

EXHIBIT G

**California State Lands Commission Presurvey Notice Requirements for
Permittees to Conduct Geophysical Survey Activities**

All parts of the Presurvey Notice must be adequately filled out and submitted to the CSLC staff a minimum of twenty-one (21) calendar days prior to the proposed survey date to ensure adequate review and approval time for CSLC staff. Note that one or more of the items may require the Permittee to plan well in advance in order to obtain the necessary documentation prior to the Notice due date (e.g., permits from other State or Federal entities). Please use the boxes below to verify that all the required documents are included in the Presurvey Notice. If "No" is checked for any item, please provide an explanation in the space provided. If additional space is needed, please attach separate pages.

Please use the boxes below to verify that all the required documents are included in the Presurvey Notice. If "No" is checked for any item, please provide an explanation in the space provided. If additional space is needed, please attach separate pages.

- | Yes | No | |
|------------|--------------------------|--|
| X | <input type="checkbox"/> | Geophysical Survey Permit Exhibit F |
| X | <input type="checkbox"/> | Survey Location (including a full-sized navigation chart and GPS coordinates for each proposed track line and turning point)
Explanation: _____ |
| X | <input type="checkbox"/> | Permit(s) or Authorization from other Federal or State agencies (if applicable)
Explanation: _____ |
| X | <input type="checkbox"/> | 21-Day Written Notice of Survey Operations to Statewide Geophysical Coordinator/ |
| X | <input type="checkbox"/> | U.S. Coast Guard Local Notice to Mariners/ |
| X | <input type="checkbox"/> | Harbormaster and Dive Shop Notifications
Explanation: _____ |
| X | <input type="checkbox"/> | Marine Wildlife Contingency Plan
Explanation: _____ |
| X | <input type="checkbox"/> | Oil Spill Contingency Plan
Explanation: _____ |
| X | <input type="checkbox"/> | Verification of California Air Resources Board's Tier 2-Certified Engine Requirement
Explanation: _____ |
| X | <input type="checkbox"/> | Verification of Equipment Service and/or Maintenance (must verify sound output)
Explanation: _____ |
| X | <input type="checkbox"/> | Permit(s) or Authorization from California Department of Fish and Wildlife for surveys in or affecting Marine Protected Area(s) (if applicable).
Explanation: _____ |

NOTE: CSLC staff will also require verification that current biological information was obtained and transmitted as outlined in Section 5 of this permit.

EXHIBIT F

PRESURVEY NOTIFICATION FORM

Applicant/Permittee's Mailing Address:

Date: 4/25/2014

George Tate

Jurisdiction: Federal ____ State ____ Both X

USGS Pacific Coastal and Marine Geology

If State: Permit #PRC 8394

400 Natural Bridges Drive

Region: II

Santa Cruz, CA 95060

Area: Goleta to Pt. Sal, CA

GEOPHYSICAL SURVEY PERMIT

Check one: X New survey Time extension of a previous survey

U.S.G.S. Pacific Coastal and Marine Geology (Applicant/Permittee) will conduct a geophysical survey offshore California in the survey area outlined on the accompanying navigation chart segment. If you foresee potential interference with commercial fishing or other activities, please contact the person(s) listed below:

FEDERAL WATERS (outside 3 nautical miles)

- 1) Applicant's representative:
- 2) Federal representative: (e.g., Bureau of Ocean Energy Management [BOEM] or National Science Foundation [NSF])

NOTE: Any comments regarding potential conflicts in Federal waters must be received by the Applicant's Representative and lead Federal agency within ten (10) days of the receipt of this notice.

STATE WATERS (Inside 3 nautical miles)

- 1) Permittee's representative:
- 2) CSLC representative: Richard Greenwood

NOTE: Any comments regarding potential conflicts in State waters should be received as soon as possible by the Permittee's representative, no more than fifteen (15) days after the receipt of this notice.

1. Expected Date of Operation: July 17-August 2, 2014
2. Hours of Operation: 24 hours; 7AM to 7PM for sparker and magnetometer; 7PM to 7AM for magnetometer only (passive)
3. Vessel Name: R/V Shearwater
4. Vessel Official Number: NOAA Hull# R6201, MMSI 366875280
5. Vessel Radio Call Sign: WDB2424
6. Vessel Captain's Name: Terence Shinn and Charles Lara
7. Vessel will monitor Radio Channel(s): 12,16
8. Vessel Navigation System: Differential GPS

9. Equipment to be used:

1. Edgetech Applied Acoustics CSP 700 Sparker

- a. Frequency (Hz, kHz): 800-850 Hz
- b. Source level: (dB re 1 μ Pa at 1 meter (m) (rms): 202 dB RMS
- c. Number of beams, across track beam width, and along track beam width:
1 beam, omnidirectional
- d. Pulse rate and length: 250-750 milliseconds depending on depth; 350 μ seconds pulse length.
- e. Rise time: 7 μ seconds
- f. Estimated distances to the 190 dB, 180 dB, and 160 dB re 1 uPa (rms) isopleths,
190 dB: 3M; 180 dB: 12M; 160 dB: 130M *
- g. Deployment depth: 1 m
- h. Tow speed: 4.5 knots
- i. Approximate length of cable tow: 30 m.

*These estimates are based on the underwater sound propagation equation:

$RSPL = SL - 20 \log(R/R_0) - AR$, where

RSPL=received sound potential level

SL= RMS source level re. 1 uPa (rms) based on manufacturer's specifications

R= Distance

R_0 = Reference Distance (1 m)

A= sound absorption coefficient

2. Geometrics G-882 Cesium Vapor Marine Magnetometer (passive sensor)

- a. Frequency (Hz, kHz): 0
- b. Source level: (dB re 1 μ Pa at 1 meter (m) (rms): 0
- c. Number of beams, across track beam width, and along track beam width:
None.
- d. Pulse rate and length: None
- e. Rise time: N/A
- f. Estimated distances to the 190 dB, 180 dB, and 160 dB re 1 uPa (rms) isopleths,
190 dB: N/A; 180 dB: N/A; 160 dB: N/A
- g. Deployment depth: 5-10m.
- h. Tow speed: 8 knots
- i. Approximate length of cable tow: 30-50 m.

Applicant's Representative:
George Tate
US Geological Survey
400 Natural Bridges Drive
Santa Cruz, CA 95060
831-460-7484

California State Lands Representative:
Richard B. Greenwood
Statewide Geophysical Coordinator
200 Oceangate, 12th Floor
Long Beach, CA 90802-4331
(562) 590-5201

BOEM Representative:
Joan Barminski
Chief, Office of Reservoir & Production
770 Paseo Camarillo
Camarillo, CA 93010
(805) 389-7707

The survey area is bounded by the coordinates:

34.8902 -120.6418
34.7650 -120.6314
34.6999 -120.6052
34.5640 -120.6381
34.4470 -120.4556
34.4660 -120.1922
34.3981 -120.1885
34.3740 -120.4488
34.5110 -120.7196
34.6434 -120.7640
34.6640 -120.7174
34.8596 -120.7752

The track line coordinates are:

Line Number	Start Line		End Line	
North0001	34.8585	-120.7710	34.8862	-120.6483
North0002	34.8776	-120.6456	34.8500	-120.7683
North0003	34.8413	-120.7621	34.8701	-120.6345
North0004	34.8627	-120.6263	34.8336	-120.7574
North0005	34.8252	-120.7545	34.8543	-120.6230
North0006	34.8453	-120.6221	34.8169	-120.7498
North0007	34.8084	-120.7453	34.8353	-120.6245
North0008	34.8254	-120.6282	34.8001	-120.7418
North0009	34.7913	-120.7386	34.8166	-120.6254
North0010	34.8066	-120.6278	34.7828	-120.7351
North0011	34.7740	-120.7335	34.7972	-120.6303
North0012	34.7870	-120.6346	34.7648	-120.7338
North0013	34.7548	-120.7356	34.7766	-120.6393
North0014	34.7661	-120.6420	34.7453	-120.7346
North0015	34.7368	-120.7308	34.7557	-120.6473
North0016	34.7481	-120.6391	34.7285	-120.7273
North0017	34.7197	-120.7241	34.7386	-120.6391
North0018	34.7306	-120.6337	34.7115	-120.7200
North0019	34.7029	-120.7162	34.7242	-120.6203
North0020	34.7161	-120.6152	34.6942	-120.7136
North0021	34.6856	-120.7102	34.7076	-120.6111
North0022	34.6986	-120.6114	34.6762	-120.7117
North0023	34.6657	-120.7144	34.6884	-120.6138
North0024	34.6782	-120.6163	34.6455	-120.7600
North0025	34.6365	-120.7590	34.6678	-120.6206
North0026	34.6576	-120.6253	34.6276	-120.7592
North0027	34.6174	-120.7629	34.6474	-120.6296
North0028	34.6375	-120.6320	34.6083	-120.7610
North0029	34.5994	-120.7603	34.6268	-120.6379
North0030	34.6166	-120.6429	34.5911	-120.7571
North0031	34.5823	-120.7542	34.6048	-120.6531

North0032	34.5970	-120.6468	34.5736	-120.7523
North0033	34.5648	-120.7498	34.5868	-120.6508
North0034	34.5761	-120.6574	34.5563	-120.7456
North0035	34.5480	-120.7406	34.5690	-120.6470
North0036	34.5610	-120.6426	34.5401	-120.7346
North0037	34.5333	-120.7236	34.5536	-120.6338
Central0038	34.5495	-120.6274	34.4980	-120.6636
Central0039	34.4967	-120.6527	34.5481	-120.6164
Central0040	34.5495	-120.6029	34.4969	-120.6399
Central0041	34.4966	-120.6276	34.5507	-120.5895
Central0042	34.5485	-120.5783	34.4973	-120.6143
Central0043	34.4962	-120.6027	34.5432	-120.5696
Central0044	34.5370	-120.5609	34.4914	-120.5928
Central0045	34.4849	-120.5853	34.5351	-120.5499
Central0046	34.5314	-120.5400	34.4814	-120.5751
Central0047	34.4758	-120.5664	34.5260	-120.5313
Central0048	34.5202	-120.5226	34.4630	-120.5630
Central0049	34.4513	-120.5589	34.5131	-120.5151
Central0050	34.5062	-120.5073	34.4460	-120.5493
Central0051	34.4378	-120.5432	34.4945	-120.5030
Central0052	34.4854	-120.4967	34.4288	-120.5369
Central0053	34.4164	-120.5324	34.4791	-120.4888
Central0054	34.4695	-120.4830	34.4121	-120.5237
Central0055	34.4077	-120.5142	34.4572	-120.4791
Central0056	34.4463	-120.4743	34.4030	-120.5048
Southwest0057	34.3930	-120.4895	34.4442	-120.4667
Southwest0058	34.4399	-120.4573	34.3904	-120.4789
Southwest0059	34.3861	-120.4692	34.4440	-120.4440
Southwest0060	34.4455	-120.4319	34.3856	-120.4578
Southwest0061	34.3854	-120.4472	34.4441	-120.4210
Southwest0062	34.4472	-120.4076	34.3852	-120.4354
Southeast0063	34.3834	-120.4041	34.4493	-120.4041
Southeast0064	34.4505	-120.3932	34.3833	-120.3933
Southeast0065	34.3843	-120.3824	34.4511	-120.3823
Southeast0066	34.4515	-120.3714	34.3857	-120.3715
Southeast0067	34.3873	-120.3606	34.4525	-120.3606
Southeast0068	34.4535	-120.3499	34.3894	-120.3500
Southeast0069	34.3908	-120.3391	34.4541	-120.3390
Southeast0070	34.4563	-120.3279	34.3915	-120.3280
Southeast0071	34.3919	-120.3171	34.4591	-120.3169
Southeast0072	34.4609	-120.3065	34.3933	-120.3067
Southeast0073	34.3941	-120.2959	34.4644	-120.2958
Southeast0074	34.4643	-120.2850	34.3965	-120.2849
Southeast0075	34.3969	-120.2743	34.4643	-120.2741
Southeast0076	34.4606	-120.2634	34.3981	-120.2634
Southeast0077	34.4011	-120.2525	34.4614	-120.2525
Southeast0078	34.4621	-120.2414	34.4031	-120.2413
Southeast0079	34.4043	-120.2307	34.4641	-120.2305

Southeast0080	34.4653	-120.2196	34.4059	-120.2198
Southeast0081	34.4075	-120.2089	34.4655	-120.2087
Southeast0082	34.4656	-120.1978	34.4082	-120.1980

**Marine Wildlife Mitigation Plan
California Seafloor Mapping Program Bathymetric Survey
Gaviota to Point Sal, CA.**

(July 14 - August 2, 2014)

1.0 INTRODUCTION

This marine wildlife mitigation plan is prepared in compliance with the USGS Pacific Coastal and Marine Science Center's existing State Geophysical Permit PRC 8394. This plan is intended to provide guidance to USGS vessel operators and scientific field personnel collecting geophysical data for the Pacific Coastal and Marine Science Center (PCMSC) in Santa Cruz, CA to avoid significant impacts to marine wildlife that may occur during regular geophysical surveys.

