Monterey Bay Aquarium Research Institute
Monterey Accelerated Research System (MARS) Project
Final Marine Mammal Monitoring Plan

February 17, 2006

Prepared for:

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1 Introduction and Background

The Monterey Bay Aquarium Research Institute (MBARI) Monterey Accelerated Research System (MARS) Project includes the installation of an advanced cabled observatory in Monterey Bay that will serve as the test bed for a state-of-the-art regional ocean observatory, currently one component of the NSF Ocean Observatories Initiative (OOI). The MARS cabled observatory will use new power and communication technologies to provide a remote, continuous, long-term, high-power, large-bandwidth infrastructure for multidisciplinary, in situ exploration, observation, and experimentation in the deep sea. MARS will be located in Monterey Bay within the boundaries of the Monterey Bay National Marine Sanctuary (MBNMS).

To facilitate oceanographic data collection in Monterey Bay, a science node containing eight scientific data ports would be installed on the sea floor. Each science port would be capable of providing electrical power and data transport in support of future experiments and data collection. Extension cables could be plugged in to any science port to provide power and communications up to 2.5 miles (4km) away from the node. The submarine cable would connect the node to shore facilities and provide power and the capacity to produce real-time data return and experiment control. Shore facilities would include a 16-foot long fiberglassbuilding or similar structure that would house the necessary equipment and electronics that can be used by scientists as portable laboratory space.

A Final Environment Impact Statement/Environmental Impact Report (EIS/EIR) was completed for the MBARI MARS Project in July 2005. The EIS/EIR contains a detailed description of the proposed project, purpose, and construction and operation activities.

2 Project Description

2.1 Overview

To facilitate oceanographic data collection in Monterey Bay, a science node containing eight scientific data ports would be installed on the sea floor. Each science port would be capable of providing electrical power and data transport in support of future experiments and data collection. Extension cables could be plugged in to any science port to provide power and communications up to 2.5 miles (4km) away from the node. The submarine cable would connect the node to shore facilities and provide power and the capacity to produce real-time data return and experiment control.

The Project has offshore and onshore segments and consists of a single submarine cable that would be laid between a shore station in Moss Landing and the science node that would be placed on the seabed on Smooth Ridge, approximately 31.7 miles (51 km) west-southwest of Moss Landing. The node would be located on the seabed at the end of the cable route and housed within a trawl-resistant bottom mount frame to secure it to the seabed. The trawl-resistant frame measures 14.8 feet (4.5 m) long, 11.7 feet (3.6 m) wide, and 4.2 feet (1.3 m) high, and would be deployed by the installation vessel along with the cable. The node would be deployed using a Remotely Operated Vehicle (ROV) after the trawl-resistant frame and cable have been installed.

The cable would be buried along approximately 76 percent of the route to a depth of 3.3 feet (1 m), where feasible. The cable would be buried using a hydraulically operated plow, which would be towed by a cable installation vessel. The plow would cut a narrow trench on the seafloor for the cable and bury the cable. In areas where this depth of burial is not achievable, the cable would be buried to the greatest depth possible. In areas where the cable cannot be buried with this method, the cable would be laid on the sea bottom and would be post-lay buried by jetting (a construction process that uses a high-pressure stream of water to excavate sediments) where feasible. Some portions of the cable would remain unburied due to hard seafloor substrate and exposed rocks.

The Applicant has contracted with Alcatel to lay the submarine cable. The Alcatel cable vessel Maersk Defender, or other equivalent vessel, would be utilized for the cable-laying operation. The Maersk Defender is a 315-foot (96-m), dy-

namically positioned ocean-going cable lay and repair vessel, which enables it to maintain position without the use of anchors. The vessel has twin main engines and propellers, two rudders, and full redundancy of equipment, allowing it to hold position or to continue working even in the event of an equipment failure. The vessel can remain at sea for approximately 32 days and is capable of operating in sea and weather conditions up to Beaufort 7 (include winds between 28 to 33 knots with wave heights between 13.5 to 19.0 feet [4.1 to 5.8 m]). The vessel is also equipped with an ROV to assist cable-laying activities with a safe working depth of 8,202 feet (2,500 m). The vessel is required to comply with all national and international regulations including ballast management, disposal regulations, safety management, and U.S. Coast Guard regulations during installation of the cable..

