

CALIFORNIA COASTAL COMMISSION

45 FREMONT, SUITE 2000
 SAN FRANCISCO, CA 94105-2219
 TELEPHONE AND TDD (415) 904-5200



ADOPTED STAFF REPORT AND RECOMMENDATION
ON COMBINED CONSISTENCY CERTIFICATION
AND COASTAL DEVELOPMENT PERMIT APPLICATION

Consistency Certification	CC-110-94
Permit Application	3-95-40
(Scripps, ATOC)	
Staff:	MPD-SF
File Date (Cons. Cert.):	12/1/94
6 Months:	7/24/95 ¹
File Date (Permit):	4/14/95
49th Day:	6/2/95
180th Day:	10/11/95
Hearing Date:	6/15/95

APPLICANT: **Scripps Institution of Oceanography**

DEVELOPMENT
LOCATION:

Pioneer Seamount, 48 nm (nautical miles) offshore of Half Moon Bay, with cable to shore connecting with existing Air Force utilities at Pillar Point Air Force Tracking Station, San Mateo County (Exhibits 1 & 2)

DEVELOPMENT
DESCRIPTION:

Acoustic Thermometry of Ocean Climate (ATOC) Project and Marine Mammal Research Program (MMRP)

TABLE OF CONTENTS

<u>Subject</u>	<u>Page #</u>
1. Executive Summary	2
2. Project Description	4
3. Resolutions: Concurrence/Approval w/Conditions ...	6
4. Permit Conditions	7
5. Marine Resources	7
a. Coastal Act Policies	7
b. Affected Resources	8
c. Alternatives	10
d. Noise Impacts	12
e. Monitoring/Mitigation	15
f. Commission Conclusion	18
6. Nearshore/Landfall Impacts	21
7. Substantive File Documents	24
8. Exhibits	End of Document

¹ OCRM letter of March 10, 1995 to CCC (Exhibit 20), which grants the Commission's request to review activities that are the subject of Scripps' application for a Monterey Bay National Marine Sanctuary (MBNMS) permit, states that the review period ends 6 months from date of receipt of notice of application for MBNMS approval, which occurred on January 24, 1995.

NOTE: This report supercedes the previously published report and contains the final changes made to the project after the mailing of the previous report and during the public hearing. The project was modified by Scripps as described in the staff Addendum dated June 5, 1995 (Exhibit 25), and subsequently modified by Scripps during the June 15, 1995, Commission hearing (Exhibit 26). The revised Executive Summary below reflects these changes.

EXECUTIVE SUMMARY

Scripps Institution of Oceanography (Scripps) proposes the Acoustic Thermometry of Ocean Climate (ATOC) project, consisting of placing a sound-emitting device at Pioneer Seamount, 48 nautical miles offshore of Half Moon Bay, connected with a power cable to shore at the Pillar Point Air Force Tracking Station. The project goal is studying global warming by measuring the speed of sound transmitted through an underwater channel. The sound source will be 980 meters deep and will emit high intensity (195 dB), low frequency sounds. The sound transmissions would last for 20 minutes every 4 hours, on four out of 11 days, which equates to a duty cycle of 3% (i.e., the source will be silent 97% of the time).

Because a number of species of marine animals hear and communicate at low frequencies, concerns have been raised over whether or not project would cause adverse effects on marine resources, such as sperm whales, sea turtles, and elephant seals. Very little is known about the effects of low frequency sound on marine animals, particularly marine mammals and sea turtles. Scripps has included within the project a Marine Mammal Research Program (MMRP), which will monitor the biological effects of the sound transmissions. The MMRP monitoring studies would continue throughout all ATOC transmissions.

In addition to the monitoring Scripps has agreed: (1) to use a "ramp up period" during which the sound will be turned up gradually, rather than starting at "full blast;" (2) to operate ATOC at "the minimum duty cycle necessary to support MMRP objectives and ATOC feasibility objectives;" (3) to cease the ATOC project in the event significant adverse impacts are occurring; (4) to allow the MMRP research group to maintain control over the sound source for the entire 2 year period; (5) to expand the scope of the independent MMRP advisory board; (6) to remove the sound source as soon as is feasible after the 2 year project; (7) that project authorization at this time is not a commitment to use of this location (Pioneer Seamount) for future ATOC studies; (8) to prepare a Programmatic EIS/R prior to any long term ATOC activities; (9) that an essential siting criterion for a long term site will be: Location in an area with minimal abundances of marine life that might possibly be adversely affected by low frequency sound; and (10) to include a fisheries biologist on the MMRP advisory board and include monitoring of impacts on fish behavior.

Given the potential scientific and environmental benefits from the research proposed, and since the only way to determine the project's impacts is to allow it to proceed in the short term and study its impacts, the authorization of a two year initial ATOC project is warranted. This conclusion is dependent

on the combination of the monitoring and protective measures incorporated into the project, the relatively short (two-year) duration of the project, and the relocation of the ATOC sound source outside the Monterey Bay National Marine Sanctuary. This conclusion is also based on the future involvement of the Commission in reviewing the results of the MMRP, in consultation with NMFS, MMC, and other reviewers. Such review may lead to modifications and/or cessation of the project, depending on the results of the monitoring. Finally, additional federal consistency review by the Commission will be triggered in the event that: (1) Scripps makes any significant modifications to either (a) the MMRP or other mitigation measures or (b) the ATOC project itself; (2) any evidence materializes documenting adverse effects on marine resources "substantially different" than those originally proposed (see Exhibit 21, Section 930.66 of federal consistency regulations); or (3) any extension beyond the two-year initial ATOC operation.

STAFF SUMMARY AND RECOMMENDATION:

I. STAFF SUMMARY

A. Project Description. The ATOC project is a research effort to determine long-term global ocean climate changes by using acoustic sound paths in the ocean's deep "sound channel" to measure average ocean temperatures. The principle behind ATOC is that sound travels faster in warm water than in cold water: the travel time is a direct measure of the large-scale average temperature between the source and a receiver. According to Scripps, "Measuring average ocean temperatures is necessary to validate global climate computer models being used and developed to answer the question of whether our earth is warming as a result of the 'greenhouse' effect."

Scripps seeks to take advantage of an acoustic "waveguide" deep within the ocean that carries subsea sounds over very long distances. This feature, known as the "sound channel," or sound frequency and ranging (SOFAR) channel, is at the ocean depth where the speed of sound is at minimum. Above the sound channel, sound travels faster because the water is warmer. Below the sound channel, sound travels faster because pressures are greater. Sounds that would otherwise spread to higher or lower depths are refracted back toward the sound channel axis by this difference in speeds. The net effect is that the sound channel transmits sounds efficiently for long distances. This effect also tends to limit sounds that are trapped in the channel from being detectable at depths outside of the channel.

Originally proposed 23 miles offshore and within the Monterey Bay National Marine Sanctuary (MBNMS), the sound source has been relocated to Pioneer Seamount, located approximately 48 nautical miles west of Pillar Point in San Mateo County. Scripps proposes to operate the sound source 3% of the time (called a 3% duty cycle); it will be silent 97% of the time). The depth of the sound device will be 980 meters. The 260 watt output acoustic sound source (Exhibit 3) would transmit low frequency (75 Hertz), digitally coded sounds, with an initial intensity of 195 decibels (dB) to receiver sites located around the Pacific Ocean (Exhibit 4).

The sound source structure would include an acoustic monitoring array (VLA), which will be used by the MMRP (discussed below). Power for the sound source would be via an electric cable to shore. The cable landfall site is on the western edge of the Pillar Point Air Force Tracking Station, located near the town of Princeton-by-the-Sea.

The onshore cable installation would be undertaken as part of an Air Force bluff restoration project previously authorized by the Commission (CD-62-94, U.S. Air Force, Pillar Point). Landward of the sandy beach, the cable would traverse an existing gully and be covered by this Air Force restoration and drainage project. The cable will be buried across the beach and through the shallow intertidal zone, and seaward of that point out to the sound source the cable will be placed on the ocean floor.

Scripps considers the proposed ATOC project to be a "demonstration phase, with the goal of proving the acoustic thermometry concept for future global ocean climate monitoring programs." Scripps states:

Following this initial demonstration period, any future facilities or operations will be subject to additional environmental review and permitting. The lessons learned from the demonstration phase will support all facets of future global climate change research planning: whether the program will proceed, where facilities will be located, equipment design, sound levels, mitigation measures, etc.

Because of its potential effects on marine resources, the ATOC project includes a Marine Mammal Research Program. Summarizing the MMRP goals, the FEIS/R states:

The Marine Mammal Research Program.

The ATOC project includes an extensive marine mammal research program (MMRP) to address the question of whether the long-term underwater low frequency acoustic transmissions are safe for marine animals (particularly marine mammals and sea turtles).

The MMRP responds to the recognized need to evaluate the potential effects of low frequency sound sources on sea life, in particular marine mammals. It is known, for example, that large whales vocalize (and presumably can hear well) in the low frequency range, similar to that used by the ATOC system. On the other hand the ATOC source intensity is comparable to, or lower than, low frequency sounds produced by large container ships and supertankers. Yet very little is known about the effects of low frequency noise on marine mammals.

Exhibit 23 contains a further listing of the ATOC and MMRP goals and objectives.

Finally, Scripps points out that one of the project goals discussed above, the understanding of global climate change which is the cause of sea level rise, was reflected in a 1992 amendment of the Coastal Act. This amendment added Section 30006.5 to that Act, as follows:

The Legislature further finds and declares that sound and timely scientific recommendations are necessary for many coastal planning, conservation, and development decisions and that the commission should, in addition to developing its own expertise in significant applicable fields of science, interact with members of the scientific and academic communities in the social, physical, and natural sciences so that the commission may receive technical advice and recommendations with regard to its decisionmaking, especially with regard to issues such as coastal erosion and geology, marine biodiversity, wetland restoration, and the question of sea-level rise, desalination plants, and the cumulative impact of coastal zone developments. [Emphasis added]

Section 30006.5 is not an enforceable policy of the Coastal Act and thus is not a legal standard for Commission review of either this consistency certification or this coastal development permit. However it can be viewed as reflecting the California Legislature's intent to encourage the receipt by the Commission of "advice and recommendations" from "members of the scientific and academic communities" who are engaging in scientific research in the specified fields, subject, of course, to the Commission's regulatory responsibility to determine in any given instance whether such research can be accomplished consistent with the mandatory enforceable policies of the Coastal Act.

B. 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 Mateo County LCP has been certified by the Commission and incorporated into the CCMP.

C. Applicant's Consistency Certification. Scripps Institution of Oceanography has certified that the proposed activity complies with California's approved coastal management program and will be conducted in a manner consistent with such program.

II. STAFF RECOMMENDATION:

The staff recommends that the Commission adopt the following resolutions:

A. Consistency Certification No. CC-110-94: Concurrence

The Commission hereby concurs with the consistency certification made by Scripps Institution of Oceanography for the proposed project, finding that the project complies with and will be conducted in a manner consistent with the California Coastal Management Program.

B. Application No. 3-95-40: Approval with Conditions

The Commission hereby grants, subject to the conditions below, a permit for the proposed development on the grounds that the development, as conditioned, will be in conformity with the provisions of Chapter 3 of the California Coastal Act of 1976, will not prejudice the ability of the local government having jurisdiction over the area to prepare a Local Coastal Program conforming to the provisions of Chapter 3 of the Coastal Act, is located seaward of the first public road nearest the shoreline and is in conformance with the public access and public recreation policies of Chapter 3 of the Coastal Act, and will not have any significant adverse impacts on the environment within the meaning of the California Environmental Quality Act.

Conditions

Standard Conditions: See Exhibit 22.

Special Conditions:

1. Nearshore Cable Laying. Prior to issuance of permit the applicant shall submit, subject to Executive Director review and approval, specific plans for cable laying shoreward of the 10 fathom contour line to the mean high tide line. If such plans require ship anchors in this area, the plans shall include a specific anchor plan for the cable laying operation. This plan shall assure that no anchors will be placed in any kelp beds or on rocky substrate, that no anchor chains shall cross over any rocky substrate, and that anchor placement occur in a manner minimizing anchor scarring.

2. Surf Zone/Beach Placement. Placement of the cable through the beach and surf zone shall occur during weekday periods. Once it is buried, Scripps agrees to re-bury the cable in the event it becomes exposed. Additionally, in the event Scripps is unable to implement the landfall portion of the project in coordination with the U.S. Air Force's Pillar Point erosion repair project (authorized by the Commission in CD-62-94), Scripps shall apply for an amendment to this permit for nearshore/landfall cable installation.

3. Post-Project Removal. At the conclusion of the project, Scripps will (a) remove all cables and other equipment; and (b) return the cable route to its pre-disturbance condition. If Scripps believes any facilities should be left in place, or that it is not feasible to remove all facilities, Scripps shall apply to the Commission for an amendment to this permit for authorization for any such abandonment-in-place.

III. Findings and Declarations:

The Commission finds and declares as follows:

A. Marine Resources/Commercial Fishing

1. Coastal Act Policies. Section 30230 of the Coastal Act is the fundamental applicable Coastal Act policy, calling for the overall protection of marine resources. This section provides:

[30230] 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 30233(a) provides specific policy direction regarding allowable uses, alternatives considerations, and mitigation requirements for projects entailing fill of ocean or other coastal waters. This section provides, in part:

The diking, filling, or dredging of open coastal waters ... shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

(5) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.

Sections 30234 and 30234.5 provide for the protection of commercial and recreational fishing. Section 30234 provides:

Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded. Existing commercial fishing and recreational boating harbor space shall not be reduced unless the demand for those facilities no longer exists or adequate substitute space has been provided. Proposed recreational boating facilities shall, where feasible, be designed and located in such a fashion as not to interfere with the needs of the commercial fishing industry.

Section 30234.5 elaborates:

The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.

Finally, Section 30240 provides for the protection of environmentally sensitive habitat areas, as follows:

(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.

2. Affected Resources. A large number of marine mammal and other marine species, many of which are threatened, endangered, or "special status" marine species, are found offshore in the central California coast project region and could be affected by the project. Whale species, generally divided into two categories (mysticetes (baleen whales) and odontocetes (toothed whales)), include Minke, blue, fin, sei, humpback, gray, right, killer, sperm, pygmy sperm, dwarf sperm, short-finned pilot, and beaked whales, as well as dolphins (common, striped, Risso's, Pacific white-sided, northern right whale, bottlenose) and porpoises (Dall's and harbor). Six of these (blue, fin, sei, humpback, right, and sperm whales) are threatened, endangered, or special status species (Exhibit 13). The FEIS/R states:

Results from the northern and central California region surveyed by Dohl et al. (1983) indicate that for all cetaceans combined, abundance estimates were highest near the Gulf of the Farallones. According to this study, all slope and deep-water areas contained cetaceans during March through May with moderate to high densities (0.3-1.2/km²) in waters west of the GOFNMS and approximately 12 nm (22km) north of Pioneer Seamount; moderate densities (0.3-0.6/km²) in waters 5 to 15 nm (9-28 km) east of Pioneer Seamount; and low densities (0.01-0.15/km²) over continental shelf waters east of Pioneer Seamount and slope waters approximately 10 nm (19 km) southeast of Pioneer Seamount.

Six pinnipeds (California sea lions, northern elephant seals, harbor seals, northern fur seals, Guadalupe fur seals, and Steller sea lions) and one fissiped (southern sea otter) are found in the region; of these the northern fur seal, Guadalupe fur seal, Steller sea lion and sea otter are threatened, endangered, or special status species.

Other species of concern include four sea turtles (leatherback, green, olive ridley, and loggerhead turtles), one fish species (winter-run chinook salmon), and five bird species (peregrine falcon, California brown pelican, short-tailed albatross, marbled murrelet, and western snowy plover).

The current status of all these species under the Federal Endangered Species Act (ESA) and the State of California endangered or protected species list is summarized in Table 3.3.7-1 (Exhibit 13). In addition, FEIS/R Table 3.3.1-1 (Exhibit 14) shows the current estimates of abundances of the marine mammals and turtle species in the region.

Fish species are also of concern and analyzed in the FEIS/R, both because of their significance in the food chain for larger mammals and their economic (commercial and recreational) significance. The FEIS/R states:

The continental shelf and slope off central California support an economically valuable range of commercial fisheries utilizing a variety of retrieval methods. In 1987, a combined total of over 15,000,000 kg of fish, with an ex-vessel value of almost \$15 million was landed at the ports of Moss Landing, Monterey, Santa Cruz, and Princeton. The retail value of the fish to the local economy was \$30-\$45 million (NOAA, 1992).

The FEIS/R notes that the majority of fishing effort is shoreward of the continental slope (Exhibit 16), stating:

A total of less than 1.1 million kg (0.5 million pounds) of invertebrates and fish were collected between 1970 and 1986 from an area near Pioneer Seamount (at depths of approximately 2000 m), while more productive inshore areas (at depths less than approximately 500 m) typically yielded total catches over 5.5 million kg (2.5 million pounds) during the same time period (MMS/CDFG Commercial Fisheries Database, 1992).

Finally, related to marine resource impacts are the secondary impacts on tourism (such as whale watching tours) and commercial and recreational diving (both in terms of effects on species abundances as well as possible effects on divers themselves).

3. Alternatives Considered. The project EIS/R contained a fairly extensive alternatives analysis, reviewing a variety of sites, as well as alternative technologies to approaching the global warming issues. Alternatives considered in the EIS/R include: 1) the proposed action as currently modified; 2) no action; 3) alternate project sites [including sites off Pacific Beach (Washington), Coos Bay (Oregon), and four California sites: San Nicolas Island, Pioneer Seamount, Sur Ridge, and Sur Slope] (Exhibit 10); 4) moored autonomous sources; 5) restricted source transmission times; 6) modified source operational characteristics; 7) global climate models; 8) satellite sensors for sea surface temperature measurements; 9) satellite sensors for sea level measurements; 10) oceanographic point sensors (measurements using conventional thermometers); and 11) autonomous polar hydrophones. Of eleven alternatives considered, the proposed action (Pioneer Seamount), no action, two alternate sites (Sur Ridge and Sur Slope), and moored autonomous sources were analyzed in greater detail.