1.1 Regulatory Basis

Species that are either currently in danger or soon likely to be in danger of extinction throughout all or a portion of its range are protected by the Endangered Species Act of 1973. The United States Fish and Wildlife Service (USFWS), and the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) implement the Endangered Species Act. During the consultation with NMFS to issue a permit for the offshore geophysical survey, it was determined no incidental take permits are required to use the equipment identified in this document to conduct scientific data acquisition in federal waters offshore of the California coast.

1.2 Geophysical Survey Purpose and Objectives

The USGS Pacific Coastal and Marine Science Center (PCMSC) will collect geophysical data (high-resolution seismic-reflection, magnetometer) data, primarily in California's State Waters, along the mainland coast between Gaviota and Point Sal. The work is being conducted to support the large, collaborative partnership of the California Seafloor Mapping Program (CSMP; (<http://walrus.wr.usgs.gov/mapping/csmp/>)). USGS CSMP work is partly funded by the California Ocean Protection Council, and collaborating State agencies have included the California Coastal Conservancy, California Geological Survey, and California Department of Fish and Wildlife. On the federal side, CSMP's partners include NOAA National Marine Fisheries Service, NOAA National Marine Sanctuaries, NOAA Office of Coast Surveys, National Park Service, and Bureau of Ocean Energy Management.

CSMP data and map products serve many purposes, providing critical data for informed decision making and all facets of coastal and marine spatial planning. Examples of recent CSMP products include:

<http://pubs.usgs.gov/sim/3281/> (Set of 11 maps and pamphlet for Offshore of Santa Barbara area; also see USGS SIMs 3225, 3254, and 3261)

http://pubs.usgs.gov/ds/781/OffshoreSantaBarbara/data_catalog_offshoresantabarbara.

html (catalog of GIS layers)

<http://dev.axiomalaska.com/maps/search/usgs.html> (groundtruthing imagery for all of California's State Waters)

Data to be collected in this proposed survey will complete CSMP data collection in central California. This baseline information will be specifically used to monitor change, characterize habitats, assess geologic hazards (sea-level rise, coastal erosion, earthquakes, tsunamis), and aid regional sediment management. The work and databases will also stimulate and enable new research and enhance public education and awareness.

This CSMP survey specifically addresses two broad areas:

Climate Change and Habitat Characterization: This work establishes geophysical baselines for monitoring future change. For example, high-resolution, seismic reflection data provide data to map broad areas of the seafloor where sediment cover is exceedingly thin (< 1 m) and capable of being mobilized under different climatic conditions, leading to expansion or reduction of rocky habitat.

Marine Zoning Monitoring: Information on geologic framework (including sediment distribution and thickness) and geologic hazards (such as potential earthquake and tsunami sources) is fundamental to all coastal and marine spatial planning activities.

PCMG will contact the NOAA Long Beach Office staff and local whale-watching operations to acquire information on the current composition and relative abundance of marine wildlife offshore as well as any pinniped haul out sites. Whale activity is moderate at the moment. Additionally, one day prior to survey activities, the NOAA Long Beach office, local whale watching operations will be contacted to get an update on marine wildlife sightings in the area. This information will be conveyed to the captain and crew prior to the survey.

The survey area will enter the Vandenberg and Point Conception State Marine Reserves and the Kashtayit State Marine Conservation Area. Permit applications for operations in these areas have been submitted to the California Department of Fish and Game.

A review of environmental responsibility of project operations will be conducted by the chief scientist in charge of the survey operations prior to commencing the first day of operations. When new personnel will be in the crew, this training will be repeated at least for those new to the crew. They will be made aware of their individual responsibility and will be shown how to be aware of possible environmental impacts and how to mitigate them during the geophysical survey operations. Information relating to seasonality, as an indication of the types of animals that might be in our survey area, at the time of survey work will also be presented to the crew. A copy of this document will be provided to the crew of our survey vessel.

All personnel will be expected to be consistently aware that they are to be alert to any presence of marine wildlife while they are performing their duties. There are a number of signs/indications of marine wildlife presence and each crew member will be responsible to maintain vigilance for those signs within the constraints of their project duties. Some of those indications are:

- a. Sounds - such as splashing, vocalizations (by animals and birds), and blowing (breathing).
- b. Visual indications - birds aggregating, changes in water character such as areas of rippled water, white water caused by splashing, changes in color or shape of the ocean surface,

1.3 Survey Schedule and Layout

The survey is scheduled to commence field activities on July 14 and is expected to conclude August 2, 2014. The survey will be conducted aboard the R/V Shearwater, departing out of Morro Bay harbor and will terminate no later than August 2 in Santa Barbara, CA. The regional map of the survey area is shown in Figure 2. This time period for the survey was chosen because historical wave height data shows that the significant wave height during July and August are most favorable for small vessel marine operations. The mean significant wave heights for July and August are 1.5m with mean peak heights of about 3m (Figure 1). While average mean Spring and Fall significant wave heights in this area are about 2-2,5 m, the peaks can range from 5-7.5m which is unsafe for sustained small vessel operations.

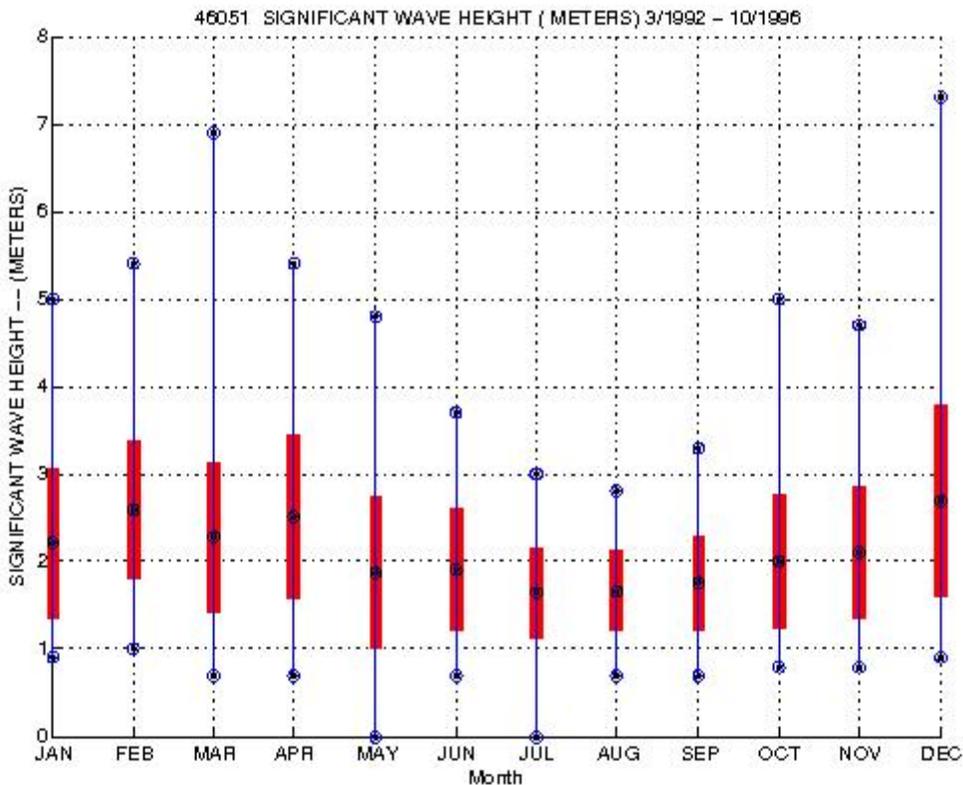


Figure 2. Historical significant wave heights at Point Conception.

2.0 Survey Equipment and Activities

The survey vessel will be the R/V Shearwater, a 62 foot long, aluminum-hulled catamaran owned and operated by NOAA Channel Islands National Marine Sanctuary (CINMS). High resolution sub bottom profile data will be collected using a chirp sub bottom profiler during daylight hours, and a towed marine magnetometer during night time hours.

The USGS is specifically requesting authorization to conduct night time passive magnetometer data collection operations. The USGS is also requesting that survey operations be extended from 10 hours to 12 hours because of the extended daylight hours at this time of year. Other operations of this type are generally conducted aboard the USGS R/V Park Snively, a similar but smaller vessel with no overnight crew berthing capabilities. These operations are always exclusively day operations with the crew returning to port daily for lodging. For the operations described in this notice, the USGS has contracted with NOAA CINMS to conduct these operations aboard their vessel that can accommodate overnight crew berthing because the size of the study area precludes daily transits to and from the nearest harbors at Morro Bay and Santa Barbara. The extended summer daylight hours will allow active source operations to be conducted for 12 hours during full daylight. This extended daily operation will result in the reduction of the total length of survey operation by three sea days.

PCMG proposes to use the following equipment to collect the required data:

- Applied Acoustics CSP-700 Marine Sparker (active source)
- Geometrics G882 Marine Magnetometer (passive sensor)

The proposed survey will require the use of a marine vessel and in-water equipment that generate noise during data acquisition. The results of modeling of the noise generated by the survey equipment is shown in Table 1. Those results indicate that the area within which the 160 dB re: 1 μPa rms sound level (the level specified by NOAA as potentially harmful to sensitive marine mammals) can be observed by monitors onboard the survey vessel. Because the acoustic data will be collected at an approximate speed of 4.5 knots, no area of the seafloor will fall within the sensitive sound level radius for more than about one minute.

~~Because the data will be collected at an approximate speed of 4.5 knots, no area of the~~

Sounder System	Frequency (kHz)	Source Level (dB peak)	Source Level (dB rms)	Distance to SL160 dBrms (meters)	Distance to SL 180 dB (rms) (meters)	Distance to SL190 dB (rms) (meters)
Applied Acoustic Sparker	800-850 Hz	216	202	130	12	3

These estimates are based on the underwater sound propagation equation:

$$RSPL = SL - 20 \log(R/R_o) - A \cdot R$$

where,
 RSPL= Recieved sound potential level
 SL= RMS source level re. 1 uPa (rms) based on manufacturer's specifications
 R= Distance
 Ro= Reference Distance (1 m)
 A= sound absorption coefficient

3.0 Marine Wildlife

3.1 Marine Wildlife

The following discusses the marine wildlife that have been recorded within the project region, those taxa that are most likely to be within the project region during the survey, and methods that will be instituted by the vessel operator to reduce or eliminate potential impacts to marine wildlife during transit and survey operations. Assigned Marine Wildlife Observers (MWO), the vessel master and others in the vessel wheelhouse will watch for marine wildlife and will institute the aforementioned mitigations.

Table 2 provides information on the seasonal variations in the marine wildlife that are expected to be or have been reported within the Project area.

