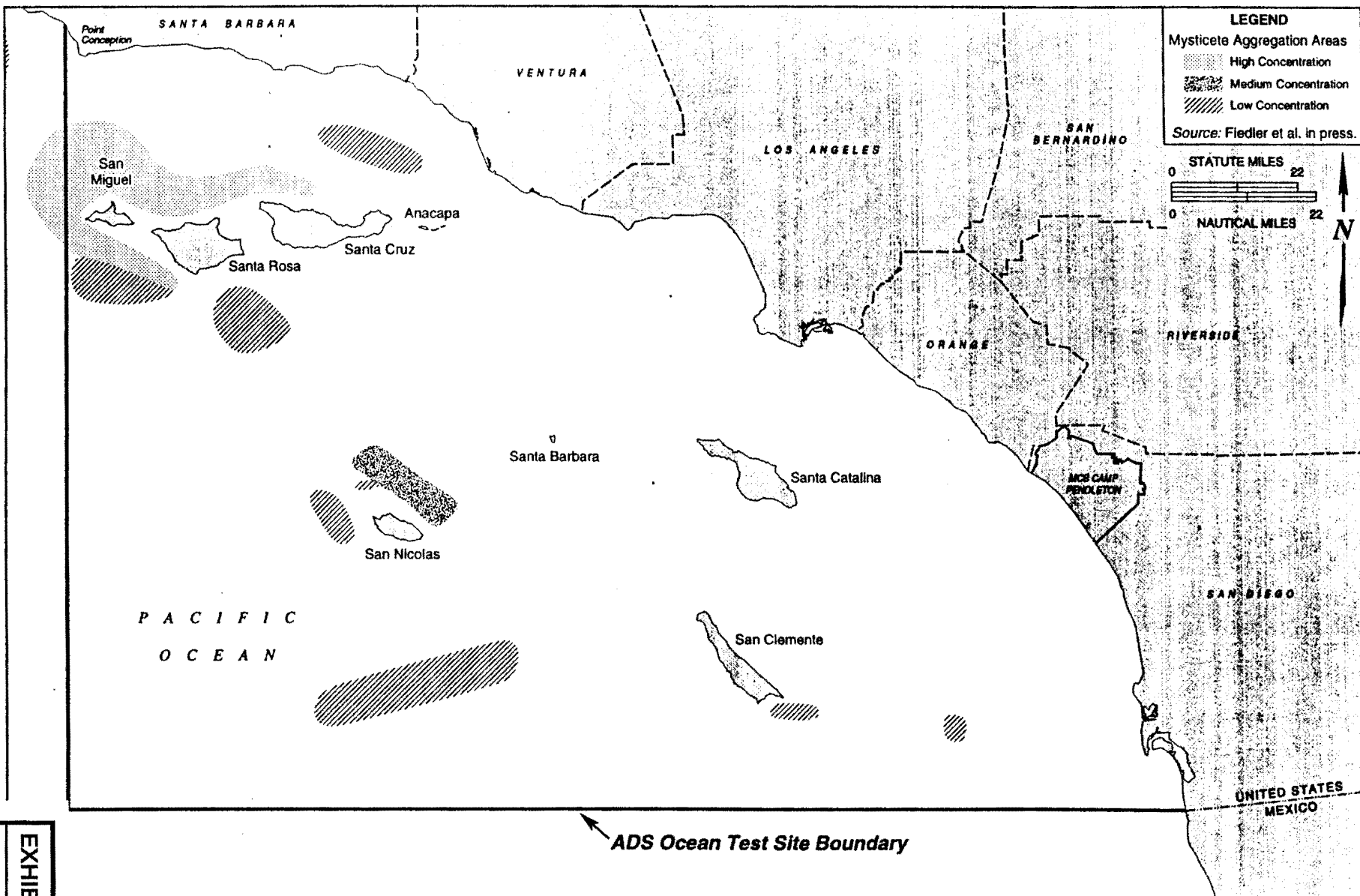
CD-109-98



Proposed ADS Ocean Test Location

2-5

4-18



Mysticete Aggregation Areas – Summer/Fall