In analyzing alternative sites, the EIS/R states:

The ATOC project's screening of potential source sites was comprehensive. First, an ocean basin was selected for the proposal. In making this selection, the northern hemisphere was preferred due to the relatively large number of subsea listening systems already in place; these were installed during the cold war at a cost of approximately \$20 billion, and could not practicably be replicated elsewhere. The Pacific was preferred over the Atlantic because the mid-Atlantic ridge is a potential acoustic barrier (and possibly an acoustic mirror) at sound channel depths. Central and eastern Pacific locations were preferred given the proximity to U.S. research institutions and the relative abundance of U.S. possessions, including the mainland U.S. From that point the proposal evolved to locate a source along the Pacific coast of Washington, Oregon, or California. Generally, a number of subsea features at the northern and southern ends of this range (east-west ridges and shoals to the north, and the Channel Islands to the south) would tend to block transmission paths from locations other than the central California region.

Within this sub-region, the EIS/R states that only a few subsea locations have the right combination of depth and topography to serve as appropriate source sites. The constraints limiting site selection include the fact that a suitable source site must, among other factors: 1) be at or near the deep sound channel depth; 2) have downward slopes in the direction of both the North Pacific and New Zealand receiving stations; 3) lack acoustic obstructions (seamounts, shoals, etc.) in the direction of those receivers; and 4) be reasonably close to shore (to minimize cable lengths and other logistical problems). The usable U.S. west coast sites were narrowed to three in the EIS/R: Pioneer Seamount, Sur Ridge and Sur Slope.

The Draft EIS/R selected Sur Ridge as the preferred alternative. However the preferred site was changed to Pioneer Seamount in the Final EIS/R; Scripps explains:

The change in proposed location was made in response to concerns raised and comments received during the comment period on the ATOC DEIS/EIR about conducting research within the Monterey Bay National Marine Sanctuary (MBNMS). The Pioneer Seamount source location is outside the MBNMS. In all respects, the selection of this alternative site should either reduce or not affect the already minor potential impacts from this project.

The EIS/R thus considers the three California sites to be approximately the same, stating "For the most part, the ... differences would be a matter of degree, with no site offering clear advantages from the standpoint of all species."

Regarding alternative technologies, the EIS/R states:

Generally speaking, all of the alternative scientific methods for addressing the global warming problem are either included in the project as proposed, or would not meet project objectives. For example, the use of global climate models is an integral part of the project. Satellite measurements of sea surface temperature and sea level are also important sources of information regarding global warming, but do not provide information comparable to that expected from ATOC. Oceanographic point sensors are also useful, but are limited due to the relatively small number of measurements that are practicable. Similarly, alternative acoustic thermometry techniques are included in the project proposal to the extent feasible. For example, this project already has source operational characteristics optimized for low transmission intensities and impacts; restricted (seasonal) source transmission times would not be expected to reduce impacts to marine animals given the low aggregate seasonality of the species of concern in the area.

A fixed source has limitations because it is necessarily dependent on favorable underwater topography. An alternative considered is a "moored autonomous source," which would be powered by batteries and could be located almost anywhere. In rejecting this alternative, the EIS/R states:

A moored autonomous source is one which is not attached to shore-based power by cables but is free-standing, powered by large battery assemblies, moored to the ocean bottom with weights, and buoyed up by floats at the correct ocean depth. The principal advantage of moored autonomous sources is the increased flexibility in siting opportunities that they present. On the other hand, most moored autonomous source locations would probably be some distance from shore, and would create severe logistical problems for any marine mammal research program. To date, there have been no sources designed for autonomous operation that efficiently operate at frequencies as low as 75 Hz, or have been proven to function at pressures found at 750-1000 m deep in the ocean. In addition, since a moored source

would sway in the horizontal plane (due to current motion), and accurate location is critical for acoustic thermometry, equipment would have to be included for real-time tracking of the source's position within just a few feet. Such equipment is available for other applications, but has not yet been adapted for this use. In addition, the power requirements of a moored autonomous source are greater than any other oceanographic application and large, battery packs (probably lithium) would be required. As a result, this alternative cannot be considered the optimum choice at this time.

Exhibit 18 (FEIS/R Table 2.2.4-1) summarizes the advantages and disadvantages of a moored autonomous source.

4. Effects of Noise on Marine Resources. The project EIS/R describes the noise emitted by the sound source as follows:

The ATOC sound source will transmit a 260 watt acoustic output, digitally coded sound with a center frequency of 75 Hertz (Hz, or cycles per sec) and a bandwidth of approximately 35 Hz (i.e., sound transmissions will be in the frequency band of 57.5-92.5Hz).

At 1 m [meter] ... from the source, the sound intensity level will be approximately 195 decibels (dB) referenced to one microPascal (uPa) on a "water standard" basis. [The EIS/R explains that the] ... decibel value for sound in water is 61.5 dB higher than for sound with equivalent power levels in air At a distance of 30 m (about 100 ft), the level will be 30 dB less, or 165 dB. At approximately 850 m (0.5 nm), the level is down to 136 dB. Unless otherwise noted, all sound levels in this EIS/EIR are referenced to water standard. [See Exhibit 11 for air vs. water standard].

The EIS/R notes that the 120 dB water standard level is frequently referred to as a "threshold" producing some minor but detectable changes in the behaviors of certain marine mammals. Using this intensity as a threshold, then a 12-18 kilometer radius around the ATOC source (see Exhibits 5-7) could be considered the likely area of disturbance. Ambient noise levels in the ocean in this frequency range are 74-91 dB, and can be up to or greater than 120 dB when vessels are present. (See Exhibit 12 for natural and manmade sounds in the ocean.)

The EIS/R attempts to define potential effects further by categorizing them into five types of impacts, as follows: (1) direct damage to hearing receptors; (2) permanent threshold shift; (3) temporary threshold shift; (4) behavioral changes in movement patterns; and (5) masking significant sounds (e.g., calls of other animals, predators, prey, sounds of hazards, such as approaching boats, etc.).

Attempting to estimate the impact on marine resources, the EIS/R summarizes past research and knowledge gained regarding effects of noise on marine resources, including marine mammals, sea turtles, fish, invertebrates, plankton, and seabirds. Exhibit 15 shows maximum anticipated exposure for the most relevant species. At the same time the EIS/R notes that:

The effects of noise on marine animals have not been studied extensively. The lack of information is particularly acute regarding large whales, which are difficult to study in the wild, and on invertebrates. In many areas, potential impacts must be inferred from incomplete data.

Complicating the issue is the fact that the significance of the noise impacts depends upon the species that may be exposed, its population density, diving behavior or likelihood of exposure, and hearing sensitivity.

In attempting to generalize which marine species would most likely be affected, the EIS/R states:

Of the protected species, the greatest potential impact is anticipated among those animals that have exhibited the capability to dive as deep as the ATOC source and that do, or might possibly, hear low frequency sounds well. This group includes the sperm whale, the elephant seal, and the leatherback sea turtle. ... When animals capable of detecting low frequency sound are at these depths during the 2% of the time that the source is transmitting, it could be audible at a considerable distance.

Although close encounters by sperm whales will be uncommon due to the low density of these animals in the study area, the effects of low frequency sounds on sperm whales at a distance in the sound channel must be considered unknown. This species' deep diving behavior makes them a correspondingly difficult animal to study, and relatively little is known about their activities at depth.

... [E]lephant seals are sufficiently rare that close encounters with the ATOC source would be unusual (less than one animal exposed to levels of 150 dB or greater, on average, every ten years at a 2% duty cycle). ... Although elephant seals are relatively easy to study, their low frequency hearing capability has yet to be tested.

Leatherbacks represent the only [turtle] species that have the capability to dive deep and may possess some measure of low frequency hearing capability.... Although little is known about leatherback hearing, they may be sensitive to low frequency sound.

...[S]ome fish can hear low frequency sounds well. ... some fish, particularly bottom dwellers that may be located very close (3-6 m) to the source, could be exposed to very loud sounds However, the significance of this effect must be evaluated in light of the relatively small area involved

In sum, the potential effects of ATOC sounds on marine animals are an important concern, but an accurate assessment of the scale of the possible impacts is also required. The greatest concern is presented by elephant seals, and possibly sperm whales and leatherback sea turtles. However, even here, significant impacts are not anticipated. These species will be a priority of the MMRP, to the extent that they are amenable to available techniques.

Acknowledging the limitations in accurately predicting marine animal reactions to ATOC, the EIS/R states:

Scientific Uncertainty.

As stressed in this EIS/EIR, available information on subsea noise and its biological impact ranges from incomplete to nonexistent, depending on the species being considered.

Potential impacts on biological resources also are limited by the relative temporary nature of the initial ATOC and MMRP experimental activities, which will span at most a two-year period of transmissions, and the limited duty cycle of the ATOC source (on only 2% of the time, off the remaining 98%, for most of the experimental period). It is also limited by the fact that relatively few of the marine mammals that could inhabit the study area are known to dive to depths that would put them in proximity to potentially harmful sound fields. During this initial experimental period, statistical analysis of sighting density data indicates that northern elephant seals would have a frequency of exposure to ATOC sound levels equaling or exceeding 10 dB only once every 10 or more years--a level that is expected, at most, to produce a temporary threshold shift. A larger number of animals may hear the ATOC transmissions, and could respond in some instances with minor behavioral changes.

For many marine animals, the means of obtaining additional information on adverse effects are unknown, and/or the costs high. The ability to obtain information concerning hearing capabilities and impacts of subsea sounds in most instances limited by nature of the animals involved. Large whales only can be studied in the wild, often are rare and difficult to approach, or even find. Therefore, to date, hearing abilities have not been measured directly but instead must be inferred. At the other end of the spectrum, many of the animals are small, or even microscopic, and include invertebrates and other animals that provide no measurable indication of hearing perception or acoustic impacts. The sheer number of species also would render a comprehensive survey exorbitantly expensive and unwieldy. The MMRP has been designed to obtain much-needed information.

Given these uncertainties, it is equally difficult to predict cumulative impacts; the EIS/R states:

... [T]he project's incremental contribution to any cumulative impacts from other sources of subsea sounds or development that affect the marine environment in the vicinity of the proposed project are speculative. Although continued increases in vessel traffic can be predicted, other effects (such as a shift to quieter vessels, changes in traffic patterns such as those that might result from redirecting Alaskan oil shipments from California to Japan, etc.) could mitigate or eliminate these increases. Additional knowledge gained from the MMRP, particularly if impacts deserving of governmental control are discovered, could result in measures to reduce subsea noise impacts through a shift in vessel traffic

patterns, vessel noise standards, or similar measures. No additional mitigation measures beyond those already identified are proposed to address cumulative impacts.

Similarly difficult to predict, for the same reasons, are secondary impacts on tourism and recreation. The FEIS/R states:

Reduction in tourism, for example, could result from impairment of such tourist-related activities as whale/dolphin/seal watching and sport fishing. However, as discussed above, except for mysticetes, less than significant impacts on marine mammals or sport fishes would be expected. MMRP and ATOC source transmission protocols would result in the termination of source transmissions before such impacts were realized.

... the possibility of any diver being exposed to a received level loud enough to hear it is unlikely ..., and the potential for any human acoustic annoyance is virtually nonexistent. Nevertheless, local diving organizations, and the local chapters of the Professional Association of Divers International (PADI) and the National Association of Underwater Instructors (NAUI) will be contacted to help assess whether any divers hear, or are annoyed, by ATOC emissions.

5. Monitoring and Mitigation Measures. Because so little is known about marine animal responses to noise, the mitigation efforts have focused primarily on monitoring as described in the Marine Mammal Research Program (MMRP), with commitments: (1) to shut down or modify the sound source if monitoring produces evidence of adverse impacts; and (2) to conduct peer review of monitoring results and their implications. The MMRP will precede commencement of regular ATOC transmissions, and Scripps has committed to using the least damaging sound frequency, and the minimum duty cycle and power level necessary to support MMRP objectives and feasibility operations.

The MMRP would use a variety of methodologies, including aerial surveys/observations, shipboard visual surveys/observations, passive acoustic monitoring, behavioral observations, photo-identification, field playback and audiometric testing, and VHF/TDR tagging. The highest priority research efforts would concentrate on the study of species believed to be the most likely to be affected (humpback and sperm whales, northern elephant seals, and leatherback sea turtles). Fish, invertebrates, and zooplankton would also be monitored, "so that an attempt could be made at meaningful correlations between marine mammal abundance and behavior, and prey abundance and distribution." The MMRP will:

... monitor fish stock assessments via CDFG [Ca. Dept. of Fish and Game] catch-block landing data; LTPY; CPY and RAY [Long Term Potential Yield, Current Potential Yield, and Recent Average Yield, respectively] data from NMFS; and interaction with the PCFFA [Pacific Coast Federation of Fishermen's Associations], PRBO [Pt. Reyes Bird Observatory], Bodega Marine Laboratory and Steinhart Aquarium to attempt evaluation of the potential for impacts to fish, particularly sharks

The MMRP studies were originally proposed to proceed in two phases: the Pilot Study and the follow-on research period during regular ATOC transmissions. The Pilot Study would examine behavioral responses in the vicinity of the Pioneer Seamount, would utilize "playback studies" examining potential responses of several species to sounds deployed from a boat in Hawaii, off the Azores or Madeira, and off Trinidad; and 3) audiometric measurements on captive odontocetes in Hawaii.

Scripps has now modified the MMRP such that the Pilot Study has been extended for the full length of the project, during which the MMRP research group would maintain control over the sound source for the entire 2 year period. In addition, Scripps has agreed to expand the scope of the MMRP advisory board. These modifications are as described more fully in Exhibit 25.

During the Pilot Study (i.e., now the entire 2 year period), the following pattern of source transmissions would be used: four days with six transmissions per day, followed by seven days of no transmissions. If surveys can be completed early during each period, the duration of the sampling periods would be reduced; whereas, if weather prevents sampling, the duration may be extended. The source level of the first 3 experimental periods (i.e., approximately 1 month of the Pilot Study) would be at 185 dB (i.e. lower than the proposed operational source level). If no biologically significant effect is observed, transmission source level during the following experimental periods would be elevated to 195 dB.

Scripps has also committed to disseminating bi-monthly status reports to these same reviewers. Furthermore, upon completion of the first 6 months of the Pilot Study (approximately 30 days after) Scripps has agreed to conduct a two-day workshop "to present and discuss the [initial] findings with colleagues, interested parties (e.g., The Marine Mammal Center [TMMC] and the Pacific Coast Federation of Fishermen Associations [PCFFA], and the public." Scripps states: "This would allow open discussion, and more public comment and understanding of the potential effects of the ATOC signals on marine animals."

Scripps has also agreed: (1) to remove the sound source as soon as is feasible after the 2 year project; (2) that project authorization at this time is not a commitment to use of this location (Pioneer Seamount) for future ATOC studies; (3) to prepare a Programmatic EIS/R prior to any long term ATOC activities; (4) that an essential siting criterion for a long term site will be: "Location in an area with minimal abundances of marine life that might possibly be adversely affected by low frequency sound;" and (5) to include a fisheries biologist on the MMRP advisory board and include monitoring of impacts on fish behavior (Exhibit 26).

A number of commenters, including the Commission staff, requested greater specificity regarding what impacts would lead to shutdown or modification of the source. In response, the FEIS/R clarifies that sound production would be suspended promptly if any of the acute or short-term responses (Table C-1, line 6 (Exhibit 8)) are observed in relation to the ATOC transmissions. These shut-down causing responses consist of:

- a. Acute Response
 - o Animal dead or disabled
 - o Increase in number of beached animals
 - o Increase in number of animals struck by vessels

- b. Short term Response
 - o Potential injurious activity (outside known baseline activities)
 - o Repeated/prolonged activity (vocalizations, blowing, time on surface, etc.)
 - o Abnormal number of animals present/absent
 - o Abnormal mother-calf activity

For long-term responses, the following response will also trigger shut down:

- o Cessation/disruption of significant biological activity (i.e., viability or reproductive potential)
 - Animals obviously and consistently avoid area when source "on"; do not return when it is "off."

The EIS/R further clarifies:

If the study results indicate that the sound transmissions are likely to have negligible short-term effects, they would be used to help design a long-term program to assess whether the ATOC feasibility operations would have negligible long-term effects. The following would be considered non-negligible long-term effects, if related to ATOC sound transmissions:

- o avoidance or abandonment of previous high-use areas;
- o increase in at-sea observations of dead animals or strandings of either live or dead animals (on the Farallon Islands or on the coast between 37° 10'N and 37° 40'N) in association with sound-caused hearing damage or other sound-caused trauma;
- o increased incidence of emaciated and/or diseased animals (which could be attributed to stress factors); or
- o decrease in calving/pupping rates and/or total population size.

Scripps has also committed to coordinating with the National Marine Fisheries Service and the Marine Mammal Commission to help evaluate the biological significance of any observations of acute or short term response, and to determine whether the experiment should be modified or terminated.

6. Commission Conclusion. Despite all the above measures, this project has raised considerable controversy. Many reviewers were concerned not only with the initial siting of the sound source within the Monterey Bay National Marine Sanctuary, but also with the fact that the project involves unquantifiable impacts to important marine species. Although now located outside the Monterey Bay National Marine Sanctuary and farther offshore (now 48 miles), given that the marine animal concentrations are comparable at this location, the concern over marine resource impacts remains.

The issue before the Commission is whether the commitments and protection measures discussed on pages 15-17 are adequate to protect marine resources. This is not an easy issue to resolve, given how little is currently known about marine animal response to sound, combined with the difficulty of monitoring these responses. Certainly if obvious adverse effects occur, sufficient commitments have been made to cease or modify project operations. Yet even with monitoring, assessing whether the project will be beneficial or detrimental may be difficult.