Prior to the main lay operation, a pre-lay grapnel run (PLGR) would be conducted along the proposed cable route. The intent of the PLGR is to attempt clearance of any seabed debris, such as wires, hawsers, abandoned fishing equipment, or other debris that may occur along the proposed route. Any debris recovered during these operations would be disposed onshore upon completion of the operations and disposed in accordance with applicable regulations.

The PLGR operation involves the towing of one or an array of grapnels along the length of the route to be plowed. The vessel proceeds at a rate that ensures the grapnel(s) maintain continuous contact with the seabed. The grapnel is usually a 'sliding prong' type, which can penetrate up to 15.7 inches (40 cm) into the sea-bed. The grapnel is connected to the towrope or wire by means of a length of 98.4 feet (30 m) of chain with a similar length of chain following the grapnel; the chain further assists in keeping the grapnel in contact with the seabed.

As the vessel moves along the route, the towing tension is monitored and the grapnel(s) is recovered if the tension increases indicating that an obstruction has been hooked. The grapnels are routinely recovered and inspected at minimum intervals of 9.3 miles (15 km) along the route. Usually, a single tow is made along the route but, in areas where other marine activity or debris amounts are high, additional runs may be necessary.

After the PLGR procedures are completed, cable installation would begin. Plow burial would occur along sections of the route containing suitable substrate conditions identified by the route and burial assessment surveys. A burial assessment survey was conducted to establish the burial depth and the level of cable armor necessary to protect the cable. Any surface-laid section of cable would be post-lay buried by jetting. Although the Applicant proposes to bury the cable to the maximum extent practicable, due to the presence of escarpments and carbonated substrate morphologies, a portion of the cable would not be buried.

At the shore-landing site, the cable would be placed in a buried steel pipeline that would be installed by horizontal directional drill (HDD) from the shore-landing site. The cable would join the HDD pipe at a location approximately 4700 feet

(1433 m) offshore at a depth of 50 feet (15.25 m). To bring the MARS cable to shore, a 5-inch (12.7-cm) diameter steel pipe would be installed underground that would extend out into Monterey Bay from the shore landing site. This pipe would serve as conduit for the MARS cable. The pipe would extend from the shore-landing site to a point on the seabed approximately 0.89 miles (1.4 km) to the northwest of the shore-landing site. The HDD exit point will be located at approximately 36º 48.75' N, 121º 48.05' W in the bay.

2.2 Plowing Operations

The plow would be deployed and recovered by means of an A-frame structure located at the stern of the vessel. A docking-frame assembly is used to minimize any excessive pendulum motion caused by vessel movement when the plow is being handled out of the water. The plow would be launched by lifting it from the working deck and moving the A-frame slowly outboard until the plow is clear of the stern; pay out would be continued until the plow is a few meters below the surface of the sea. At this stage, the plow systems would be checked prior to transferring the weight of the plow to the towline and carefully lowering the plow to the seabed. As the plow is lowered, the plow control umbilical with attached recovery line would be simultaneously paid out.

When the plow arrives on the seabed, the cable-laying vessel moves slowly forward paying out cable to maintain tension, and adjustments are made to the tow wire and umbilical line to achieve the optimum towing scope or 'layback' for the plow. While these adjustments are made, the plow remains stationary. Just prior to the start of plowing, the tow winch rendering is set to avoid excessive towing tensions.

As the plow starts to move, the plow skids would be raised (causing the share to dig deeper into the seabed) and the depressor arm would be lowered until the required burial depth is achieved. Cable would be paid out such that the cable reaches the seabed a few meters in front of the plow. This would result in minimal residual cable tension measured at the plow. During plow burial operations, there is typically a 6.6-foot (2-m)-wide area of disturbance along the installation route. The plow to be used for installation is capable of burial to 3.6 feet (1.1 m), down slopes of up to 12 degrees, and up slopes in excess of 30 degrees.

When the end of the plowed section is reached, the skids are lowered and the depressor arm is raised causing the burial depth to be reduced to a minimum. The cable-laying vessel is stopped and the towing scope is reduced while simultaneously recovering the umbilical and attached recovery line. When the plow lifts clear of the seabed, the cable-laying vessel would move ahead very slowly as the plow is raised to the surface. Lay cable is paid out to maintain appropriate tension. The plow would be held at a point just below the surface while the recovery line is attached to the lift wire, which passes over a sheave at the top of the A-frame. The plow is then raised on the recovery/lift line to engage in the docking frame. Finally, the A-frame is moved inboard, and the plow is lowered to the vessel's deck.