Table 2: Abundance Estimates for Marine Mammals and Reptiles of California Unless Otherwise Indicated

Common Name Scientific Name	Population Estimate	Current Population Trend
REPTILES		
Cryptodira		
Olive Ridley turtle <i>Lepidochelys olivacea</i>	1.39 million (Eastern Tropical Pacific)**	Increasing
Green turtle <i>Chelonia mydas</i>	3,319-3,479** (Eastern Pacific Stock)	Increasing
Loggerhead turtle <i>Caretta caretta</i>	1,000 (California)**	Decreasing
Leatherback turtle <i>Dermochelys coriacea</i>	178 (California)**	Decreasing
MAMMALS		
Mysticeti		
California gray whale <i>Eschrichtius robustus</i>	18,017 (Eastern North Pacific Stock)	Fluctuating annually
Fin whale <i>Balaenoptera physalus</i>	2,624 (California/Oregon/Washington Stock)	Increasing off California
Humpback whale <i>Megaptera novaeangliae</i>	1,878 (California/Oregon/Washington Stock)	Increasing
Blue whale <i>Balaenoptera musculus</i>	2,046 (Eastern North Pacific Stock)	Unable to determine
Minke whale <i>Balaenoptera acutorostrata</i>	202 (California/Oregon/Washington Stock)	No long-term trends suggested
Northern right whale <i>Eubalaena japonica</i>	17 (based on photo-identification) (Eastern North Pacific Stock)	No long-term trends suggested
Sei whale <i>Balaenoptera borealls</i>	83 (Eastern North Pacific Stock)	No long-term trends suggested
Odontoceti		
Short-beaked common dolphin <i>Delphinus delphis</i>	343,990 (California/Oregon/Washington Stock)	Unable to determine
Long-beaked common dolphin <i>Delphinus capensis</i>	17,127 (California Stock)	Unable to determine
Dall's porpoise <i>Phocoenoides dalli</i>	32,106 (California/Oregon/Washington Stock)	Unable to determine
Harbor porpoise <i>Phocoena phocoena</i>	1,478 (Morro Bay Stock)	Increasing
Pacific white-sided dolphin <i>Lagenorhynchus obliquidens</i>	21,406 (California/Oregon/Washington Stock)	No long-term trends suggested
Risso's dolphin <i>Grampus griseus</i>	4,913 (California/Oregon/Washington Stock)	No long-term trends suggested

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Short-finned pilot whale <i>Globicephala macrorhynchus</i>	465 (California/Oregon/Washington Stock)	No long-term trends suggested
Bottlenose dolphin <i>Tursiops truncatus</i>	684 (California/Oregon/Washington Offshore Stock)	No long-term trends suggested
	290 (California Coastal Stock)	No long-term trends suggested
Northern right whale dolphin <i>Lissodelphis borealis</i>	6,019 (California/Oregon/Washington Stock)	No long-term trends suggested
Sperm whale <i>Physeter macrocephalus</i>	751 (California/Oregon/Washington Stock)	No long-term trends suggested
Killer whale <i>Orcinus orca</i>	85 (Eastern North Pacific Southern Resident Stock)	Decreasing
	162 (Eastern North Pacific Offshore Stock)	No long-term trends suggested
Pinnipedia		
California sea lion <i>Zalophus californianus</i>	141,842 (U.S. Stock)	Unable to determine; increasing in most recent three year period
Northern fur seal <i>Callorhinus ursinus</i>	5,395 (San Miguel Island Stock)	Increasing
Guadalupe fur seal <i>Arctocephalus townsendi</i>	3,028 (Mexico Stock) Undetermined in California	Increasing
Northern (Steller) sea lion <i>Eumetopias jubatus</i>	2,479 California Stock	Decreasing
Northern elephant seal <i>Mirounga angustirostris</i>	74,913	Increasing
Pacific harbor seal <i>Phoca vitulina richardsi</i>	31,600	Stable
Fissipedia		
Southern sea otter <i>Enhydra lutris nereis</i>	2,711*	Unable to determine

Estimates provided by National Marine Fisheries Service (NOAA Fisheries 2011) *

Estimate provided by USGS (2010)

** Estimates provided by National Marine Fisheries Service (NMFS) (2004), Marquez, et al. (2002), Eguchi et al. (2007), Benson et al. (2007), and NMFS (2007). Estimates are based on number of current numbers of nesting females.

During the transit periods, there is a potential for encountering marine wildlife and therefore onboard monitoring will occur. Table 3 lists those species that are likely to occur in the survey area

Table 3. Marine Wildlife Species and Most Likely Periods of Occurrence within the Survey Area

Family Common Name	Month of Occurrence ^{<1>}											
	J	F	M	A	M	J	J	A	S	O	N	D
REPTILES												
Cyrodira												
Olive Ridley turtle (T) ⁽²⁾												
Green turtle (T) ^{(1),(2)}												
Loggerhead turtle (T) ⁽²⁾												
Leatherback turtle (E) ⁽²⁾												
MAMMALS												
Mysticeti												
California gray whale												
Blue whale (E)												
Fin whale (E)												
Humpback whale (E)												
Minke whale												
Sei whale (E)												
Northern right whale (E)												
Odontoceti												
Short-beaked common dolphin												
Dall's porpoise												
Harbor porpoise												
Long-beaked common dolphin												
Pacific white-sided dolphin												
Risso's dolphin												
Sperm whale												
Short-finned pilot whale												
Bottlenose dolphin												
Northern right whale dolphin												
Killer whale												
Pinnipedia												
Northern fur seal ⁽³⁾												
California sea lion												
Northern elephant seal ⁽⁴⁾												
Pacific harbor seal												
Guadalupe fur seal (T)												
Steller sea lion												
Fissipedia												
Southern sea otter (T) ⁽⁵⁾												
Relatively uniform distribution												
	Not expected to occur						Most likely to occur due to seasonal distribution					

(E) Federally listed endangered species.

(T) Federally listed threatened species.

(1) Not Used

(2) Rarely encountered, but may be present year-round. Greatest abundance during July through September.

(3) Only a small percent occur over continental shelf (except near San Miguel rookery, May-November).

(4) Common near land during winter breeding season and spring molting season.

(5) Only nearshore (diving limit 100 feet).

Sources: Bonnell and Dailey (1993), NOAA Fisheries (2011), NCCOS (2007)

4.0 ONBOARD MITIGATIONS

4.1 Fishing Gear Clearance

In addition to submitting the required Notice to Mariners that will advise commercial fishers of pending on-water activities, prior to the start of each survey day, the vessel will traverse the proposed survey corridor for that day to note and record the presence of deployed fishing gear. No survey lines within 30 m (100 ft) of the observed fishing gear will be completed. The survey crew will not remove or relocate any fishing gear; removal or relocation will only be accomplished by the owner or by an authorized California Department of Fish and Game (CDFG) agent.

4.2 Survey Monitoring

At all times during survey activities, two to four marine wildlife monitors (MWOs) will be present on the vessel. The onboard MWO shall have the authority to stop operations if a mammal or turtle is observed within the specified safety zone. The MWO will be present at the highest practical vantage point on the vessel and will use binoculars to observe the surrounding area. We will make contact with the NOAA Long Beach office and local whale watching organizations prior to commencement of operations to acquire information on the current composition and abundance of marine wildlife offshore and convey sighting data to the vessel crew and MWOs prior to departure. The certification of MWOs is provided in Appendix A.

The MWO will survey an area at least 200 m in all directions centered on the sound source (towed array behind the vessel) throughout the period of time that the survey equipment is operating. This 200 m visual range will encompass the 130 m safe radius distance to the 160 dB noise level shown in Table 1.

If the monitor observes a marine mammal approaching the safety zone, the equipment will be shut down and will be re-started (ramped up) only when the MWO is assured that there is no longer the possibility of marine wildlife entering the safety zone.

The onboard monitors will have the authority to require that operations be stopped if a mammal or turtle is observed approaching the specified safety zone or appears to be negatively affected by the survey activities. The monitors will also have the authority to recommend continuation (or cessation) of operations during periods of limited visibility (i.e. fog) based on the observed abundance of marine wildlife. Periodic reevaluation of weather conditions and reassessment of the continuation/cessation recommendation will be completed by the onboard monitors.

4.3 Mitigations During Transit and Survey

The research vessel will make three return transits during day-light hours from Santa Barbara to the survey area as laid out in Appendix B. During transits, there is a potential for encountering marine wildlife and onboard monitoring will be conducted by the MWOs, the vessel master and science crew. During transits the vessel will maintain a minimum distance of 100 m from observed animals. If the vessel master observes a marine mammal within the path of the transiting vessel, they will immediately slow the vessel and/or change course in order to avoid contact.

Cetaceans (whales) vary in their swimming patterns and duration of dives and therefore all shipboard personnel will be watchful as the vessel crosses the path of a whale or anytime whales are observed in the area.

If whales are observed during transits, the vessel master will institute the following measures:

- Maintain a minimum distance of 130 m from sighted whales;
- Do not cross directly in front of or across the path of sighted whales;
- When transit directions is parallel to whale path, maintain constant speed that is not greater than the whales speed, or alter transit direction away from whale path;
- Do not position the vessel in such a manner to separate female whales from their calves;
- If a whale engages in evasive or defensive action, slow the vessel and move away from the animal until the animal calms or moves out of the area.

During survey operations, the vessel will maintain survey a speed of 4-5 knots and will maintain a heading that coincides with survey track lines. If marine wildlife is observed within the vicinity of the vessel, the vessel master will take precautions to avoid proximity to marine wildlife (collision), ending and restarting the track line survey if necessary.

If a collision with marine wildlife occurs, the vessel master will document the conditions under which the accident occurred, including the following:

- Location of the vessel when the collision occurred (latitude and longitude);
- Date and time;
- Speed and heading of the vessel;
- Observed conditions (e.g., wind speed and direction, swell height, visibility in miles or kilometers, and presence of rain or fog);
- Species of marine wildlife contacted; and
- Organization, vessel ID and name of master in charge of the vessel at time of accident.

In accordance with NOAA requirements, after a collision, the vessel should stop, if safe to do so. The vessel may proceed after confirming that it will not further damage the animal by doing so. The vessel will then communicate by radio or telephone all details to the vessel's base of operations. The PCMSC Marine Operations Superintendent will contact the Stranding

Coordinator, NMFS, Southwest Region, Long Beach, to obtain instructions. Alternatively, the vessel captain may contact the NMFS Stranding Coordinator directly using the marine operator to place the call or directly from an onboard telephone, if available to:

**NOAA Southwest Regional Stranding
Coordinator
National Marine Fisheries Service
501 West Ocean Blvd, Suite 4200
Long Beach, CA 90802-4213
562-980-4017
Contact: Sarah Wilkin
Email: sarah.wilkin@noaa.gov**

It is unlikely that the vessel will be asked to stand by until NOAA or CDFG personnel arrive, however this will be determined by the Stranding Coordinator. According to the MMPA, the vessel operator is not allowed to aid injured marine wildlife or recover the carcass unless requested to do so by the NOAA Stranding Coordinator.

Although NOAA has primary responsibility for marine mammals in both state and federal waters, the CDFG will also be advised that an incident has occurred in state waters affecting a protected species. Reports should be communicated to the federal and state agencies listed below:

Federal Sarah Wilkin, Stranding Coordinator Southwest Region National Marine Fisheries Service Long Beach, California (562)980-4017	State Enforcement Dispatch Desk California Department of Fish and Game Long Beach, California (562)590-5132	State California State Lands Commission Mineral Resources Management Division Long Beach, California (562) 590-5071
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4.4 Operational Measures

Operational measures to reduce impacts to marine mammals or turtles will include: 1) soft-start technique, 2) acoustic safety zone radii, 3) slow vessel speeds, 4) avoidance of pinniped haul out sites, and 4) limitations on equipment usage.

a) *Soft Start*

The soft-start technique will involve initiating the sparker at the lowest practical sound level, increasing the output in such a manner as to increase in steps not exceeding approximately 6 decibels per 5-minute period. During this time, MWOs will monitor the safety zone for marine mammal or turtle

sightings.

b) Safety Zone Monitoring

The safety zone monitoring will follow the protocols outlined in Exhibit H of the Permit (PRC 8394), which sets a safety zone of 130 m for the sparker system and 80 m for the chirp sub-bottom profiler as specified in Table 1. In the event a pinniped haul out site is located within 300 m of the survey boundary, USGS will take the following measures:

- Not approach within 300 m of the haul-out site (consistent with NMFS guidelines);
- Expedite survey activity in this area in order to minimize the potential for disturbance of pinnipeds on land;
- Have the MWM monitor pinniped activity onshore as the vessel approaches, observing and reporting on the number of pinnipeds potentially disturbed

The vessel will continuously monitor the daily survey area to ascertain the presence, species and location of any marine wildlife is apparent in the intended survey area. The MWOs and onboard personnel will be watchful as the vessel crosses this path or anytime whales are observed in the area. The vessel operator shall observe the following guidelines:

- Make every effort to maintain distance from sighted marine mammals and other marine wildlife;
- Do not cross directly in front of (perpendicular to) migrating whales or any other marine mammal or turtle;
- When paralleling marine mammals or turtles, the vessel will operate at a constant speed that is not faster than that of the animals;
- Care will be taken to ensure female whales are not separated from their calves; and, if a whale engages in evasive or defensive action, the vessel will reduce speed or stop until the animal calms or moves out of the area.

c) Vessel Speed

Survey speeds for both sparker and magnetometer data acquisition will be approximately 5 knots for maximum sparker data accuracy and data quality, and 8 knots during nighttime magnetometer surveys.

d) Limitations on equipment usage

Limitations on the frequency, pulse length, and pulse rate will be implemented to reduce potential harmful noises. For the sub-bottom profiler, the highest frequency band possible will be used and the shortest possible pulse length and lowest pulse rate (pings per second) will be used. For the sparker, the system will be operated at the lowest power possible that provides sufficient signal for the optimal resolution and data quality.