Southern California Bight

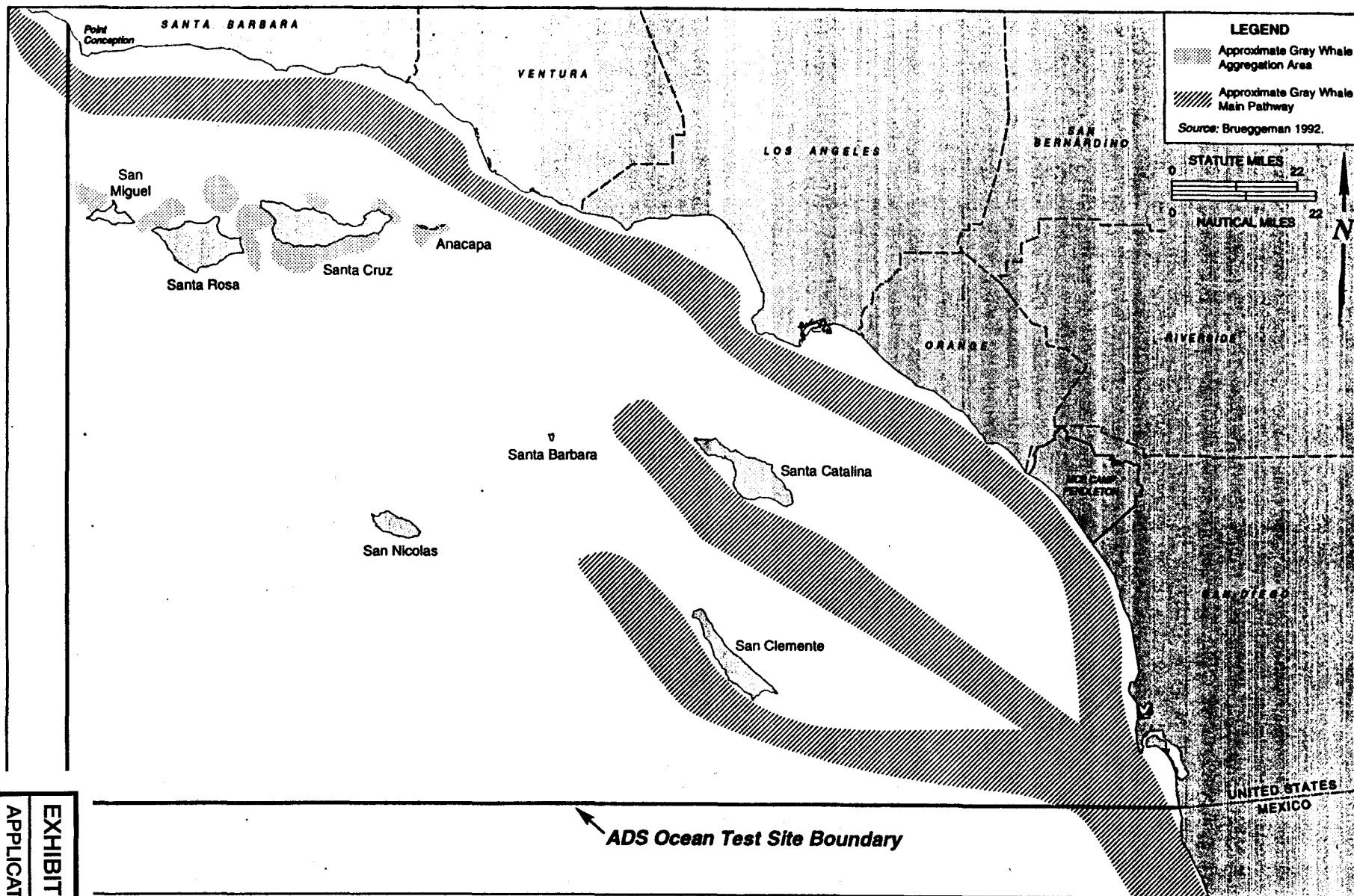
FIGURE

4-1

EXHIBIT NO. 7

APPLICATION NO.

