APPENDIX 1

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

Monterey Bay National Marine Sanctuary
299 Foam Street
Monterey, CA 93940

MONTEREY BAY NATIONAL MARINE SANCTUARY RESEARCH PERMIT

Permittee:
Dr. Marcia McNutt
Monterey Bay Aquarium Research Institute
7700 Sandholdt Road
Moss Landing, CA 95039

Permit Number: MBNMS-2007-030
Effective Date: March 6, 2008
Expiration Date: December 31, 2010

Project Title: Monterey Accelerated Research System (MARS) supplemental research projects not analyzed in the EIR/EIS

This permit is issued for activities in accordance with the National Marine Sanctuaries Act (NMSA), 16 USC §1431 *et seq.*, and regulations thereunder (15 CFR Part 922). All activities must be conducted in accordance with those regulations and law. No activity prohibited in 15 CFR Part 922 is allowed except as specified in the activity description below.

Subject to the terms and conditions of this permit, the National Oceanic and Atmospheric Administration (NOAA) National Marine Sanctuary Program hereby authorizes the permittee listed above to conduct research activities within Monterey Bay National Marine Sanctuary (MBNMS or sanctuary). All activities are to be conducted in accordance with this permit and the permit application received February 22, 2008. The permit application is incorporated into this permit by reference; provided, however, that if there are any conflicts between the permit application and the terms and conditions of this permit, the terms and conditions of this permit shall be controlling.

PERMITTED ACTIVITY DESCRIPTION:

The following activities are authorized by this permit:
The installation, monitoring, use, continued placement, maintenance, repair, and removal of scientific equipment upon the seafloor for use in conjunction with the existing Monterey Accelerated Research System (MARS) cable. The following projects, (not described in the original EIR/EIS for the cable project) are approved herein:

Eye-In-The-Sea (EITS)
Benthic Rover
Sedimentation Sensor/Time-Lapse Camera System
Deep-Sea Environmental Sample Processor (D-ESP)
Free Ocean CO2 Enrichment (FOCE) System
A Smart Sensor Web for Ocean Observation: System Design, Modeling, and Optimization
Monitoring pelagic biomass fluxes in Monterey Bay
No further disturbance of the cultural or natural resources of the sanctuary is allowed.

PERMITTED ACTIVITY LOCATION:

The permitted activity is allowed only in the following location(s):
These projects will be connected to the trawl resistant science node at the end of the MARS cable, or conducted within the localized vicinity of the cable.

In addition to the terms above, the following terms and conditions apply to this permit:

SPECIAL CONDITIONS:

1. Authorized activities may be conducted from March 6, 2008 through December 31, 2010. All equipment shall be removed no later than the expiration date of this permit. The permittee may request an amendment from the MBNMS Superintendent in advance of this expiration date, to extend the effective date of this permit.

2. Permitted activities shall be limited to the following:
   a) The installation, maintenance, and recovery of individual scientific instruments, moorings, and anchors, related to MARS cable research projects, including instrumentation known as: Eye-In-The-Sea (EITS); Benthic Rover; Sedimentation Sensor/Time-Lapse Camera System; Deep-Sea Environmental Sample Processor (D-ESP); Free Ocean CO2 Enrichment (FOCE) System; A Smart Sensor Web for Ocean Observation: System Design, Modeling, and Optimization; and Monitoring Pelagic Biomass Fluxes in Monterey Bay.
   b) The discharge of twenty liters of liquid carbon dioxide (CO_2) to be combined with seawater, to be released at four intervals per year, for a total volume of carbon dioxide not to exceed 80 liters per calendar year. An equal amount of non-toxic chemicals or tracer dyes may be released as part of this experiment.
   c) Seabed alteration, including the operation of scientific equipment upon the seafloor and coring of the seabed to collect benthic samples; sediments, and non-commercial rocks.

3. The equipment and support structures authorized by this permit shall only be used in accordance with the methods and objectives identified in the permit application cited above. Disturbance of any other Sanctuary resources is prohibited.

4. All equipment authorized for installation under this permit shall be removed when such equipment is no longer in use, or sooner if directed by the MBNMS Superintendent if such equipment is causing or may cause unacceptable harm to Sanctuary resources or qualities. Intentional abandonment of equipment or any item is prohibited.

5. In the event that any scientific equipment are damaged or dislocated due to weather or any other cause, the permit holder shall use all reasonable means available to the permit holder to locate and recover the affected item(s).

6. To the extent practicable, anchors and anchoring devices shall be recovered from the Sanctuary. For logistical reasons, anchors weighing more than 500 pounds, which are deemed unrecoverable, may be left in place. The location and description of any anchor

abandoned in the Sanctuary shall be noted in the summary report with an explanation why the equipment was not recovered.

