

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.

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

Jurisdiction: Federal _____ State _____ Both _____
If State: Permit #PRC _____
Region: _____
Area: _____

Date: _____

GEOPHYSICAL SURVEY PERMIT

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

_____ (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

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 _____
- 2. Hours of Operation _____
- 3. Vessel Name _____
- 4. Vessel Official Number _____
- 5. Vessel Radio Call Sign _____
- 6. Vessel Captain's Name _____
- 7. Vessel will monitor Radio Channel(s) _____
- 8. Vessel Navigation System _____

9. Equipment to be used _____
- a. Frequency (Hz, kHz) _____
 - b. Source level (dB re 1 μ Pa at 1 meter (m) [root mean square (rms)]) _____
 - c. Number of beams, across track beamwidth, and along track beamwidth _____

 - d. Pulse rate and length _____
 - e. Rise time _____
 - f. Estimated distances to the 190 dB, 180 dB, and 160 dB re 1 μ Pa (rms) isopleths _____

 - g. Deployment depth _____
 - h. Tow speed _____
 - i. Approximate length of cable tow _____

Applicant's Representative:

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
 Regional Supervisor
 Office of Strategic Resources
 770 Paseo Camarillo
 Camarillo, CA 93010
 (805) 389-7585

Other Federal Representative (if not BOEM):

LOCAL NOTICE TO MARINERS

Notice of Survey Operations

**DEPARTMENT OF HOMELAND SECURITY
UNITED STATES COAST GUARD
COMMANDER, 11TH COAST GUARD DISTRICT**

Building 50-2 Coast Guard Island

Alameda, CA 94501-5100

LNM Point of Contact

BM1 Alfred K Albert:

510-437-2980

Alfred.K.Albert@uscg.mil

1. Name of Contractor: *AQUEOS/FUGRO*
2. Type of Operation: *ROV Inspection*
3. Location / Position Information: *Offshore Morro Bay and Santa Barbara, California State Waters (See Attached Maps)*
4. Start and End Dates: *Start: September 28, 2016, End: October 21, 2016*
5. Vessel(s) Involved (include FCC Call Sign): *M/V Clean Ocean*
6. Radio Yes / No, VHF Freq's Monitored: *Yes, VHF 16*
7. Any other pertinent Info: *24 hour operations will be conducted.*
8. POC Name & Telephone Number(s): *Cindy Pratt or Eddie Stutts (Fugro)
805-650-7000*
9. Chart Number: *18020 & 18703*

SOUTHERN CALIFORNIA-SURVEY OPERATIONS

OFFSHORE MORRO BAY AND SANTA BARBARA, CALIFORNIA – STATE LANDS

Aqueos/Fugro will be conducting an ROV inspection survey from the M/V Clean Ocean in the area outlined on the attached portions of Chart 18020 and 18703. Operations will last approximately 5-7 days and be carried out between September 28 to October 21, 2016 (24 hour operations). The survey area is outlined by the following coordinates.

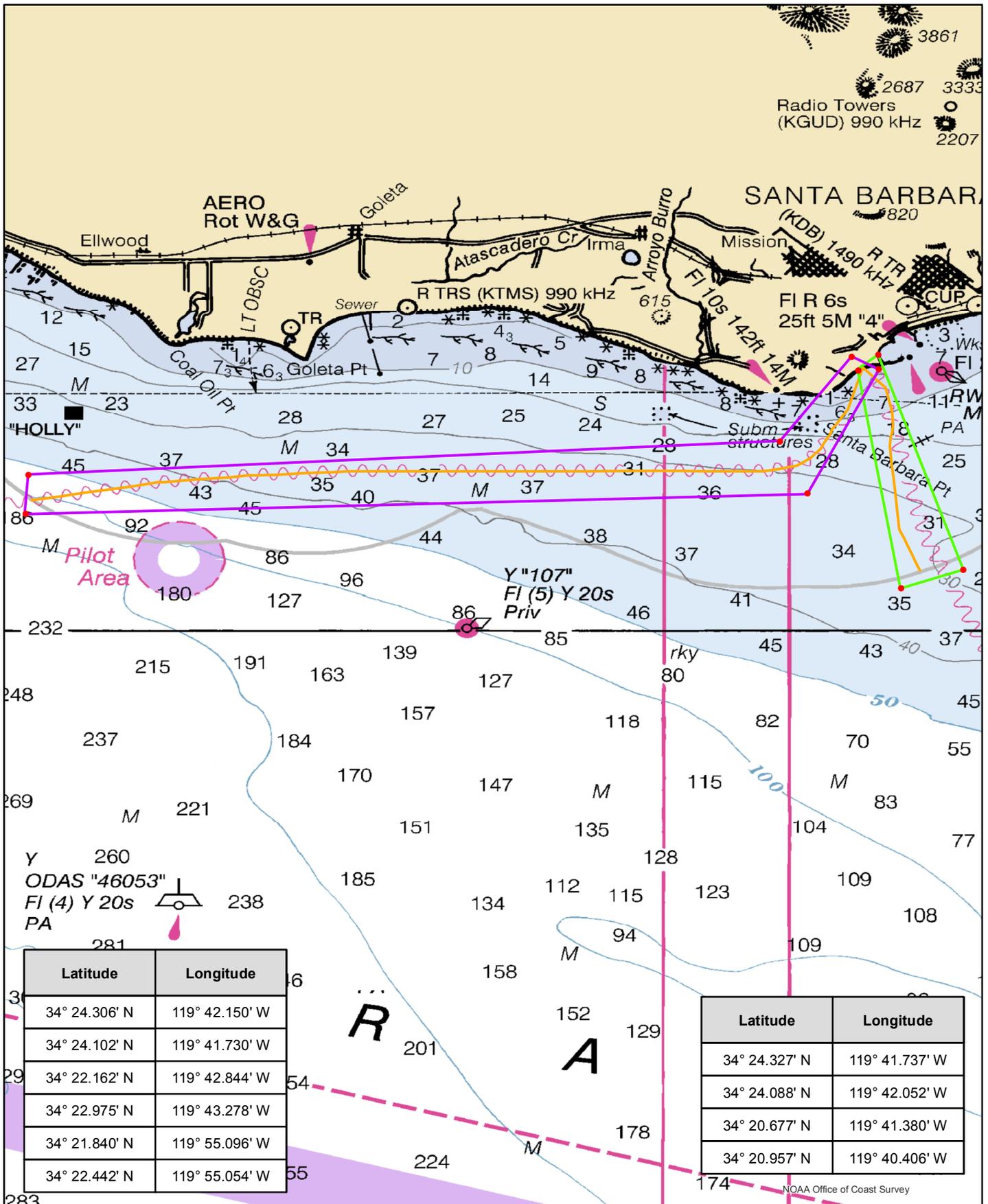
LATITUDE	LONGITUDE
OFFSHORE SANTA BARBARA	
34° 24.306' N	119° 42.150' W
34° 24.102' N	119° 41.730' W
34° 22.162' N	119° 42.844' W
34° 22.975' N	119° 43.278' W
34° 21.840' N	119° 55.096' W
34° 22.442' N	119° 55.054' W
34° 24.327' N	119° 41.737' W
34° 24.088' N	119° 42.052' W
34° 20.677' N	119° 41.380' W
34° 20.957' N	119° 40.406' W

LATITUDE	LONGITUDE
OFFSHORE MORRO BAY	
35° 26.501' N	121° 3.791' W
35° 25.527' N	121° 3.709' W
35° 23.308' N	120° 57.580' W
35° 23.554' N	120° 51.796' W
35° 24.545' N	120° 52.059' W
35° 23.836' N	120° 55.033' W

The vessel will have limited maneuverability during operations and mariners are advised to use due caution when transiting in the area. For more details or comments contact Eddie Stutts or Cindy Pratt at 805-650-7000.