The plow is primarily intended for use in simultaneous lay and bury operations. For simultaneous lay and burial, the lay cable touches down on the seabed ahead of the plow. As the plow moves forward, it picks the cable up off the seabed and buries it. This technique is made possible by the steering mechanism, which allows the plow to track along the cable without moving it sideways across the seabed. Cables with a low submerged weight may be laid directly into the bell mouth at the front of the plow. In this mode of operation, the plow is deployed and recovered with the lay cable passing through the plow and with the tow cable and umbilical connected. The system is diver-less in normal operation. Post-lay burial operations would require the use of an ROV or divers to load and unload the cable on the seabed.

2.3 Trawl-Resistant Node Frame Deployment

The cable would most likely be installed from the shore-landing site towards the sea. The plow would be retrieved when the main cable-laying vessel gets to within 2 km of the science node installation point. The main lay vessel would then surface lay the cable and deploy the trawl-resistant node frame on the end of a ground rope and continue surface laying the ground rope. When the trawl-resistant frame is on the seabed, an acoustic release would be activated which would part the ground rope just above the seabed.

After the cable and the trawl-resistant node frame have been deployed, the Research Vessel Point Lobos would lower the science node onto the ocean floor near the trawl-resistant node frame. An ROV would then latch onto the science node, lift it, and then lower it into the trawl-resistant node frame. The ROV would then attach the underwater mateable connectors between the node and the trawl-resistant node frame to allow the node electronics to be connected to the shore through the cable.

2.4 MARS Instrumentation

It is not possible to predict or describe all of the instrumentation that may be used on the MARS Observatory during its lifetime. Scientists and engineers would submit proposals regularly to design and test new instrumentation and data collection methods. A description of typical instrumentation currently in use as part of MBARI research within the MBNMS, and instrumentation that may be used for research and data collection in the future as part of the MARS Project, is provided in the EIS/EIR.

2.5 Horizontal Directional Drilling (HDD)

HDD would be used to install an underground conduit, consisting of a 5-inch diameter steel pipe from shore to a point below the seafloor approximately 0.89 miles (1.4 km) offshore at a depth of 50 feet (15.25 m). HDD is a highly specialized boring technique that would be used to drill an arc that would travel under Monterey Bay from the landing site to the location of the buried undersea cable. Lubrication containing water and bentonite clay, referred to as drilling mud or fluid, would be used to aid the drilling. Bentonite is a non-toxic, inert substance

that provides a number of critical functions in HDD operations, including the removal of suspended solids from the borehole, cooling the drill head, and filling the annulus space in the surrounding soils. The steel conduit in which the fiber optic cable would be placed would be advanced in sections through the borehole as it is created.

Before the HDD operation begins, the entry and exit points would be established and relative elevations and drill distances surveyed and verified. During this operation, any existing subsurface obstructions in the area, including the location of all utility crossings, would be identified and marked. Where possible, the locating grid would be placed along the entry portion of the drill path to verify the position of the drill head during drilling operations. At the proposed exit point (i.e., where the HDD operation proposes to "daylight" on the seabed offshore), a marine support crew would set a buoy at the exit coordinate, and this distance would then be measured and verified. The depth of the drill path recommended by the HDD contractor is -90 feet (27 m) to -100 feet (30 m) below sea surface level. This depth would result in a drill path approximately 56 feet (17 m) below the sea floor and is intended to hinder the release of drilling mud to the surface while remaining above unknown subterranean formations that may occur at greater depths.

The proposed staging area for the HDD operation is located on the south side of the entry channel to Moss Landing Harbor near the north end of Sandholdt Road. After mobilization and preparation of the drill rig, support equipment, and verification of relevant permit requirements, HDD operations would begin. Drilling activities would be conducted 12 hours a day and continue until the bore has been completed. The Applicant anticipates HDD operations would be completed within 13.5 days.