7. No activity authorized by this permit shall disturb or impact any historical or marine archaeological resources of the Sanctuary. If historical or marine archaeological resources are encountered at any time, the permit holders shall cease all further activities under this permit and immediately contact the Sanctuary Superintendent.

8. MBARI shall submit a final summary report of all activities conducted under this permit to the individuals listed in General Condition #2 no later than December 1st of each year that this permit is valid. The report must include information regarding daily activities such as location of research activities, techniques employed, problems encountered, installation and removal techniques employed; equipment maintenance, loss, or replacement; archaeological disturbance; discharge of expendable devices; accidental or unauthorized discharges/deposits of matter into the Sanctuary; or any other significant occurrence throughout the permit period, etc. The annual report shall include a synopsis of research results to date, as well as any proposed future projects. In addition, MBARI shall deliver a synthesized presentation to key MBNMS staff in the Fall of each year this permit is valid. This presentation should highlight the previous year's research as well indicate any upcoming projects that would require consideration under the MBNMS permit.

GENERAL CONDITIONS:

1. Within 30 (thirty) days of the date signed by the sanctuary official the permittee must sign and date on the appropriate line below for this permit to be considered valid. Once signed and dated, the permittee must ensure that the persons listed below each receive a signed original within 35 (thirty-five) days of the date signed by the sanctuary official:

Deirdre Hall
Permit Coordinator
Monterey Bay National Marine Sanctuary
299 Foam Street
Monterey, CA 93940

David Bizot
National Permit Coordinator
NOAA National Marine Sanctuary Program
1305 East-West Highway (N/ORM6)
Silver Spring, MD 20910

2. It is a violation of this permit to conduct any activity authorized by this permit prior to the sanctuary official having received a permit with the permittee's original signature on the appropriate line below. The permittee must contact the sanctuary office to ensure the requisite documentation has been received before conducting any activity authorized by this permit.

3. This permit may only be amended by the National Marine Sanctuary Program. The permittee may not change or amend any part of this permit at any time. The terms of the permit must be accepted in full, without revision; otherwise, the permittee must return the permit to the sanctuary office unsigned with a written explanation for its rejection. Amendments to this permit must be requested in the same manner the original request was made.

4. All persons participating in the permitted activity must be under the supervision of the permittee, and the permittee is responsible for any violation of this permit, the NMSA, and sanctuary regulations for activities conducted under, or in junction with, this permit. The permittee must assure that all persons performing activities under this permit are fully aware of the conditions herein.

5. This permit is non-transferable and must be carried by the permittee at all times while engaging in any activity authorized by this permit.

6. This permit may be suspended, revoked, or modified for violation of the terms and conditions of this permit, the regulations at 15 CFR Part 922, the NMSA, or for other good cause. Such action will be communicated in writing to the applicant or permittee, and will set forth the reason(s) for the action taken.

7. This permit may be suspended, revoked or modified if requirements from previous National Marine Sanctuary Program permits or authorizations issued to the permittee are not fulfilled by their due date.

8. Permit applications for any future activities in the sanctuary or any other sanctuary in the system by the permittee might not be considered until all requirements from this permit are fulfilled.

9. This permit does not authorize the conduct of any activity prohibited by 15 CFR § 922, other than those specifically described in the "Permitted Activity Description" section of this permit. If the permittee or any person acting under the permittee's supervision conducts, or causes to be conducted, any activity in the sanctuary not in accordance with the terms and conditions set forth in this permit, or who otherwise violates such terms and conditions, the permittee may be subject to civil penalties, forfeiture, costs, and all other remedies under the NMSA and its implementing regulations at 15 CFR Part 922.

10. Any publications and/or reports resulting from activities conducted under the authority of this permit must include the notation that the activity was conducted under National Marine Sanctuary Permit MBNMS-2007-030-A1and be sent to the sanctuary official listed in general condition number 1.

11. This activity may also require permission from other agencies. The enclosed permit is not valid until all other necessary permits and/or authorizations are obtained. Any direct or incidental harassment of marine mammals requires a permit from the National Marine Fisheries Service (contact Monica DeAngelis at (562) 980-3232) and/or U.S. Fish and Wildlife Service (contact Dave Pereksta at 805-644-1766). Direct or incidental harassment of seabirds requires a permit from the U.S. Fish and Wildlife Service. Deployment of mooring or surface buoys may require authorization from the US Coast Guard (contact Brian Aldrich at 510-437-2983).

12. The permittee shall indemnify and hold harmless the National Marine Sanctuary Program, NOAA, the Department of Commerce and the United States for and against any claims arising from the conduct of any permitted activities.