NOAA Nautical Chart 18020 with Proposed Survey Area

ROV Survey Notice
Offshore Point Castillo, California

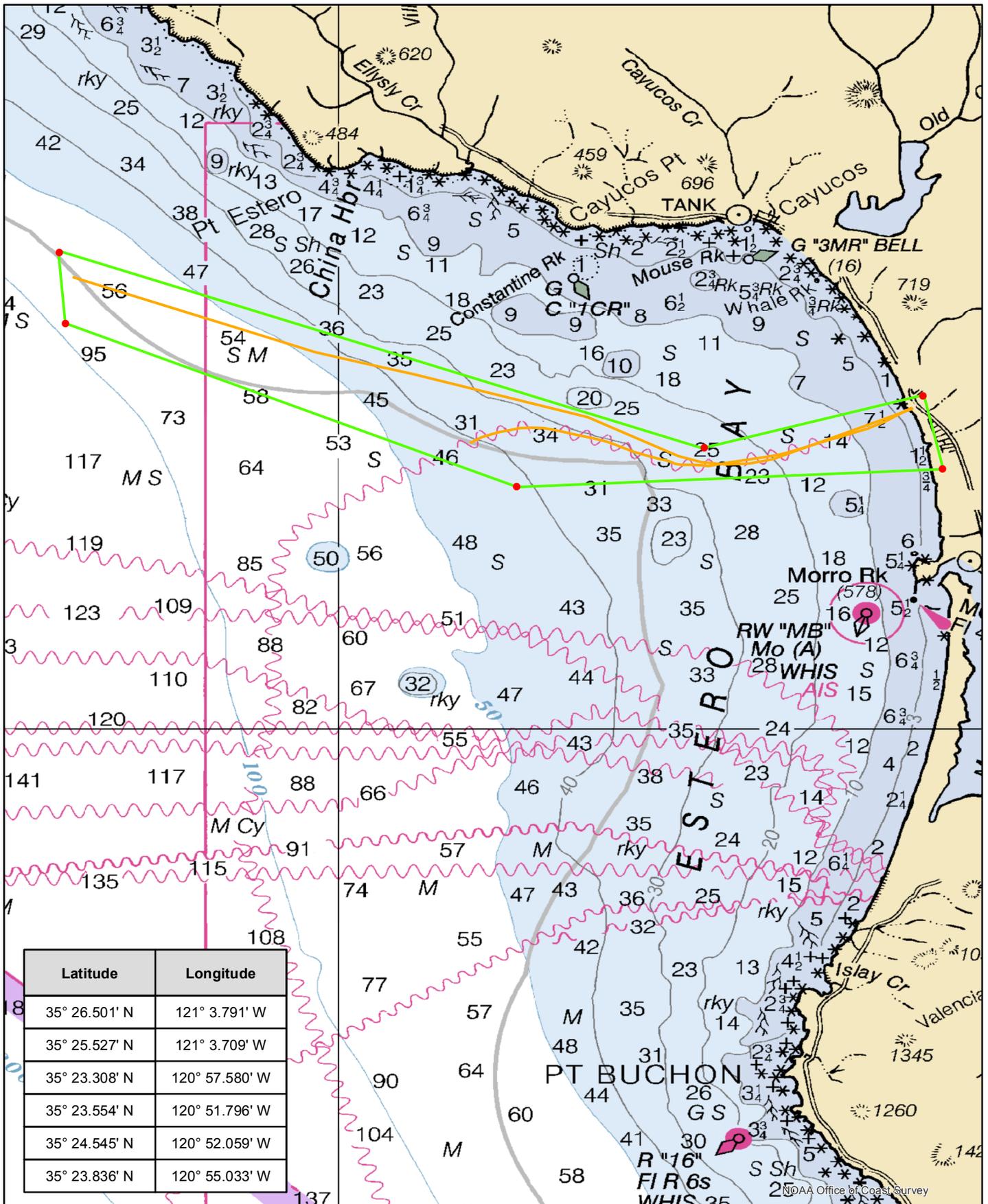


Latitude	Longitude
34° 24.306' N	119° 42.150' W
34° 24.102' N	119° 41.730' W
34° 22.162' N	119° 42.844' W
34° 22.975' N	119° 43.278' W
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NOAA Nautical Chart 18020 with Proposed Survey Area

ROV Survey Notice
Offshore Toro Creek, California



OIL SPILL CONTINGENCY PLAN

FUGRO 2016 ON-BOARD SPILL CONTAINMENT AND CLEAN-UP PLAN

THIS PLAN IS FOR FUGRO PERSONNEL TO READ *BEFORE* A SPILL OCCURS --AND TO KEEP HANDY FOR REFERENCE DURING AN EMERGENCY.

↳ **THE KEY TO SPILL PROTECTION IS *EARLY* RESPONSE AND ACTION.**

THIS PLAN IS FOR ALL EMPLOYEES ON A VESSEL OR BARGE. IT OUTLINES THE COMPANY PRIORITIES, THE LOCATION OF SPILL RESPONSE EQUIPMENT, INSTRUCTIONS ON HOW TO RESPOND, DIRECTIONS TO EMERGENCY MEDICAL FACILITIES, AND NOTIFICATION NAMES AND PHONE NUMBERS.

SPILL RESPONSE

PRIORITIES

In the event of a spill, on-site personnel are in the best position to take prompt action to minimize and control the spill.

Our company priorities are:

1. Personnel Safety
2. Prevention of Fire or Explosion
3. Elimination of Spill Source
4. Containment of the Spill
5. Collection and Storage of Contaminated Debris and Materials
6. Notification of Spillage
7. Preparation of Reports

SAFETY OF PERSONNEL IS ALWAYS OUR FIRST PRIORITY.



SPILL RESPONSE MEASURES

In case of an actual spill, take the following actions IF IT IS SAFE TO DO SO:

Call 911 for medical or fire emergency assistance if needed

Isolate and administer to injured persons if necessary

TAKE NECESSARY STEPS TO REDUCE THE RISK OF FIRE

- Turn off equipment, valves, or pumps
- Turn off or extinguish any sources of hot surfaces or flame

STOP SPILL AT SOURCE IF SAFE AND POSSIBLE

- Stop equipment leaks by crimping hoses, plugging holes, or isolating parts
- Upright turned over oil/grease or paint buckets
- Stop tank leaks by placing in additional containment or plugging hole

CONTAIN ON-DECK SPILL FROM SPREADING OVERBOARD

- Berm around spreading spill with absorbent material (rags, kitty litter, sock boom, etc)
- Apply granular absorbent ("kitty litter") in sufficient quantity to soak up entire spill
- Wipe small spills with cotton rags

CONTAIN WATER-BORNE SPILLS TO AS SMALL AN AREA AS POSSIBLE

- Apply absorbent pads to spilled material
- Deploy oil boom/absorbent sock boom

☞ **IF SPILL IS LARGE, CALL THE FUGRO SUPERINTENDENT OR VICE PRESIDENT AS SOON AS POSSIBLE.**

☞ **FOR IMMEDIATE DEPLOYMENT OF LARGE OIL BOOM, CALL ONE OF THE FOLLOWING COMPANIES.**

- Clean Seas, LLC (805) 684-3838
- Marine Spill Response Corporation (MSRC) Tel: (510) 478-0702
- National Response Corporation (NRC) Tel: (562) 506-2060
- Patriot Environmental Services (562) 244-2204
- Foss Maritime or another closer response team and request response to clean up the fuel

CLEAN UP SPILL AND USED SPILL MATERIALS

- Gather soaked rags, absorbents, boom and dirt
- Place in leak proof containers for storage and disposal



EMPLOYEE TRAINING ON OIL SPILL CONTINGENCY PLAN

Prior to the departure of the vessel for any activities, all Captain and crew members on the vessel will have read the Oil Spill Contingency Plan, understand procedures to be implemented in the event of an oil spill, and know where the oil spill kit is located on the vessel.

EMERGENCY EQUIPMENT

LOCATION

As part of each job start-up safety meeting, the spill containment and cleanup material will be discussed and verified.

EQUIPMENT

The Spill Containment and Cleanup Materials include:

- 1 Box of 20 Gloves: in spill kit box located in front compartment of vessel
- 2 pair Goggles: in spill kit box located in front compartment of vessel
- 1 Box of Rags: in spill kit box located in front compartment of vessel
- 1 Box of 20 Garbage bags: in spill kit box located in front compartment of vessel
- 30 each Absorbent pads: spill kit box located in front compartment of vessel
- 1 Small Oil Boom: located on back deck
- 1 12lb Bag Granular absorbent (“kitty litter”): located in front compartment of vessel
- 1 Shovel: located on back deck

FIRE EXTINGUISHERS ARE MOUNTED ON ALL VESSELS, PICKUP TRUCKS AND THERE IS ONE IN THE OFFICE. THE FIRE EXTINGUISHER WILL BE CHECKED FOR EXPIRATION DATE AND THE LOCATION DISCUSSED AT EACH SAFETY MEETING.

INVENTORY & RESTOCKING

The on-board spill containment and cleanup materials are inventoried by the Foreman at the start of every job, at least monthly and after a spill response. Depleted items are to be reported to the Superintendent or any member of the office staff. Items are to be ordered immediately and restocked promptly.





NOTIFICATIONS

In case of a spill, notify a Fugro 24 hour representative (see addendum 1 for names and phone numbers).