4.5 Monitoring Reporting

A Post Survey Field Operations and Compliance Report will be submitted to CSLC staff as soon as possible but no more than 30 days after the completion of survey activities.

APPENDIX A: MARINE WILDLIFE OBSERVER CERTIFICATIONS

Since 2006, the USGS Pacific Coastal and Marine Science Center has provided trained marine mammal observers in support of low power geophysical surveys in California State Waters and Federal Waters under NOAA National Marine Fisheries (NMFS) jurisdictions. These surveys have been conducted under permit authorizations from California State Lands Commission (CSLC) (Permit# PRC 8394) and various NMFS Incidental Harassment Authorizations (IHAs) and Letters of Concurrence. PCMSC has provided training for 136 of their staff research scientists and science and technical support staff as marine wildlife observers (MWO) to support our geophysical surveys and meet our marine mammal mitigation obligations under pursuant to our CSLC and NMFS permit requirements.

The MWO training for our science and technical support staff is provided by Dr. James Harvey, a Professor of Marine Science at MLML and the Interim Director of MLML. Jim has taught courses on the biology and ecology of marine turtles, birds, and mammals for 22 years. Jim has also advised more than 70 graduate students as they obtained their M.S. degree, and has all of the instructional material (handouts, identification manuals, slides, video, etc.) for teaching this workshop.

The training has been conducted during several 2 day workshop at Moss Landing Marine Laboratories on the identification of marine mammal species, including handouts, slides, and video. All species of marine mammals in the area of planned USGS activities were discussed, their status and trends, and identifying features that allow species identification, and possibly differentiation between sexes and age classes. The workshop participants were instructed in the “normal” behaviors of marine mammals using visual explanations, slides, and video. A typical data sheet was prepared and participants were instructed how they would complete the data form. The rationale for the need for trained observers and importance of the data was emphasized. This training concluded with an observational cruise aboard an MLML vessel on Monterey Bay to observe the marine mammals discussed in the course in their natural setting and receive identification tips and other information in a field setting similar to that which they would expect during science operations.

PCMG Certified Marine Mammal Observers

<u>Observer Name</u>	<u>Staff Position</u>
Alicia Balliser-Gee	Science Support
Ginger Barth	Research Scientist
Jayne Bormann	Science Support
Daniel Brothers	Research Scientist
Katherine Coble	Research Scientist
Guy Cochrane	Research Scientist
Jamie Conrad	Research Scientist
Peter Dartnell	Science Support
Pete Dal Ferro	Science Support - Vessel Master

USGS Pacific Coastal and Marine Geology Science Center
California Seafloor Mapping Program (CSMP) - Monterey Bay Swath Mapping Survey

Theresa Fregoso	Science Support
Steven Hartwell	Science Support
<u>Observer Name</u>	<u>Staff Position</u>
Patrick Hart	Research Scientist
Sam Johnson	Research Scientist
Simon Klemperer	Research Scientist
Sean Paul LaSelle	Science Support
Tom Lorenson	Science Support
Brent Lughino	Science Support
Tom Parsons	Research Scientist
Carol Reiss	Science Support
Ray Sliter	Science Support
Mike Torresan	Science Support
Peter Triezenberg	Science Support
Steve Watt	Research Scientist
Janet Watt	Research Scientist
Jenny White	Science Support - Vessel Master
Jeff Beeson	Science Support

APPENDIX B: VESSEL OPERATIONS DAILY PLAN

Operational Plan for USGS Central California geophysical survey (7/18/14 to 8/1/14)

Note: The schedule below anticipates optimal circumstances in which there are no significant equipment problems, no days in which weather (e.g., excessive wind or large swells, heavy fog) restricts operations; no delays attributable to closures offshore of Vandenberg Air Force Base (VAFB), etc. Any of the above can result in schedule adjustments.

Day 1. July 18 daylight hours: Early AM departure from Santa Barbara Harbor. Transit to Gaviota. Collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data on N-S (perpendicular to shore) tracklines, from east to west.

July 18-19 dark hours: Transit to Point Sal. Collection of marine-magnetometer data.

Day 2. July 19 daylight hours: Collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data on NE-SW (perpendicular to shore) tracklines, from north to south, beginning at Point Sal and extending to offshore VAFB.

July 19-20 dark hours: Collection of marine-magnetometer data.

Day 3. July 20 daylight hours: Collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data on NE-SW (perpendicular to shore) tracklines, from north to south, offshore VAFB (south of Purisima Point).

July 20-21 dark hours: Collection of marine-magnetometer data.

Day 4. July 21 daylight hours: Collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data on NE-SW (perpendicular to shore) tracklines, from north to south, offshore VAFB. End between Purisima Point and Point Arguello.

July 21-22 dark hours: Collection of marine-magnetometer data and transit to Point Conception.

Day 5. July 22 daylight hours:
AM collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data on N-S (perpendicular to shore) tracklines, from west to east. PM transit to Santa Barbara for re-fueling, etc.

July 22-23 dark hours: Santa Barbara harbor.

Day 6. July 23 daylight hours: Transit to area between Gaviota and Point Conception. Collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data on N-S (perpendicular to shore) tracklines, from east to west.

July 23-24 dark hours: Collection of marine-magnetometer data and transit to area between Purisima Point and Point Arguello.

Day 7. July 24 daylight hours: Collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data on NE-SW (perpendicular to shore) tracklines, from north to south. End offshore northern Point Arguello

July 24-25 dark hours: Collection of marine-magnetometer data.

Day 8. July 25 daylight hours: Collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data on NE-SW (perpendicular to shore) tracklines, from north to south. End offshore southern Point Arguello.

July 25-26 dark hours: Collection of marine-magnetometer data.

Day 9. July 26 daylight hours: Collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data on NE-SW (perpendicular to shore) tracklines, from north to south, between Point Arguello and Point Conception.

July 26-27 dark hours: Collection of marine-magnetometer data and transit to area between Gaviota and Point Conception.

Day 10. July 27 daylight hours:

AM: collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data on N-S (perpendicular to shore) tracklines, from east to west.

PM: Transit to Santa Barbara Harbor for refueling, etc.

July 27-28 dark hours: Santa Barbara Harbor

Day 11. July 28 daylight hours:

Depart Santa Barbara Harbor. Transit to Point Conception. Collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data on NE-SW (perpendicular to shore) tracklines, from east to west.

July 28-29 dark hours: Collection of marine-magnetometer data.

Day 12. July 29 daylight hours: Collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data on NE-SW (perpendicular to shore) tracklines, from east to west, between Point Conception and Point Arguello.

July 29-30 dark hours: Collection of marine-magnetometer data. Transit to Point Sal.

Day 13. July 30 daylight hours: Collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data on shore-parallel trackline ("tie line"), about 3-4 km offshore, from Point Sal around Point Conception to Gaviota.

July 30-31 dark hours: Collection of marine-magnetometer data.

Day 14. July 31 daylight hours: Collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data, either completing unfinished work planned for Days 1-13, or working in federal waters.

July 31-August 1 dark hours: Collection of marine-magnetometer data.

Day 15. August 1 daylight hours:

AM: Collection of low-energy (500 j) minisparker seismic-reflection and marine-magnetometer data, either completing unfinished work planned for Days 1-13 or working in federal waters.

PM: Transit to Santa Barbara Harbor. De-mobilization.

**U.S. GEOLOGICAL SURVEY
PACIFIC COASTAL AND MARINE SCIENCE CENTER**

**MANAGEMENT OF ACCIDENTAL DISCHARGE AND VESSEL INCIDENTS
DURING OFFSHORE GEOPHYSICAL SURVEYS**

1.0 INTRODUCTION

The survey operations will be conducted aboard the NOAA Research Vessel *Shearwater*, owned and operated by the Channel Islands National Marine Sanctuary in Santa Barbara, CA. Because of the vessel's size, it is anticipated that response to any operational spills will be quickly identified and response will be initiated quickly and efficiently by the vessel master and on board designated vessel crew. At the initiation of each project or project phase, a spill management review will be conducted by the vessel master who is in all cases the responsible authority. Oil spills in United States (U.S.) marine waters shall be reported immediately.

2.0 PETROLEUM BASED SPILL RESPONSE

The intent of this section is to identify measures to aid in the prevention of petroleum-based product spills, to provide spill response, containment, and reporting procedures, and to provide additional information that may be useful when dealing with a spill.

2.1 Prevention

Prevention is the most effective way to avoid the safety hazards and environmental damage that oil spills present. Measures of prevention include:

- Maintaining all machinery and equipment in good condition. Particular attention should be paid to all fuel system components (hoses, valves, filters, tanks, vents, etc.); hydraulic system components (pumps, hoses, seals, motors, rams, etc.); and equipment containing lubricating oils (main engine, generator engine, winch gear boxes, reduction gear). Inspections should be conducted in accordance with the departure checklist carried in these Orders.
- Exercising care during fueling to avoid tank overflows. Given *SHEARWATER'S* large fuel capacity, "topping off the tanks should not be required for normal operations.
- Inspecting and maintaining any scientific equipment containing petroleum-based products.

2.2 Containment

In the event of a leak or spill, attempt to contain the spill using any of the following measures.

- Shut down all involved equipment if it is safe to do so (i.e. best practice may dictate that survey equipment be recovered and secured on-deck before attempting to address a hydraulic system leak/spill).
- Isolate or interrupt the spill by cutting supply lines, where applicable.
- Contain the spill by placing physical and/or absorbent barriers "downstream" of the spill. Sorbent pads, rags, towels, paper towels, or similar material may help to contain and/or clean up a minor spill. Spilled material that reaches the bilges should be left there and pumped at a shoreside facility, unless safety concerns dictate otherwise.

2.3 Recovery and Cleanup

Spills on deck should be contained and cleaned up immediately to prevent migration into the water, and to remove related hazards, such as the potential for slipping. Enclosed spaces should be ventilated (where applicable) and Personal Protective Equipment (PPE) donned prior to initiating any clean-up actions. Any recovered product, including absorbent materials saturated with petroleum-based product should be retained in plastic bags or buckets for shoreside disposal. If clean-up requires the use of soap and water, retain all such liquids and their by-products for shoreside disposal. The use of detergents to disperse spilled product is strictly prohibited by federal law.

Spilled material that enters the water may be contained or recovered using various materials onboard *SHEARWATER*, but the containment and recovery of any significant discharge will likely require professional assistance. Either way, contact the authorities immediately, as directed in the following section.

2.4 Oil Spill Containment Material Carried Aboard *SHEARWATER*

- 1 or more bales of sorbent pads
- 1 large bag of rags

2.5 Petroleum Products Carried Aboard *SHEARWATER*

Material Safety Data Sheets (MSDS) for each of the following petroleum-based products are carried in the Appendices of these Orders.