13. Any question of interpretation of any term or condition of this permit will be resolved by NOAA.

Your signature below, as permittee, indicates that you accept and agree to comply with all terms and conditions of this permit. This permit becomes valid when you, the permittee, countersign and date below. Please note that the expiration date on this permit is already set and will not be extended by a delay in your signing below.

Marcia McNutt 3/10/08

Dr. Marcia McNutt — Date
President and CEO
Monterey Bay Aquarium Research Institute

3/6/08

for Paul Michel — Date
Superintendent
Monterey Bay National Marine Sanctuary

STATE OF CALIFORNIA—THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, *GOVERNOR*

CALIFORNIA COASTAL COMMISSION

45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE (415) 904-5200
FAX (415) 904-5400
TDD (415) 597-5885

November 8, 2007

Mandy Allen
Operations Administrator
Monterey Bay Aquarium Research Institute
7700 Sandholt Road
Moss Landing, CA 95039

RE: Monterey Bay Aquarium Research Institute (MBARI) Proposal for MARS Cable Experiments (CDP E-05-007/Consistency Certification CC-076-05)

Dear Ms. Allen:

On September 15, 2005, the Coastal Commission approved Coastal Development Permit E-05-007 and Consistency Certification CC-076-05 to install and operate a 31.7-mile long marine research fiber optic cable offshore of Moss Landing and within the Monterey Bay National Marine Sanctuary (called the "MARS" project). The project included placement in federal waters of an instrument node at the seaward end of the cable that provides power and data transmission to and from shore. The Commission's approval of the project did not include future attachment to the node of scientific instrumentation or additional cable.

By letter dated September 17, 2007, (as modified by e-mail dated October 30, 2007), MBARI proposes a number of MARS cable-related experiments that include placing additional structures on the seafloor. MBARI believes these experiments will not affect resources of the coastal zone. The proposed experiments are:

Eye-In-The-Sea (EITS)
The EITS is a deep-sea data collection system designed for connection to the MARS node to provide real-time *in-situ* measurements of deep-sea marine activity. The EITS will collect video, audio, bioluminescent activity and current data. In addition to a camera, the EITS will be equipped with a photomultiplier tube (PMT), bait deployment arms and a hydrophone. MBARI will deploy the EITS in February 2008 for six months. The base weighs 155 lbs. and functions as an anchor allowing the EITS to be removed for servicing without the need for anchor removal. MBARI will collect no specimens for this project.

Benthic Rover
MBARI proposes to deploy a Benthic Rover on MARS in spring 2008 for one year to conduct a diverse series of measurements at the deep-sea, sediment-water interface. These experiments will contribute to an understanding of biogeochemical cycling in the ocean. MBARI also proposes up to six autonomous deployments of the Benthic Rover, i.e., unconnected from the

MARS, to take place over the course of a year, as needed, to perfect systems of scientific data collection. All deployments will take place in the vicinity of the MARS note site.

Sedimentation Sensor/time-Lapse Camera
This system is a free vehicle array with a tethered, releasable flotation package. The array will consist of a camera and lights, a sedimentation sensor, a current meter, and a controller mounted on a titanium frame. At the seafloor, using the flotation package, the ROV *Ventana* will manipulate the system, placing it approximately 500 meters from the MARS node. Once the system is in place, the *Ventana* will connect it to the node. The array sits on the seafloor on four "feet" that will have a negligible effect on benthic habitat.

Cabled Free Ocean CO_2 Enrichment System (FOCE)
The FOCE is a system to supply CO_2-enriched seawater to the seafloor to study the effects of CO_2 enrichment of the oceans caused by increasing levels of CO_2 in the atmosphere. The purpose of the experiment proposed at this time is to design, fabricate and test such a system. MBARI will not attempt to measure effects on sea life, and expects to have no effects on sea life with this experiment. The ROV *Ventana* will deploy and test the components. No pure CO_2 liquid or gas will be discharged. CO_2 used to enrich the local seawater will not exceed 20 liters. The MBARI plans on three or four FOCE series in 2008 of two to four days duration.

Under the federal consistency procedures (15 CFR Section 930.65), the Commission reviews project modifications and any changed circumstances to determine whether a previously concurred-with activity remains consistent with the Coastal Act, or whether the modifications/changes render the project; (1) substantially different than originally described; and (2) no longer consistent with the applicable Coastal Act policies. Based on the information included in your submittals, the Coastal Commission staff agrees with MBARI that the experiments would not affect the coastal zone, and that, as modified, the originally concurred-with activity remains consistent with the applicable Coastal Act policies.

If you have any questions, please call me at 415-904-5205.