CD-109-98



Gray Whale Aggregation Areas and Main Pathways – Winter/Spring
Southern California Bight

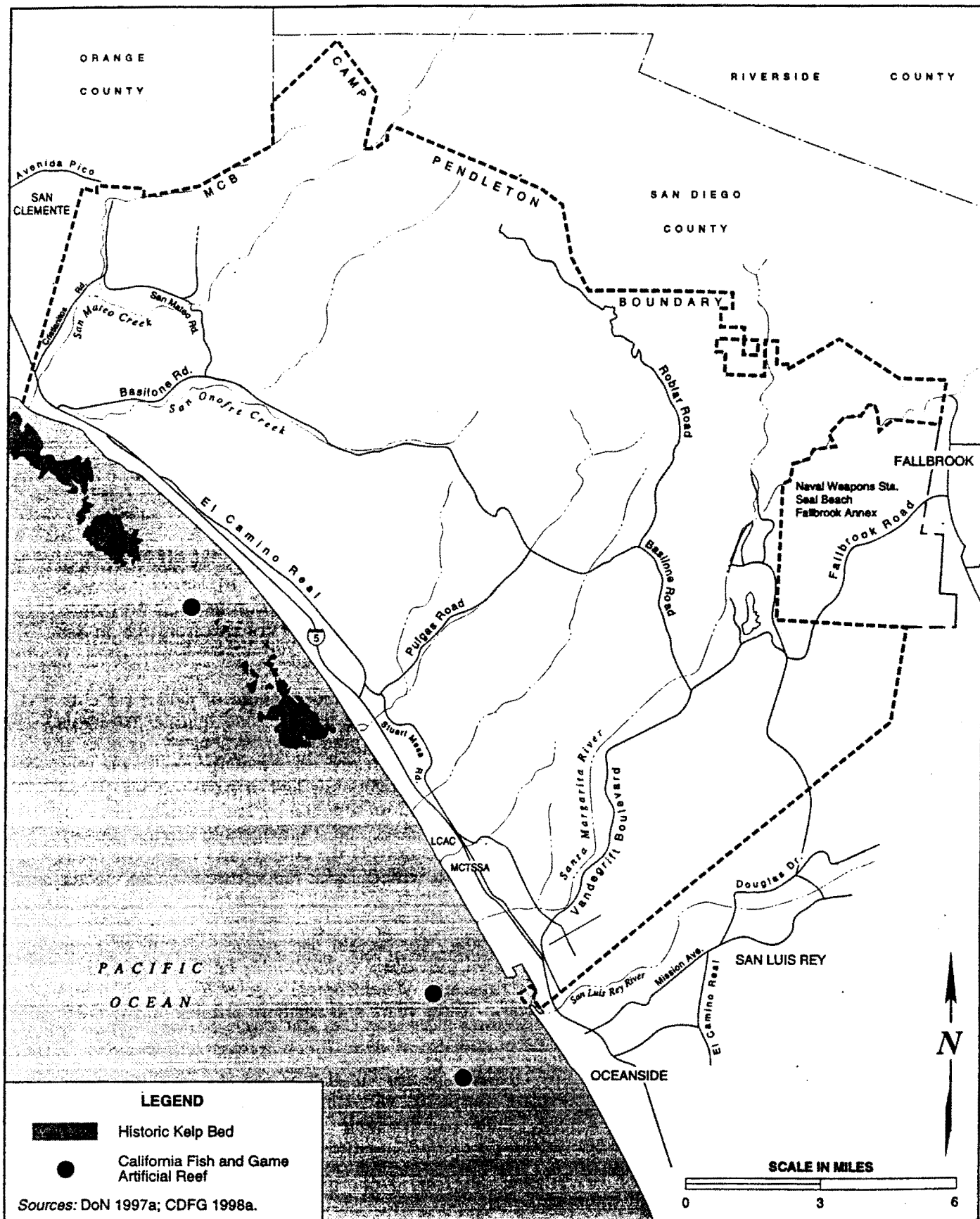
FIGURE

4-2

EXHIBIT NO. 8

APPLICATION NO.