- Low Sulfur Diesel Fuel, 1,200 gallon capacity. The fuel is carried in two 600-gallon tanks located aft of the port and starboard main engine spaces.
- AW-46 Hydraulic Oil, 40 gallon capacity. Hydraulic oil is carried in one tank in the port main engine space, forward, and a second tank in the starboard main engine space, forward.
- 15W40 Lube Oil, approximately 12 quarts. These spare quarts are stowed in the aft storage areas of both main engine spaces.
- 30W Transmission Lube Oil, approximately 2 gallons. These spare gallons are stowed in the aft storage areas of both main engine spaces.

3.0 Reporting

Petroleum-based product spills that enter the water must be reported as soon as practicable, without compromising the crew's ability to contain the spill. The spill shall be reported to both the nearest US Coast Guard station and the CINMS shoreside point of contact. Reporting requirements may be satisfied using either VHF radio frequencies, cell phone, or satellite phone. Contact *each* of the following four entities to report the spill event.

- US Coast Guard National Spill Response Center (800-424-8802).
- West Coast Oil Spill Hotline (800-OILS-911).
- California Department of Fish and Game (888-334-2258).
- CINMS shoreside POC. The POC may then direct you to place follow-up call(s) to additional emergency response personnel. Refer to the last page of this section for a list of Enforcement/Emergency Response contact information, as needed.

The information reported should include:

- Vessel name and call sign
- Vessel location
- Type of material spilled and estimated quantity
- Date and time when the spill occurred
- Actions taken to control or contain the spill
- Description of obvious impacts on local wildlife, if known
- Additional information requested by the response personnel handling your call
- Other information that may be of use (i.e. other involved vessels in the area)

Additionally, California Department of Fish and Game certified wildlife rescue/response organizations will be contacted about the spill. In the Southern California area, these include the following contacts:

Oiled Wildlife Care Network
1-877-UCD-OWCN

Animal Advocates
323-651-1336

California Wildlife Center
310-458-9453 310-378-9

South Bay Wildlife Rehab

**U.S. GEOLOGICAL SURVEY
PACIFIC COASTAL AND MARINE SCIENCE CENTER**

GEOPHYSICAL SOUND SOURCE SYSTEMS MAINTENANCE RECORD

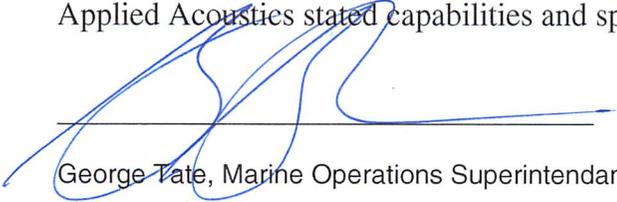
Applied Acoustics CSP-700 Sparker

1.0 Introduction

The USGS Pacific Coastal and Marine Science Center (PCMSC) owns and operates a broad range of geophysical sound sources, seafloor mapping systems, geologic and geotechnical sediment sampling systems, and oceanographic instrument systems. This requires considerable technical and operational support to successfully undertake and complete its field programs. Operational and technical support for these systems is provided by the PCMSC Marine Operations Facility (Marfac) in Santa Cruz, CA. Our Marfac group is staffed by a team of ten ocean engineers, electronics technicians, and marine engineering technicians. They operate, maintain and repair all geophysical and oceanographic systems used to support all of PCMSC's scientific field operations.

The USGS-owned Applied Acoustics CSP-700 Sparker sound source was returned to the manufacturer and was given a thorough checkout and complete electrical test as per manufacturer's recommended procedures on February 20, 2014. All tests were passed and the system was determined to be within specified operational parameters.

These procedures were followed by a full at-sea check of all system parameters in order to confirm system performance meets specs. The CSP-700 Sparker is fully compliant with Applied Acoustics stated capabilities and specifications.


George Tate, Marine Operations Superintendent

2/28/14

Date



CSP-CSPD-700X/C

Model Type:	CSPD 700
Unit S/N:	2080429
Supply Voltage:	110Vac

This Power Supply, S/N 2080429 was given a thorough checkout and complete Electrical Test as per manufacturer's recommended procedures on Feb. 20, 2014. The equipment passed every test, all voltages are within operational parameters; and is certified to be fully compliant with factory specifications in all aspects of its capabilities. All testing performed by:

NameCarl Schubert

Date 2/20/14

Test Engineer Signature

Carl Schubert

Subsea Technologies Inc

1323 Price Plaza Drive

Katy, Texas 77449

281-398-5600 office

**CALIFORNIA AIR RESOURCES BOARD TIER 2 ENGINE CERTIFICATION
RESEARCH VESSEL SHEARWATER**

MM-AIR-1: ENGINE TUNING, ENGINE CERTIFICATION, AND FUELS

The following information is provided as required for compliance with Mitigation Measure (MM) AIR-1: *Engine Tuning, Engine Certification, and Engine Fuels*. The Research Vessel *Shearwater* is a 62 ft. 2003 aluminum catamaran built for NOAA by All American Marine in Bellingham, WA and was delivered with two Detroit Diesel Series 60 diesel engines. These engines comply with IMO NO_x limits and the comprehensive emission requirements (EU RCD and US EPA Tier 2, rating 5 Marine Leisure and rating 4 Marine Commercial).

The manufacturer's specifications for these engines is provided below.

Diesel Engines Series 60

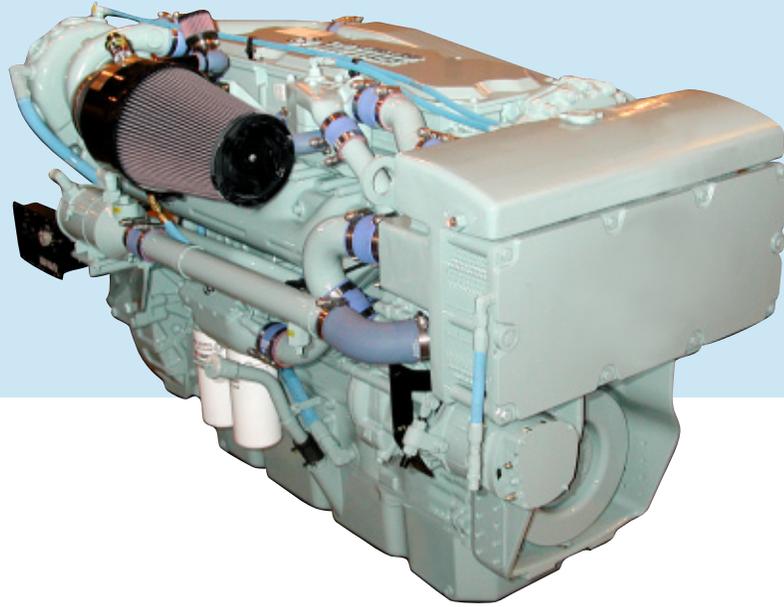
for Marine Applications

Maximum Continuous 1B

354 - kW

480 - mhp

475 - bhp



Compliant

with MARPOL 73/78 (IMO)

Annex VI NO_x Limits

EPA Tier II

Engine Specifications

Version	In-line 6 cylinder
Displacement	14.0 liters (855 cu in)
Bore and Stroke	133 mm x 168 mm (5.24 in. x 6.61 in.)
Description	Turbocharged and charge air cooled
Governor	DDEC
Port Model	6062HK33/35
Starboard Model	6062HK32/34

Standard Power Rating

Air Temp. 25 °C	kW	mhp	bhp	rpm
Sea Water Temp. 25 °C				
Rated Power	354	480	475	2100
Rating Conditions	SAE J 1228			

Standard Boat Profile

100% Power, 50% Time
85% Power, 25% Time
<15% Power, 25% Time

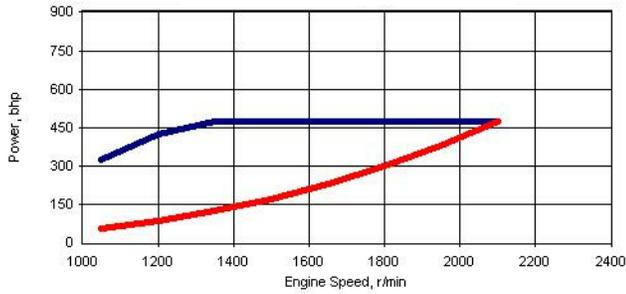
Typical applications

- Crew Boats
- Water Taxis
- Pilot Boats
- Ferry Boats
- Patrol Boats



DaimlerChrysler Off-Highway

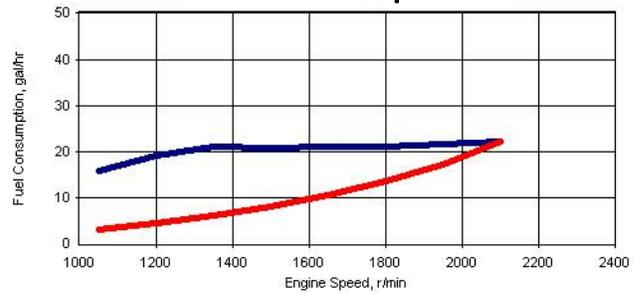
BHP



■ Rated BHP ■ Prop BHP

Power output guaranteed within +2/-0% at SAE J1228 conditions:
 77°F (25°C) air inlet temperature
 29.31 in. Hg (99 kPa) dry barometer
 100°F (38°C) fuel inlet temperature
 .853 specific gravity at 60°F (15°C)

Fuel Consumption



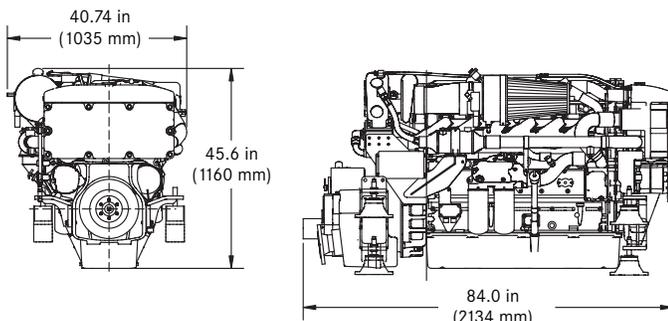
■ Rated Fuel Consumption ■ Prop Fuel Consumption

Performance shown includes:
 Air intake restriction: 10 in. H₂O (2.5kPa)
 Exhaust back pressure: 15 in. H₂O (3.7kPa)
 Fuel Density: 7.11 lb/gal

Rating Definition - Maximum Continuous

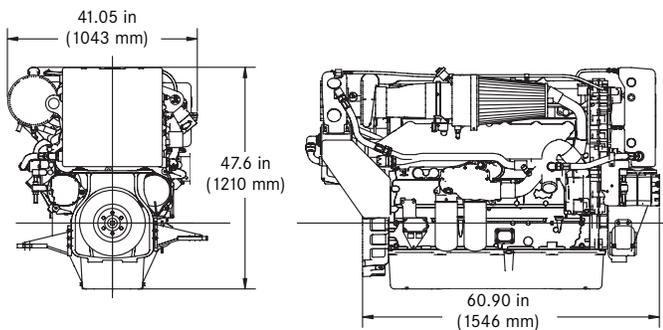
The marine continuous-maximum rating applies to medium to high speed commercial boats that operate at moderate to low load factors. Duration of full throttle operation is limited to 75% of total operating time.

Dimensional Information - Heat Exchanged



Dry Weight w/ TD5114A Marine Gear: 4,240 lbs. (1923 kg)

Dimensional Information - Keel Cooled



Dry Weight w/o Marine Gear: 3,525 lbs. (1599kg)

All dimensions are approximate. For complete dimensional information, refer to installation drawing provided by your authorized Detroit Diesel Corporation representative. Marine transmission shown represents standard option marine gear.