GIVE THE FOLLOWING INFORMATION TO THE BEST OF YOUR ABILITY:

- Your name
- Location
- Date of spill
- Time of spill
- Substance spilled
- Quantity spilled
- Potential for continued spill
- Possible health hazard
- Source of spill
- Actions taken
- Threatened resources/utilities

THE ENVIRONMENTAL COORDINATOR WILL:

- Notify the applicable local, state and federal authorities
- Coordinate and disseminate information to the media
- Handle the legal obligations and responsibilities of the company





Addendum 1

Emergency Notification

PHONE LIST

Fugro , Inc.
Office 805-650-7000

California State Lands Commission
24-Hour Emergency Number 562-590-5201

Fire Emergency 911 911

Medical Emergency 911 911





Addendum 2

Guide for Fugro Management

1. Call for outside assistance if appropriate for the spill.
2. Call the Company Environmental and Safety Coordinator to coordinate the legal notifications and media inquiries:
3. If there is an **actual** release to the environment, the U.S. EPA Emergency Response Program requires notification to **one** of the following organizations:

NATIONAL RESPONSE CENTER	1-800-424-8802
U.S. COAST GUARD MARINE SAFETY OFFICE	1-510-437-3073
	1-510-437-3074

4. Other organizations that may be involved:

U.S. EPA Hazardous Waste	1-415-744-2000
California Office of Emergency Services	1-800-852-7550
Additional number	1-916-427-4287
State of California Water Quality	1-510-286-1255
State of California Fish & Game	1-707-944-5512
After hours and weekends	1-916-445-0045
Vessel Traffic	1-415-556-2760
Ca Oiled Wildlife Care Network	1-916-445-0045

5. The information that will be requested is attached as Addendum # 6.





Addendum 3

Fugro ,Owner, and Management Information

Fugro Environmental and Safety Coordinator

Jeffery Ripper 858-427-2017

Officers of the Corporation

David Millar 858-945-3699

Eddie Stutts 805-432-2213



Addendum 4

OPERATIONAL INFORMATION

NORMAL OPERATIONS

We contract with public and private entities to conduct high resolution low energy geophysical and geotechnical engineering surveys.

To accomplish this work, we purchase equipment, tools, material, and supplies which are gathered at various mobilization sites and loaded onto vessels and barges which are berthed alongside a dock. When needed tugboats move barges to and from the jobsites. At the completion of projects, the reverse process takes place - unloading equipment, materials, tools, and supplies.

POTENTIAL SPILLS DUE TO NORMAL OPERATIONS

Oil, grease, fuel, or hydraulic fluid leak from machinery or equipment

Cranes, winches, generators, light plants and boats require fluids to operate.

- Fluids could leak onto the vessel or into the water

Oil, grease, or fuel spill from storage

Oil and grease are stored in the vessels and/or barges in 5 gallon or smaller plastic buckets.

- Buckets could be dropped or punctured in transport

Fuel is stored in steel tanks housed on the vessels.

- Tanks could be punctured by sharp objects

Paint spill

Paint is generally purchased and utilized as needed. If extra is kept, one gallon pails and spray cans could be stored below deck.

- Pails could be punctured or tipped over during use





Addendum 5

PRODUCT USAGE INFORMATION

CHEMICALS AND FUELS (DESCRIPTION & QUANTITIES)

SDS sheets are available on the vessel, and the Fugro office.

Oil	< 4 quarts
Gasoline	< 100 gallons





Addendum 6

SPILLS RESULTING FROM VESSEL FUELING

All vessel fueling will be conducted on land at a gas station or at an approved docking facility. No cross vessel fueling will be performed.



MARINE WILDLIFE CONTINGENCY PLAN

MARINE WILDLIFE CONTINGENCY PLAN

X2 TELECOM, LLC ROV SURVEY OFFSHORE MORRO BAY AND SANTA BARBARA, CALIFORNIA

Project No. 1602-2691

Prepared for:

Fugro Pelagos, Inc.
4820 McGrath St., Suite 100
Ventura, California 93003

Prepared by:

Padre Associates, Inc.
369 Pacific Street
San Luis Obispo, California 93401

September 2016



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APPENDICES

Appendix A: HYSUB 20 - Remotely Operated Vehicle Specification Sheet

1.0 INTRODUCTION

This Marine Wildlife Contingency Plan (MWCP) has been developed for Fugro Pelagos, Inc. (Fugro), in support of the X2 Telecom, LLC Remotely Operated Vehicle (ROV) survey along an existing fiber optic system, located offshore of Morro Bay and Santa Barbara, California. This MWCP has been prepared in accordance with the requirements in the existing California State Lands Commission (CSLC)-issued geophysical and geologic sampling permit No. 8391.9. This MWCP is designed to reduce or eliminate adverse impacts to marine wildlife resources within the survey area.

This MWCP is specific to the equipment and activities that are proposed for the survey. The proposed monitoring and mitigations have been successfully used in agency-approved MWCPs for similar offshore surveys in California marine waters, and have been shown to be effective in reducing or eliminating potential impacts to marine mammals and turtles (marine wildlife).

1.1 PURPOSE AND OBJECTIVES

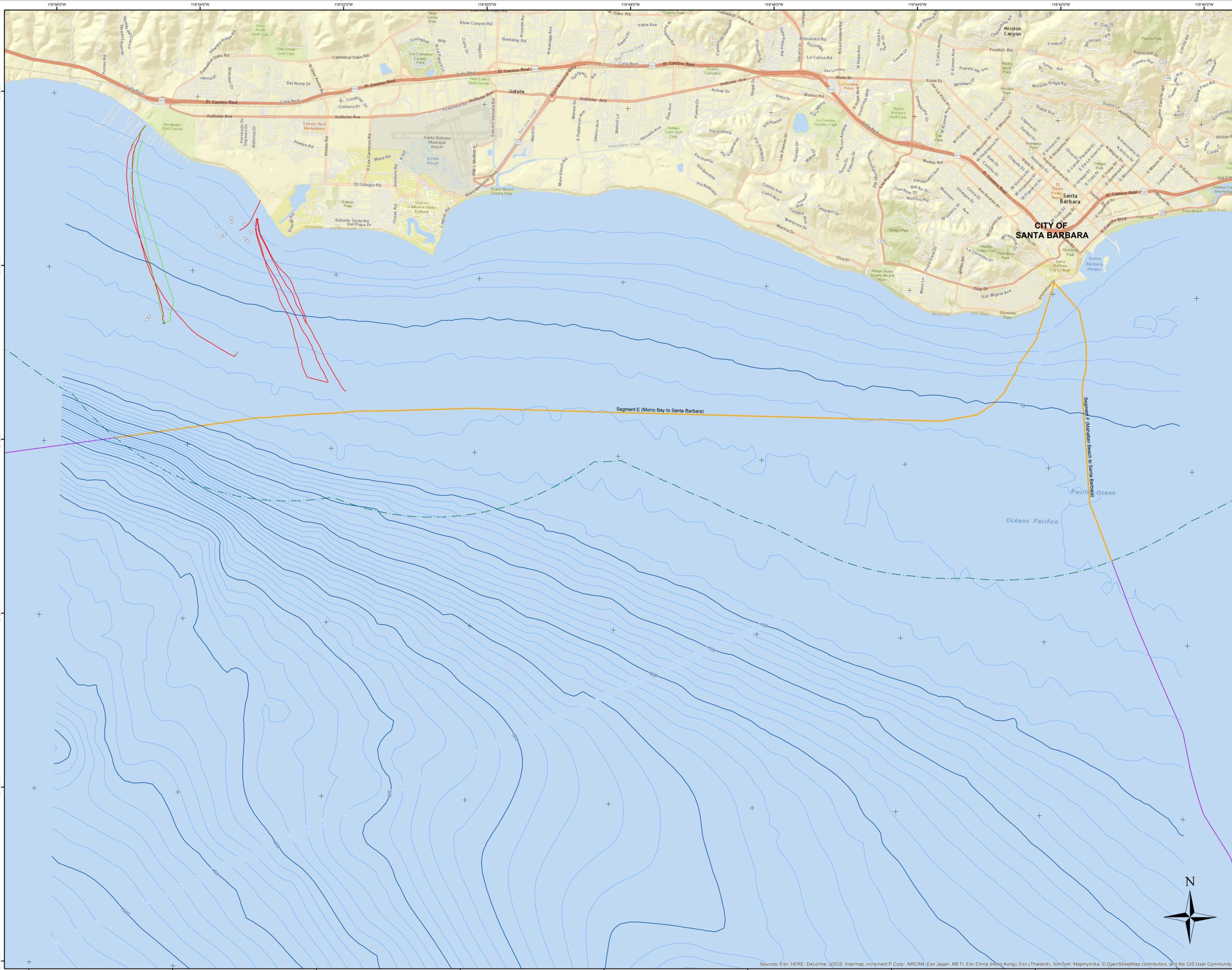
The proposed survey will utilize a ROV to record video and inspect an existing fiber optic system within the cable corridor. The survey will be completed by Fugro in accordance with requirements specified by Aqueos Corporation (Aqueos) statement of work.