CD-109-98



FIGURE

MCB Camp Pendleton Historic Kelp Beds and
Location of California Department of Fish and Game Artificial Reefs

EXHIBIT NO. 9

APPLICATION NO.

CD-109-98

Table 3-2. Marine Mammals Common to Waters Offshore California

Common Name	Scientific Name	Stock	Status ¹	Pop. Estimate (CV) ²	Winter/Spring	Summer/Fall
Mysticetes						
Gray whale	<i>Eschrichtius robustus</i>	East. N. Pacific	NL	22,263 (0.09)*	Common	Uncommon
Blue whale	<i>Balaenoptera musculus</i>	CA	E	2,146 (0.23)	Uncommon	Common
Fin whale	<i>Balaenoptera physalus</i>	CA	E	1,896 (0.59)	Uncommon	Common
Minke whale	<i>Balaenoptera acutorostrata</i>	CA	NL	446 (0.44)	Uncommon	Common
Humpback whale	<i>Megaptera novaeangliae</i>	CA	E	1,701 (0.33)	Uncommon	Common
Bryde's whale	<i>Balaenoptera edeni</i>	CA (1991/93)	NL	24 (2.0)	Uncommon	Uncommon
Sei (or Bryde's) whale	<i>Balaenoptera borealis</i>	CA (1991/93)	E	36 (0.71)	Uncommon	Uncommon
Northern right whale	<i>Eubalaena glacialis</i>	N. Pacific	E	16 (1.11)**	Uncommon	Uncommon
Odontocetes						
Sperm whale	<i>Physeter macrocephalus</i>	CA	E	503 (0.42)	Common	Common
Pygmy (or dwarf) sperm whale	<i>Kogia breviceps</i>	CA (1991/93)	NL	3,145 (0.54)	Uncommon	Uncommon
Killer whale	<i>Orcinus orca</i>	CA	NL	323 (0.60)	Uncommon	Uncommon
Baird's beaked whale	<i>Berardius bairdii</i>	CA	NL	157 (0.53)	Uncommon	Common
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	CA	NL	2,162 (0.55)	Uncommon	Uncommon
Beaked whales spp.	<i>Mesoplodon spp.</i>	CA(1991/93)	NL	1,378 (0.58)	Uncommon	Uncommon
Risso's dolphin	<i>Grampus griseus</i>	CA	NL	7,366 (0.52)	Common	Uncommon
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	CA(1991/93)	NL	1,004 (0.37)	Common	Uncommon
Northern right whale dolphin	<i>Lissodelphis borealis</i>	CA	NL	9,131 (0.77)	Common	Uncommon
Long-beaked common dolphin	<i>Delphinus capensis</i>	CA	NL	72,251 (0.83)	Uncommon	Common
Short-beaked common dolphin	<i>Delphinus delphis</i>	CA	NL	326,815 (0.42)	Common	Common
Striped dolphin	<i>Stenella coeruleoalba</i>	CA	NL	5,734 (0.55)	Uncommon	Common
Pacific white-sided dolphin	<i>Lagenorhynchus obliquidens</i>	CA	NL	60,026 (0.84)	Common	Uncommon
Bottlenose dolphin	<i>Tursiops truncatus</i>	CA	NL	320 (0.43)	Common	Common
Dall's porpoise	<i>Phocoenoides dalli</i>	CA	NL	60,756 (0.50)	Common	Uncommon
Pinnipeds						
California sea lion	<i>Zalophus c. californianus</i>	U.S.	NL	167,000-188,000	Common	Common
Harbor seal	<i>Phoca vitulina richardsi</i>	CA	NL	30,293-188,000	Common	Common
Northern elephant seal	<i>Mirounga angustirostris</i>	CA Breeding	NL	84,000-188,000	Common	Uncommon
Guadalupe fur seal	<i>Arctocephalus townsendi</i>	CA/Mexico	T	7,408-188,000	Uncommon	Uncommon
Northern fur seal	<i>Callorhinus ursinus</i>	San Miguel Is.	NL	10,036-188,000	Common	Uncommon
Mustelids						
Southern sea otter	<i>Enhydra lutris nereis</i>	Experimental population	T	< -50	Uncommon	Uncommon