Determining the least environmentally damaging feasible alternative prior to receiving monitoring results is similarly difficult. For example, several project opponents maintain that the 'moored autonomous source' alternative (described on page 11-12) would, if properly located, affect significantly fewer marine organisms than the proposed 'fixed' source. Scripps appears convinced that for the short term, the moored autonomous source alternative is not viable, or, as Scripps terms it, not "the optimum choice at this time" (see page 12). The Commission staff has attempted to determine the feasibility of the moored alternative; however the various technologies are highly technical, making this an extremely difficult assessment to make. If this project were proposed for a longer term period this determination would be more critical, and the Commission believes the moored alternative, as well as other less damaging alternative fixed source locations, must be more fully analyzed for feasibility as alternatives for any long term ATOC studies.

At this point, given the potential scientific and environmental benefits from the research proposed, and since the only way to determine the project's impacts is to allow it to proceed in the short term and study its impacts, the authorization of a two year initial ATOC project at this site is warranted. The Commission makes no commitment to any longer term use of this site; no such application has been made and any determination regarding longer term use would be premature at this time.

The Department of Fish and Game comment letter on the Draft EIS/R echoes many of the concerns raised, in stating:

The Department concurs with the evaluation that the potential for physically harmful effects to aquatic organisms is not significant and not likely to occur. However, it does appear that adequate data are provided to support a finding that aquatic organisms would be exposed to sound levels that have previously elicited avoidance behavioral responses.

The Department believes that the DEIS/EIR provides enough data to support a finding that an area surrounding the ATOC source will be ensonified to levels that have elicited avoidance responses in whales. It also suggests that there is a potential to mask and/or interfere with long-distance communication or echolocation by whales should communication coincide with periods of sound transmission (page 4-32, 4-52). The MMRP will not be conducted long enough to analyze the potential to determine the impact of these effects on a marine mammal's well being with only a two-year study (e.g., increased stress on individuals or populations, disruption of cow-calf communication, etc.) These chronic, long-term effects on a species' well being may not be determined even by an extensive lengthy study. ...

However, the MMRP will be an important first step towards providing answers to these questions.

Similar concerns are articulated by Dr. Sylvia Earle (former Chief scientist for NOAA), whose comments on the Draft EIS/R state:

It seems obvious that the proposed research will, in fact, have some impact on the behavior of marine organisms, although it is not clear what the magnitude of that influence will be, nor is there agreement on the best methods for finding out. Because of the uncertainties, the toughest question to be resolved seems to be whether or not the risks involved can be justified in the search for answers to questions of critical importance to the future of mankind -- and of life in the sea.

I share with many others deep concerns about adding additional stresses to ocean ecosystems already modified by recent human activities ranging from overfishing to various kinds of pollution including high levels of "noise pollution" generated by ship traffic and other sources.

However, I am convinced that the greatest threat to the health of the oceans and to the planet as a whole is lack of knowledge and the profound mistakes in judgment that result from ignorance. Therefore, I believe it is important to try to resolve the problems associated with ATOC, if possible, and find ways to fill the enormous gaps in understanding the nature of the ocean and the effects of human activity on marine life. Some of the uncertainties about the nature of planetary temperature may be resolved by the proposed ATOC research and new insight about the impact of noise on marine life is likely to be derived from the proposed MMRP. While many have questioned the protocols and the likelihood of success of the ATOC research and the MMRP, there is general agreement that the scientists involved are of the highest caliber in their respective disciplines. It seems likely that if anyone can extract meaningful results from the research proposed, they can.

Criticisms have been raised concerning time and funding requirements, as well as other aspects of the proposed studies, but some of the most serious questions relate to the location of the sound sources within protected areas. Much of the criticism would likely be softened by focusing only the MMRP in areas where marine mammals are concentrated, i.e., even within the sanctuaries, but moving the source for the long-term ATOC Project outside [the current ATOC site has been moved outside the sanctuary], and to seek sites where there are known to be few marine mammals or other species notably sensitive to noise.

Whatever is decided, caution is clearly needed and there should be protocols in place for discontinuing activities that appear to be causing problems -- even without definitive proof of damage. Despite the genuine worry that new and significant sounds in the sea will have undesirable, even lethal impacts on certain creatures, it may well be that more damaging than the effects of the ATOC Project and the MMRP is the ignorance that will continue if such research is not conducted. With or without these projects, the volume of noise in the sea is likely to increase significantly. It is vital that better understanding be gained of what this means to marine life, to the health of the ocean environment, and to the human future.

Although Dr. Earle's comments were made on the Draft EIS/R and addressed the alternative site proposed in that document (the Sur Ridge site), the Commission believes they are equally applicable to the revised project at the Pioneer Seamount site.

In conclusion, the Commission believes at this point, given the potential scientific and environmental benefits from the research proposed, and since the only way to determine the project's impacts is to allow it to proceed at least in the short term and study its impacts, that the authorization of a two-year initial ATOC project is warranted. This conclusion to authorize ATOC to proceed is dependent on the combination with the monitoring and protective measures incorporated into the project, the up-front commencement of the MMRP and the relatively short (two-year) duration of the project prior to seeking any further permanent authorization, and the relocation of the ATOC sound source outside the Monterey Bay National Marine Sanctuary.

This conclusion is also based on the future involvement of the Commission in reviewing the results of the MMRP, in consultation with NMFS, MMC, and other reviewers. Such review may lead to modifications and/or cessation of the project, depending on the results of the monitoring. In making this conclusion the Commission makes no commitment to any longer term use of this site; no such application has been made and any determination regarding longer term use would be premature at this time.

Finally, additional federal consistency review by the Commission will be triggered in the event that: (1) Scripps makes any significant modifications to either (a) the MMRP or other mitigation measures or (b) the ATOC project itself; (2) any evidence materializes documenting adverse effects on marine resources "substantially different" than those originally proposed (see Exhibit 21, Section 930.66 of federal consistency regulations); or (3) any extension beyond the two-year initial ATOC operation.

With these considerations, the Commission finds the ATOC/MMRP project: (1) is adequate to protect marine resources, commercial and recreational fishing, and related activities (such as tourism and diving); (2) represents the least environmentally damaging feasible alternative, at least for this initial two year period; and (3) is therefore consistent with Sections 30230, 30233, 30234, 30234.5, and 30240 of the Coastal Act.

B. Nearshore/Landfall Impacts. Applicable Coastal Act policies to the portion of the ATOC project located within the coastal zone are: (1) Sections 30230, 30233, 30234, 30234.5, and 30240, which provide for the protection of marine resources, environmentally sensitive habitat, and commercial and recreational fishing resources, and which discuss allowable uses for fill of coastal waters (these sections are quoted on page 7-8); (2) Section 30251, which provides for protection of scenic coastal views; (3) Sections 30210-30214, which provide for the protection of public access and recreation opportunities; and (4) Section 30244, which provides for the protection of archaeological resources.

Several potential issues are raised by the physical installation within the coastal zone of the power source cable serving the ATOC project. These issues are: offshore, nearshore, beach and upland habitat impacts, visual impacts, archaeological impacts, and public access and recreation. Within the 3-mile limit of State tidelands and on land within the coastal zone the project is subject to the Commission's coastal development permit authority. Where necessary, conditions are being imposed (see page 7) to address the relatively minor resource issues raised.

The upland cable installation would be undertaken as part of a bluff restoration project of the U.S. Air Force Tracking Station at Pillar Point in San Mateo County. The Air Force will be correcting problems that have occurred in an eroded gully on the west side of the Pillar Point Air Force Station by filling, contouring and installing drainage facilities. The ATOC cable would be installed in coordination with these activities and covered by fill material during this restoration project. The ATOC cable would be 3 inches in diameter, would be entirely underground throughout this onshore area, and would be installed in connection with the Air Force's previously planned restoration project. The Commission previously found that project to be consistent with the applicable Coastal Act policies (see Consistency Determination CD-62-94 (U.S. Air Force, Pillar Point), and the Commission's findings in that case are hereby incorporated by reference.

Scripps proposes to bury the cable across the beach and through the shallow intertidal zone to further reduce impacts, and has committed to installing the cable during mid week, to further minimize disruption of access and recreation during peak weekend periods. In addition, by combining installation in the surf zone and beach area with the Air Force's drainage improvement program project (CD-62-94, US. Air Force, Pillar Point), access impacts (as well as landform alteration impacts) would be further minimized.

In the shallow subtidal zone, kelp bed communities (particularly bull kelp and feather boa kelp) would only be affected if the cable is laid across one or more of these plants. Even if this were to occur, it would not likely have

any permanent or long-range effects on this resource. Nonetheless, kelp forests and beds will be avoided during facility installations. Invertebrate communities, such as red abalone and various species of crabs and fish, such as rockfish, lingcod, surfperch, salmon, and halibut would not be affected by the cable, either during or after its installation. Most species would merely move away during installation and return thereafter. Condition 1 is being imposed to assure that cable laying operations do not affect any environmentally sensitive habitat.

To assure physical effects would be minimized, Scripps has committed to the following mitigation measures:

The portions of the ATOC cable and protective casing in the nearshore area, surf zone and bluff area would be designed to minimize the potential for adverse impacts, including the potential for bluff erosion.

ATOC facilities would be removed at the end of the experiment, to the extent economically and practicably feasible.

A qualified archaeologist will be retained to visit the ATOC activity site and determine whether monitoring of the cable trenching will be required. If required, he/she will monitor trenching activities and specific measures recommended will be implemented to avoid any significant impacts to cultural resource materials.

If shipwrecks or other resources are identified, they will be avoided during installation of the ATOC facilities.

The cable for the ATOC project constitutes an allowable use for fill of coastal waters as an incidental public service. Section 30233 (a)(5) specifically mentions burying of cables as an example of an incidental public service, and the Commission has traditionally considered temporary activities, such as the short term trenching for the cable, to constitute an "incidental" use under 30233 (a)(5). In terms of the cable to shore, there is no less environmentally damaging alternative, and the impacts have been minimized through coordination with the above-discussed Air Force project. Finally, the small diameter of the cable should avoid impacts on commercial fishing (trawling) activities. The above mitigation measures, along with the Commission's conditions, complete the project's compliance with the 3-part test of Sections 30233 (allowable use, alternatives, and mitigation tests).

The Commission finds that, with the above measures, and the conditions requiring cable laying plans minimizing habitat impacts, cable placement through the beach during weekday periods, and removal of all facilities upon completion of the project (unless an amendment to this permit is submitted and approved), the project would be consistent with the applicable habitat and marine resources, dredging and filling, commercial and recreational fishing, public access and recreation, visual quality, and archaeological policies (Sections 30230, 30233, 30234, 30234.5, 30240, 30251, 30210-30214, and 30244) of the Coastal Act.

C. California Environmental Quality Act (CEQA).

Section 13096 of the California Code of Regulations requires Commission approval of Coastal Development Permit applications to be supported by a finding showing the application, as conditioned by any conditions of approval, to be consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(i) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impact which the activity may have on the environment.

The proposed project has been conditioned in order to be found consistent with the policies of the Coastal Act that protect habitat and marine resources, commercial and recreational fishing, public access and recreation, visual quality, and archaeological resources. Mitigation measures, as discussed on page 7 and 15-17, will minimize adverse environmental impacts. As conditioned, there are no feasible alternatives or feasible mitigation measures available, beyond those required and incorporated into the project, which would substantially lessen any significant adverse impact which the activity may have on the environment. Therefore, the Commission finds that the proposed project, as conditioned, is the least environmentally damaging feasible alternative and can be found consistent with the requirements of the Coastal Act and to conform to CEQA.

SUBSTANTIVE FILE DOCUMENTS:

1. Consistency Determination CD-62-94 (U.S. Air Force, Pillar Point).
2. Consistency Determination CD-36-94 (U.S. EPA, Site Designation, Dredge Disposal Site SF-DODS).
3. Navy Negative Determination ND-98-93 (Acoustic Thermometry of Ocean Climate Project (ATOC, Big Sur).
4. Draft EIS/EIR for the California Acoustic Thermometry of Ocean Climate Project and its associated Marine Mammal Research Program, ARPA (Advanced Research Project Agency), NOAA/NMFS (National Marine Fisheries Service), and UCSD (University of California, San Diego), November 1994.
5. Final EIS/EIR for the California Acoustic Thermometry of Ocean Climate Project and its associated Marine Mammal Research Program, ARPA, NOAA/NMFS, and UCSD, April 1995.
6. The Heard Island Papers, Journal of the Acoustical Society of America, Vol. 96, No. 4, October, 1994.
7. 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.
8. Listening for climatic temperature change in the northeast Pacific: 1983-1989. Spiesberger, Metzger and Furgeson, J. Acoust. Soc. Am. 92(1), July 1992.
9. A Telemetry Scheme for Ocean Acoustic Tomography: Real Time Monitoring, Spiesberger and Bowlin, J. Marine Env. Engg., Vol. 1, pp. 1-22, 1993.
10. Is it Cheaper To Map Rossby Waves in the Global Ocean Than in the Global Atmosphere?, John Spiesberger, J. Marine Env. Engg., Vol. 1, pp. 83-90, 1993.
11. Basin-Scale Ocean Monitoring with Acoustic Thermometers, Oceanography, Vol. 5 No. 2, 1992, Spiesberger and Metzger.