As the drill stem approaches the exit point on the ocean floor, the drilling conditions would be monitored to determine the exact location of the drill head in relation to the exit point. The actual bore exit would be identified by the drill crew when the bottom-hole assembly is no longer supported by the soil and the angle of the drill string changes dramatically. A marine support crew would be dispatched to dive on the exit to verify the exit point. Once the exit has been verified, an on-site inspector would be given the true offshore exit coordinate for approval.

2.6 Remove Bottom-hole Assembly

Once the exit location has been approved, divers would jet down through the sediment to a point approximately 1 foot above the sea floor and cut off the drill steel at the desired depth using underwater cutting equipment. Once the pipe is cut and the end of the pipe has been de-burred to remove any sharp edges, the guidance wire would be removed and a pipe pig attached to an aircraft cable would be installed at the onshore end of the drill pipe. The pipe pig would be hydraulically pushed through the drill pipe with fresh water with the cable trailing the pig. This removes any remaining drilling fluids, proofs the pipe, verifies the

inside of the pipe is clean, and provides a cable for pulling the fiber optic cable through the drill pipe. A "Tide Flex" check valve and a bell mouth would be installed on the offshore end of the drill and any extra cable would be pushed into the land portion of the drill pipe. The cable would be tied off to a cap that would be placed on the land portion of the drill pipe. A locator ball would be placed above the cap and the pipe would be buried according to specification. The locating ball would be used to relocate the pipe casing prior to installation of the fiber optic cable.

2.7 Operation

Routine operation of the Project would consist of the ongoing installation, monitoring, and removal of various types of scientific equipment and instrumentation deployed on the seabed within a 2.5-mile (4-km) radius of the science node. Equipment would be handled using ROVs and day vessels belonging to the Applicant. Research equipment and instrumentation would be attached to the ports on the science node and supplied with power and data transmission capabilities to shore. The types of equipment that would be deployed over the life of the Project cannot be accurately predicted at this time, as specific research will require the development of specific instrumentation. At any one time, multiple pieces of equipment could be connected to the science node. Schedules for installation and removal of this equipment and durations of these activities will be project dependent and cannot be predicted at this time.

2.8 Maintenance and Repairs

The communications and power electronic components are housed within the central node that can be accessed and removed without disturbing the trawl-resistant frame and buried cable. The node can be removed using the Applicant ROV's and brought to the surface and transported to the Applicants onshore facilities for maintenance as required. Inspections of the highest risk areas of the cable route would be conducted 2 years after installation and thereafter, every 5 years. High-risk areas include: near the HDD entrance pipe near shore, the unburied section on the neck of Smooth Ridge and near the node. Additionally, selected locations on the shelf will also be inspected. If the cable were found to be unburied in sections that where previously buried, the cable would be re-buried if there were a serious risk to cable damage if left unburied. Our geologists have indicated that we are in a period of sediment build up on the shelf, so it is unlikely that the cable will become unburied over its lifetime. Inspections will also be conducted if a loss of power or communications is detected to or from the node, or if fishing gear is reported lost in the cable route vicinity.

Diagnostics within the power system and other optical measurements allow for the location of specific faults along the cable route and repairs would be undertaken via the Applicants vessels. The cable will be repaired using a cable laying vessel by retrieving the damaged section with a grapnel and brining it on board the vessel without cutting the cable whenever possible. The cable with then be lowered and buried to the extent possible using a ROV jetting tool. If the repair cannot be conducted without cutting the cable, the cable will be cut, and each end

brought on board the vessel for diagnostic measurements. Following any repairs, the cable would then be lowered back on to the submarine surface and buried to the extent possible using the ROV jetting tool. The repaired area would then be inspected using ROV's to determine the extent of burial achieved.

2.9 Decommissioning and Removal

It is projected that the submarine cable, node, and trawl-resistant frame will have a life expectancy of 25 years. At the end of the Projects life, the cable, node, and trawl-resistant frame will be removed. Removal activities would likely require the use of shipboard winches. Marine vessels and ROVs would be used for cable excavation, sectioning, and retrieval. Any sections of cable that were substantially encrusted or overgrown and effectively "cemented" to the bottom in hard bottom areas would be recovered to the extent possible. Cable that was laid inside conduit would be drawn from the shoreline onto a cable reel. Complete cable removal activities would require approximately 20 days.