Standard Equipment

Main Engines - Water-cooled exhaust components; Aluminum flywheel housing size SAE #1, "Workboat Blue" finish

Fuel System - Electronic unit injection system; secondary fuel filter mounted on engine

Engine Oil System - Dual filters mounted on engine

Engine Cooling System (6062HK34/35) - Titanium plate modular heat exchanger system with integral fuel cooler; sea water cooled charge air cooler; gear driven self-priming raw water pump with 2.5" inlet

Engine Cooling System (6062HK32/33) - Engine equipped for Keel cooling including expansion tank, separate circuit cooling pump, engine fuel cooler, and marine gear oil cooler

Air Inlet System - Air intake filter with silencer and closed breather system; 24V emergency air shutdown

Electrical - Starter: 24V, Alternator: 24V/100 amp, belt driven

Engine Mounting - Engine mounts with isolators or solid mount

Marine Gear - DDC shallow case electric shift marine gear; gear oil cooler in raw water circuit

Port/STBD Engine Configuration - For ease of service and maintenance

Optional Equipment

Flywheel Housing - Cast iron

Engine Lube System - Remote mount lube oil filters - single or double

Electrical - 12V starter; 12V alternator/130 amp; 12V Amot air shutdown

Accessory Drives - SAE A (front gear train), Front crankshaft pulley for use with V-belts & interface for remote PTO

Transmission - Deep case, Down Angle

Transmission Options - Trolling valve, companion flange and PTO

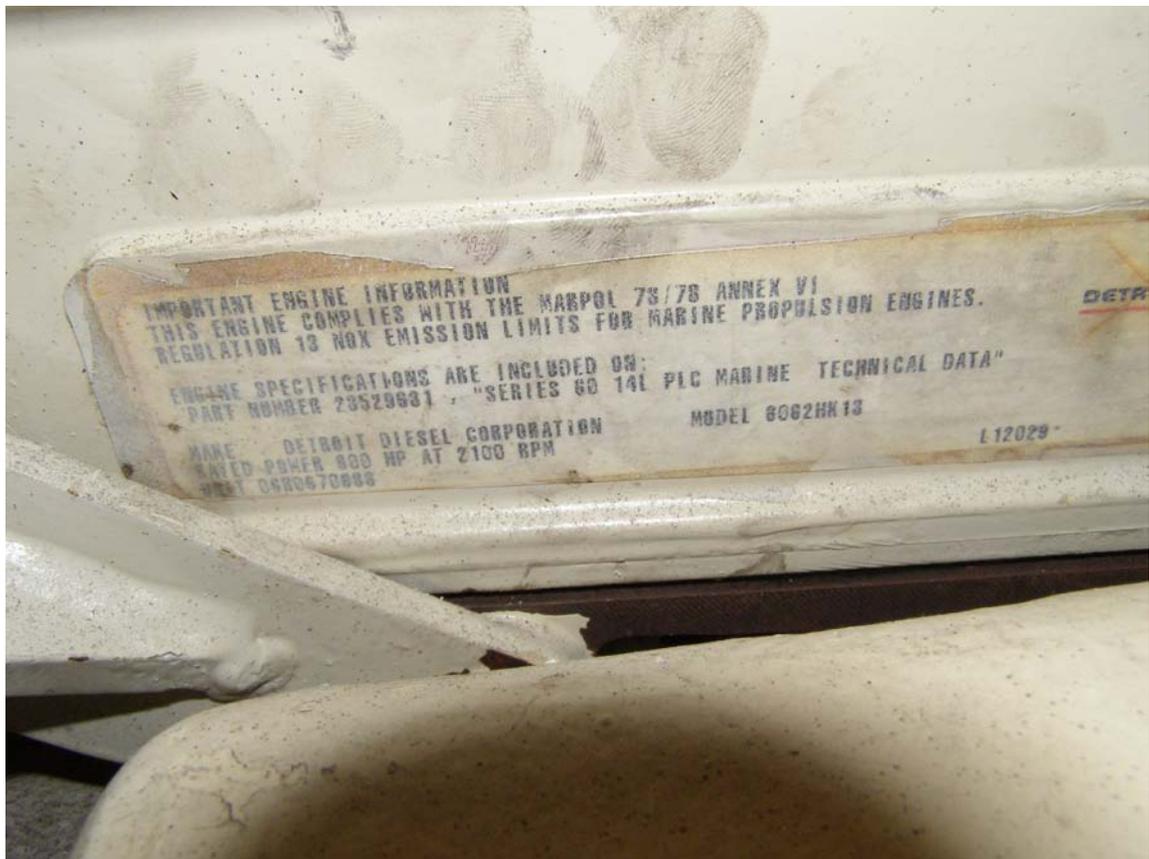
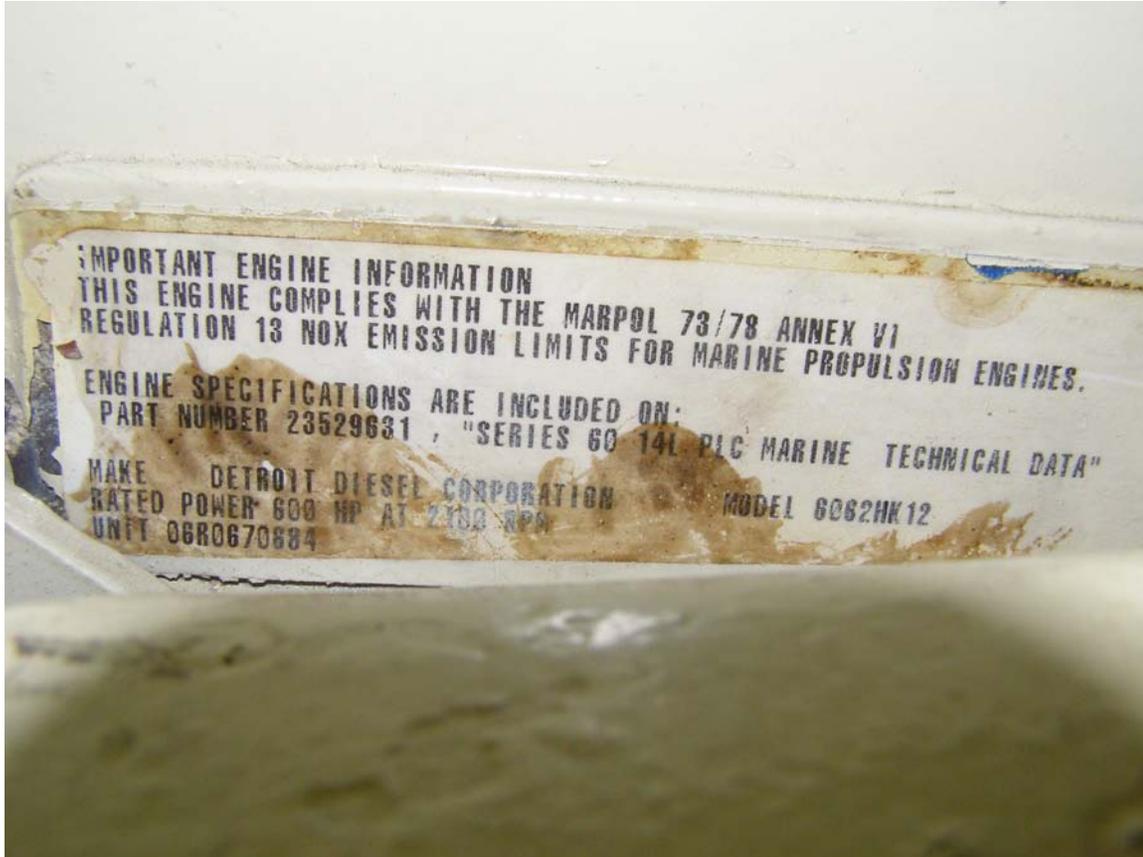
Exhaust - Raw water cooled stainless elbow (heat exchanger cooled only)

Front PTO - Direct Drive Front PTO rated at either 350 or 525 ft. lbs.

Marine Society Certification - Available upon request



For more information contact your MTU or DDC distributor. All Detroit Diesel distributors in NAFTA are authorized MTU distributors.
www.mtu-online.com / www.detroitdiesel.com / marine@detroitdiesel.com



*US Geological Survey - Pacific Coastal and Marine Geology Science Center
(MM) AIR-1 Certification - Gaviota to Point Sal, CA*



California Natural Resources Agency
 DEPARTMENT OF FISH AND WILDLIFE
2014 SCIENTIFIC COLLECTING PERMIT APPLICATION

SCIENTIFIC COLLECTING PERMIT

Doc ID: _____

DEPARTMENT USE ONLY

THIS PERMIT IS VALID: FROM ____/____/____ THROUGH ____/____/____	PERMANENT ID NUMBER SC-	# OF PI's
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**PERMIT, AMENDMENTS AND REPORT OF SPECIMENS CAPTURED OR SALVAGED
 MUST BE IN IMMEDIATE POSSESSION WHILE COLLECTING**

SCIENTIFIC COLLECTING IS NOT ALLOWED UNDER THE AUTHORITY OF A SPORT FISHING LICENSE

NEW **RENEWAL** - **SC-** When renewing, Report of Specimens Collected or Salvaged **MUST BE ATTACHED** or application will be returned.
 *Fees include a nonrefundable three percent (3%) application fee, not to exceed \$7.50 per item. (Section 700.4, Title 14, California Code of Regulations (CCR)).

CHECK ONE: Nonrefundable Application Fee (submit now) **INDIVIDUAL OR ENTITY - \$104.29*** **STUDENT - \$26.01***

DO NOT SUBMIT THE PERMIT FEE NOW - You will be required to submit the permit fee when the permit is ready to be issued: Individual, Entity or PI - \$311.00* Student - \$52.02*
BEFORE COMPLETING APPLICATION: Read instructions, permit descriptions, standard conditions, and number authorizations requested or issued. **Complete all appropriate sections of the application (sponsor's section may be required). Type or print clearly.**

SECTION 1 - INDIVIDUAL PERMITTEE INFORMATION - Complete only if applying as an individual.

FIRST NAME	M.I.	LAST NAME	GO ID NUMBER (FROM ALDS ISSUED LICENSE)
AFFILIATION	<input type="checkbox"/> Check here if you want future correspondence mailed to your affiliation		TITLE
PERMITTEE'S MAILING ADDRESS	DAY TELEPHONE	FAX NUMBER	
CITY	STATE	ZIP CODE	E-MAIL ADDRESS
HAIR COLOR	EYE COLOR	HEIGHT	WEIGHT
SEX		DATE OF BIRTH	
<input type="checkbox"/> MALE <input type="checkbox"/> FEMALE			
AFFILIATION'S MAILING ADDRESS	CITY	STATE	ZIP CODE

SECTION 2 - ENTITY PERMITTEE - Complete only if applying as a qualified entity.

Entities include California certified small businesses, aquariums or zoos accredited by the Association of Zoos and Aquariums, museums, California Special Districts, public agencies, non-profit non-governmental organizations, accredited colleges or universities and instructors at accredited colleges or universities. Proof of such status must be provided with the application. An additional permit fee is required for each PI when the permit is ready to be issued.

ENTITY'S NAME US Geological Survey	DAY TELEPHONE (831) 460-7484	FAX NUMBER (831) 421-9209
ENTITY'S MAILING ADDRESS 400 Natural Bridges Drive	CITY Santa Cruz	STATE CA
		ZIP CODE 95060

PRINCIPAL SCIENTIFIC INVESTIGATOR (PI) INFORMATION - Provide the following information and attach a statement of qualifications or resume for the full-time permanent employee responsible for providing adequate supervision and training of the employees and volunteers listed below. **WHAT IS THE TOTAL NUMBER OF PI's PROPOSED FOR THIS SCP? 1**

If you have more than one PI proposed under the entity permit, complete and attach page 8 (make copies if needed). The entity shall submit a non-refundable application fee for each PI.

(1) FIRST NAME Samuel	M.I. Y	LAST NAME Johnson	TITLE Geologist
GO ID NUMBER (FROM ALDS ISSUED LICENSE)	DAY TELEPHONE (831) 460-7546	E-MAIL ADDRESS sjohnson@usgs.gov	

List **ALL** employees or volunteers that will be working under the Principal Scientific Investigator named above. Attach a separate list if needed. An amendment form and fee must be submitted, approved, and returned to you by the Department before you can add or remove employees and volunteers from this list.