Sources: Population Estimates
Cetaceans - Barlow 1997
* Hobbs et al. in press
** Forney et al. 1995

Pinnipeds - Barlow et al. 1997

¹Status: E = Endangered
T = Threatened
NL = Not Listed

²CV = Coefficient of variation

**DEPARTMENT OF THE NAVY**

NAVAL FACILITIES ENGINEERING SERVICE CENTER
1100 23RD AVE
PORT HUENEME CA 93043-4370

IN REPLY REFER TO:

September 15, 1998

Mr. Mark Delaplaine
California Coastal Commission
45 Freemont Street, Suite 2000
San Francisco, California 94105-5200

RE: CD-109-98, U.S. Navy, Consistency Determination for Advanced Deployable Systems
Ocean Tests.

Dear Mr. Delaplaine:

On September 3, 1998, you addressed a letter to John Cannon requesting additional information on the above referenced consistency determination. A copy of the Environmental Assessment (EA) is provided as enclosure (1) for your review. A revision is scheduled to be released on September 28, 1998. A list of the modifications currently being implemented into the document is provided in enclosure (2). The information you requested is provided below.

1. The Space and Naval Warfare System Command (SPAWAR) has determined that this is of local interest. The two interested parties and their addresses are as follows:

Laura Hunter
Environmental Health Coalition
1717 Kettner Blvd., Suite 100
San Diego, CA 92101
Tel. (619) 235-0281
Fax (619) 232-3670

Surfrider Foundation
122 S. El Camino Real, Suite #67
San Clemente, CA 92672
Tel. (949) 492 8170
Fax (949) 492 8142

2. In response to item two in your letter, visual renderings of the proposed shore station and their relationship to existing development is provided in enclosure (3). The facility is not visible from I-5.
3. There are two sensitive resources in the nearshore waters off Camp Pendelton, shipwrecks and kelp beds. Although shipwrecks are relatively abundant within the area of potential effect for the ocean tests, documented shipwrecks would be avoided not only to avoid potentially historical sensitive resources, but also to avoid complicating the Advanced Deployable System (ADS) retrieval process upon test completion. Approximate shipwreck locations are provided in the EA, Figure 2-5 on page 2-15. The laydown of the proposed ADS tests would not occur in any kelp bed locations, as shown in Figure 3-4 on page 3-14 of the EA.

EXHIBIT NO. 11

APPLICATION NO.

CD-109-98

RE: CD-109-98, U.S. Navy, Consistency Determination for Advanced Deployable Systems Ocean Tests.

4. General Renke and Colonel K.W. Quigley, Deputy, Natural Resources, Environmental Security at Camp Pendelton were briefed on the proposed action on May 11, 1998. We were directed to work with the Environmental Security office. We have had two meetings at Camp Pendelton, one of which was a brief to the Environmental Impact Working Group. A letter of concurrence will be submitted to the Environmental Security office shortly.
5. A letter of concurrence, dated August 18, 1998, was received from the Fish and Wildlife Service and it is provided in Appendix E of the EA. As per the direction of Chief of Naval Operations code N456 (Environmental/NEPA Compliance), since we are below the threshold for "take" we are not required to consult for a "take" permit with the National Marine Fisheries Service (NMFS).
6. The Gray Whale Aggregation and Main Pathways are shown in Figure 4-2 on page 4-19. The proposed ADS tests will occur in the Gray whale migration path during migration season. We are not able to avoid migration season because we are participating in a military exercise. We have proposed appropriate mitigation measures to minimize any possible impacts. These measures are defined in the EA (page 4-34) but they are currently being refined as indicated in enclosure (2).
7. The Mysticete aggregation areas are shown in Figure 4-1 on page 4-18 and Pinnipeds of the Channel Islands are shown in Figure 3-6 on page 3-23 of the EA. The potential impacts on marine mammals from vessel operations and towed sources are discussed in Section 4.5 of the EA. We are not implementing acoustic monitoring.
8. We are doing both continuous and pulsed transmissions at night. However, the source level will be no greater than 140 dB for continuous transmissions at night. A continuous sound transmission of 140 dB attenuates to 120 dB at a distance of 10 m and a pulsed sound transmission of 175 dB attenuates to 160 dB at 6 m. Given that the ship's deck lighting illuminates beyond this range, we would be able to continue to perform a visual search at night. Continuous source level transmissions in low visibility weather will be limited to low transmission levels such that the visual search requirement does not exceed the visibility.
9. The thresholds established for ADS were based on the observed responses of gray whales and bowhead whales to actual and played-back anthropogenic noise as documented in "Low Frequency Sound and Marine Mammals: Current Knowledge and Research Needs" National Research Council, 1994.
10. Regarding diver safety, a notice to mariners will be published prior to each proposed test. In addition, if dive flags or dive boats are spotted within 0.5 miles of the support vessel, active acoustic operations will be curtailed.