1.2 PROPOSED AREA AND ACTIVITIES

The proposed survey is estimated to be completed in five days and will take place in two survey areas; offshore the cities of Morro Bay and Santa Barbara (Figures 1.2-1 and 1.2-2). Survey depths are estimated to be from shore out to a depth of 110 meters (m) (361 feet [ft]) offshore Morro Bay, and 225 m (738 ft) offshore Santa Barbara. The vessel will mobilize in Port Hueneme and will return to Port Hueneme after completion of the survey.

1.3 SURVEY EQUIPMENT

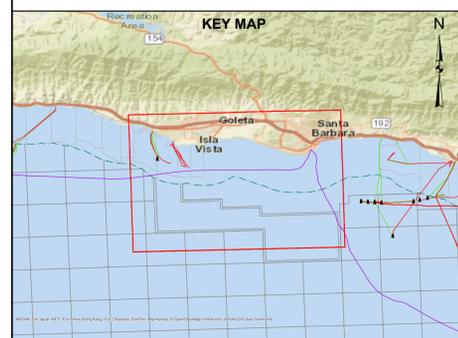
The survey will utilize the diving support vessel (DSV) *Clean Ocean*, a 47 m (155 ft) vessel owned and operated by Aqueos. The HYSUB 20 ROV will be utilized to conduct the survey. The ROV will use video recording equipment only and will be non-pulse generating and non-acoustic. Appendix A – ROV specifications, provides information on the ROV survey equipment to be used by Aqueos.



- LEGEND**
- Proposed Survey Lines
 - Map Extent
- Infrastructure**
- Pipeline
 - Power Cable
 - 3-Mile Boundary
 - Telecom Cable
- Contours**
- Major Contours, Contour Interval = 50 Meters
 - Minor Contours, Contour Interval = 10 Meters

This document may only be used for the purpose for which it was commissioned and in accordance with the terms of engagement for that commission. Unauthorized use of this document in any form whatsoever is prohibited. Not for navigational use.

GEODETIC INFORMATION
 DATUM: NAD 83
 PROJECTION: Geographic Coordinate System





FUGRO
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Ventura, California 93003
Tel: (805) 650-7000
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www.fugro-pelagos.com



AQUEOS
EXCELLENCE IN SUBSEA SOLUTIONS

**PROPOSED SURVEY LINES
 X2 TELECOM, LLC
 ROV SURVEY**

**September 2016
 Santa Barbara County, California**

HORIZONTAL SCALE: 1" = 3,000'



NO:	DATE:	DESCRIPTION:	DRAWN:	CHKD:	APPR:
0	SEP 2016	Proposed Survey Lines	AT	CP	CP
1	SEP 2016	Proposed Survey Lines	AT	CP	CP

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

2.0 MARINE WILDLIFE

Multiple species of marine turtles, cetaceans (whales, dolphins, and porpoises, pinnipeds (seals and sea lions), and fissipeds (sea otter) have been recorded along the California coast (Table 2.0-1). Most of the recorded species can occur within the survey region, although seasonal abundances of these taxa vary; pinnipeds and some dolphins are year-round residents (Table 2.0-2). Other species are migratory, such as the gray whale (*Eschrichtius robustus*), or seasonal, such as the blue and humpback whales (*Balaenoptera musculus* and *Megaptera novaeangliae*, respectively); therefore, are more abundant during specific months. Within the survey region, resident, seasonal, and migrant taxa could be expected to occur.

Table 2.0-1. Abundance Estimates for Marine Wildlife within Central California

Common Name Scientific Name	Population Estimate	Current Population Trend
REPTILES		
Cryptodira		
Olive Ridley turtle <i>Lepidochelys olivacea</i>	1.1 million (Eastern Tropical Pacific DPS)	Stable
Green turtle <i>Chelonia mydas</i>	20,112 (Eastern Pacific DPS)	Stable
Loggerhead turtle <i>Caretta caretta</i>	7,138 (California)	Decreasing
Leatherback turtle <i>Dermochelys coriacea</i>	361 (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>	2,589 (California/Oregon/Washington Stock)	Increasing off California
Humpback whale <i>Megaptera novaeangliae</i>	1,876 (California/Oregon/Washington Stock)	Increasing
Blue whale <i>Balaenoptera musculus</i>	1,551 (Eastern North Pacific Stock)	Unable to determine
Minke whale <i>Balaenoptera acutorostrata</i>	202 (California/Oregon/Washington Stock)	No long-term trends suggested
Northern Pacific right whale <i>Eubalaena japonica</i>	31 (based on photo-identification) (Eastern North Pacific Stock)	No long-term trends suggested
Sei whale <i>Balaenoptera borealis</i>	83 (Eastern North Pacific Stock)	No long-term trends suggested
Odontoceti		
Dall's porpoise <i>Phocoenoides dalli</i>	32,106 (California/Oregon/Washington Stock)	Unable to determine
Harbor porpoise <i>Phocoena phocoena</i>	28,833 (Northern California/Southern Oregon Stock)	Increasing
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>	76,224 (California Stock)	Unable to determine
Pacific white-sided dolphin <i>Lagenorhynchus obliquidens</i>	21,406 (California/Oregon/Washington Northern and Southern Stock)	No long-term trends suggested

Table 2.0-1. Abundance Estimates for Marine Wildlife within Central California

Common Name Scientific Name	Population Estimate	Current Population Trend
Risso's dolphin <i>Grampus griseus</i>	4,913 (California/Oregon/Washington Stock)	No long-term trends suggested
Short-finned pilot whale <i>Globicephala macrorhynchus</i>	465 (California/Oregon/Washington Stock)	No long-term trends suggested
Striped dolphin <i>Stenella coeruleoalba</i>	8,231 (California, Oregon, Washington)	No long-term trends suggested
Baird's beaked whale <i>Berardius bairdii</i>	466 (California, Oregon, Washington)	No long-term trends suggested
Cuvier's beaked whale <i>Ziphius cavirostris</i>	4,481 (California, Oregon, Washington Stock)	No long-term trends suggested
Mesoplodont beaked whales	389 (California, Oregon, Washington)	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
Dwarf sperm whale <i>Kogia sima</i>	Unknown (California, Oregon, Washington)	No long-term trends suggested
Pygmy sperm whale <i>Kogia breviceps</i>	271 (California/Oregon/Washington Stock)	No long-term trends suggested
Killer whale <i>Orcinus orca</i>	78 (Eastern North Pacific Southern Resident Stock)	No long-term trends suggested
	354 (West Coast Transients)	
	162 (Eastern North Pacific Offshore Stock)	
Pinnipedia		
California sea lion <i>Zalophus californianus</i>	153,337 (U.S. Stock)	Unable to determine; increasing in most recent three year period
Northern fur seal <i>Callorhinus ursinus</i>	6,692 (California - San Miguel Island Stock)	Increasing
Guadalupe fur seal <i>Arctocephalus townsendi</i>	3,028 (Mexico Stock) Undetermined in California	Increasing
Northern elephant seal <i>Mirounga angustirostris</i>	74,913 (California Breeding Stock)	Increasing
Pacific harbor seal <i>Phoca vitulina richardsi</i>	26,667 (California Stock)	Stable
Fissipedia		
Southern sea otter <i>Enhydra lutris nereis</i>	2,944**	Unable to determine

Source: Allen, 2011; NMFS, 2016a,b; and USGS, 2015

* Estimates are based on known data of the population of nesting females for eastern Pacific Distinct Population Segments.