Sincerely,

Alison Dettmer
Deputy Director
Energy, Ocean Resources and Federal Consistency Division

cc: Santa Cruz District Office
MBNMS (Deirdre Hall)
State Lands Commission (Sue Young)

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105- 2219
VOICE (415) 904- 5200
FAX (415) 904- 5400
TDD (415) 597-5885

November 30, 2007

Mandy Allen
Operations Administrator
Monterey Bay Aquarium Research Institute
7700 Sandholt Road
Moss Landing, CA 95039

RE: Monterey Bay Aquarium Research Institute (MBARI) Proposal for MARS Cable Experiment (CDP E-05-007/Consistency Certification CC-076-05) - Additional Approval for Deep-Sea Environmental Sample Processor (D-ESP) Experiment in 2008

Dear Ms. Allen:

On September 15, 2005, the Coastal Commission approved Coastal Development Permit E-05-007 and Consistency Certification CC-076-05 which allowed the Monterey Bay Aquarium Research Institute (MBARI) to install and operate a 31.7-mile long marine research fiber optic cable offshore of Moss Landing and within the Monterey Bay National Marine Sanctuary. The project included placement in federal waters of an instrument node at the seaward end of the cable that provides power and data transmission to and from shore as part of the Monterey Accelerated Research System (MARS) program.

On November 8, 2007, Coastal Commission staff issued a letter of approval for the following projects proposed as part of the MARS program in 2008: Eye-In-The-Sea (EITS), Benthic Rover, Sedimentation Sensor/Time-Lapse Camera, and the Cabled Free Ocean CO_2 Enrichment System (FOCE). The Commission's approval of the above MARS projects for 2008 did not include the Deep-Sea Environmental Sample Processor (D-ESP) project, which MBARI also proposed; this letter shall serve to include the D-ESP project as part of the suite of MARS projects authorized by the Commission for 2008.

Deep-Sea Environmental Sample Processor (D-ESP)
The D-ESP is a metal alloy canister that will be deployed on the seafloor where it will collect water samples via membrane filtration and analyze particulate matter of the deep sea. The instrument, with attendant contextual sensors, will temporarily disturb approximately 2 m^2 of sea floor. MBARI expects to deploy the D-ESP in September 2008 and recover it in its entirety in March 2009.

Based on the information included in your MARS project submittal, the Coastal Commission staff agrees with MBARI that the D-ESP experiment would not affect the coastal zone, and that, as modified, the originally concurred-with activity remains consistent with the applicable Coastal Act policies.

If you have any questions, please call me at 415-904-5205.

Sincerely,

Alison Dettmer
Deputy Director
Energy, Ocean Resources and Federal Consistency Division

cc: Santa Cruz District Office
MBNMS (Deirdre Hall)
State Lands Commission (Sue Young)

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, GOVERNOR

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105- 2219
VOICE AND TDD (415) 904- 5200
FAX (415) 904- 5400

February 29, 2008

Linda Kuhnz
Monterey Bay Aquarium Research Institute (MBARI)
7700 Sandholdt Road
Moss Landing, California 95039-9644

RE: **Modifications to MARS Project (CDP E-05-007/CC-076-05) – Deployment of Smart Sensor Web and Simrad EK60 Echosounder**

Dear Ms. Kuhnz:

On September 15, 2005, the Coastal Commission authorized the above-referenced MBARI proposal to install and operate a 31.7 mile long marine research fiber optic cable offshore of Moss Landing and within the Monterey Bay National Marine Sanctuary. The project included placement in federal waters of an instrument node at the seaward end of the cable that provides power and data transmission to and from shore as part of the Monterey Accelerated Research System (MARS) program.

In letters dated February 13, 2008, and February 26, 2008, MBARI proposes to deploy as part of the MARS program a "Smart Sensor Web for Ocean Observation" and a Simrad EK60 echosounder seaward of the coastal zone boundary. This science experiments will make use of the existing MARS subsea mooring infrastructure. Under the federal consistency procedures (15 CFR Section 930.65), the Coastal Commission reviews project modifications and any changed circumstances to determine whether a previously-concurred activity remains consistent with the Coastal Act, or whether the modifications/changes render the project: (1) substantially different than originally described; and (2) no longer consistent with the applicable Coastal Act policies.

Based on the information included in MARS project submittals, the Coastal Commission staff agrees with MBARI that the deployment of this equipment would not affect the coastal zone, and that, as modified, the originally-concurred with activity remains consistent with the applicable policies.

If you have questions, please call me at 415/904-5205.

Sincerely,

ALISON DETTMER
Deputy Director
Energy, Ocean Resources and Federal Consistency Division