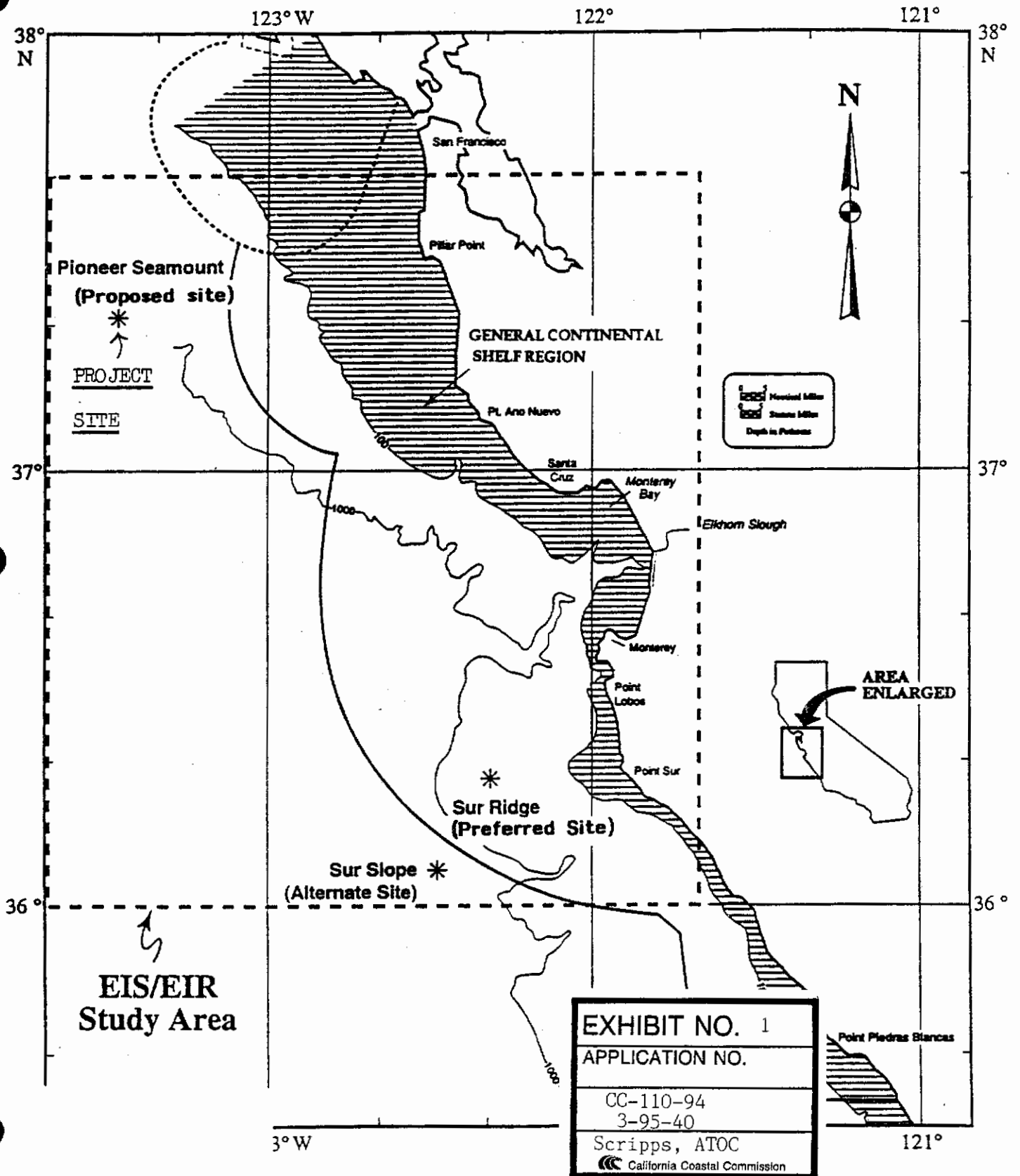


Figure 1.1.6-2 General EIS/EIR study area and ATOC preferred and proposed sites

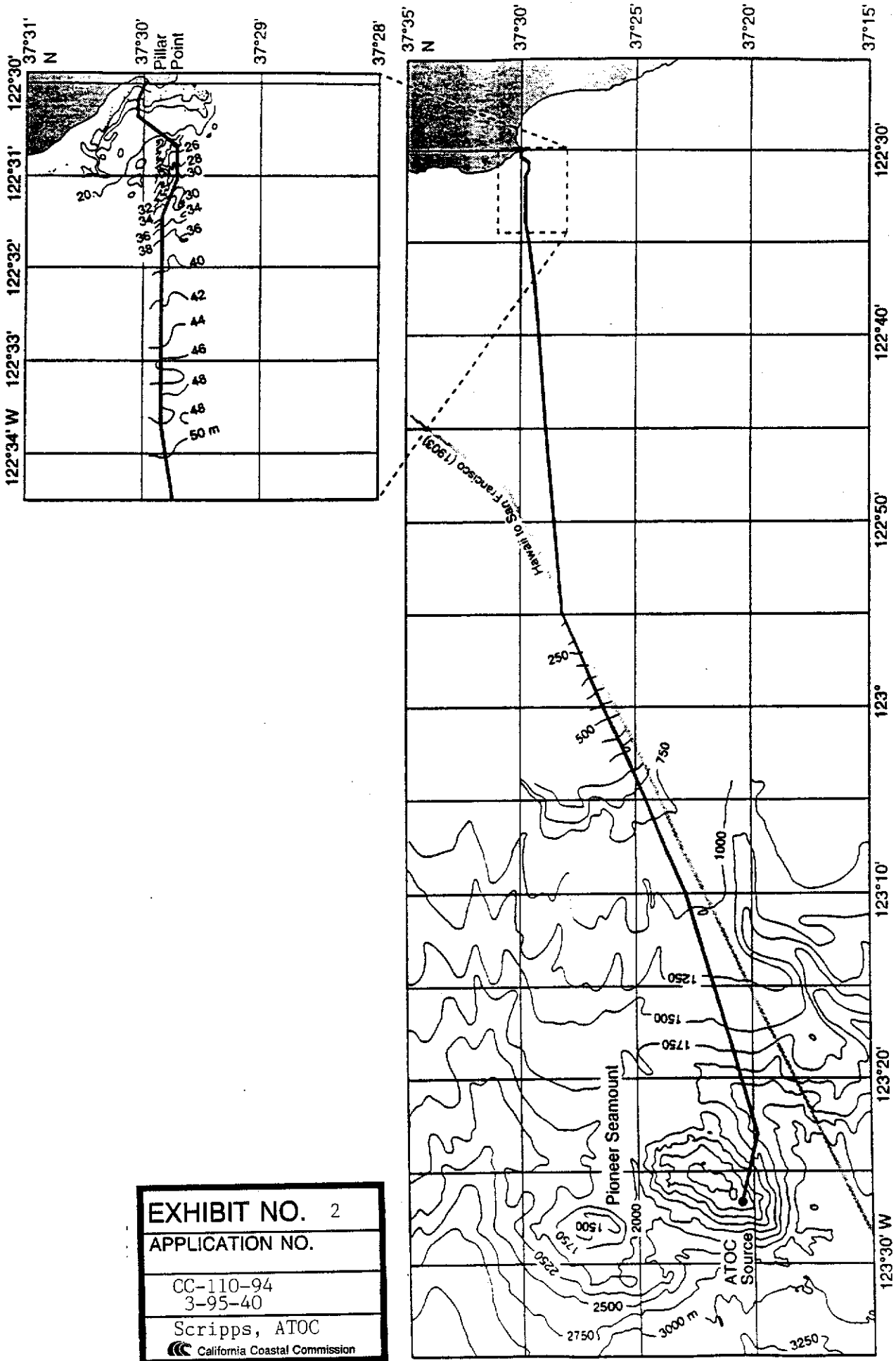


EXHIBIT NO.	2
APPLICATION NO.	
	CC-110-94 3-95-40
	Scripps, ATOC
	California Coastal Commission

Figure 1.1.6-4 Proposed Pillar Point cable route.

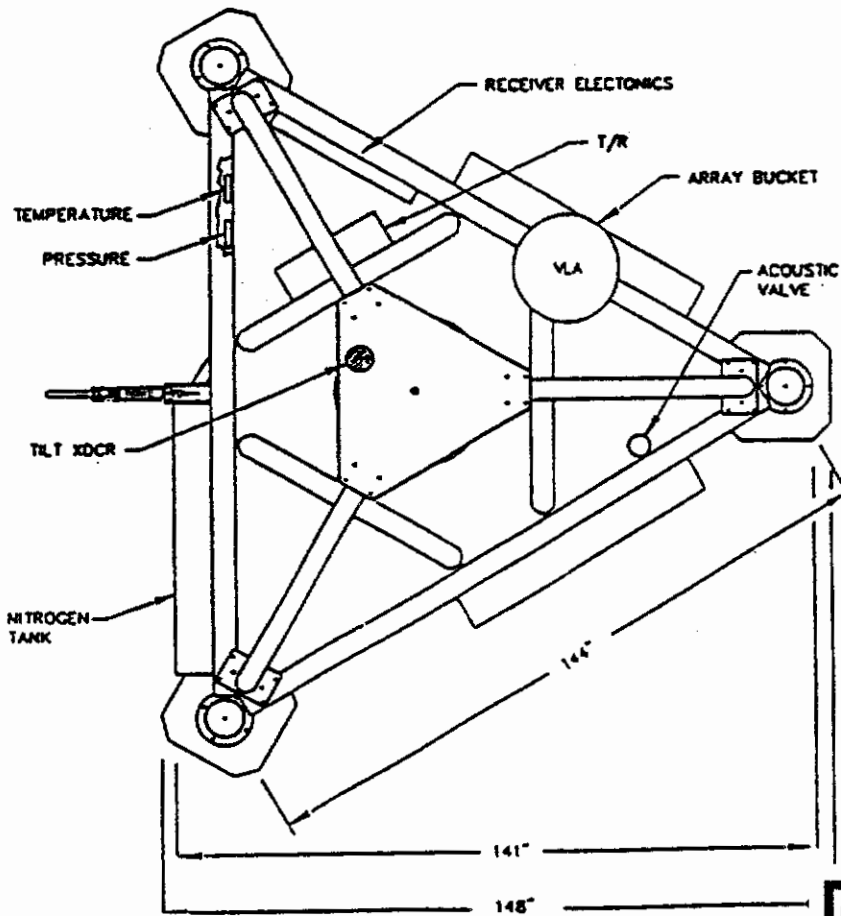
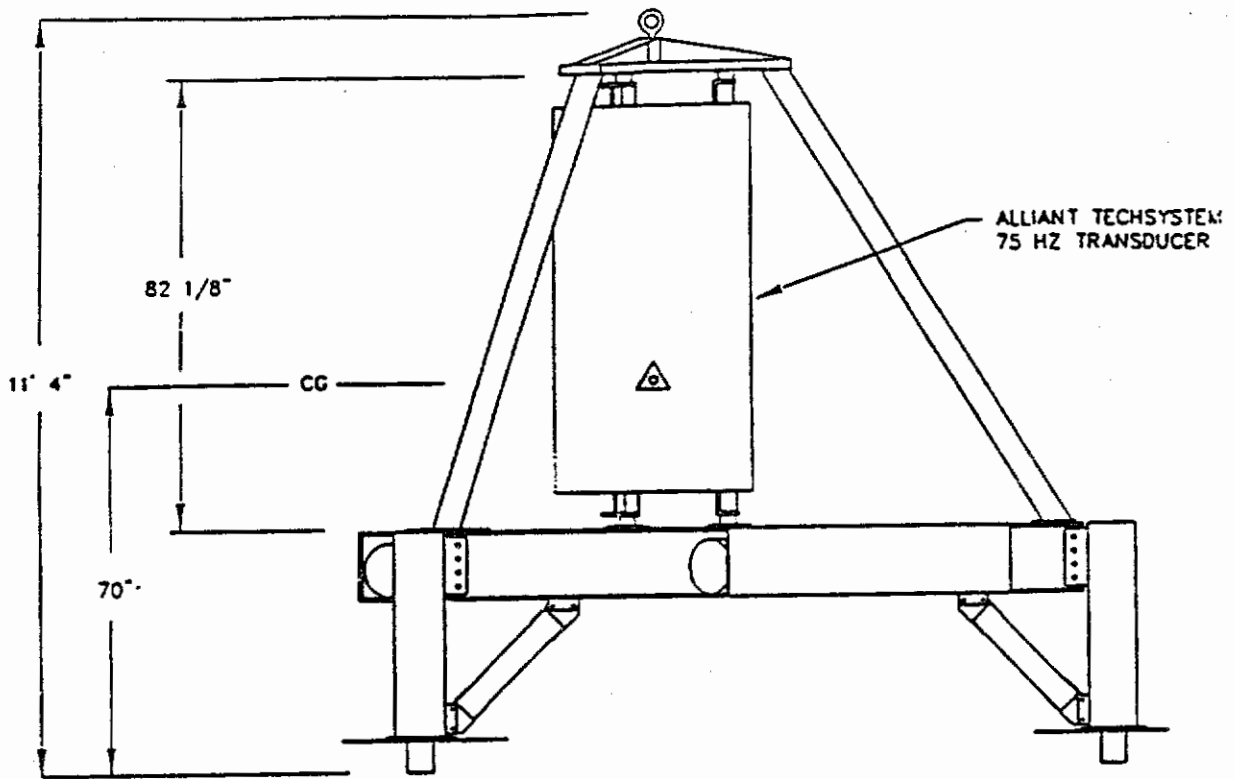
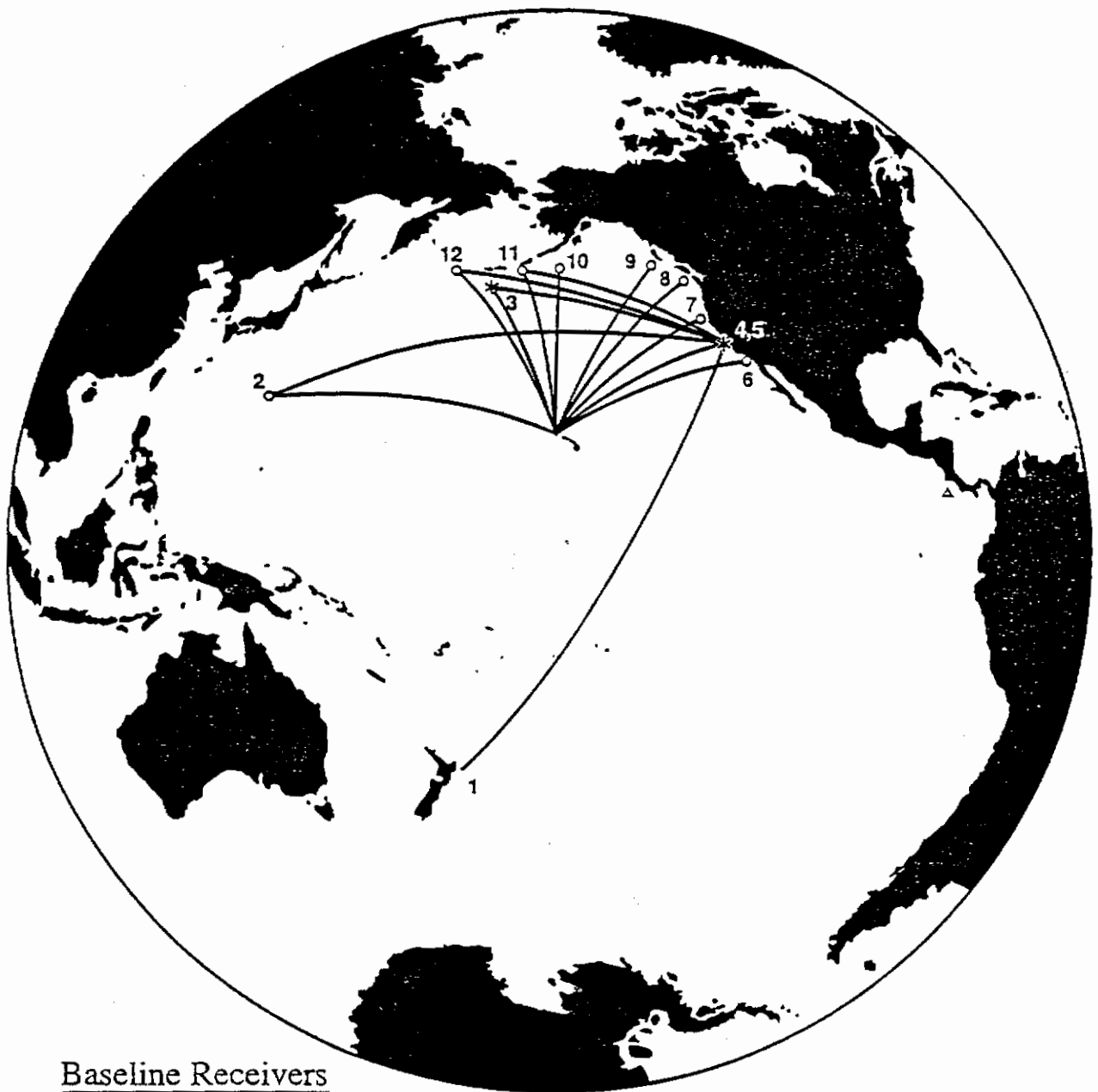


Figure 1.1.6-1 ATOC acoustic source (line drawing)

EXHIBIT NO.	3
APPLICATION NO.	
	CC-110-94 3-95-40
	Scripps, ATOC
	California Coastal Commission

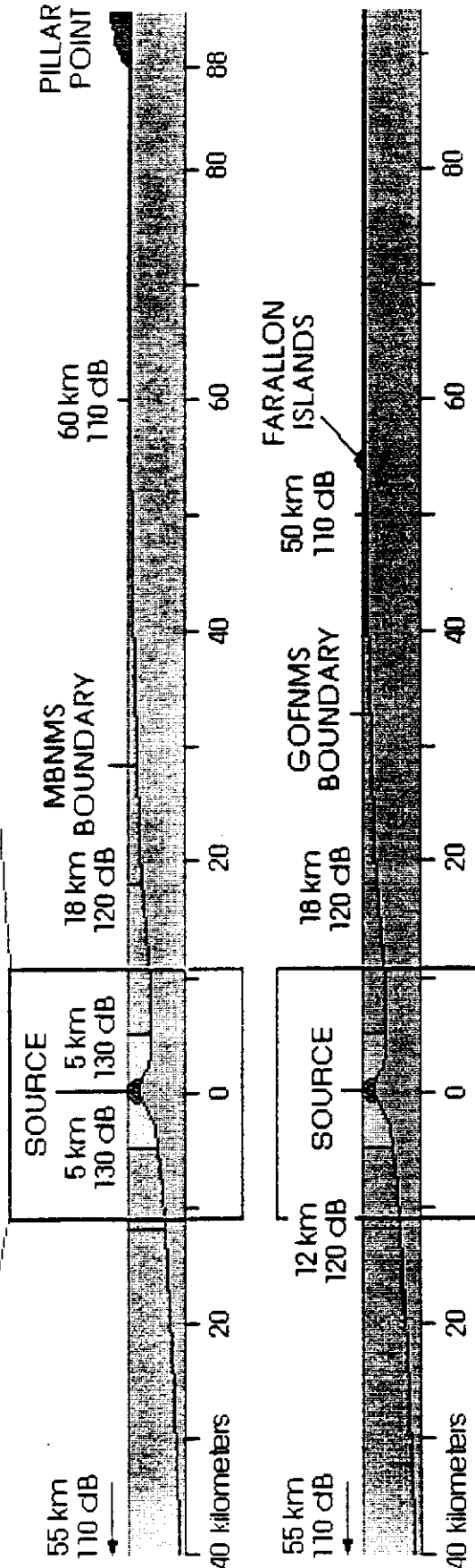
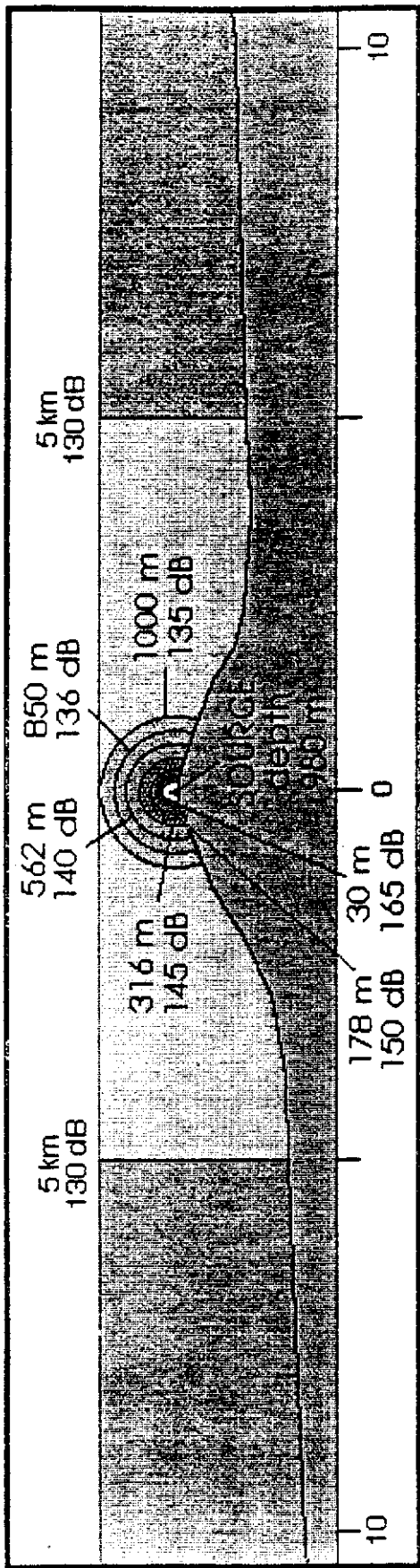


Baseline Receivers

- * ATOC Vertical Line Array
 - o Navy (notional locations)
- | | |
|-----------------------------|----------------------|
| 1. New Zealand (Autonomous) | 5. Pt. Sur (N) |
| 2. Guam (N) | 6-9. East Pac (N) |
| 3. West Pac (Autonomous) | 10-12. North Pac (N) |
| 4. Pt. Sur VLA | |