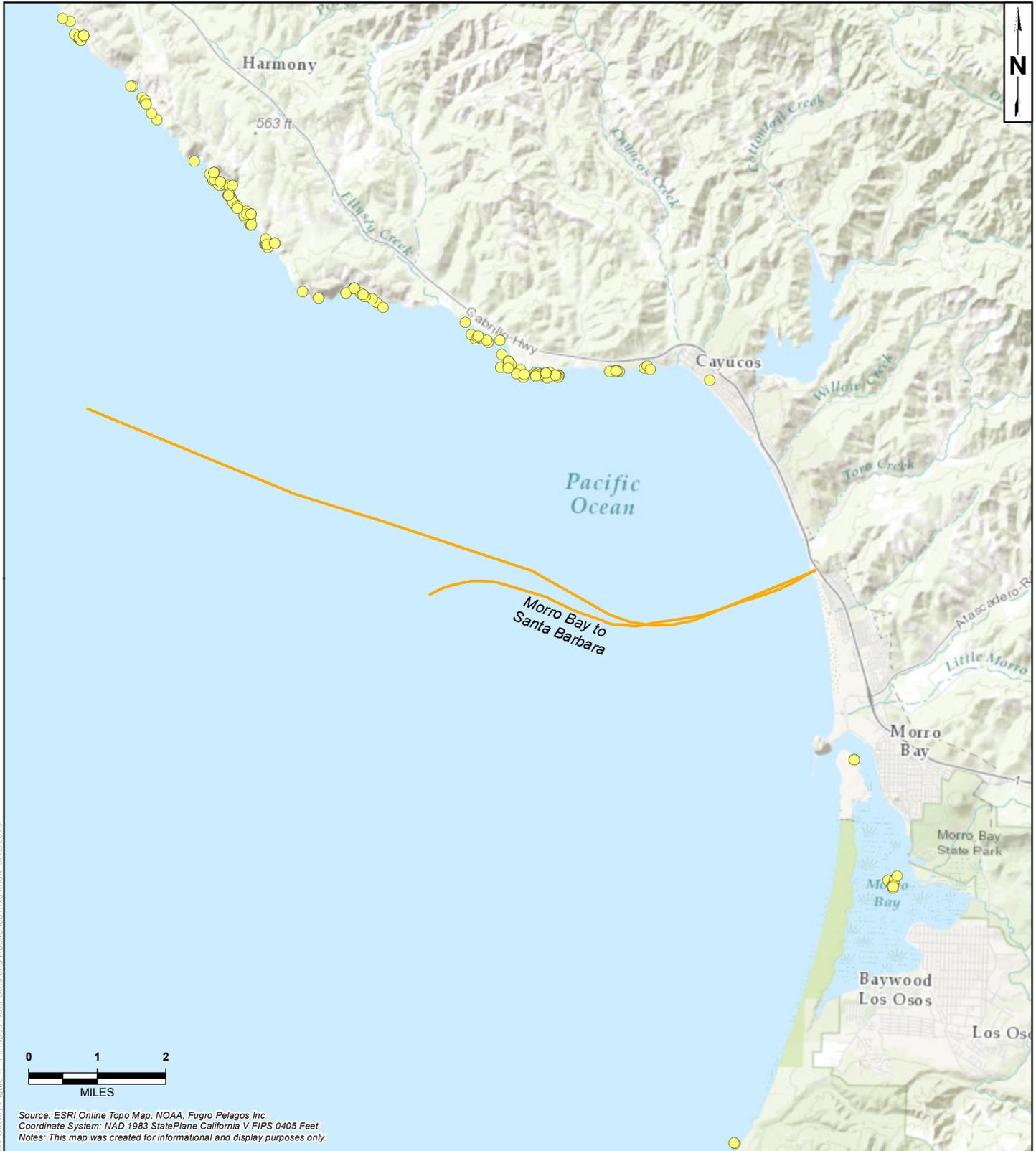
** Estimate provided by USGS, 2015

Table 2.0-2. Marine Wildlife Species within Central California and Periods of Occurrence

Family Common Name	Month of Occurrence ⁽¹⁾											
	J	F	M	A	M	J	J	A	S	O	N	D
REPTILES												
Cryptodira												
Olive ridley turtle (T) ⁽²⁾												
Green turtle (T) ⁽²⁾												
Leatherback turtle (E) ⁽²⁾												
Loggerhead turtle (T) ⁽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												
Dall's porpoise												
Harbor porpoise												
Short-beaked common dolphin												
Long-beaked common dolphin												
Pacific white-sided dolphin												
Risso's dolphin												
Short-finned pilot whale												
Bottlenose dolphin												
Northern right whale dolphin												
Sperm whale												
Dwarf sperm whale												
Pygmy sperm whale												
Baird's beaked whale												
Cuvier's beaked whale												
Mesoplodont beaked whales												
Killer whale												
Pinnipedia												
Northern fur seal ⁽³⁾												
Guadalupe fur seal												
California sea lion												
Northern elephant seal ⁽⁴⁾												
Pacific harbor seal												
Steller sea lion												
Fissipedia												
Southern sea otter (T) ⁽⁵⁾												

2.1 PINNIPED HAUL-OUTS AND ROOKERIES

The proposed survey activities will not occur near any known pinniped haul-out and/or rookeries (Figure 2.1-1 and 2.1-2 depicts the locations of haul-outs and rookeries in both of the survey regions). The closest pinniped haul-out or rookery is approximately 4.3 kilometers (km) (2.7 miles [mi]) from the Morro Bay survey area routes and approximately 4.5 km (2.8 mi) from the Santa Barbara survey area routes.



LEGEND:

- Harbor Seal Haul-Out
- Proposed Survey Line

MAP EXTENT:



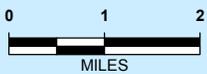
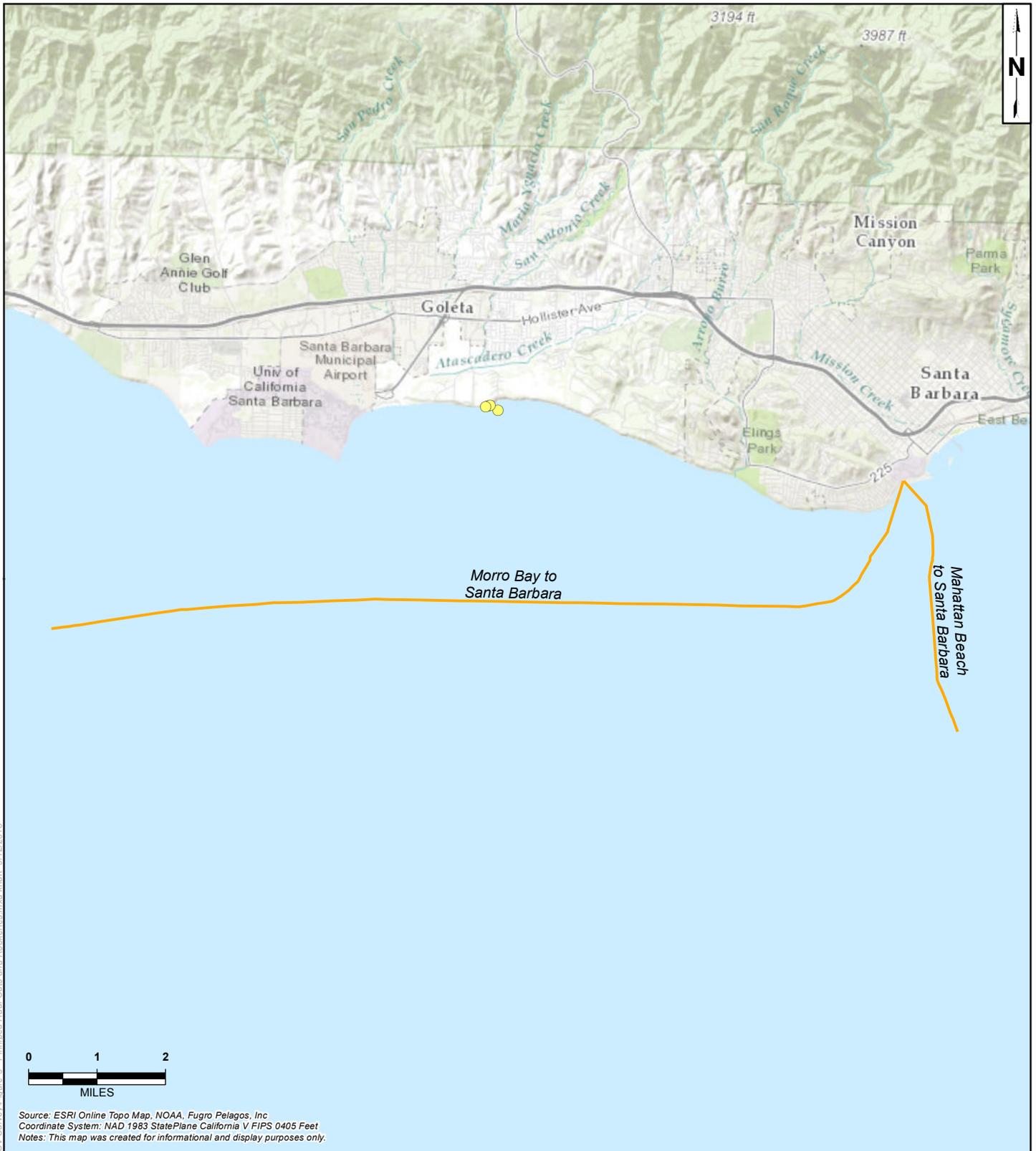
Z:\Kreim\GIS Maps\Map Project\X2 Telecom, LLC ROV Survey\Figure 4 - Pinniped Haul-Outs and Rookeries.mxd.khart 9/12/2016



PROJECT NAME: X2 TELECOM, LLC ROV SURVEY SAN LUIS OBISPO COUNTY, CA	
PROJECT NUMBER: 1602-2691	DATE: September 2016

PINNIPED HAUL-OUTS AND ROOKERIES

FIGURE 2.1-1



Source: ESRI Online Topo Map, NOAA, Fugro Pelagos, Inc
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
 Notes: This map was created for informational and display purposes only.