FIRST NAME	LAST NAME	DRIVER'S LICENSE OR DMV ID NUMBER	STATE

FOR DEPARTMENT OF FISH AND WILDLIFE USE ONLY

REVIEWED BY/DATE	APPLICATION FEE TRANSACTION #	PERMIT FEE TRANSACTION #	# APPLICATIONS	LRB Routed To/DATE
				1. 2. 3.



California Natural Resources Agency
 DEPARTMENT OF FISH AND WILDLIFE
2014 SCIENTIFIC COLLECTING PERMIT APPLICATION (Continued)

FIRST NAME	M.I.	LAST NAME OR ENTITY NAME (if qualified entity)	PERMANENT ID NUMBER SC-
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SECTION 3 – PERMIT INFORMATION

USE OF PERMIT: CHECK ALL APPLICABLE BOXES

- BIOLOGICAL CONSULTING (generally, catch and release only)
 RESEARCH
 MUSEUM COLLECTION
 BIOLOGICAL COLLECTION SERVICE
 STATE, FEDERAL OR OTHER AGENCY BIOLOGIST
 EDUCATION
 OTHER -

Wildlife and Activity: Reminder - You must provide justification in Section 5 for each wildlife taxa and activity checked here.

Check the type of wildlife taxa to be taken AND circle the type of activity requested: S=sacrifice; R=capture and release; C=take into captivity; SL=salvage; M=mark.

<input type="checkbox"/> MAMMALS	<i>None</i>	S	R	C	SL	M	<input type="checkbox"/> FRESHWATER FISHES	<i>None</i>	S	R	C	M	
<input type="checkbox"/> BIRDS*	<i>Other activity - None</i>	S	R	C	SL	M	<input type="checkbox"/> FRESHWATER INVERTEBRATES	<i>None</i>	S	R	C	M	
<input type="checkbox"/> REPTILES	<i>None</i>	S	R	C	SL	M	<input type="checkbox"/> ANADROMOUS FISHES	<i>None</i>	S	R	C	M	
<input type="checkbox"/> AMPHIBIANS	<i>None</i>	S	R	C	SL	M	<input type="checkbox"/> MARINE FISHES	<i>None</i>	S	R	C	SL	M
<input type="checkbox"/> VERNAL POOL/TERRESTRIAL INVERTEBRATES		S	R	C	SL	M	<input type="checkbox"/> MARINE AQUATIC PLANTS	<i>None</i>	S		C	SL	
*See Standard Condition "K"	<i>None</i>						<input type="checkbox"/> MARINE/TIDAL INVERTEBRATES	<i>None</i>	S	R	C	SL	M

CHECK ONE: Other SCP permittees are involved in activity or project. YES NO (If yes, list the permittees below. Attach separate list if needed.)

FIRST NAME	LAST NAME	SCIN NUMBER
		SC-
		SC-
		SC-

SECTION 4 – SPONSOR INFORMATION

Students, teachers and individuals collecting on behalf of an organization must all have one member of the organization sponsor them. Sponsors must fully complete this section of the application. Students must have one faculty member with affiliation to the student's college or university sponsor the student. Elementary and secondary school teachers must be sponsored by their principal. In some other cases, the Department may review an application and determine that a sponsor is needed and will request this information directly from the applicant or organization.

SPONSOR'S FIRST NAME	M.I.	LAST NAME	DAY TELEPHONE
TITLE	ORGANIZATION	E-MAIL ADDRESS	
MAILING ADDRESS	CITY	STATE	ZIP CODE
SPONSOR'S CERTIFICATION/SIGNATURE: I verify the take described in this application is required by this organization.			DATE
X			

APPLICATION CERTIFICATION

By checking all boxes, I hereby declare that the following information is provided in this amendment and in the justification section.

- Purpose
 Species + Numbers to be collected
 Locations + Timeframes for Collecting
 Species Disposition
 Methods/Activity
 Literature Cited
 Attached Federal/State Permit(s) (Applicable/Not Applicable – Circle appropriate one)

I understand that if I fail to provide all information, circle items or check the boxes, my permit may be denied. I certify that I have read, understand, and agree to abide by, all conditions of this permit and attachments, the applicable provisions of the FGC, and the regulations promulgated thereto. I certify that I am not currently under any Fish and Wildlife license or permit revocation or suspension, and that there are no other legal or administrative proceedings pending that would disqualify me from obtaining this permit. I agree that if I make any false statement as to any fact required as a prerequisite to the issuance of this permit, the permit is void and will be surrendered where purchased, and I understand that I may be subject to prosecution pursuant to FGC Section 1054 or to other administrative actions pursuant to Section 746, Title 14, of the CCR.

APPLICANT SIGNATURE: X	DATE 5/3/14
<i>George B. Tate, Deputy Center Director U.S.G.S. Pacific Coastal and Marine Geology Science Center</i>	



California Natural Resources Agency
 DEPARTMENT OF FISH AND WILDLIFE
 2014 SCIENTIFIC COLLECTING PERMIT APPLICATION (Continued)

FIRST NAME	M.I	LAST NAME OR ENTITY NAME (If qualified entity) US Geological Survey	PERMANENT ID NUMBER SC-
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SECTION 5 – PERMIT JUSTIFICATION – Required for ALL activities.

IS A FEDERAL OR ADDITIONAL STATE PERMIT OR MOU REQUIRED? YES (If yes, attach copies.) NO

PROVIDE START AND END DATE AND/OR EXPLAIN SEASONAL REQUIREMENTS FOR YOUR WORK. Favorable marine conditions for small vessel operations	START 07/14/2014	END 08/02/2014
---	---------------------	-------------------

REMINDER - You must provide justification here for each wildlife taxa and activity circled in Section 3. Use the space below to summarize your proposed research. Be sure to include each of the following headers in **bold/underlined** and as follows: **purpose** (include scientific or educational need for the requested activity); **methods/techniques** (include equipment/gear) and the reason for using them; **species and numbers to be collected**, if known (include scientific and common names); **collection locations** (include counties and specific locales and reasons for choosing them); and **disposition**, which describes the organism's fate (i.e. sacrifice, catch and release, salvage, captivity). If you propose to collect in a Marine Protected Area (MPA), give the proper name of the MPA and explain (1) Why collection is required within an MPA and provide justification for why it can not be conducted outside of an MPA; (2) Why the proposed methods are appropriate for this activity; and (3) Describe the frequency of the proposed activity per collecting area. If you are working in areas where special status species (listed, fully protected, or species of special concern) are expected to be incidentally captured, explain why collection is required in these areas, and describe how your methods/techniques and equipment/gear will avoid or minimize take of non-target sensitive species. If requesting marking/tagging, captivity, or sacrifice, specific details as described above must be included for each species and activity requested. **Attach additional pages if needed. Attach complete copies of appropriate federal permits and additional State permits (e.g., Memorandum of Understanding) to avoid delay of processing.**



California Natural Resources Agency
 DEPARTMENT OF FISH AND WILDLIFE
2014 SCIENTIFIC COLLECTING PERMIT APPLICATION (Continued)

FIRST NAME	M.I.	LAST NAME OR ENTITY NAME US Geological Survey	PERMANENT ID NUMBER SC-
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FOR DEPARTMENT OF FISH AND WILDLIFE USE ONLY

<input type="checkbox"/> _____ PAGES OF ATTACHMENTS NOTED IN THIS PERMIT SHALL REMAIN WITH THIS PERMIT AT ALL TIMES. CONDITIONS, AUTHORIZATIONS, AND APPROVALS ARE AS FOLLOWS:	ISSUED BY/DATE
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DEPARTMENT REVIEWER(S) SIGNATURE		
1.	2.	3.



California Natural Resources Agency
 DEPARTMENT OF FISH AND WILDLIFE
2014 SCIENTIFIC COLLECTING PERMIT APPLICATION (Continued)
ADDITIONAL PRINCIPAL SCIENTIFIC INVESTIGATOR

SCIENTIFIC COLLECTING PERMIT

Doc ID: _____

PERMANENT ID NUMBER

SC-

ENTITY PERMITTEE – Complete only if applying as a qualified entity.

PRINCIPAL SCIENTIFIC INVESTIGATOR (PI) INFORMATION - Provide the following information and attach a statement of qualifications or resume for the full-time permanent employee responsible for providing adequate supervision and training of the employees and volunteers listed below. *The entity shall submit a non-refundable application fee for each PI. An additional permit fee is required for each PI when the permit is ready to be issued. YOU MUST ATTACH A COPY OF YOUR IDENTIFICATION (see page two).*

FIRST NAME	M.I	LAST NAME	TITLE
GO ID NUMBER (FROM ALDS ISSUED LICENSE)	DAY TELEPHONE	E-MAIL ADDRESS	

List **ALL** employees or volunteers that will be working under the Principal Scientific Investigator named above. Attach a separate list if needed. An amendment form and fee must be submitted, approved, and returned to you by the Department before you can add or remove employees and volunteers from this list.

FIRST NAME	LAST NAME	DRIVER'S LICENSE OR DMV ID NUMBER	STATE

FOR DEPARTMENT OF FISH AND WILDLIFE USE ONLY

APPLICATION FEE TRANSACTION #	PERMIT FEE TRANSACTION #
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California Natural Resources Agency
 DEPARTMENT OF FISH AND WILDLIFE
2014 SCIENTIFIC COLLECTING PERMIT APPLICATION (Continued)
ADDITIONAL PRINCIPAL SCIENTIFIC INVESTIGATOR

SCIENTIFIC COLLECTING PERMIT

Doc _____ ID: _____

PERMANENT ID NUMBER

SC-

ENTITY PERMITTEE – Complete only if applying as a qualified entity.

PRINCIPAL SCIENTIFIC INVESTIGATOR (PI) INFORMATION - Provide information for the full-time permanent employee responsible for providing adequate supervision and training of the employees and volunteers listed below. *If you have more than one PI proposed under the entity permit, complete and attach page 5 (make copies if needed). The entity shall submit a non-refundable application fee for each PI. An additional permit fee is required for each PI when the permit is ready to be issued. YOU MUST ATTACH A COPY OF YOUR IDENTIFICATION (see page two).*

FIRST NAME	M.I	LAST NAME	TITLE
GO ID NUMBER (FROM ALDS ISSUED LICENSE)	DAY TELEPHONE	E-MAIL ADDRESS	

List **ALL** employees or volunteers that will be working under the Principal Scientific Investigator named above. Attach a separate list if needed. An amendment form and fee must be submitted, approved, and returned to you by the Department before you can add or remove employees and volunteers from this list.

FIRST NAME	LAST NAME	DRIVER'S LICENSE OR DMV ID NUMBER	STATE

FOR DEPARTMENT OF FISH AND WILDLIFE USE ONLY

APPLICATION FEE TRANSACTION #	PERMIT FEE TRANSACTION #
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California Natural Resources Agency
 DEPARTMENT OF FISH AND WILDLIFE
Credit Card Payment Authorization Form

METHOD OF PAYMENT – Please Do Not Send Cash Indicate type of payment: Check* Money Order Visa MasterCard

Enclose a check or money order payable to **California Department of Fish and Wildlife (CDFW)** or complete the Visa or MasterCard authorization below. *CHECK POLICY: Checks must be imprinted with name and address.

Checks returned to the CDFW due to insufficient funds are subject to a \$30 returned check fee.

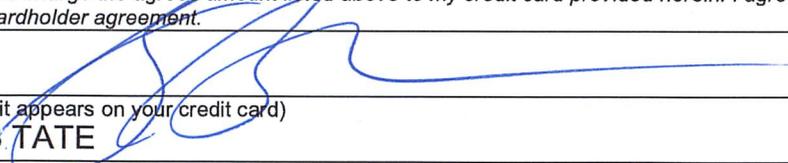
TOTAL \$104.29 ~~\$1.00~~

CREDIT CARD #: 5 5 6 8 | 2 6 0 0 | 0 0 7 9 | 9 6 1 2 |

EXPIRATION DATE (MM/YY): 1 0 | 1 4 |

CVC Number (On back of credit card) 6 1 2 |

I authorize CDFW to charge the agreed amount listed above to my credit card provided herein. I agree that I will pay for this purchase in accordance with the issuing bank cardholder agreement.