Figure 1.1.3-1 ATOC baseline network

EXHIBIT NO. ●
APPLICATION NO.
CC-110-94 3-95-40
Scripps, ATOC California Coastal Commission



PIONEER SEAMOUNT ATOC SOURCE

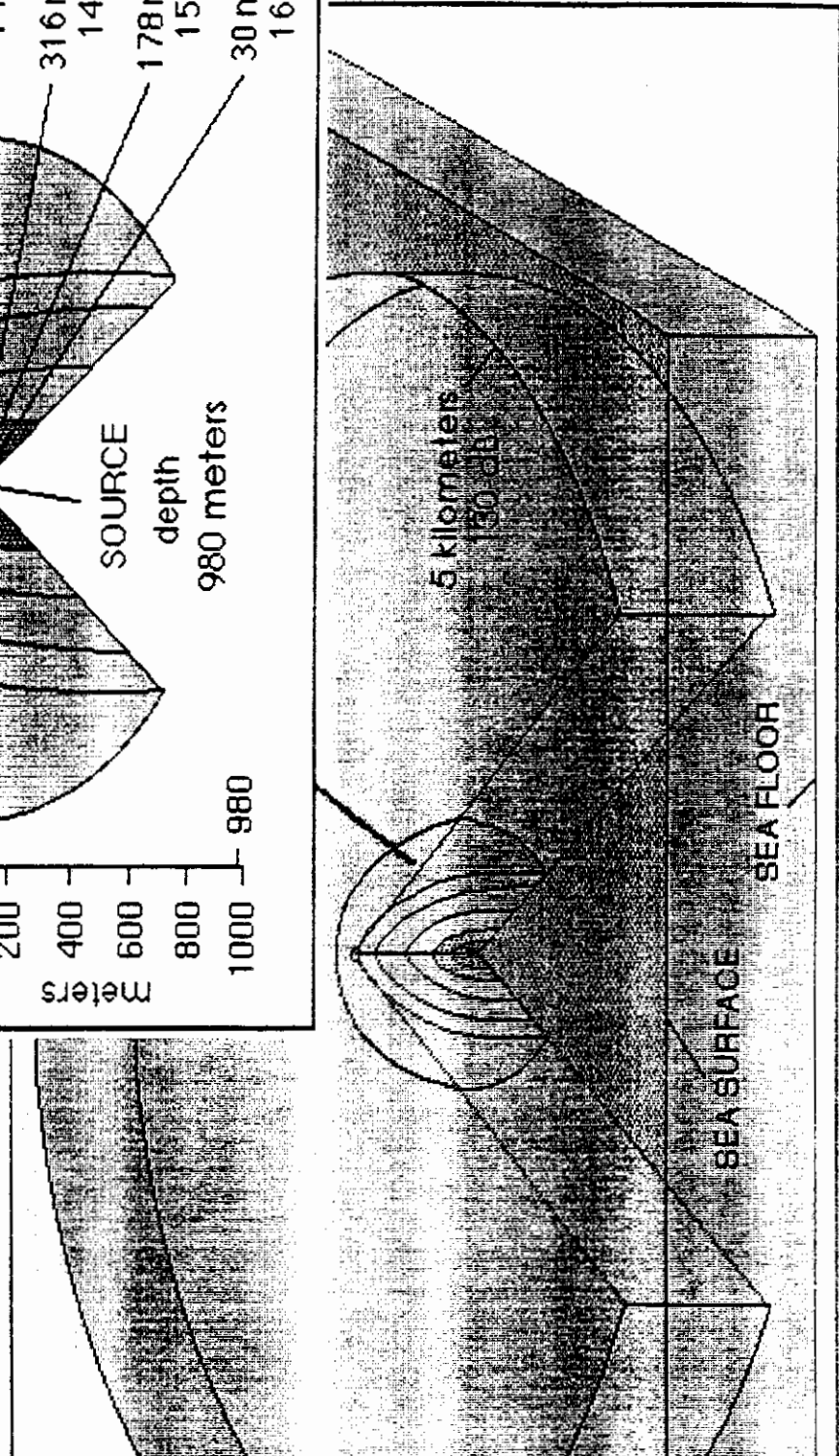
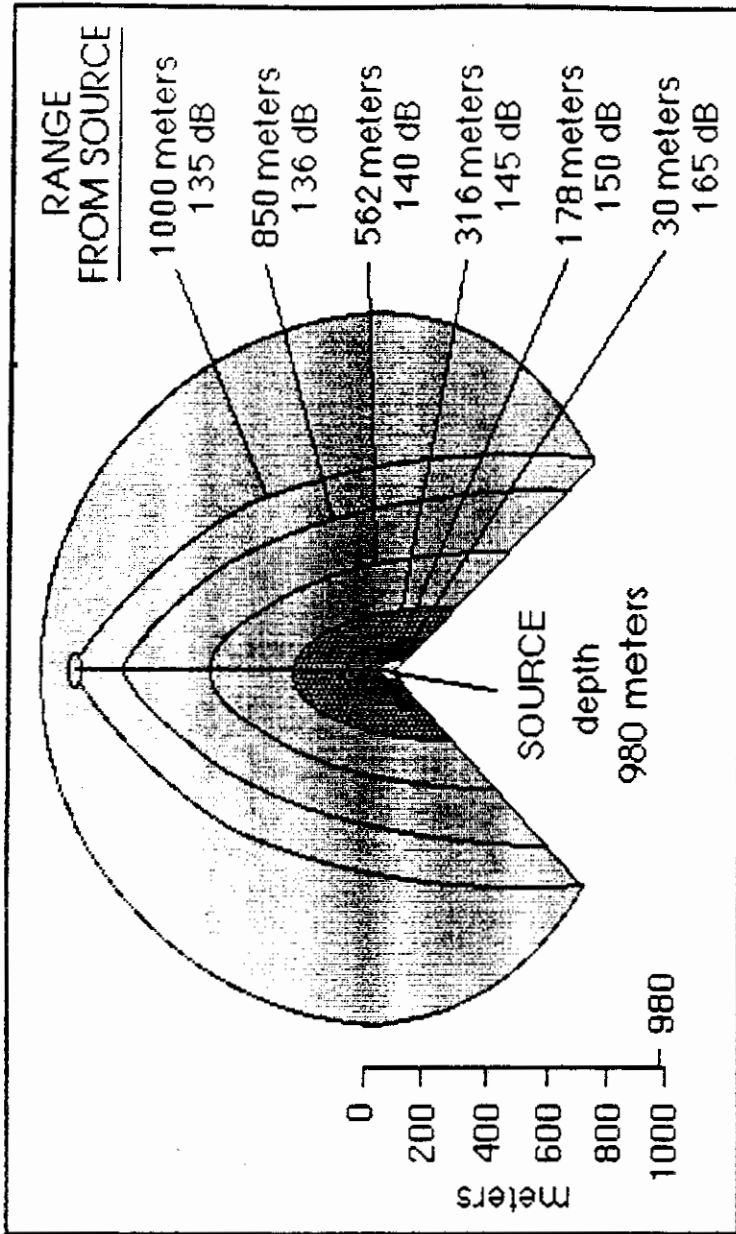
SOUND FIELDS - CROSS SECTION (to scale)

Note: Sound fields based on spherical spreading to 1000 m range, PE model data beyond 1000 m.

Figure 2.2.1.2-10 Pioneer Seamount sourcesound fields-cross-section (to scale)

EXHIBIT NO.	5
APPLICATION NO.	
CC-110-94	
3-95-40	
Scripps, ATOC	
California Coastal Commission	

PIONEER SEAMOUNT ATOC SOURCE SOUND FIELDS IN 3D



Note: Sound fields based on spherical spreading to 1000 m range. FE model data beyond 1000 m.

Figure 2.2.1.2-9 Pioneer Seamount source sound fields in 3D

EXHIBIT NO.
APPLICATION NO.
CC-110-94 3-95-40
Scripps, ATOC California Coastal Commission

PIONEER SEAMOUNT ATOC SOURCE SOUND FIELDS (100 m depth)

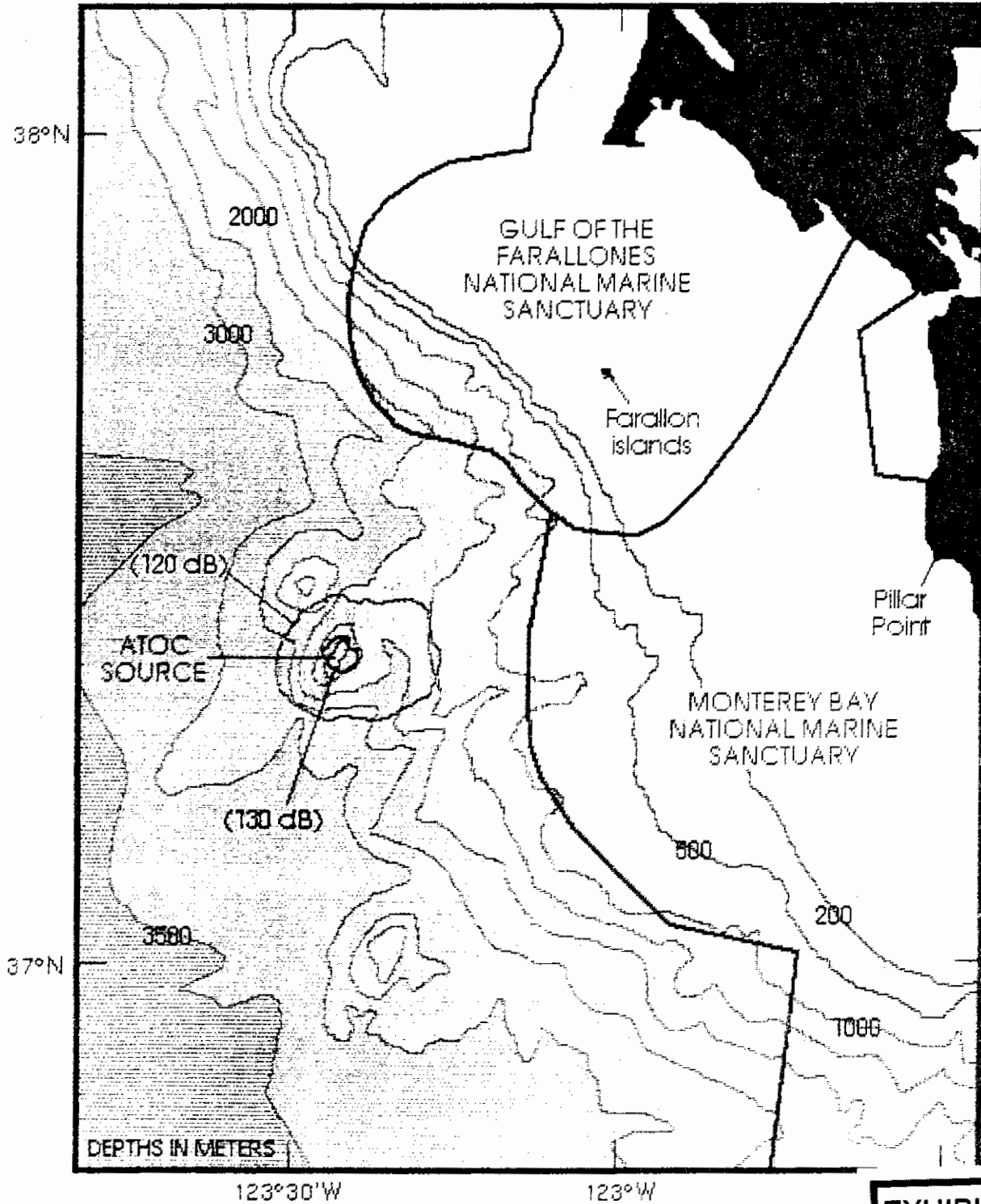


Figure 2.2.1.2-11 Pioneer Seamount ATOC source sound fields

EXHIBIT NO. 7

APPLICATION NO.

CC-110-94

3-95-40

Scripps, ATOC

California Coastal Commission

RESEARCH DATA COLLECTION METHODS	Aerial Visual Survey/Obs	Aerial Acoustic Obs	Vessel Visual Obs	Vessel Acoustic Survey/Obs (pass & active)	VLA-Based Acoustic (pass.)	SOSUS Based Acoustic (pass.)	Photo-ID (aerial & vessel)	Tags (TDR (e-scal))	Tags (SL-TDR (e-scal))	Tags (ADL (e-scal))	Tags (VRT (e-scal))	Cetacean Playback Studies	Odonoto-cete Audio-metrics	Sea Turtle Playback Studies
POTENTIAL RESPONSE														
1. Change in Swim Pattern/direction	0	0	0	0	0	0	0	•	•	•	•	•	•	•
2. Change in Ventilation Rate	0	•	•	•	•	•	•	•	•	•	•	•	•	•
3. Change in Vocalization Pattern/Rate		•		•	•	•				0				
4. Change in Surface Activity										0				
a. Feeding/Socializing/Nursing	0	0	•	0	0		0	0	0	0	0	0	0	0
b. Aerial Activity							0	•	•	•	•	•	•	•
5. Change in Diving Behavior	0	0	•	0			0	•	•	•	•	•	•	•
a. Dive Depth							0	•	•	•	•	•	•	•
b. Dive Duration							0	•	•	•	•	•	•	•
6. a. Acute Response	•		•				0	0	0	0	•			
• Animal dead or disabled							0	0	0	0	•			
• Increase in number of beached animals	0		0				0	0	0	0	•			
• Increase in number of animals struck by vessels							0	0	0	0	•			
b. Short-Term Response	0		0				0	0	0	0	•			
• Potential injurious activity (outside known baseline activities)							0	0	0	0	•			
• Repeated/prolonged activity (vocalizations, blowing, time on surface, etc.)							0	0	0	0	•			
• Abnormal number of animals present/absent	•	0	•	0	0	0	•	•	•	•	•	•	•	•
• Abnormal mother-calf activity	0		0				•	•	•	•	•	•	•	•
7. Long-Term Changes														
a. Habituation	•	0	•	0	•	•	•	0	0	0	0			
b. Displacement	•	0	•	0	0	0	•	0	0	0	0			
c. Cessation/disruption of significant biological activity (i.e., viability or reproductive potential)	•	0	•	0	0	0	•	0	0	0	0			
• Animals obviously and consistently avoid area (or are attracted to it) when source "on"; do not return (or depart) when it is "off."							•	•	•	•	•	•	•	•
PHYSICAL AUDITORY EFFECTS														
1. Hearing threshold/TTS level														0

Source shut-down guidelines if observed in relation to source transmission.
 Determination Capability: • Primary Capability 0 Potential/Limited Capability Blank = No Capability

EXHIBIT NO.	8
APPLICATION NO.	
CC-110-94	
3-95-40	
Scripps, ATOC	
California Coastal Commission	

Event	1984												1985												1986											
	J	A	S	O	N	D	J	F	M	A	M	A	J	A	B	O	N	D	J	F	M	A	M	A	J	J	A	S	O	N	D					
Source Transmission																																				
Aerial Visual & Acoustic Surveys/Observations																																				
Shipboard Visual & Acoustic Surveys/Observations																																				
VLA-Based Acoustic Detection of Mysticetes																																				
SOSUS-Based Acoustic Detection of Mysticetes																																				
Photo Identification																																				
Tag-based Behavioral Studies of Elephant Seals																																				
Cetacean Playback Studies																																				
Otolithic Audiometrics																																				
Sea Turtle Playback Studies																																				
Research Reports																																				

Table 2.2.1.1-1 Pioneer Seamount MMRP Schedule of Events

EXHIBIT NO.	9
APPLICATION NO.	
CC-110-94	
3-95-40	
Scripps, ATOC	
California Coastal Commission	

SITES EVALUATED	Deep Sound Channel Axis weight-factor (5)	Clear Acoustic View (4)	Seasonal Variation (1)	Site Locally Flat (2)	Site Steeply Sloped (3)	Minimal Cable Armor & Trench. Reqmts. (2)	Good Bottom Properties (2)	Minimum Bottom Currents (2)	Minimum Cable Run to Shore (5)	Close Logistic Support (5)	Use of Existing Technology (no major eng) (4)	Minimal Risk to Cable from Bottom Fishing (3)	Potential for Low Env. Consequence (5)	RELATIVE SCORE
Pacific Beach, WA (38 nmi/70 km west)	L	L	M	H	M	M	H	M	M	M	H	M	H	245
OR (25 nmi/46 km west)	M	L	M	H	L	M	H	M	M	M	H	M	M	227
Pioneer Seamount, CA	H	H	M	M	H	L	M	M	L	L	H	M	M	254
Sur Ridge, CA	H	H	M	H	M	M	M	H	H	H	H	M	M	355
Sur Slope, CA	H	H	M	H	L	M	H	H	M	M	L	M	M	262
San Nicolas, CA (50 nmi/93 km west)	H	L	M	H	M	M	H	M	L	L	H	M	H	249

Relative Criteria Fulfillment:

H = Fulfills Criteria >90%
M = Fulfills Criteria 50%-90%
L = Fulfills Criteria <50%

Note 1: Relative Score Criteria: H = 10; M = 5; L = 1

Note 2: Weighting factor based on relative importance to achieving program objectives.

Note 3: Relative Score determined by multiplying relative score criteria values by weighting factor, then adding the 13 results for each site.

Note 4: "Potential for Low Environmental Consequences" added since the DEIS/SIR in response to comments.

Table 2.2.3.3-1. ATOC source site selection criteria.