LEGEND:

- Harbor Seal Haul-Out
- Proposed Survey Line

MAP EXTENT:



Z:\Krestin\GIS Maps\Map Project\X2 Telecom, LLC ROV Survey\Figure 3 - Pinniped Haul-Outs and Rookeries.mxd\kchart_9/11/2016



PROJECT NAME: X2 TELECOM, LLC ROV SURVEY SANTA BARBARA COUNTY, CA	
PROJECT NUMBER: 1602-2691	DATE: September 2016

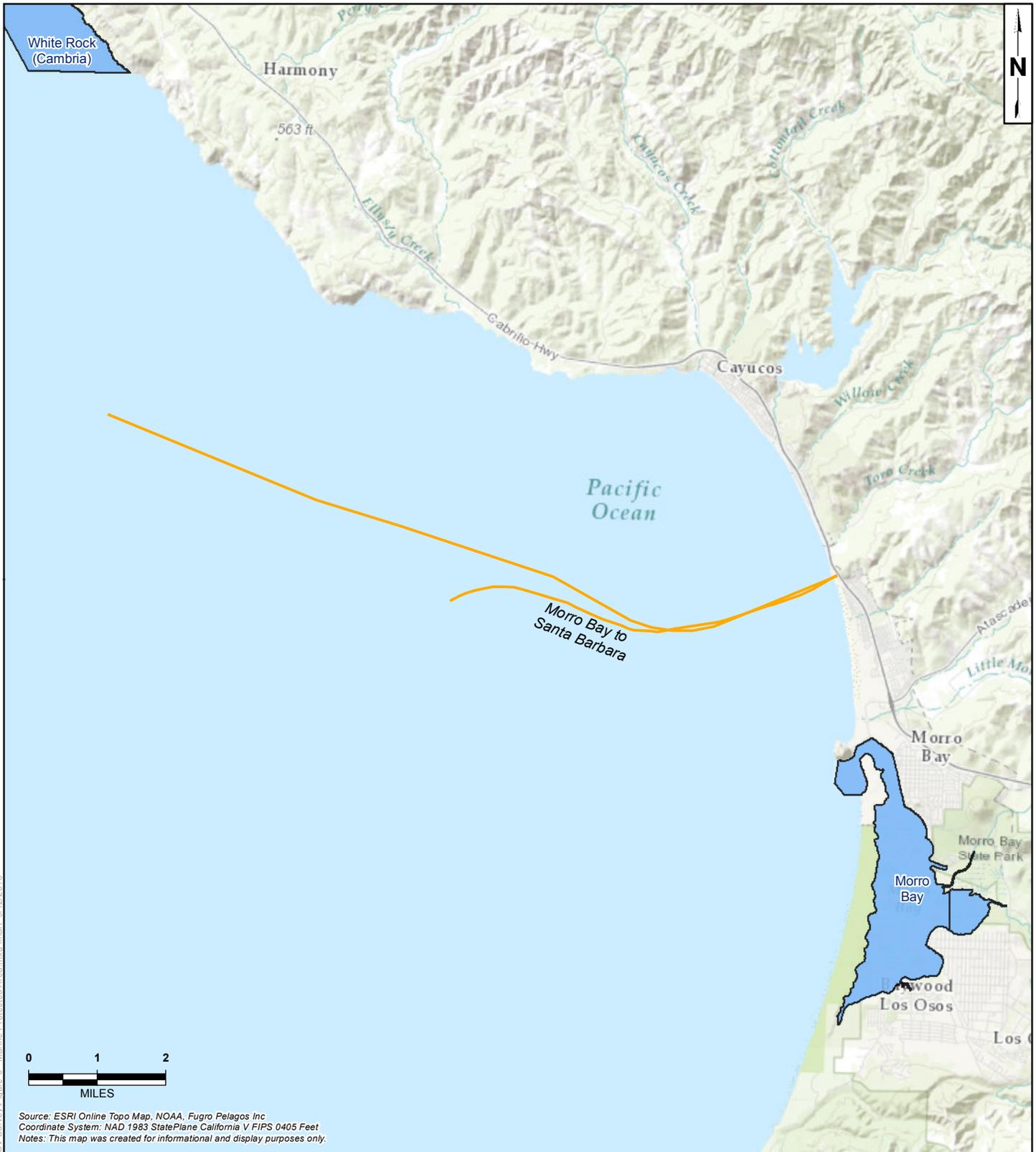
**PINNIPED HAUL-OUTS
AND ROOKERIES**

**FIGURE
2.1-2**

3.0 MARINE PROTECTED AREAS

The proposed Morro Bay survey are will not occur within a designated Marine Protected Area (MPA). The Morro Bay MPA is approximately 4.3 km (2.7 mi) southeast of the Morro Bay survey area routes (Figure 3.0-2).

Within the Santa Barbara survey area, the proposed cable route that runs from Santa Barbara to Morro Bay, is located within the Campus Point MPA (Figure 3.0-2). Fugro will obtain the necessary scientific collecting permit (SCP), in accordance with CSLC geophysical and geologic sampling permit and consultation with the California Department of Fish and Wildlife (CDFW), in order to conduct surveys along the western Santa Barbara cable route. All SCP conditions and impact avoidance measures will be implemented for survey activities within the MPA.



LEGEND:

- Proposed Survey Line
- Marine Protected Area (MPA)

MAP EXTENT:



PROJECT NAME: X2 TELECOM, LLC ROV SURVEY
 SAN LUIS OBISPO COUNTY, CA

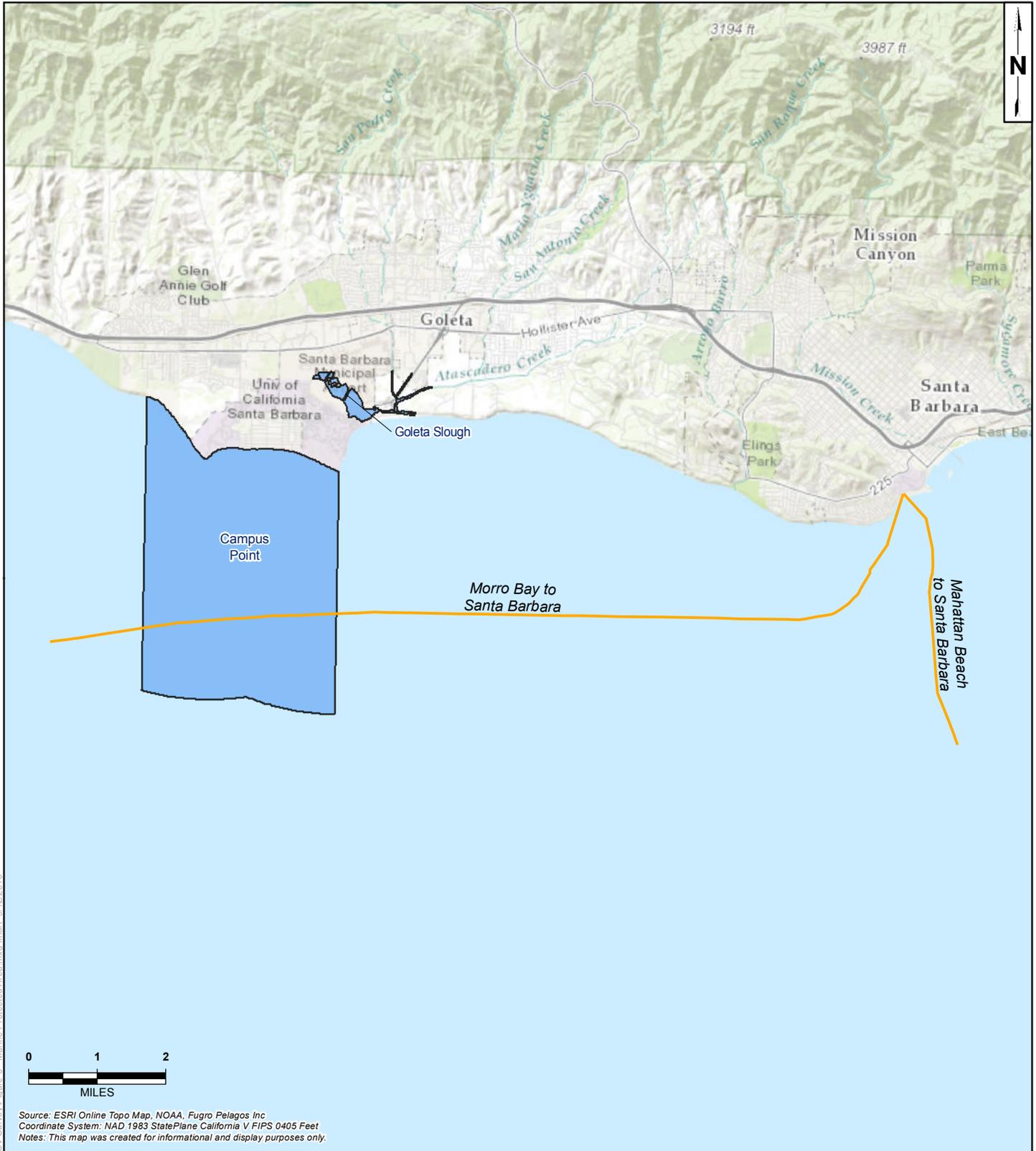


PROJECT NUMBER:	DATE:
1602-2691	September 2016

MARINE PROTECTED AREA

FIGURE 3.0-1

Z:\Kris\GIS Maps\Map Project\X2 Telecom, LLC ROV Survey\Figure 6 - Marine Protected Area.mxd khart 9/12/2016



Source: ESRI Online Topo Map, NOAA, Fugro Pelagos Inc
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
 Notes: This map was created for informational and display purposes only.