SIGNATURE		DATE	
 PRINT NAME (As it appears on your credit card) GEORGE B TATE		5/13/14	
		PHONE NUMBER (831) 460-7484	
ADDRESS	CITY	STATE	ZIP CODE
400 NATURAL BRIDGES DRIVE	SANTA CRUZ	CA	95060

ATTACHMENT I: Justification for Geophysical Survey Operations

Geophysical Survey Purpose and Objectives

The USGS Pacific Coastal and Marine Science Center (PCMSC) will collect geophysical data (high-resolution seismic-reflection, magnetometer) data, primarily in California's State Waters, along the mainland coast between Gaviota and Point Sal. The work is being conducted to support the large, collaborative partnership of the California Seafloor Mapping Program (CSMP; (<http://walrus.wr.usgs.gov/mapping/csmp/>)). USGS CSMP work is partly funded by the California Ocean Protection Council, and collaborating State agencies have included the California Coastal Conservancy, California Geological Survey, and California Department of Fish and Wildlife. On the federal side, CSMP's partners include NOAA National Marine Fisheries Service, NOAA National Marine Sanctuaries, NOAA Office of Coast Surveys, National Park Service, and Bureau of Ocean Energy Management.

CSMP data and map products serve many purposes, providing critical data for informed decision making and all facets of coastal and marine spatial planning. Examples of recent CSMP products include:

<http://pubs.usgs.gov/sim/3281/> (Set of 11 maps and pamphlet for Offshore of Santa Barbara area; also see USGS SIMs 3225, 3254, and 3261)

http://pubs.usgs.gov/ds/781/OffshoreSantaBarbara/data_catalog_offshoresantabarbara.html (catalog of GIS layers)

<http://dev.axiomalaska.com/maps/search/usgs.html> (groundtruthing imagery for all of California's State Waters)

Data to be collected in this proposed survey will complete CSMP data collection in central California. This baseline information will be specifically used to monitor change, characterize habitats, assess geologic hazards (sea-level rise, coastal erosion, earthquakes, tsunamis), and aid regional sediment management. The work and databases will also stimulate and enable new research and enhance public education and awareness.

This CSMP survey specifically addresses two broad areas:

Climate Change and Habitat Characterization: This work establishes geophysical baselines for monitoring future change. For example, high-resolution, seismic reflection data provide data to map broad areas of the seafloor where sediment cover is exceedingly thin (< 1 m) and capable of being mobilized under different climatic conditions, leading to expansion or reduction of rocky habitat.

Marine Zoning Monitoring: Information on geologic framework (including sediment distribution and thickness) and geologic hazards (such as potential earthquake and tsunami sources) is fundamental to all coastal and marine spatial planning activities.

Methods/Techniques

The survey vessel used for this work will be the *R/V Shearwater*, a 62 foot long, aluminum-hulled catamaran owned and operated by NOAA Channel Islands National Marine Sanctuary (CINMS). High resolution sub bottom profile data will be collected using a marine sparker sound source (active source) and a towed marine magnetometer (passive sensor). The proposed survey will require the use in-water of equipment that generates noise during data acquisition. The results of modeling of the noise generated by the survey equipment is shown in Table 1. Those results indicate that the area within which the 160 dB re:1 μ Pa rms sound level (the level specified by NOAA as potentially harmful to sensitive marine mammals) can be observed by monitors onboard the survey vessel. This survey will a "no take" operations under NOAA Marine Mammal Protection Act (MMPA) guidelines in that trained, on-board, marine-mammal observers will be used to ensure that the source is shut down anytime a marine mammal is found to be entering the 160 dB safety radius (130 m for this source) and only started again using soft-start techniques once the animal is outside the safety radius.

Table 1. Distances to Received Pressure Levels from Geophysical Sound Source

Sounder System	Frequency (kHz)	Source Level (dB) peak	Source Level (dB) (rms)	Distance to SL 160 dB (rms) (meters)	Distance to SL 180 dB (rms) (meters)	Distance to SL 190 dB (rms) (meters)
Applied Acoustic Sparker	800-850 Hz	216	202	130	12	3

These estimates are based on the underwater sound propagation equation:

$RSPL = SL - 20 \log (R/R_o) - AR$ where,

RSPL=Received sound potential level

SL= RMS source level re. 1 uPa (rms) based on manufacturer's specifications

R= Distance

Ro= Reference Distance (1 m)

A= sound absorption coefficient

Project Location

The Survey will be conducted along pre established track lines. The track lines run along the inner California coast from Point Sal to Goleta, CA, and will cover both State waters (as shown in Figure 1) and Federal waters. The vessel speed for the survey will be around 4.5 nautical miles/hour.

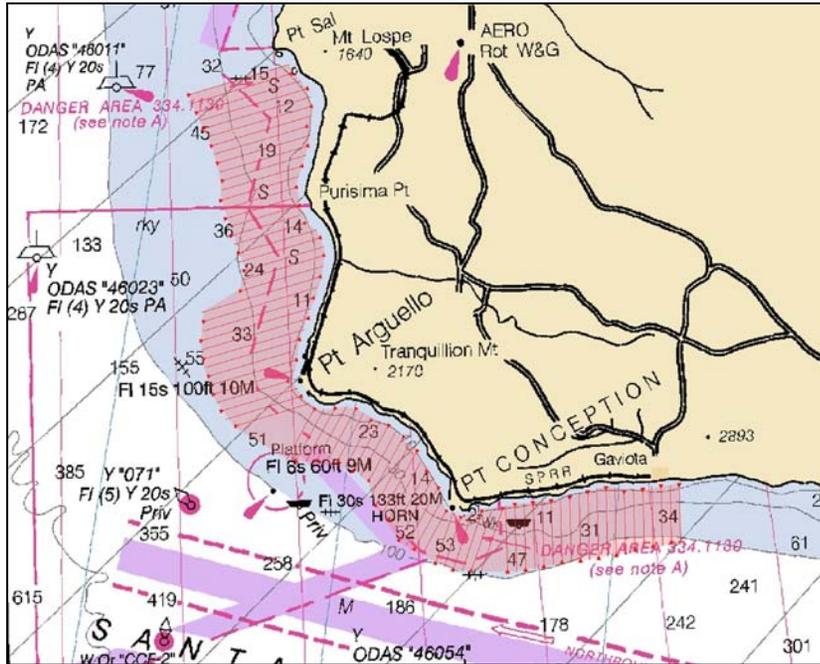


Figure 1. Project location and survey track lines.

The survey will be conducted from July 14 to August 2 to take advantage of the favorable marine conditions (mean significant wave height and seasonal winds). Track lines run predominantly on-off shore at 1 km spacing, consistent with standard geophysical survey techniques, which will minimize the amount acoustic noise generated by the sound sources in the MPA. At survey speeds, no area on the seafloor will fall within the sensitive sound-level radius for more than about one minute.

Collection Areas

The track lines will enter the Vandenberg State Marine Reserve, Point Conception State Marine Reserve and Kashtayit State Marine Conservation Areas. **No biologic collecting will be conducted in these areas.**

Species and Numbers to be Collected

None.

Applicable State and Federal Permits

Marine operations in support of this project will be conducted under California State Lands Geophysical Survey Permit #PRC 8394. These geophysical survey operations will be conducted as "NO TAKE" operations under NOAA NMFS guidelines (observance of a 160dB safety zone for marine mammals) for the Marine Mammal Protection Act and do not require a NOAA NMFS permit.

PRE-SURVEY NOTIFICATIONS

1. NOAA - Marine Mammal Activity
2. Harbor Masters
3. SLC Geophysical Coordinator/Notice to Mariners
4. Dive Shops

George Tate

From: Monica DeAngelis - NOAA Federal
Sent: Tuesday, April 29, 2014 12:24 PM
To: George Tate
Cc: Samuel Johnson; Keen, Kelly@SLC; Greenwood, Richard@SLC
Subject: Re: Mammal Activity between Point Sal and Point Conception

Hi George,

Hard to say with any confidence especially given the oceanographic conditions that might be shifting from the "norm," but I would suspect you'd have dolphins, large whales (especially humpback fins, and blue whales), and pinnipeds scattered throughout the area. I know they are already seeing blues and humpbacks off of San Francisco. As we get closer to July, I might be able to provide you with more information.

Cheers,
Monica

On Tue, Apr 29, 2014 at 12:01 PM, George Tate <gtate@usgs.gov> wrote:

Hi Monica,

I am inquiring regarding mammal activity in the between Point Sal and Point Conception during the month of July. We will be conducting a geophysical survey this year under a CA State Lands permit from July 10 to August 1 and would like any advice you may have regarding recent observations and what animals we are likely to encounter so we can plan and effectively mitigate our operations.

Thank you in advance,

George Tate
Deputy Center Director for Operations

Pacific Coastal and Marine Geology

*U.S. Geological Survey
Pacific Science Center
400 Natural Bridges Drive , Santa Cruz, CA 95060*

831.460.7484 voice
831.421.9209 FAX
831.234.7399 cell

--

Monica L. DeAngelis

Marine Mammal Biologist

NOAA Fisheries West Coast Region

U.S. Department of Commerce

Office: 562-980-3232

Fax: 562-980-4027

Monica.DeAngelis@noaa.gov

To report whale sightings in California: whales@noaa.gov

www.westcoast.fisheries.noaa.gov



George Tate

From: George Tate
Sent: Tuesday, May 06, 2014 11:28 AM
To: 'stevem@portsanluis.com'; 'EEndersby@morro-bay.ca.us'; 'mkronman@santabarbaraca.gov'
Cc: 'Greenwood, Richard@SLC'; 'Keen, Kelly@SLC'
Subject: Pre-survey Notice of Geophysical Survey - Pt Sal to Goleta - Harbor Masters
Attachments: CSLC EXHIBIT F - Johnson Conception.pdf

PRE SURVEY NOTIFICATION FOR GEOPHYSICAL SURVEY

The USGS Pacific Coastal and Marine Geology Science Center (PCMGSC) will be conducting a high resolution (low power) geophysical cruise from Point Sal to Goleta, CA under California State Lands Permit #8394. The survey will be conducted from July 14 to August 2, 2014 aboard the NOAA research vessel *Shearwater*, a 63 foot aluminum All American Marine catamaran hull vessel. We will be flying day shapes required by the US Coast Guard during survey operations.

In keeping with our California State Lands Permit requirements, we are providing you with the attached Geophysical Presurvey Notice for your information.

Best regards,

George Tate
Deputy Center Director for Operations
Pacific Coastal and Marine Geology
U.S. Geological Survey
Pacific Science Center
400 Natural Bridges Drive, Santa Cruz, CA 95060

831.460.7484 voice
831.421.9209 FAX
831.234.7399 cell

George Tate

From: George Tate
Sent: Tuesday, May 06, 2014 11:28 AM
To: 'slcogpp@slc.ca.org'; 'D11LNM@uscg.mil'
Cc: 'Greenwood, Richard@SLC'; 'Keen, Kelly@SLC'
Subject: Pre-survey Notice of Geophysical Survey - Pt Sal to Goleta - Geophysical Coordinator and Notice to Mariners
Attachments: CSLC EXHIBIT F - Johnson Conception.pdf

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Best regards,

George Tate
*Deputy Center Director for Operations
Pacific Coastal and Marine Geology
U.S. Geological Survey
Pacific Science Center
400 Natural Bridges Drive , Santa Cruz, CA 95060*

831.460.7484 voice
831.421.9209 FAX
831.234.7399 cell

George Tate

From: George Tate
Sent: Tuesday, May 06, 2014 11:28 AM
To: 'cmcdiver@aol.com'; 'mail@centralcoastkayaks.com'; 'Info@scubasb.com';
'info@santabarbarascuba.com'
Cc: 'Greenwood, Richard@SLC'; 'Keen, Kelly@SLC'
Subject: FW: Pre-survey Notice of Geophysical Survey - Pt Sal to Goleta - Dive Shops
Attachments: CSLC EXHIBIT F - Johnson Conception.pdf

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Best regards,

George Tate
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831.460.7484 voice
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