EXHIBIT NO. 10
APPLICATION NO.
CC-110-94 3-95-40
Scripps, ATOC California Coastal Commission

Range from ATOC Source	dB (water standard)	dB (air standard)	Comparable Sounds
1 m (approximately 3 ft)	195	133.5	Container ship at comparable distance. Very high powered loudspeaker system at comparable distance. Ambulance siren at comparable distance.
30 m (approximately 100 ft)	165	103.5	Large ship at comparable distance. Rock concert (comparable to sounds 200-400 ft from ATOC source). Jet airliner (10 m) Ambulance siren (somewhat closer than 34 m). "Very loud"
1000 m (sea surface above ATOC source)	135	73.5	Small power boat. Freeway 34 m away. Beluga whale threshold (1000 Hz). "Moderately loud"
12-18 km (7-10 nm)	120	58.5	Sea sounds (wind and wave action) during storm. Normal speech (1 m)
50-60 km (27-32 nm)	110	48.5	Symphony orchestra at 6 m (20 ft) Heavy surf on beach at 1 m (3 ft) Heavy truck (64 km/hr) at 15 m (50 ft)

Table ES-1. Relationship of sound level of common sounds in air and water (20-1000 Hz)

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.	Urlick, 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 I.1.3-1 Natural and human-made source noise comparisons.

EXHIBIT NO.	12
APPLICATION NO.	
CC-110-94	
3-95-40	

Common Name	Scientific Name	Status
Mysticetes		
Blue Whale	<i>Balaenoptera musculus</i>	FE
Fin Whale	<i>B. physalus</i>	FE
Sei Whale	<i>B. borealis</i>	FE
Humpback Whale	<i>Megaptera novaeangliae</i>	FE
Right Whale	<i>Eubalaena glacialis</i>	FE
Odontocetes		
Sperm Whale	<i>Physeter macrocephalus</i>	FE
Pinnipeds		
Northern Fur Seal	<i>Callorhinus ursinus</i>	D (Special Status)
Guadalupe Fur Seal	<i>Arctocephalus townsendi</i>	ST, FT
Steller Sea Lion	<i>Eumetopias jubatus</i>	FT
Fissipeds		
Southern Sea Otter	<i>Enhydra lutris</i>	FT
Birds		
Peregrine Falcon	<i>Falco peregrinus</i>	FE
California Brown Pelican	<i>Pelecanus occidentalis californicus</i>	SE, FE
Short-Tailed Albatross	<i>Diomedea albatrus</i>	FE
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	SE, FT
Western Snowy Plover	<i>Charadrius alexandrinus nivosus</i>	FT
Sea Turtles		
Leatherback Turtle	<i>Dermochelys coriacea</i>	FE
Green Turtle	<i>Chelonia mydas</i>	FT
Olive Ridley Turtle	<i>Lepidochelys olivacea</i>	FT
Loggerhead Turtle	<i>Caretta caretta</i>	FT
Fish		
Winter-Run Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	SE, FE

FE = Federally listed endangered
 ST = State listed threatened
 FT = Federally listed threatened
 SE = State listed endangered
 D = Depleted (under the Marine Mammal Protection Act) (Special Status)

Table 3.3.7-1 Threatened, endangered, or special status species

EXHIBIT NO. 13
APPLICATION NO.
CC-110-94 3-95-40
Scripps, ATOC California Coastal Commission

SPECIES	WINTER/ (Note 1)	SPRING	SUMMER/ (Note 2)	FALL
	N	CV	N	CV
Mysticetes:				
Minke whale (<i>B. acutorostrata</i>)	71	0.61	569	1.10
blue whale (<i>Balaenoptera musculus</i>)	28	1.03	2,198	0.36
fin whale (<i>B. physalus</i>)	78	0.80	913	0.59
sei whale (<i>B. borealis</i>)	n/c	n/c	61	1.21
humpback whale (<i>Megaptera novaeangliae</i>)	375	0.36	609	0.41
gray whale (<i>Eschrichtius robustus</i>)	20,869	0.34	n/c	n/c
right whale (<i>Eubalaena glacialis</i>)	16	1.08	n/c	n/c
Odontocetes:				
common dolphin (<i>Delphinus delphis</i>)	270,983 (Note 3)	0.31	249,712 (Note 4)	0.28
striped dolphin (<i>Stenella coeruleoalba</i>)	n/c	n/c	20,715	0.43
Risso's dolphin (<i>Grampus griseus</i>)	28,809	0.45	9,433	0.40
Pac. white-sided dolphin (<i>Lagenorhynchus obliq.</i>)	110,398	0.44	13,060	0.58
north. right whale dolphin (<i>Lissodelphis borealis</i>)	19,835	0.43	9,390	0.58
Dall's porpoise (<i>Phocoenoides dalli</i>)	8,489	0.23	82,876	0.35
bottlenose dolphin (<i>Tursiops truncatus</i>)	2,959	0.50	1,606	0.47
killer whale (<i>Orcinus orca</i>)	62	0.75	431	1.21
sperm whale (<i>Physeter macrocephalus</i>)	857(1286)*	1.05	725(1088)*	0.47
beaked whales (<i>Ziphius cavirostris</i> , <i>Berardius bairdi</i> , <i>Mesoplodon</i> spp.)	426(852)*	0.38	1430(2860)* (Note 5)	0.9
harbor porpoise (<i>Phocoena phocoena</i>)	1,532	0.33	3,810	0.24

pygmy sperm whale (<i>Kogia breviceps</i>)	Abundance Unknown	Note 6
dwarf sperm whale (<i>Kogia simus</i>)	Abundance Unknown	Note 6
short-finned pilot whale (<i>Globicephala macrorhyn.</i>)	Abundance Unknown	Note 7

Pinnipeds (SCB unless otherwise noted):	ANNUAL	
California sea lion (<i>Zalophus californianus</i>)	122,000	
northern elephant seal (<i>Mirounga angustirostris</i>)	87,000	
harbor seal (<i>Phoca vitulina richardsi</i>)	32,325	
northern fur seal (<i>Callorhinus ursinus</i>)	30,000	Note 8
Guadalupe fur seal (<i>Arctocephalus townsendi</i>)	1-5	Note 9
Steller sea lion (<i>Eumetopias jubatus</i>)	100	Note 9
Fissiped (Pt. Sur coast):		
southern sea otter (<i>Enhydra lutris</i>)	114	Note 10

EXHIBIT NO. 14
APPLICATION NO.
CC-110-94 3-95-40
Scripps, ATOC California Coastal Commission

Table 3.3.1-1 Estimates of the stock of marine mammal and sea turtle species offshore central California

SPECIES	ABUNDANCE	REMARKS
Sea Turtles:		
loggerhead (<i>Caretta caretta</i>)	Unknown	Note 11
green (<i>Chelonia mydas</i>)	Unknown	Note 11, 12
olive ridley (<i>Lepidochelys olivacea</i>)	Unknown	Note 11
leatherback (<i>Dermochelys coriacea</i>)	Unknown	Note 13

*Numbers in () indicate estimates accounting for whales submerged during entire survey evolution; correction factors: x 1.5 for sperm whales, x 2 for beaked whales (Barlow, pers. comm., 1995)

Note 1: Corrected estimates from Forney and Barlow (1993); Buckland et al. (1992) for gray whales.

Note 2: Corrected estimates from Barlow (1993a); Forney and Barlow (1993) for harbor porpoises.

Note 3: Short and long beaked.

Note 4: Short-beaked only.

Note 5: Unidentified beaked whales.

Note 6: "No real estimates of abundance available" (Handbook of Marine Mammals, Vol. 4, D.K. and M.C. Caldwell, 1989)

Note 7: Dept. of Navy Report on Continuing Action (NAVFACENGCOM, SW Div., San Diego, CA, Sep 1993)

Note 8: From Bonnell et al., 1983. Majority of animals are migratory--present in central Calif. waters only in winter and early spring. Small pupping colony resides on San Miguel Island year-round

Note 9: Do not breed in SCB; therefore no incidental take is anticipated (56 FR 1608, July 30, 1990).

Note 10: Stock estimate for Pt Sur area; however, sea otters are coastal (<2 km offshore) never diving >100 m; therefore no incidental take is anticipated.

Note 11: NOAA-TM-NMFS-F/SPO-2, Dec 1992 (for eastern tropical Pacific [ETP])

Note 12: "Green turtles are the most commonly observed hard-shelled sea turtle on the western coast of the USA" (NOAA-TM-NMFS-SWFSC-186, Sep 1993)

Note 13: Predominant sea turtle species in central California coastal area (Eckert, pers. comm., 1994)

N=corrected abundance estimates.

CV=coefficient of variation calculated by Forney and Barlow (1993).

n/c = not calculated

SCB = Southern California Bight

14 2

Table 3.3.1-1 Estimates of the stock of marine mammal and sea turtle species offshore central California

Mysticete Species	Maximum Exposure (dB)	Potential Effects
blue whale	138	Uncertain; however, no acute or short-term responses (Table C-1) expected. Minimal potential for TTS. Notes 1, 2.
fin whale	139	Uncertain; however, no acute or short-term responses (Table C-1) expected. Minimal potential for TTS. Notes 1, 2.
sei whale	138	Uncertain; however, low population makes exposure unlikely. No acute or short-term responses (Table C-1) expected. Minimal potential for TTS. Notes 1, 2.
minke whale	140	Uncertain; however, no acute or short-term responses (Table C-1) expected. Minimal potential for TTS. Notes 1, 2.
humpback whale	137	Uncertain; however, no acute or short-term responses (Table C-1) expected. Minimal potential for TTS. Notes 1, 2.
gray whale	138	Uncertain; however, no acute or short-term responses (Table C-1) expected. Minimal potential for TTS. Notes 1, 2.
right whale	138	Uncertain; however, very low population and preference for coastal areas makes exposure very unlikely. No acute or short-term responses (Table C-1) expected. Notes 1, 2.

Note 1: Potential for adverse effects from behavioral modification and/or habituation are speculative but expected to be minimal.

Note 2: In light of the number of mysticetes that could potentially be exposed to some transmissions and the relatively brief and intermittent nature of the transmissions, masking effects are uncertain, but presumed to be less than significant.



Table 4.3.1.1.3-1. Summary table of potential effects of ATOC sound on mysticetes

Odontocete Species	Maximum Exposure (dB)	Potential Effects
sperm whale	195	No acute or short-term behavioral responses (Table C-1) expected; masking very unlikely; low potential for temporary threshold shift.
beaked whale	195	Masking unlikely; low potential for short-term disruption, but probable lack of low frequency hearing capability makes these impacts unlikely.
killer whale	140	No acute or short-term behavioral responses (Table C-1) expected due to lack of low frequency hearing capability and shallow dives.
Risso's dolphin	145	No acute or short-term behavioral responses (Table C-1) expected due to lack of low frequency hearing capability and shallow dives.
common, striped, Pacific white-sided, bottle-nosed, and northern right-whale dolphin	140	Shallow diving and poor low frequency hearing make impacts unlikely.
Dall's, and harbor porpoise	140	No acute or short-term behavioral responses (Table C-1) expected due to lack of low frequency hearing and shallow diving.
short-finned pilot whale	145	Rare in project vicinity; unlikely that any individuals would be exposed.

EXHIBIT NO. 15

APPLICATION NO.

CC-110-94
3-95-40

Scripps, ATOC
California Coastal Commission

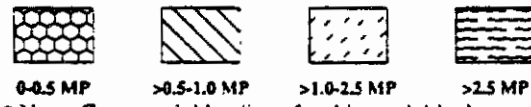
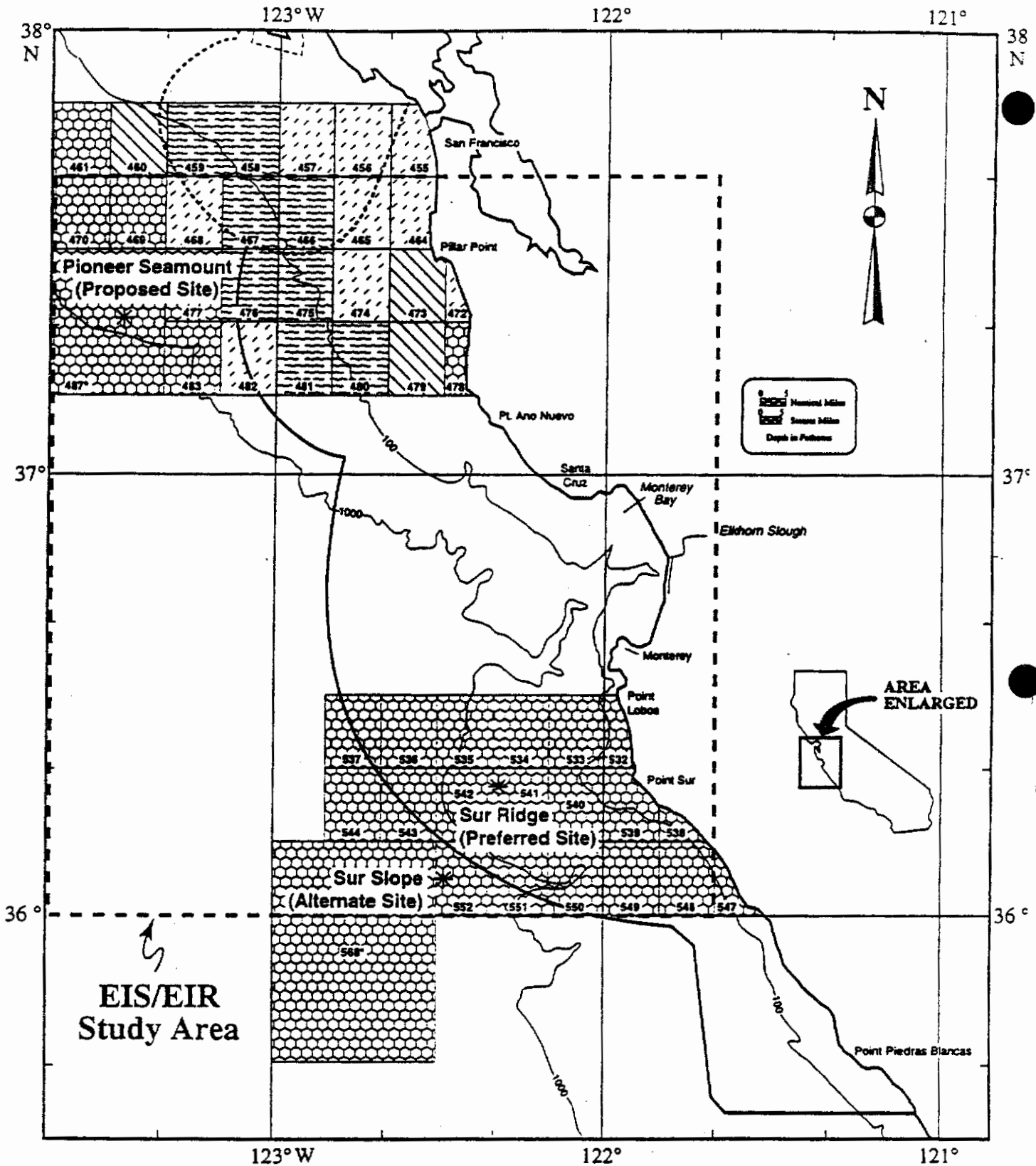
Table 4.3.1.2.3-1. Summary table of potential effects of ATOC sound on odontocetes

Pinniped/Fissiped Species	Maximum Exposure (dB)	Potential Effects
northern elephant seal	195	Possible low-mid-frequency hearing capacity results in low potential impacts; some minor masking or behavioral disturbance could occur.
northern fur seal	138	Mid-high-frequency hearing and shallow diving capability prevent impacts.
California sea lion	142	Mid-high frequency hearing capability limits impacts.
harbor seal	<120	Mid-high frequency hearing capability, shallow diving and near-shore range prevents impacts.
Guadalupe fur seal	None	Rare in study area.
Steller sea lion	142	Rarely enter study area.
southern sea otter	<110	Assumed mid-high frequency hearing capability, shallow diving and near-shore range prevent impacts.

Table 4.3.1.3.3-1. Summary table of potential effects of ATOC sound on pinnipeds/fissipeds

Sea Turtle Species	Maximum Exposure (dB)	Potential Effects
loggerhead sea turtle	136	Low frequency hearing capability uncertain but sensitivity presumed to be relatively poor; significant impacts unlikely
olive ridley sea turtle	136	Low frequency hearing capability uncertain but sensitivity presumed to be relatively poor; significant impacts unlikely.
green sea turtle	136	Low frequency hearing capability uncertain but sensitivity presumed to be relatively poor; significant impacts unlikely
leatherback sea turtle	195	Potential for behavioral changes and temporary threshold shift but low possibility of occurrence.

Table 4.3.2.1.3-1. Summary table of potential effects of ATOC sound on sea turtles



* Note: Commercial landings for this catch block were adjusted by unit area relative to other catch blocks

Figure 3.4.1-1 Total commercial fishing landings by catch block between 1978-1986 (data from MMS-CDFG).

EXHIBIT NO. 16	APPLICATION NO.	CC-110-94	Scripps, A.C.	California Coastal Commission
		3-95-40		

Survey Location	Depth Range (m)	Total Species	Density (individuals per km ²)	Biomass (kg per km ²)	Predominant Species	Commercially Important Species
Continental Shelf	72-85	29	150,000-250,000	10,000-25,000	Sanddabs Rex Sole English Sole Pink Surfperch	yes yes yes no
Shelf/Slope	128-504	19	50,000-1,400,000	22,000-120,000	Shorbelly Rockfish Flatfishes Sablefish Skates	yes yes yes no
Near Pioneer Canyon	495-1170	19	150,000-250,000	55,000-115,000	Flatfishes Rockfishes Sablefish	yes yes yes
Continental Slope	1008-1656	16	50,000-150,000	8000-40,000	Rattails Thornyheads Dover Sole Finescale Codlings	potential yes yes no
Continental Slope	1278-1764	14	< 10,000-50,000	2000-40,000	Rattails Thornyheads Eelpouts	potential yes no
North of Pioneer Seamount ¹	2300-3065	15	~ 1400	Data not collected	Rattails Finescale Codlings Eelpouts Snailfishes	potential no no no

Source: SAIC 1992b, except for footnote¹.