ExH. 11, p. 2

RE: CD-109-98, U.S. Navy, Consistency Determination for Advanced Deployable Systems Ocean Tests.

11. The test sites, test dates, and specific transmit frequencies are classified to ensure the safety, security, and integrity of the ADS program and equipment.

If you have any questions or if you require additional information, please do not hesitate to contact Ms. Shawn Hynes. She can be reached by phone at (805) 982-1170, by fax at (805) 982-5204, by email at hynessm@nfesc.navy.mil, as well as by regular mail at Commander, NFESC/Code ESC51 S. Hynes, 1100 23rd Avenue, Port Hueneme, CA 93043. Your cooperation and assistance are greatly appreciated.

Sincerely,



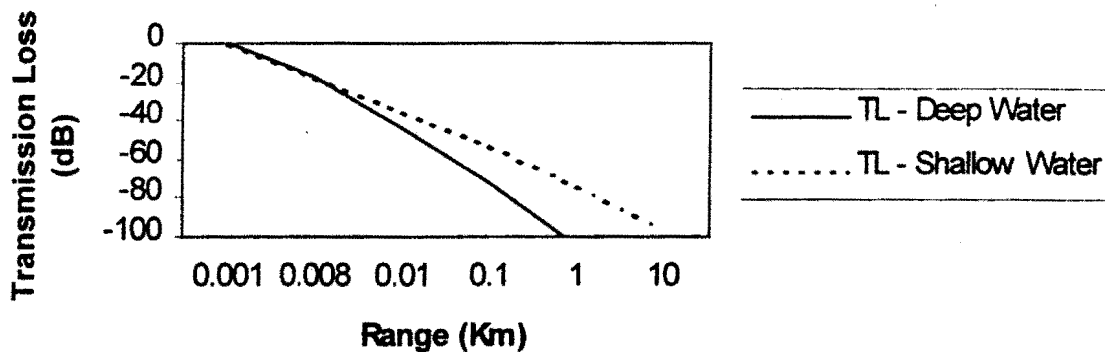
ROBIN SKINNER

Environmental, Safety, and Health Manager

- Encl: (1) Environmental Assessment
(2) Modifications to the EA
(3) Visual renderings of the shore station.

EXH. 11, p. 3

Figure 3-10. Theoretical Underwater Transmission Loss (TL)



Source: Richardson et al. 1995.

Table 3-13. Typical Natural Underwater Noise Sources and Levels

Noise Source	Noise Level (dB)
Wind and waves	85
Earthquake/magma movement	95-135
Bottlenose dolphin	125-173
Humpback whale call	175
Gray whale call	185
Killer whale call	160

Source: Scripps Institution of Oceanography (Scripps) 1997b.

Table 3-14. Typical Man-Made Underwater Noise Sources and Levels

Noise Source	Noise Level (dB)	Noise Characteristics
Large tanker	177	A continuous noise on shipping pathways worldwide
Icebreaker	183	A cycling noise primarily in Arctic Ocean, north of Canada, Alaska, and Russia
Low frequency sonar	200+	Continuous pulses at undisclosed locations, potentially worldwide
Supply ship	174	Continuous sound emitted along shipping lanes worldwide
Seismic oil exploration	210	Low-pitched pulses of sound, generated in oil-rich ocean areas worldwide
Dredging boat	167	Continuous, low frequency grinding, in nearshore construction areas

Source: Scripps 1997b.