2.10 Construction Schedule

Construction of the Project includes several components, including trenching for cable burial, installation of the cable landing pipe by HDD, and construction of onshore facilities. HDD activities are schedule to commence in March 2006. Installation of the ocean cable would occur 24 hours per day and is scheduled to occur sometime between September and December 2006. The total estimated installation time for cable laying is approximately 10-14 days, including considerations for inclement weather.

After mobilization and preparation of the drill rig, support equipment, and verification of relevant permit requirements, HDD operations would begin. Drilling activities would be conducted 12 hours a day and continue until the bore has been completed. The Applicant anticipates HDD operations would be completed within 13.5 days.

3 Regulation Pertaining to Marine Mammals

3.1 The Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) (16 U.S.C. 1362), subject to limited exceptions, prohibits any person or vessel subject to the jurisdiction of the United States from "taking" marine mammals in the United States or on the high seas without authorization. "Taking," which includes any harm or harassment, is defined in Section 3 of the MMPA as "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill any marine mammal. The term "harassment" means any act of pursuit, torment, or annoyance that has the potential to:

- Injure a marine mammal or marine mammal stock in the wild; or
- Disturb a marine mammal stock in the wild by causing disruption of the behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

Section 101(a)(5) of the MMPA directs the Secretary of the Department of Commerce to allow, upon request, the incidental (but not intentional) taking of marine mammals by US citizens who engage in a specified activity (exclusive of commercial fishing) within a specified geographical region if certain findings are made and regulations are issued. Permission may be granted by the Secretary for the incidental take of marine mammals if the taking will: (1) have a negligible impact on the species or stock(s); and (2) not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses. Regulations must be issued setting forth the permissible methods of taking and the requirements for monitoring, mitigating measures, and reporting such taking. Under the incidental take regulations the monitoring program must verify the nature and amount of taking by the activity is consistent with the taking authorized.

3.2 Endangered Species Act

The Endangered Species Act (ESA) provides for the listing of endangered and threatened species of plants and animals as well as the designation of critical habitat for listed animal species. The ESA prohibits the taking of any endangered species without (for federal agencies) an incidental take authorization. The definition of "taking" includes injury and harassment. The ESA also requires federal agencies to exercise their authorities, in consultation with designated agencies (in effect, the USFWS and NOAA Fisheries, as appropriate), to conserve endangered

species. It further requires federal agencies to consult with these agencies on any action that may jeopardize the continued existence of any threatened or endangered species, which has been interpreted by regulation to require consultation for any action that "may affect" such species. For actions that may adversely affect species, the regulatory agencies may recommend mitigation. Such mitigation is required if an agency action would otherwise jeopardize the species existence, and it may be required if agency action will result in a take and, therefore, require an incidental take authorization.

This EIS will serve as the basis for the development of a Biological Assessment, required under the ESA, for endangered or threatened marine and terrestrial species and their critical habitats. Upon completion of the EIS consultation with NOAA Fisheries and FWS will be initiated. Based on information in the Biological Assessment, NOAA Fisheries and FWS will provide a Biological Opinion on whether the proposed action would be likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. That Biological Opinion may include an incidental take statement if the proposed action will result in any takes of listed species.

4 Marine Mammal Species of Concern

The MBNMS has one of the most diverse and abundant assemblages of marine mammals in the world, including nine federally listed threatened or endangered species. Additionally, many other marine mammal species protected under the MMPA occur in the Project area, including six species of pinnipeds, one species of fissiped, and multiple species of cetacean.

Large species of whales are typically more abundant during summer and fall months, specifically July through November. However, gray whales are the exception, usually migrating southward between December and February, and northward between February and May. Generally dolphins are present in the area year-round, but are less abundant February through July. Any state or federal listed threatened or endangered species are discussed further below.

Table 4-1 Pinnipeds known to occur within the MBNMS

Common Name	Species Name	Status
northern elephant seal	*Mirounga angustirostris*	
harbor seal	*Phoca vitulina*	
California sea lion	*Zalophus californianus*	
Steller sea lion	*Eumetopias jubatus*	FT
northern fur seal	*Callorhinus ursinus*	D
Guadalupe fur seal	*Arctocephalus townsendi*	FT, ST
northern elephant seal	*Mirounga angustirostris*	

Source: De Vogelaere, A., S. Benson. 2000, http://bonita.mbnms.nos.noaa.gov/research/techreports/trmarinemammal.html