¹ Cailliet et al., 1992; Data are not directly comparable to SAIC (1992b) since different trawl methods were used (beam and small otter trawl versus large otter trawl for SAIC 1992b).

Table 3.3.3.1-1 Summary of demersal fish community characteristics in the general vicinity of the study area

EXHIBIT NO. 17
APPLICATION NO.
CC-110-94 3-95-40
Scripps, ATOC California Coastal Commission


Advantages	Disadvantages
<ul style="list-style-type: none"> • Would avoid problem of acoustic interaction with the bottom which could influence propagation. • Could potentially be placed in areas of low marine animal activity. • Basic source and battery technology is fairly mature. • Basic mooring and transponder hardware is fairly reliable. • If successful, cost savings over cabled bottom sources could be realized in some situations. 	<ul style="list-style-type: none"> • Frequency of proposed sources is as much as 122 Hz higher than desired: <ul style="list-style-type: none"> - Transmission loss issue (higher TL). - Marine animal issue (higher frequencies are closer to odontocetes' hearing). • New pressure compensation equipment must be designed, developed and field tested. • New source driving electronics and amplifiers must be designed, developed and field tested. • New mooring electronics package (including time-shift processor) must be designed developed and field tested. • Source wander (up to 300 m) compensation scheme is unproven and would require design, development and field testing. If not fully successful, this would be disqualifying. • Breakdown of large batteries over time could introduce harmful chemicals into marine animals' habitat. • No capability to modify source level, duty cycle, or other operational parameters once deployed. • Technical risks considered to be high because this technique is as yet untried, so no data base exists on underwater operational reliability, service life, or maintenance requirements • Maintenance and repair would be more difficult and costly than cabled bottom sources closer to land. • If source placement is far from land (in hopes of removing it from as much marine activity as possible), it would render any viable research on low frequency sound effects on marine animals infeasible.

Table 2.2.4-1 Moored autonomous source advantages and disadvantages

EXHIBIT NO. 18
APPLICATION NO.
CC-110-94 3-95-40
Scripps, ATOC California Coastal Commission

SCOPING PROCESS SUMMARY

<u>DATE</u>	<u>SCOPING ACTION</u>
4/29/94	ARPA issues Notice of Intent (NOI) to prepare an EIS on the ATOC MMRP.
5/3/94	NOI is published in Federal Register.
5/3 - 10/1/94	NMFS staff reviews scoping comments received and consults with ARPA and others involved in preparing the EIS to ensure that scoping comments are addressed in the Draft environmental document.
5/15/94	ATOC project team presents the project to the MBNMS Research Advisory Committee.
5/16/94	NMFS conducts a Public Scoping Hearing in Santa Cruz, CA. UCSD announces at NMFS Public Scoping Hearing that the environmental document will be a joint federal/state EIS/EIR, and that UCSD will be the state lead agency.
5/13/94	Dr. Sylvia Earle, former National Oceanic and Atmospheric Administration Chief Scientist hosts meeting at the Airport Hilton Hotel, San Francisco, CA to provide a forum for the ATOC project team and agency representatives to meet with concerned environmental groups (including the Natural Resources Defense Council, Sierra Club Legal Defense Fund, Save Our Shores, Friends of the Sea Otter, and others). At this meeting, input is sought regarding the specifics of the project protocols; refinements and alternatives are discussed and incorporated into the project.
6/2 & 6/3/94	UCSD publishes Notice of Preparation of the joint EIS/EIR for the California ATOC MMRP and notice of a public scoping meeting to be held in San Diego on 6/23/94 in the following newspapers of general circulation: <ol style="list-style-type: none">1) Los Angeles Times2) San Diego Union-Tribune3) San Francisco Chronicle4) Santa Cruz County Sentinel

EXHIBIT NO. 19
APPLICATION NO.
CC-110-94 3-95-40
Scripps, ATOC
 California Coastal Commission

- 6/3/94 UCSD distributes Notice of Preparation to various responsible agencies and other interested agencies, groups, and individuals (See Attachment 1), indicating comments would be received through 7/5/94. (Comments were in fact received through 7/20/94, and all comments were considered in determining the scope and content of the EIS/EIR.)
- 6/23/94 UCSD conducts public scoping meeting in San Diego.
- 7/19/94 Dr. Sylvia Earle convenes a second meeting between ATOC team members, agencies, and interested environmental organizations. At this meeting, which is held at the California Academy of Sciences in San Francisco, CA, further refinements to the project protocols are discussed.
- 7/94 ATOC project team conducted national telephone survey of environmental organizations to determine how best to keep them informed and what concerns they had about the project.
- 9/9/94 Survey questionnaire was distributed at a meeting of the American Cetacean Society in the San Diego area to determine what concerns the members had about the project and to determine how best to keep them informed of activities associated with the project.
- 1/93 to Present The ATOC project office has carried out a public information program throughout the planning phase of the project. This effort has increased dramatically as a result of national media attention that began in March, 1994 in response to the program's applications for marine mammal research permits. The program distributes information including brochures, technical materials and children's educational literature to contact lists for environmental groups, government officials, and the general public. Monthly activity reports are available as part of an ATOC Project description on Mosaic via Internet. This medium alone has a monthly readership of 1,000 individuals from educational institutions, government agencies, businesses and other countries. A national telephone survey of target

audiences was implemented in the summer of 1994 to determine the level of awareness and understanding of the program's environmental goals. A media contact list specific to the program has ben generated and contacts are made with the event of new program information. Program scientists have attended speaking events to brief interested groups on the goals and changes to the program. Meeting of concerned individuals and groups have been organized and have resulted in solutions toward more sensitive designs to both the climate research and the marine mammal research programs. A video tape of the program is now nearly completed, awaiting approval of permits and data to tell the results of the experiment.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT
Silver Spring, Maryland 20910

MAR 10 1995

Peter M. Douglas
Executive Director
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

Dear Mr. Douglas:

This letter responds to the California Coastal Commission's ("Commission") request to review, as an unlisted activity, the Scripps Institute of Oceanography's ("Scripps") application for a Monterey Bay National Marine Sanctuary ("MBNMS") permit renewal for activities associated with the Acoustic Thermometry of Ocean Climate ("ATOC") project. The Office of Ocean and Coastal Resource Management ("OCRM") has determined that the ATOC project can be reasonably expected to affect coastal uses or resources of California's coastal zone. Therefore, Scripps must comply with the federal consistency requirements of the Coastal Zone Management Act of 1972 ("CZMA") section 307(c)(3)(A) and 15 C.F.R. Part 930, Subpart D, and the Commission may review Scripps' application for a MBNMS permit renewal for the ATOC project. OCRM, through its Sanctuaries and Reserves Division and the MBNMS, will not approve Scripps' application until the Commission has concurred with Scripps' consistency certification, or, if the Commission objects, if Scripps appeals the objection to the Secretary of Commerce and the Secretary overrides the Commission's objection.

OCRM's determination that sounds emanating from the ATOC sound source can be reasonably expected to affect marine animals that are resources of both the outer continental shelf ("OCS") and the coastal zone is based on information provided by Scripps and the Commission. Scripps also raised procedural concerns with the Commission's request. OCRM has previously determined that there are no procedural defects in the Commission's request. Letter from Jeffrey R. Benoit, Director, OCRM, to Andrew Forbes, Scripps (Jan. 27, 1995).

The Commission received Scripps' consistency certification on December 1, 1994, but did not receive the MBNMS application until January 24, 1995. OCRM previously determined that, for this particular case, the Commission's receipt of the application constitutes federal agency notice for purposes of 15 C.F.R. § 930.54(a). *Id.* Therefore, in accordance with 15 C.F.R. § 930.54(e), the Commission must complete its review within six months from the receipt of the MBNMS application: by July 24, 1995. This assumes that the certification, draft environmental impact statement for the ATOC project ("DEIS"), and the MBNMS application contain all the necessary information.

EXHIBIT NO. 20
APPLICATION NO.
CC-110-94 3-95-40
Scripps, ATOC California Coastal Commission



OCRM has determined that the marine animals at issue that ply the waters of the coastal zone and the OCS are coastal resources. The CZMA and its legislative history indicate that the effects test is to be construed broadly. In addition, Secretary of Commerce consistency appeal decisions have held that coastal resources are not bound by jurisdictional limits, and they may be affected when outside of the coastal zone. The California coastal management program requires that:

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.

Cal. Pub. Res. Code § 30230. The Commission considers marine mammals that migrate through or are found in California waters as coastal resources. Letter from Peter M. Douglas, Executive Director, Commission, to Jeffrey Benoit, Director, OCRM (Dec. 30, 1994), letter from Mark Delaplaine, Commission, to Andrew Forbes, Scripps (Dec. 29, 1994). (Thus, an activity that affects or is reasonably likely to affect these coastal resources that migrate through or use California waters, whether they may be affected while in or outside the coastal zone, is subject to federal consistency in accordance with the CZMA and 15 C.F.R. Part 930.)

In this case, the Commission asserts that the ATOC project can be reasonably expected to affect marine mammals of the coastal zone, including the humpback and blue whales that are sensitive to low frequency noise and which swim at depths where the noise would be audible. Further, the zone of influence of the noise source includes portions of California waters and the program may affect commercial fishing and coastal recreation. Letter from Peter M. Douglas, Executive Director, Commission, to David W. Hyde, Scripps, and Terry Jackson, MBNMS, at 2 (July 14, 1994). The State is concerned with the health of populations of marine resources that spend all or portions of their lives within the coastal zone.

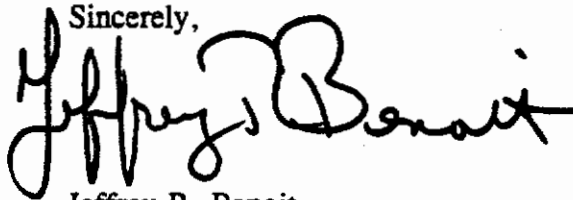
Scripps asserts that effects will be temporary and localized at the sound source. Letter from Andrew Forbes, Scripps, to Jeffrey Benoit, Director, OCRM, at 5 (Jan. 13, 1995). However, Scripps states that there will be "minor or uncertain impacts" and derivative effects on commercial fisheries. While Scripps and the DEIS assert minimal effects on all marine resources, they make it clear that there will be some effects, and that there is a substantial amount of uncertainty regarding these effects. *Id.*; DEIS at 4-12, 15. While stating that effects are minimal, ATOC project proponents recognize this uncertainty and the potential to affect marine resources. The DEIS states that, "very little is known about effects of low frequency sound on marine animals, particularly marine mammals and sea turtles," DEIS at 1-4, and "[t]he lack of information is particularly acute" for large whales. DEIS at 4-12. Hence the proposal to conduct a pilot research study to accompany

the ATOC project. Further, there could be direct impacts from the installation of cables needed for the sound source. DEIS at 4-9. These impacts are expected to be minimal, but there is the potential for effects to coastal resources. Id.

Therefore, OCRM approves the Commission's request to review Scripps' application for a MBNMS permit renewal. As such, the Commission's review includes a review of all associated facilities in accordance with 15 C.F.R. § 930.21. An associated facility is subject to consistency if it is covered by 15 C.F.R. § 930.21(a) and (b). This is further clarified by 15 C.F.R. § 930.21 which states, "the proponent [(federal agency or entity seeking federal approval or funding)] of a Federal action must consider whether the Federal action and its associated facilities affect the coastal zone" (emphasis added). Thus, an applicant for federal approval must include a discussion of individual and cumulative effects from associated facilities in making its consistency certification. The associated facilities for the ATOC project are those project components that are designed, operated or otherwise used, in full or in major part, to meet the needs of the project, and without which the project could not be conducted. See 15 C.F.R. § 930.21.

Please call David Kaiser, OCRM's Federal Consistency Coordinator, at (301) 713-3098, x 144, or John King, Assistant Regional Manager, Pacific Region, Coastal Programs Division, OCRM, at (301) 713-3121, x 188, if you have any questions.

Sincerely,



Jeffrey R. Benoit
Director

cc: Tami Grove
Andrew Forbes
Dr. Ralph W. Alewine, III
Ann Terbush
CDR Terry Jackson
Dr. Charlie Wahle

EX-20-13

Exhibit 21


Section 930.66, federal consistency regulations:

Availability of mediation for previously reviewed activities.

(a) Federal and State agencies shall cooperate in their efforts to monitor Federally licensed and permitted activities in order to make certain that such activities continue to conform to both Federal and State requirements.

(b) The State agency shall request that the Federal agency take appropriate remedial action following a serious disagreement resulting from a State agency objection to a Federally licensed or permitted activity which was: (1) Previously determined to be consistent with the State's management program, but which the State agency later maintains is being conducted or is having coastal zone effects substantially different than originally proposed and, as a result, is no longer consistent with the State's management program; or (2) previously determined not to be an activity affecting the coastal zone, but which the State agency later maintains is being conducted or is having coastal effects substantially different than originally proposed and, as a result, the activity affects the coastal zone in a manner inconsistent with the State's management program. The State agency's request must include supporting information and a proposal for recommended remedial action; a copy of the request must be sent to the applicant. [Emphasis added]

(c) If, after a reasonable time following a request for remedial action, the State agency still maintains that a serious disagreement exists with the Federal Agency, either party may seek the Secretarial mediation services provided in Subpart G of this part.

EXHIBIT NO.	21
APPLICATION NO.	
	CC-110-94 3-95-40
	Scripps, ATOC
	 California Coastal Commission

Standard Conditions

1. Notice of Receipt and Acknowledgment. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
2. Expiration. If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.
3. Compliance. All development must occur in strict compliance with the proposal as set forth in the application for permit, subject to any special conditions set forth below. Any deviation from the approved plans must be reviewed and approved by the staff and may require Commission approval.
4. Interpretation. Any questions of intent of interpretation of any condition will be resolved by the Executive Director or the Commission.
5. Inspections. The Commission staff shall be allowed to inspect the site and the development during construction, subject to 24-hour advance notice.
6. Assignment. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
7. Terms and Conditions Run with the Land. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.


EXHIBIT NO.
APPLICATION NO.
CC-110-94 3-95-40
Scripps, ATOC  California Coastal Commission

Exhibit 23

FEIS/FEIR statement of ATOC and MMRP objectives:

Acoustic Thermometry Program Objectives:

- o Observe the ocean on the large space scales (3000 to 10,000 km) which characterize climate, so that modelers will be able to: 1) test their models against the average ocean temperature changes seen by ATOC over a few years, and 2) if, and when, the models prove adequate, use those same observations to "initialize" the models to make meaningful predictions.
- o Develop and demonstrate the equipment necessary to undertake acoustic thermometry experiments, in particular, reliable low frequency sound sources.
- o Prove the concept of using acoustic thermometry to measure ocean climate variability for global applications by establishing multiple acoustic pathways in the North Pacific.
- o Obtain early baseline data on transmission times in Pacific pathways to compare with data that may be obtained in a follow-on global program, if such a program is approved.
- o Determine the minimum source level and duty cycle necessary for obtaining valid climatic data.
- o Characterize oceanographic factors that are "noise" to the global climate "signal," such as tidal, internal wave fields, and mesoscale variations, and determine the constraints they impose on the design of a future (conceptual) ocean monitoring system.
- o Utilize existing U.S. Navy seafloor hydrophones to the maximum extent feasible to increase the number of acoustic pathways and, hence the quantity of data at a relatively small cost.

The Marine Mammal Research Program Objectives:

- o Assess the potential effects of ATOC sound transmissions on the relative distribution and abundance of marine animals (particularly marine mammals and sea turtles) within the 120 dB sound field (modeled at 100 m depth), so as to minimize uncertainties associated with determination of the significance of any effects.

EXHIBIT NO. 23
APPLICATION NO.
CC-110-94 3-95-40
Scripps, ATOC California Coastal Commission

- o Obtain information to help evaluate what effects the ATOC sound transmissions could potentially have on the relative distribution, abundance and diving behavior of marine mammals and sea turtles.
- o Identify mitigation measures to avoid the potential disruption of behavioral patterns of local marine animals, particularly marine mammals and sea turtles.
- o Assess the level of any responses of indicator species to ATOC sound signals, particularly whether any marine mammal or sea turtle demonstrates an acute or short-term response (Table C-1) to low frequency sound transmissions with ATOC source characteristics.

Exhibit 24

Related Permits, Approvals and Actions

A number of federal approvals, federal funding and direct implementation actions are involved in the California ATOC project, as follows:

1. National Marine Fisheries Service (NMFS). Scripps applied to NMFS on December 8, 1993, for a scientific research permit under the Marine Mammal Protection Act and Endangered Species Act to "take" by harassment marine mammals and protected species that may be affected by the operation of the proposed sound source. This application is still pending. ARPA (the Advanced Research Projects Agency, the lead federal agency) is also currently undertaking consultation with NMFS under Section 7 of the Endangered Species Act.

2. Monterey Bay National Marine Sanctuary. A revised permit to install the source cable across the Monterey Bay National Marine Sanctuary will be needed.

3. U.S. Army Corps of Engineers. A request for authorization to utilize one or more Section 10 Nationwide Permits (NWP) will be needed from the Corps. The three NWPs applicable to the ATOC cables are NWP 5 for scientific measurement devices, NWP 6 for survey activities, and NWP 18 for small structures.

4. U.S. Navy. The ATOC project has been authorized to use certain facilities at the Point Sur Naval Facility, specifically an existing building, utility line easement, offshore cables, and an existing horizontal line array (HLA).

5. U.S. Air Force. The ATOC project is currently negotiating arrangements for use of certain facilities at the Pillar Point Air Force Station, specifically an existing building to house the onshore electronics that support the sound source. Scripps expects this authorization to be completed in the near future.