EXHIBIT NO.
APPLICATION NO.
CD-109-98

NOISE SOURCE	MAXIMUM SOURCE LEVEL	REMARKS	REFERENCE
UNDERSEA EARTHQUAKE	272 dB	Magnitude 4.0 on Richter scale (energy integrated over 50 Hz bandwidth)	Wenz, 1962.
SEAFLOOR VOLCANO ERUPTION	255+ dB	Massive steam explosions	Dietz and Sheehy, 1954; Kibblewhite, 1965; Northrop, 1974; Shepard and Robson, 1967; Nishimura, NRL-DC, pers. comm., 1995.
AIRGUN ARRAY (SEISMIC)	255 dB	Compressed air discharged into piston assembly	Johnston and Cain, 1981; Barger and Hamblen, 1980; Kramer et al., 1968.
LIGHTNING STRIKE ON WATER SURFACE	250 dB	Random events during storms at sea	Hill, 1985; Nishimura, NRL-DC, pers. com., 1995.
SEISMIC EXPLORATION DEVICES	212-230 dB	Includes vibroseis, sparker, gas sleeve, exploder, water gun and boomer seismic profiling methods.	Johnston and Cain, 1981; Holiday et al., 1984.
FIN WHALE	200 dB (avg. 155-186)	Vocalizations: Pulses, Moans	Watkins, 1981b; Cummings et al., 1986; Edds, 1988.
CONTAINER SHIP	198 dB	Length 274 meters; Speed 23 knots	Buck and Chalfant, 1972; Ross, 1976; Brown, 1982b; Thiele and Ødegaard, 1983.
ATOC SOURCE	195 dB	Depth 980 m; Average duty cycle 2-8%	DEIS/EIR for the California ATOC Project and MMRP, 1994.
HUMPBACK WHALE	192 dB (avg. 175-190)	Fluke and flipper slaps	Thompson et al., 1986.
SUPERTANKER	190 dB	Length 340 meters; Speed 20 knots	Buck and Chalfant, 1972; Ross, 1976; Brown, 1982b; Thiele and Ødegaard, 1983.
BOWHEAD WHALE	189 dB (avg. 152-185)	Vocalizations: Songs	Cummings and Holiday, 1987.
BLUE WHALE	188 dB (avg. 145-172)	Vocalizations: Low frequency moans	Cummings and Thompson, 1971a; Edds, 1982.
RIGHT WHALE	187 dB (avg. 172-185)	Vocalizations: Pulsive signal	Cummings et al., 1972; Clark 1983.
GRAY WHALE	185 dB (avg. 185)	Vocalizations: Moans	Cummings et al., 1968; Fish et al., 1974; Swartz and Cummings, 1978.
OFFSHORE DRILL RIG	185 dB	Motor Vessel KULLUK; oil/gas exploration	Greene, 1987b.
OFFSHORE DREDGE	185 dB	Motor Vessel AQUARIUS	Greene, 1987b.
OPEN OCEAN AMBIENT NOISE	74-100 dB (71-97dB in deep sound channel)	Estimate for offshore central Calif. sea state 3-5; expected to be higher (≥ 120 dB) when vessels present.	Urick, 1983, 1986.

Note: Except where noted, all the above are nominal total broadband power levels in 20-1000 Hz band. These are the levels that would be measured by a single hydrophone (reference 1 μ Pa @ 1 m) in the water.

Table 1.1.3-1 Natural and human-made source noise comparisons.

SOURCE: ATOC EIS/EIR

RECEIVED

JUN 03 1998

California Coastal Commission
45 Fremont St. Suite 2000
San Francisco, Ca.

CALIFORNIA
COASTAL COMMISSION

6-3-98

Attention: Mr. Mark DeLaplaine

Dear Commissioners: I am writing this letter to document recent occurrences involving testing of the U.S. Navy Low Frequency Active SONAR system, and how these occurrences relate to the Scripps/Applied Physics Lab A.T.O.C. experiment.