Table 4-2 Cetaceans known to occur within the MBNMS

Common Name	Species Name	Status
blue whale	Balaenoptera musculus	FE
fin whale	Balaenoptera physalus	FE
sei whale	Balaenoptera borealis	FE
minke whale	Balaenoptera acutorostrata	
Humpback whale	Megaptera novaeangliae	FE

Table 4-2 Cetaceans known to occur within the MBNMS

Common Name	Species Name	Status
California gray whale	Eschrichtius robustus	
Northern Pacific right whale	Eubalaena glacialis	FE
sperm whale	Physeter macrocephalus	FE
pygmy sperm whale	Kogia breviceps	
dwarf sperm whale	Kogia simus	
Baird's beaked whale	Berardius bairdi	
Cuvier's beaked whale	Ziphius cavirostris	
Hubbs' beaked whale	Mesoplodon carlhubbsi	
short-finned pilot whale	Globicephala macrorhynchus	
killer whale	Orcinus orca	
false killer whale	Pseudorca crassidens	
Pacific white-sided dolphin	Lagenorhynchus obliquidens	
northern right whale dolphin	Lissodelphis borealis	
Risso's dolphin	Grampus griseus	
short-beaked common dolphin	Delphinus delphinus	
long-beaked common dolphin	Delphinus capensis	
Bottlenose dolphin	Tursiops truncatus	
striped dolphin	Stenella coeruleoalba	
Dall's porpoise	Phocoenoides dalli	
harbor porpoise	Phocoena phocoena	

Source: De Vogelaere, A., S. Benson. 2000, http://bonita.mbnms.nos.noaa.gov/research/techreports/trmarinemammal.html

Table 4-3 Fissipeds known to occur within the MBNMS

Common Name	Species Name	Status
southern sea otter	Enhydra lutris	FT

Source: De Vogelaere, A., S. Benson. 2000, http://bonita.mbnms.nos.noaa.gov/research/techreports/trmarinemammal.html

4.1 Threatened and Endangered Species of Marine Mammals

Blue Whale

Blue whales may move along the entire California coastline during fall searching for euphausiid prey. Euphausiid swarms are often seen in great concentrations in Monterey Bay and blue whales have been observed feeding on dense swarms near Monterey and the Farallones. Blue hale are a federal endangered species.

Fin Whale
Fin whales are federally listed as endangered, but were once one of the most abundant of the large whales. Current counts suggest that a mere 80,000 animals remain worldwide with between fifty and several hundred in the MBNMS. Fin whales within the MBNMS range throughout the boundaries from April through September and commonly feed on krill associated with upwelling at the boundaries of offshore currents.

Sei Whale
Sei whales are a federal endangered species. They occur only rarely in California waters, with estimates of only 56 individuals during surveys off the coasts of California, Oregon, and Washington (Caretta et al. 2004).

Humpback Whale
Humpback whales are a federal endangered species. They are one of the most common large baleen whales seen in the MBNMS, though California estimates are significantly lower than those for blue whales. Humpback whales are seen most frequently off central California during fall; feeding, primarily on euphausiid prey around the Farallon Islands. Most evidence indicates that the humpback whales feeding off California have moved north from areas used during winter off Mexico.

Northern Pacific Right Whale
The Northern Pacific right whale is one of the rarest mammals in the world. The three most recent sightings of the Northern Pacific right whale south of Alaska have occurred in the MBNMS, two of which occurred in the last four years. The entire region is considered to be within the whales' range. Right whales within the MBNMS range throughout the Sanctuary boundaries from October through March. Northern Pacific right whales are a federal endangered species.

Sperm Whale
Sperm whales are a federal endangered species. It is not frequently reported in the MBNMS, although it is the most abundant large whale in the eastern North Pacific. Areas of deep water, where they often are associated, are infrequently surveyed and many of the sperm whales observed are typically noted greater than 30 km from shore and in the vicinity of the MBNMS. Sperm whales do at times occur relatively close to shore in the MBNMS because of the deep water associated with the Monterey Canyon.

Stellar Sea Lion
The Stellar sea lion is a federal threatened species. In California, many were historically known to occur on Año Nuevo Island, Point Lobos State Reserve, and the Farallon Islands. Año Nuevo Island is now the southernmost breeding area for this species, and they are rarely seen at other haul-out sites in the MBNMS.