LEGEND:

- Proposed Survey Line
- Marine Protected Area (MPA)

MAP EXTENT:



PROJECT NAME: X2 TELECOM, LLC ROV SURVEY
 SANTA BARBARA COUNTY, CA



PROJECT NUMBER:	DATE:
1602-2691	September 2016

MARINE PROTECTED AREA

FIGURE
3.0-2

Z:\Krestin\GIS\Maps\Map_Project\X2_Telecom, LLC ROV Survey\Figure 5 - Marine Protected Area.mxd khart 9/12/2016

4.0 ONBOARD MONITORING AND OTHER MITIGATIONS

4.1 PRE-SURVEY NOTIFICATIONS

A Notice to Mariners will be submitted to the United States Coast Guard (USCG) and all applicable agencies, 21 days prior to the start of the survey. The Notice to Mariners will provide information regarding proposed activities and location of survey activities. The notice will also be delivered for posting to the local harbormaster's office.

4.2 VESSEL TRANSIT

The survey vessel will transit during daylight hours, whenever possible, to and from the designated port of call. During transit periods, there is a potential for encountering marine wildlife and therefore onboard monitoring will be conducted by the vessel operator. If nighttime transit is required, Fugro will send request to CSLC, per the geophysical permit requirements, prior to start of the survey.

During transit periods, the vessel will maintain a minimum distance of 500 m (1,640 ft) for the protection of large marine mammals (i.e., whales) and a 152 m (500 ft) distance for the protection of smaller marine mammals (i.e., dolphins, sea lions, etc.); no minimum distance is specified for marine reptiles. If the vessel operator observes a marine mammal or reptile within the path of the transiting vessel, the vessel operator will immediately slow the vessel and/or change course in order to avoid a collision, unless those actions jeopardize the safety of the vessel crew.

When whales are in the survey area and/or are observed proximal to the vessel during transit periods the vessel operator will observe the following guidelines:

- Avoid crossing directly in front of or across the path of sighted whales;
- Transit parallel to whales and maintain a constant speed that is not faster than the whale's speed;
- Refrain from positioning the vessel in such a manner to separate a female whale from her calf;
- Avoid using the vessel to herd or drive whales; and
- 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.

4.3 FISHING GEAR CLEARANCE

In addition to submitting the required Notice to Mariners that will alert commercial fishers of pending on-water activities prior to the start of each survey location, the vessel will traverse the proposed survey corridor to note and record the presence of deployed fishing gear. The type and location of fishing gear (buoys) will be noted, and the California Department of Fish and Wildlife (CDFW) Southern District Enforcement Office will be contacted. No survey lines will be completed within 30 m (100 ft) of any observed fishing gear. 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 CDFW agent (Table 4.2-1).

Table 4.2-1. Fishing Gear Contact Information

Enforcement Dispatch Desk California Department of Fish and Wildlife, Southern District	California Department of Fish and Wildlife, Marine Division
(562) 598-1032	(831) 649-2870

4.4 SURVEY MONITORING

During ROV operations, the vessel will be moving slowly (less than two nautical miles per hour) and will need to maintain a heading that coincides with the survey corridor. In addition, all ROV operations will be conducted during daylight hours, wherever possible. If nighttime operations are required, Fugro will include a request to CSLC, per the geophysical permit requirements, prior to start of the survey.

As per CLSC Low Energy Offshore Geophysical Permit Program, a Marine Wildlife Monitor is not required onboard vessels that utilize non-pulse or non-acoustic generating equipment, as their only form of geophysical equipment. Therefore, if marine wildlife is observed by vessel crew within the vicinity of the vessel, then the vessel and ROV operators will be advised to take precautions to avoid collision or entanglement of the animal within the ROV umbilical. Those precautions will include:

- Minimizing the amount of umbilical deployed (without jeopardizing the ROV survey equipment or vessel);
- Continue observations of the animal(s) until it/they are clear of the operations;
- Slow the vessel to minimum speed needed to maintain heading and maintain stable marine operations; and
- Avoid crossing the anticipated path of the marine animal's direction of movement, wherever possible.

With the institution of these procedures, no impacts associated with vessel transit or ROV operations to marine wildlife are expected.

5.0 RECORDING AND REPORTING PROCEDURES

5.1 COLLISION RESPONSE

If a collision with marine mammal or reptile occurs, the vessel operator must document the conditions under which the accident occurred, including the following:

- Location (latitude and longitude) of the vessel when the collision occurred;
- Date and time of collision;
- Speed and heading of the vessel at the time of collision;
- Observation conditions (e.g., wind speed and direction, swell height, visibility in miles or kilometers, and presence of rain or fog) at the time of collision;
- Species of marine wildlife contacted (if known);
- Whether an observer was observing for marine wildlife at the time of collision; and
- Name of vessel, vessel owner/operator (the company), and captain or officer in charge of the vessel at time of collision.

If a collision occurs, the vessel should stop, if safe to do so. However, the vessel is not obligated to stand by and 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 (Table 5.2-1).

Table 5.2-1. Collision Contact Information

Federal	State	State
Justin Viezbicke Stranding Coordinator National Marine Fisheries Service Long Beach, California (562) 980-3230	Enforcement Dispatch Desk California Department of Fish and Wildlife Los Alamitos, California (562) 598-1032	California State Lands Commission Division of Environmental Planning and Management Sacramento, California (916) 574-1938

The Marine Mammal Protection Act (MMPA) requires that collisions with or other survey-related impacts to marine wildlife will be reported promptly to the National Marine Fisheries Service (NMFS) Stranding Coordinator. From the report, the NMFS Stranding Coordinator will coordinate subsequent action, including enlisting the aid of marine mammal rescue organizations, if appropriate.

From the vessel's base of operations, a telephone call will be placed to the National Marine Fisheries Service West Coast (California) Stranding Coordinator in 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:

National Marine Fisheries Service
West Coast Stranding Coordinator
501 West Ocean Blvd, Suite 4200
Long Beach, CA 90802
(562) 980-3230
Contact: Justin Viezbicke
Email: justin.viezbicke@noaa.gov

It is unlikely that the vessel will be asked to stand by until NMFS or CDFW personnel arrive; however, this will be determined by the NMFS 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 NMFS Stranding Coordinator.

Although NMFS has primary responsibility for marine mammals in both state and federal waters, the CDFW will also be advised that an incident has occurred in state waters affecting a protected species.

6.0 REFERENCES

Allen, S., Mortenson, J., and Webb, S.. 2011. Field Guide to Marine Mammals of the Pacific Coast: Baja, California, Oregon, Washington, British Columbia. University of California Press. Berkeley and Los Angeles, California.

Bonnell, M.L., and Dailey, M.D.. 1993. Ecology of the Southern California Bight: A Synthesis and Interpretation. Berkeley, CA: University of California Press.

National Marine Fisheries Service. 2016a. Marine Mammal Stock Assessment Reports by Species. Website: <http://www.nmfs.noaa.gov/pr/sars/species.htm>. Updated June 17, 2016 accessed on August 10, 2016.