During Phase III LFAS testing done in Hawaiian waters the vessel Cory Chouest was responsible for an incident that involved extremely negative impacts on a dolphin researcher, Ms. Chris Reid. As you may be aware, the Cory Chouest was prohibited from conducting LFAS transmissions if humans were in the water near the source. Due to this restriction many scheduled Phase III transmissions were either terminated or not conducted. The particulars of the incident were reported to me directly from Ms. Reid via phone communication. On one day during Phase III, Ms. Reid was observing the dolphins she studies which regularly enter Captain Cook Bay, and she realized they were acting very irregularly. She decided to hop in the water and when she held her breath and descended she could hear a very unusual sound. She said it sounded like a loud hum. When she surfaced she complained of dizziness, disorientation, nausea and other maladies. She was taken to a physician who described her condition as resembling that of "an acute trauma victim." She said there were no vessels in sight. In truth, the Cory Chouest and possibly another ship, the U.S. Navy SWATH LFAS vessel Victorious were conducting transmissions nearby.

During one of the court cases filed against Chris Clark and the LFAS Phase III experiment in Hawaii recently, Mr. Clark admitted Ms. Chris Reid was ensonified by the LFAS transmit vessel Cory Chouest at a received level of 125dB. There was no evidence presented that rebuked the fact Ms. Reid suffered the negative impacts she and the attending physician reported and observed. All Chris Clark said was 125db was the equivalent of being 400 yards from a singing Humpback Whale. In my personal experiences, being near a singing Humpback is one of the greatest experiences, while being ensonified by testing of the full power U.S. Navy LFAS system and the high power low frequency sine waves it transmits is by far the worst experience of my life.

The lack of a denial by chief "scientist" Chris Clark in court that low frequency sound transmissions can cause such negative impacts in humans leads me to our local ATOC experiment. Pages 17 & 18, Section 2 of the California ATOC Final EIS/EIR shows the predicted soundfield around the ATOC soundsource. The 120dB isopleth is 18km heading toward shore and 12km heading out to sea.

As I suggested to the CCC's Mr. DeLaplaine and Scripps Suzy Pike, it would seem clear that since Scripps/APL refuses to publish a transmission schedule before they begin ocean basin scale ATOC/MMRP 195dB 75Hz transmissions, there should be an area around the sound source where humans are excluded due to possible negative reactions. The lack of a transmission schedule prior to the fact would make this "Human Exclusion Zone" a 24 hour a day, 365 day per year restriction. At this time, with the evidence already presented in court, the received level

EXHIBIT NO. 14

APPLICATION NO.

CD-109-98

should be below the 125dB level that caused the negative reactions in Ms. Reid. I would suggest the 120dB isopleth indicated in the California ATOC EIS/EIR as a reasonable level at this time.

In no way am I suggesting a received level of 120dB will cause no harm in humans or other species, either marine or terrestrial.

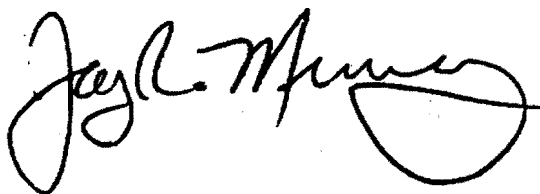
If Scripps/APL published a transmission schedule prior to the fact, the "Human Exclusion Zone" could be placed in effect during transmission periods only.

The only question posed to me by Scripps concerning this situation was, "Jay, how many people dive near Pioneer Seamount anyway?" I responded that I personally don't dive there, but that doesn't guarantee other divers won't. With the evidence already presented it would seem imperative that the agencies in charge of the ATOC experiment protect themselves from future litigation by implementing these zones of influence immediately. Just sitting there, continuing to transmit and hoping nobody else gets hurt is a recipe for disaster.

I suggest the "Human Exclusion Zone" should be made public worldwide in several different ways as to notify as many humans as possible. A public release in the Federal Register will not be sufficient.

Sincerely,

Jay R. Murray
369 El Caminito
Carmel Valley, Ca. 93924
408-659-4729

A handwritten signature in black ink, appearing to read "Jay R. Murray". The signature is stylized with a large, sweeping loop at the end.