Guadalupe Fur Seal

The Guadalupe fur seal is listed as both a federal and state threatened species. It is the only pinniped listed that occurs infrequently in the MBNMS. This species breeds on Guadalupe Island off Mexico.

Southern Sea Otter

The southern sea otter is a federal threatened species that may occur along the nearshore portions of the cable route. The sea otter's broader range extends from the Gaviota Coast in Santa Barbara County to Half Moon Bay in San Mateo County. Sea otters inhabit a narrow zone of coastal waters, normally staying within one mile of shore. They are seldom found in open waters deeper than thirty meters (100 feet), preferring instead the kelp beds, which serve as resting, foraging, and nursery sites.

5 Potential Impacts

Marine mammal could potentially be affected by the proposed Project. Potential impacts include the disturbance of marine mammals due to noise associated with cable laying activities and an increase in risk that a large marine mammal might become entangled in an anchor line or be hit by a vessel due to construction activities and associated vessel traffic. However, no entanglement of marine mammals has been documented during cable laying operations. Marine mammals tend to avoid vessels and areas of human activity and would be unlikely to approach the Project area during construction activities. Other potential impacts include noise disturbances from the cable laying operations, and contact with oil from an accidental fuel spill.

6 Mitigation Measures and Marine Mammal Monitoring

The Project Applicant has committed to implementing the following measures to avoid or minimize any potential impacts to marine mammals during construction and operation activities for the MARS Project. This section describes the procedures that shall be followed by all vessel crew members and marine mammal monitors on all MARS vessels during all construction activities.

6.1 Marine Mammal Observers

Two trained marine mammal monitors approved by the Executive Director in consultation with the NOAA Marine Fisheries Service ("NOAA Fisheries") shall be onboard the cable installation vessel (including repair and maintenance operations), the post-lay inspection vessel, burial vessels, and other support vessels at all times (alternating work shifts of a maximum of 4 hours each) to monitor for marine wildlife in the work area during all installation activities.. Additionally, two trained marine wildlife monitors approved by the Executive Director in consultation with NOAA Fisheries shall be onboard all vessels used for retrieval of entangled fishing gear, and for any routine inspection surveys. Prior to commencing any construction activities, marine mammal watches (or shifts) will be scheduled and assigned, and all monitoring and mitigation procedures shall be observed.

At least 10 days prior to the commencement of cable installation operations, the applicant shall provide to the approved marine mammal monitors a document compiling all marine mammal mitigation measures that have been required of the applicant by the responsible agencies.

6.2 Marine Mammal Observer Training

Prior to commencing construction activities, all marine mammal monitors shall be familiar with the Project, related proposed activities, and all monitoring and safety plans, including:

- The marine mammal monitoring plan for the project;
- Marine mammal sighting, identification and distance estimation methods;
- Marine mammal “safety zone” of 500 meters;

- Operation of specialized equipment (reticle binoculars, night vision devices and GPS systems); and
- Data recording and data entry systems including procedures for recording marine mammal sightings, monitoring activities, environmental conditions, and entry error control.

6.3 Marine Mammal Observer Equipment

The monitors shall have the appropriate safety and monitoring equipment to conduct their activities. The applicant shall ensure that the monitors have a 360-degree view of all activities during all marine operations (*e.g.*, cable installation, post-lay inspection, burial, maintenance and repair, retrieval of entangled fishing gear, and inspection surveys). At a minimum the following equipment will be available for specific use by marine mammal observers:

- During daytime observations, all monitors shall use 7 x 50 reticulated binoculars;
- During nighttime observations or as appropriate for low-light observations, all monitors shall use nighttime vision equipment;
- GPS equipment (for location recording); and
- Rangefinder (to test and improve observer ability to estimate distances).

6.4 Commencement of Cable Lay Operations

- Prior to commencement of cable-lay operations, the monitors shall set a 500-meter safety zone around the vessel for the protection of marine mammals;
- Marine mammal monitors shall have the authority to stop any activity if it appears likely that a marine mammal could enter the safety zone;
- Two marine mammal monitors will make a visual survey for 30 minutes prior to commencing construction activities to ensure that no marine mammals are present within the safety radius established; and
- Once the area around the vessel is determined to be free of marine mammals, the cable-lay activities may commence.