6. Continued ARPA Funding. Funding for the ATOC project is provided primarily by a grant from ARPA (Advanced Research Projects Agency). Following completion of the EIS/EIR, ARPA will determine whether to authorize continued use of ARPA funds for ATOC and MMRP activities.


In addition to the above federal authorizations, several state agency reviews and/or approvals are needed, including State Lands Commission lease approval, State Historic Preservation Officer consultation, Department of Fish and Game consultation, and University of California approval.

EXHIBIT NO. 24

APPLICATION NO.

CC-110-94
3-95-40

Scripps, ATOC

 California Coastal Commission

CALIFORNIA COASTAL COMMISSION

45 FREMONT, SUITE 2000
 SAN FRANCISCO, CA 94105-2219
 VOICE AND TDD (415) 904-5200



Th 4a
 Th 5a

TO: Commissioners and Interested Parties

FROM: Peter Douglas, Executive Director

DATE: June 5, 1995

SUBJECT: Scripps/ATOC ADDENDUM TO REVISED STAFF REPORT AND RECOMMENDATION ON COMBINED CONSISTENCY CERTIFICATION AND COASTAL DEVELOPMENT PERMIT APPLICATION FOR CC-110-94/3-95-40

I. Background. On June 2, 1995, the Commission staff recommendation was mailed to the Commissioners and interested parties. On June 5, 1995, the Commission staff received the attached letter containing project modifications, based on an agreement between Scripps Institution of Oceanography and representatives of a number of environmental organizations. The major points of this agreement modify the project in a number of ways; the following is a brief summary of these modifications:

1. The MMRP Pilot study, initially a 6 month study, will be extended for the full 2 year period. The MMRP research group will maintain control over the sound source for the entire 2 year period.
2. The scope of the independent MMRP advisory board is expanded, and greater public dissemination of the advisory board discussions will occur. The environmental organizations will be represented by two new members on the advisory board.
3. Project authorization at this time is not a commitment to use of this location (Pioneer Seamount) for future ATOC studies. The sound source will be removed as soon as is feasible after the 2 year project, and Scripps will not reuse the source "until such removal has occurred, except with the consent of the environmental organizations as a group."
4. A Programmatic EIS/R will be prepared prior to any long term ATOC activities. An essential siting criterion for a long term site will be: "Location in an area with minimal abundances of marine life (including but not limited to marine mammals) that might possibly be adversely affected by low frequency sound." In addition, Scripps expresses its understanding that "the MMRP does not claim that it will be able to prove or disprove long-term impacts on marine mammals [from a 2 year study], and therefore the results of the MMRP will not be so used."

II. Staff Recommendation. The staff originally recommended that the Commission concur with the ATOC/MMRP project, for the reasons explained in the staff report mailed for the June 1995 Commission meeting. The above modifications do not alter the staff's recommendation that the Commission concur with the consistency certification for the project as now described. Any further modification to the above commitments and the commitments already reflected in the existing staff recommendation may trigger the need for additional Commission authorization.

Attachment

EXHIBIT NO.	25
APPLICATION NO.	
CC-110-94/3-95-40	

LAW OFFICES OF
ALAN C. WALTNER
1736 FRANKLIN STREET, EIGHTH FLOOR
OAKLAND, CALIFORNIA 94612

TELEPHONE
(510) 465-4494
(510) 208-4562 (DIRECT)

FACSIMILE
(510) 465-6248
(510) 208-4558

June 5, 1995

Peter Douglas
Executive Director
California Coastal Commission
45 Fremont, Suite 2000
San Francisco, CA 94105-2219

RECEIVED
JUN - 5 1995
CALIFORNIA
COASTAL COMMISSION

Tami Grove
Central California District Director
California Coastal Commission
725 Front Street, Suite 300
Santa Cruz, CA 95060

Re: ATOC Project Federal Consistency Review

Dear Mr. Douglas and Ms. Grove:

As you know, at the May hearing regarding the consistency review and coastal development permit for the Acoustic Thermometry of Ocean Climate Project ("ATOC") and associated Marine Mammal Research Program ("MMRP"), it was reported that the applicant, Scripps Institution of Oceanography ("Scripps") had undertaken discussions with a number of concerned environmental organizations in an attempt to resolve outstanding differences regarding these pending applications.

We are pleased to inform you that those discussions have been successful, resulting in the attached agreement. Please note that under the agreement Scripps will be requesting that the National Marine Fisheries Service ("NMFS") include as conditions in the pending Scientific Research Permit ("SRP") the following two mitigation measures:

- o The MMRP Pilot Study will be extended through the entire initial research period of approximately 18 to 24 months, in lieu of the ATOC feasibility phase in the current proposal. As a result, the MMRP will retain control of the sound source (including determination of duty cycle and decisions regarding operation, suspension and termination) through the entire 18 to 24 month initial research period, and no transfer of control or shift to a climate research transmission schedule will occur during that period. The transmission schedule for the extended Pilot Study will

Peter Douglas/Tami Grove
June 5, 1995
Page 2


preliminarily be the same four day on, seven day off protocol as for the original Pilot Study, subject to review and potential mid-course corrections approximately six months into the Pilot Study, under the procedures currently contemplated for the "quick look" report. The objective of the quick look report will be solely to review the progress of the MMRP to that date, and no attempt will be made to come to final conclusions regarding the potential effects of ATOC source transmissions on marine mammals, except as required by the guidelines for shut-down of the sound source.

- o The MMRP will invite two members and two observers to the MMRP Advisory Board, from individuals nominated by the environmental organizations. Minutes of the Advisory Board meetings and a summary of those meetings will be made available to the public, and the summary will be distributed to a mailing list to be developed. The Advisory Board shall be provided full and prompt access to all MMRP documents and data (except documents such as personnel records that may be protected by law from disclosure), and the MMRP shall provide a prompt response to all Advisory Board comments regarding the MMRP. Regular reports shall be provided by the MMRP to the Advisory Board including, at minimum, bi-monthly Pilot Study Status Reports and the Final Pilot Study Report. The parties understand that NMFS will maintain continuing oversight over the MMRP, and any disputes between the MMRP and the Advisory Board will be reported to NMFS for appropriate disposition. In the event of disagreement between the MMRP and the Advisory Board, the MMRP agrees, pending disposition by NMFS, to defer to the Advisory Board.

In addition, under the agreement other mitigation measures that will apply beyond the time-frame of the SRP will be submitted to the Chancellor of the University of California at San Diego to be included as additional mitigation measures and conditions of approval.

Scrapps therefore requests that the consistency certification be considered on the basis of the project with the additional features provided for in the agreement.

Sincerely,



Alan Waltner

SETTLEMENT AGREEMENT AND RELEASE

1. This agreement ("the agreement") is made and entered into effective June 2, 1995, by and between the Natural Resources Defense Council, Environmental Defense Fund, Earth Island Institute, Humane Society of the United States, League for Coastal Protection, and American Oceans Campaign ("environmental organizations") and the University of California, including the Acoustic Thermometry of Ocean Climate Project ("ATOC") of the Scripps Institution of Oceanography ("Scripps") (collectively referred to as "the University"), regarding the ATOC project and associated Marine Mammal Research Program ("MMRP"), and shall be binding upon and inure to the benefit of the environmental organizations and the University, and their respective successors, assigns, predecessors, subsidiaries, affiliates, officers, directors, attorneys and shareholders, partners and limited partners, to the extent permitted by law. The parties to this agreement hereby agree as follows:

2. The MMRP Pilot Study will be extended through the entire initial research period of approximately 18 to 24 months, in lieu of the ATOC feasibility phase in the current proposal. As a result, the MMRP will retain control of the sound source (including determination of duty cycle and decisions regarding operation, suspension and termination) through the entire 18 to 24 month initial research period, and no transfer of control or shift to a climate research transmission schedule will occur during that period. The transmission schedule for the extended Pilot Study will preliminarily be the same four day on, seven day off protocol as for the original Pilot Study, subject to review and potential mid-course corrections approximately six months into the Pilot Study, under the procedures currently contemplated for the "quick look" report. The objective of the quick look report will be solely to review the progress of the MMRP to that date, and no attempt will be made to come to final conclusions regarding the potential effects of ATOC source transmissions on marine mammals, except as required by the guidelines for shut-down of the sound source.

3. The installation of the cable to the Pioneer Seamount site will not be considered as a siting criterion or factor pertaining to the location of any long-term ATOC operational sound source offshore California. ATOC further agrees to remove the sound source as soon as feasible after the end of the initial 18 to 24 month research phase, and will not reuse the source until such removal has occurred, except with the consent of the environmental organizations as a group.

4. In the event that ATOC proposes to install and/or operate a long-term sound source, a full environmental review process will be undertaken in compliance with all applicable laws, including the preparation, circulation and approval of a programmatic environmental impact statement under NEPA (and equivalent document for affected states that have corresponding

state law requirements) on any significant impacts of all components of the project, including any source locations contemplated at that time for the full duration of the anticipated project; provided, however, that to the extent the decision to prepare such a document is beyond the control of ATOC, ATOC agrees to request that the federal or state lead agency undertake such preparation. Such programmatic document will contain an analysis of all reasonable alternatives that could feasibly meet project objectives. ATOC further agrees to seek additional appropriate permits from NMFS.

5. In selecting the proposed site for future long-term operational ATOC sound sources that are not to be associated with MMRP activities, none of the siting criteria applicable to the MMRP set forth in the California ATOC/MMRP EIS will be applied, and the following will be included as an essential siting criterion for the ATOC operational phase: "Location in an area with minimal abundances of marine life (including but not limited to marine mammals) that might possibly be adversely affected by low frequency sound." The goal of this siting criterion shall be to minimize impacts on the marine environment, recognizing that in cases where no or insufficient data exist adverse effects will be presumed for siting purposes, and further recognizing the need to provide adequate buffer zones around areas of significant marine life resources.

6. The MMRP will invite two members and two observers to the MMRP Advisory Board, from individuals nominated by the environmental organizations. Minutes of the Advisory Board meetings and a summary of those meetings will be made available to the public, and the summary will be distributed to a mailing list to be developed. The Advisory Board shall be provided full and prompt access to all MMRP documents and data (except documents such as personnel records that may be protected by law from disclosure), and the MMRP shall provide a prompt response to all Advisory Board comments regarding the MMRP. Regular reports shall be provided by the MMRP to the Advisory Board including, at minimum, bi-monthly Pilot Study Status Reports and the Final Pilot Study Report. The parties understand that NMFS will maintain continuing oversight over the MMRP, and any disputes between the MMRP and the Advisory Board will be reported to NMFS for appropriate disposition. In the event of disagreement between the MMRP and the Advisory Board, the MMRP agrees, pending disposition by NMFS, to defer to the Advisory Board.

7. As to those commitments that pertain to the MMRP (items 2 and 6 above), ATOC and the MMRP will request that they be included as permit conditions in the Scientific Research Permit ("SRP") under consideration by the National Marine Fisheries Service ("NMFS"). ATOC and the MMRP also will request the UCSD

Chancellor to include all of the terms above as additional mitigation measures and supplemental conditions of approval. The agreement shall terminate, and shall be void and of no effect as to all of the parties, in the event that these terms are not included in the SRP and UCSD Chancellor's approval as so provided.

8. The environmental organizations agree not to challenge any of the permits or other approvals for the initial 18 to 24 month experimental period pertaining to ATOC and the MMRP, including the certification/adoption of the Final Environmental Impact Statement/Environmental Impact Report for the California Acoustic Thermometry of Ocean Climate Project and its associated Marine Mammal Research Program ("FEIS/EIR"), and the project approvals listed at page 1-24 of the FEIS/EIR ("approvals"), and hereby waive and release any and all claims and/or causes of action relating thereto. The environmental organizations agree not to commence any legal action challenging these proceedings or permits, and further agree not to oppose these applications or permits in applicable administrative proceedings. The environmental organizations may provide comments in these administrative proceedings, but such comments shall be limited to: (a) issues presented by specific proposed permit language and final revisions to the MMRP and ATOC projects not yet reduced to writing and provided to the environmental organizations, and (b) contingent comments necessary to exhaust administrative remedies in the event that the agreement terminates. Any such comments shall also state the environmental organizations' agreement not to oppose the subject approvals provided that all of the mitigation measures proposed in the FEIS/EIR and adopted by UCSD Chancellor remain in effect and provided further that all of the terms and conditions of the agreement become and remain effective.

Notwithstanding the foregoing, the environmental organizations reserve the right to challenge any violations of permits issued for ATOC and/or the MMRP, and/or violations of the agreement. The environmental organizations further reserve the right to challenge future permits or environmental documents for activities beyond the initial 18 to 24 month experimental period, and by this agreement the environmental organizations do not endorse any long-term ATOC program. The University reserves any and all defenses to such challenges. Furthermore, the agreement by the environmental organizations not to oppose the MMRP shall not be taken as concurrence or agreement in any results of the MMRP.

9. The MMRP recognizes the limitations of any scientific research attempting to prove long-term impacts on marine animal populations and the difficulties of conclusively associating such

impacts with a specific cause. The MMRP recognizes that the predicted statistical power of aerial and boat based survey efforts proposed for the area is predicted to be limited and may, depending upon actual sighting numbers, only resolve large (as compared to slight or subtle) response differences. Other observational platforms, including acoustic observations and tagging, are designed to be capable of resolving relatively slight or subtle short-term responses in individual animals. For these reasons, and given the fact that the proposed research in the Pioneer Seamount study area is limited to less than two years, the MMRP does not claim that it will be able to prove or disprove long-term impacts on marine mammals, and therefore the results of the MMRP will not be so used.

10. The environmental organizations agree that none of the changes provided by the agreement requires delaying any of the applicable permit proceedings.

11. In any public statements regarding the agreement, it will be stated that all parties have worked diligently to resolve disagreements about the MMRP, resulting in an agreement by the environmental organizations not to oppose the MMRP during the initial 18 to 24 month research phase.

12. The agreement shall constitute the entire agreement between the parties with respect to the subject matter hereof and supersedes all prior negotiations and agreement, whether written or oral. This is an integrated agreement.

13. The agreement shall be governed by the laws of the State of California and, except as provided above, shall be modified only by further written agreement among the signatories thereto.

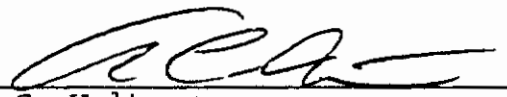
14. The parties acknowledge that they are each represented by competent and independently selected counsel, and that they have each read the agreement and have had the agreement explained to them by their counsel. The parties further acknowledge that the agreement has been drafted in a cooperative and joint effort of all of the parties and that none of the language herein shall be deemed to have been drafted by any particular party.

15. The agreement (with the exception of paragraph 5) shall only apply to the proposed ATOC California sound source and associated MMRP and will have no effect on the pending proposals by ATOC and the MMRP regarding activities in Hawaii, unless a new offer is made by the University and accepted by a sufficient number and composition of Hawaii organizations to be identified in any such offer.

16. Each of the undersigned represents and warrants that he or she has the power and authority to enter into the agreement and to bind legally the party or parties on whose behalf he or she is signing.

17. This agreement may be executed by the parties either by an authorized representative or by and through their counsel, and may be signed in counterparts. Signatures transmitted by facsimile shall be deemed to have the same force and effect as original signatures. This agreement shall become effective if and only if the signatures for all of the undersigned parties (with the exception of the League for Coastal Protection) are received at the offices of the undersigned counsel for the University on or before 6:00 p.m. Pacific Time, June 2, 1995.

Date: 6/2, 1995 LAW OFFICES OF ALAN WALTNER

By: 
Alan C. Waltner
Attorneys for the University of
California, including the Scripps
Institution of Oceanography and Acoustic
Thermometry of Ocean Climate Project

Date: _____, 1995 SIERRA CLUB LEGAL DEFENSE FUND

By: _____
Michael R. Sherwood
Attorneys for Humane Society of the
United States and American Oceans
Campaign

Date: _____, 1995 HELLER, EHRMAN, WHITE & MCAULIFFE

By: _____
Nicole J. Walthall
Attorneys for Earth Island Institute

[Signatures on opposite pages]

EX-100

Settlement Agreement and Release
June 2, 1995
Page 6

Date: 4/2, 1995

ENVIRONMENTAL DEFENSE FUND

By: Rod Fujita JFW
Rod Fujita

Date: _____, 1995

LEAGUE FOR COASTAL PROTECTION

By: _____

Date: _____, 1995

NATURAL RESOURCES DEFENSE COUNCIL

By: _____
Joel Reynolds

CALIFORNIA COASTAL COMMISSION

45 FREMONT, SUITE 2000
 SAN FRANCISCO, CA 94105-2219
 VOICE AND TDD (415) 904-5200



TO: Scripps
 Zeke Grader, PCFFA
 Pietro Parravano, HMBFMA
 ATOC File CC-110-94

FROM: Mark Delaplaine, Federal Consistency Supervisor *MD*

DATE: June 16, 1995

SUBJECT: **Scripps/ATOC** Modifications to CONSISTENCY CERTIFICATION
 CC-110-94 made during June 15, 1995 Commission public hearing.

During the June 15, 1995, Scripps incorporated the following project modifications into its project description and consistency certification for the ATOC/MMRP project. These modifications consist of:

1. Fisheries Biologist. Scripps agrees to include a fisheries biologist on the project team.

2. Fisheries Monitoring. Scripps' MMRP will include monitoring and analysis of impacts on fish behavior, and if any significant impacts are determined (as defined using the CEQA criteria in the April 1995 Final EIR for the project), Scripps will modify or stop sound transmissions in the same manner as described for marine mammals and sea turtles in Appendix C to the Final EIR.

3. MMRP Advisory Board. Scripps will recommend to the MMRP Advisory Board that it be expanded by one member to include a fisheries biologist.

408 65 5334

Alex Mena

EXHIBIT NO.	26
APPLICATION NO.	
CC-110-94/3-95-40	
Scripps, ATOC California Coastal Commission	