6.5 Marine Mammal Sightings

The marine mammal monitors shall determine and report the following details of any marine mammal sighting:

- Bearing and distance to mammal;
- Identification of species;
- From bearing and distance, the perpendicular distance to ship track will be computed;

- The vessel pilot shall be advised immediately of all marine mammal sightings during construction activities; and
- The marine mammal monitor and vessel pilot shall plot current ship track and marine mammal position(s) to determine the estimated closest approach to the mammal.

6.6 Marine Mammal Evasion Procedures

If a marine mammal is sited, the position of the marine mammal(s) shall be determined regularly by the marine mammal observer to determine its current and projected location with relation to the ship. If appropriate to vessel capabilities, and time permits, the marine mammal monitor shall consult with the vessel pilot to determine if evasive maneuvers (change in course, change in speed) can be taken to avoid the observed marine mammal.

If a marine mammal approaches the 500-meter (1,640 foot) "safety zone"), or the monitor determines that project operations have the potential to threaten the health or safety of marine wildlife or "take" a protected species as defined by regulations implementing the federal Endangered Species Act (50 CFR § 222.102) and the Marine Mammal Protection Act (50 CFR § 216.3), the monitors shall have the authority to order cessation of all project operations until the monitors determine there is no longer a threat and/or the animal(s) transits the area. The vessel pilot or captain shall comply with this order as soon as it safe to do so and for as long as the order remains in effect.

If environmental conditions (*e.g.*, high sea state, fog) preclude monitors from seeing out to at least one nautical mile, the monitors shall require personnel aboard work and support vessels to maintain heightened vigilance for an approaching marine mammal. If environmental conditions preclude the monitors from seeing within the 500-meter (1,640 foot) safety zone, the monitors shall have the authority to order cessation of all project operations until visual conditions improve. The vessel captain or pilot shall comply with this order as soon as it is safe to do so and for as long as the order remains in effect.

6.7 Reporting

For all marine mammal sightings, the marine mammal monitor shall determine and report the following details to the required agencies:

- Location, and bearing and distance to mammal from the vessel;
- Direction of marine mammal travel;
- Identification of species;
- Monitors shall fax (or send electronically, as appropriate) a daily sighting report to NOAA Fisheries and FWS. The report shall contain a summary of daily activities, weather conditions, and information as described above for all marine mammal sightings;

- MBARI shall immediately contact The Marine Mammal Center for assistance should a marine mammal be observed to be in distress;
- In the event that a whale becomes entangled in any cables or line, the monitor shall immediately notify The Marine Mammal Center and all required agencies (as provided in Table 6.7-1 below), so appropriate response measures can be implemented. Similarly, if any take involving harassment or harm to a marine mammal occurs, the monitor shall immediately notify the required regulatory agencies; and
- Within 30 days of the last day of all marine operations that require marine mammal monitors onboard a vessel(s) the applicant shall submit to the Executive Director and NOAA Fisheries a marine mammal monitoring report prepared by the approved marine mammal monitors. The report shall include: (a) an evaluation of the effectiveness of monitoring protocols and (b) reporting of (i) marine mammal and other wildlife sightings (species and numbers); (ii) any wildlife behavioral changes that may have been attributable to project operations; and (iii) any project delays or cessation of operations due to the presence in the project area of marine wildlife species.

Table 6.7-1. Important Contact Information

Agency or Organization	Address	Phone Numbers
The Marine Mammal Center	Monterey Bay Operations PO Box 778 Moss Landing, CA 95039	Rescue:(831) 633-6298 Ph: (415) 289-7325
NOAA's National Marine Fisheries Service Monica DeAngelis Marine Mammal Biologist	Southwest Region Protected Resources Division 501 W. Ocean Blvd., Suite 4200 Long Beach, CA 90802	Ph: (562) 980-3232 Fax: (562) 980-4027
U.S. Fish and Wildlife Service David M. Pereksta Assistant Field Supervisor	Ventura Fish and Wildlife Office 2493 Portola Road, Suite B Ventura, California 93003	Ph: (805) 644-1766 Fax: (805) 644-3958
California Coastal Commission Alison J. Dettmer Manager	Energy & Ocean Resources Unit 45 Fremont Street, Suite 2000 San Francisco, California 94105	Ph: (415) 904-5205 Fax: (415) 904-5400

7 References

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