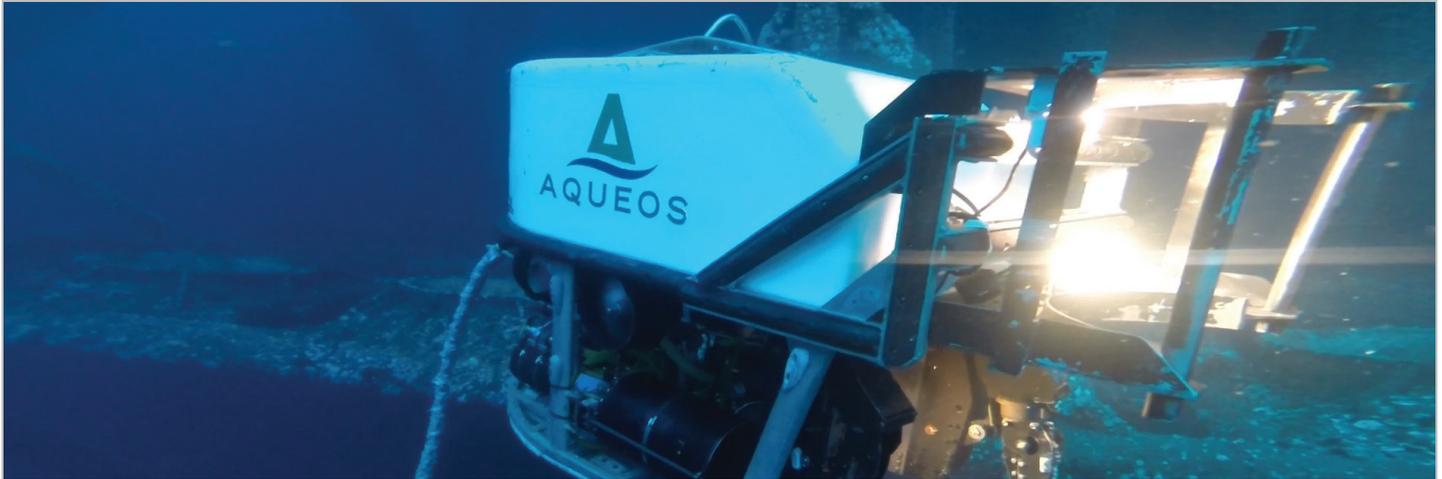
National Marine Fisheries Service 2016b. Status of Marine Turtles Website: <http://www.fisheries.noaa.gov/pr/species/turtles/> Updated April 5, 2015 accessed on August 10, 2016.

NOAA National Centers for Coastal Ocean Science (NCCOS). 2007. A Biogeographic Assessment off North/Central California: In Support of the National Marine Sanctuaries of Cordell Bank, Gulf of the Farallones and Monterey Bay. Phase II - Environmental Setting and Update to Marine Birds and Mammals. Prepared by NCCOS's Biogeography Branch, R.G. Ford Consulting Co. and Oikonos Ecosystem Knowledge, in cooperation with the National Marine Sanctuary Program. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 40. 240 pp.

U.S. Geological Survey, 2014. Spring 2014 Mainland California Sea Otter Survey Results. Website accessed online at: <http://www.werc.usgs.gov/ProjectSubWebPage.aspx?SubWebPageID=24&ProjectID=91> on April 15, 2016.

APPENDIX A

HYSUB 20 – REMOTELY OPERATED VEHICLE SPECIFICATIONS SHEET



Features:

- 2,000' Operating Depth
- 2ea Hydraulic Manipulators (Five function and Four function)
- High Resolution Color Video Camera (CCD)
- Low Light Wide Angle B&W CCD
- High Resolution Color Imaging Sonar
- Camera Pan and Tilt
- HID and Halogen Lighting
- Computer Controlled:
 - Auto Altitude, Depth and Heading
 - Digital Stills Camera (Optional)
 - Climate Controlled Operations Van
- Rapid System Deployment
- Complete Spares

Documentation:

- DVD and Hard Drive Recording (Video and Sonar)
- Cathodic Potential Measurements (Data Recorded on Video and Hard Drive)

Capabilities:

- Pipelines-External/Internal
- Offshore Platforms
- Cathodic Potential
- Power & Communications Cables
- Dams
- Insurance Surveys
- Biological-Geological Surveys
- Acoustic Tracking & Positioning
- Search and Recovery Operations

Optional Equipment:

- Broadcast Quality Video
- Laser Scaling and Precision Measurements
- Hydraulic tooling
- High Resolution Digital Imaging
- CTD Conductivity, Depth and Temperature Unit

HYSUB 20 - REMOTELY OPERATED VEHICLE

Light Work Class ROV



VEHICLE	
Length:	7'
Width:	3.5'
Height:	4.5'
Weight in Air:	2,000 lbs
Frame:	6061 T6 Aluminum
Fittings:	316 Stainless Steel
Depth Rating:	3000'
Payload:	100 lbs (additional flotation can be added for larger payloads)
Horsepower:	2 each 10hp Power Units
Lighting:	4 each x 250 watt Halogen 2 each x 70 watt HID
Cameras:	1 each Color Zoom CCD 1 each Low Light Wide Angle B&W CCD 1 each Low Light B&W CCD (Vehicle can be fitted with up to 5 cameras as required for operations)
Navigation:	Mesotech MS1000 Color Imaging Sonar Teledyne-CDL TOGS Fiber Optic Gyro (FOG) True North Revolution 2X Compass Paroscientific Digiquartz Depth Sensor Mesotech 200 Khz Altimeter
Telemetry:	Asynchronous serial data transmission for control of auto heading, depth, altitude and data displays.
Power Requirements:	480 VAC, 3 Phase, 60 Hz, 50 KVA

DEPLOYMENT SYSTEM	
Length:	15.5'
Width:	8'
Weight:	17,000 lbs

CONTROL AND SUPPLIES VANS	
Lengths:	20' and 4'
Width:	8'
Heights:	10' and 8'
Weights:	15,000 and 6,000 lbs



VERIFICATION OF ENGINE REQUIREMENTS



CUMMINS INC.
Columbus, IN 47201
Marine Performance Curves

Basic Engine Model
QSK19-M

Curve Number:
M-4533

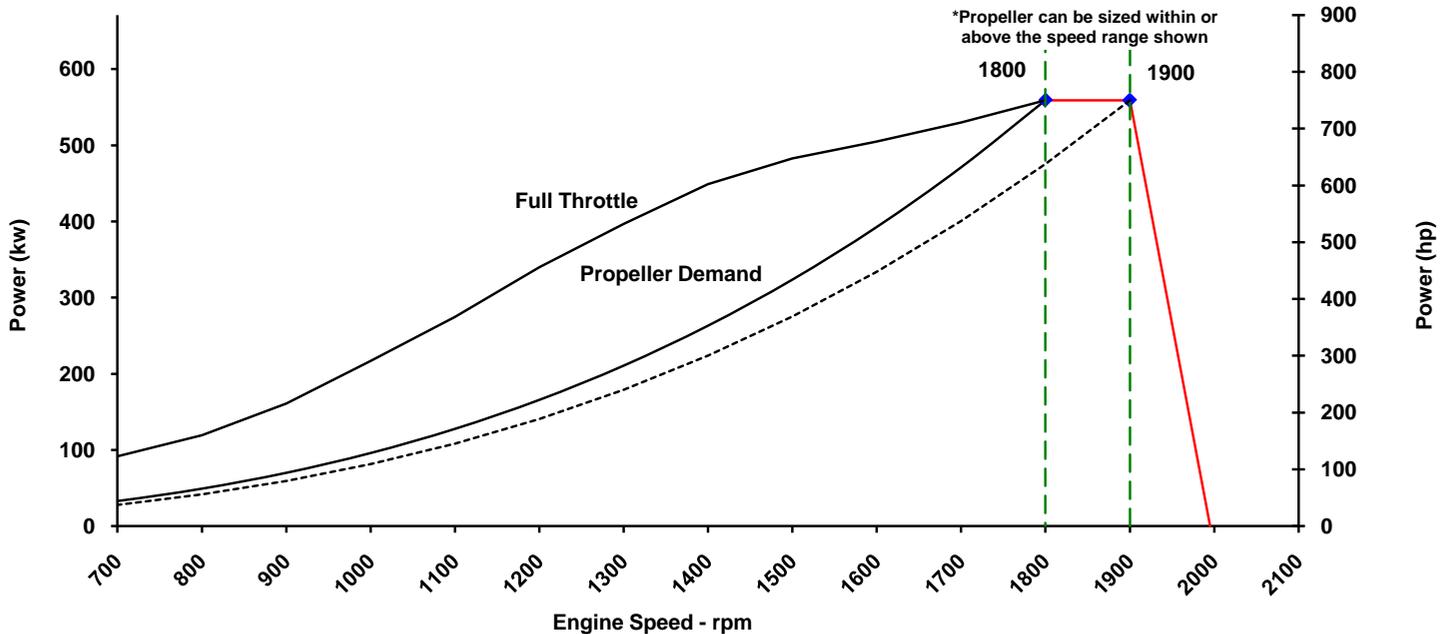
Engine Configuration
D193102MX03

CPL Code:
3455

Date:
24-Aug-11

Displacement: **18.9 liter [1150 in³]** Rated **559 kw [750 bhp]**
 Bore: **159 mm [6.25 in]** Rated **1800 rpm**
 Stroke: **159 mm [6.25 in]** Rating Type: **Heavy Duty**
 Cylinders: **6** Aspiration: **Turbocharged / LTA**
 Fuel System: **Modular Common Rail (MCRS) with C3.0 Injectors**

CERTIFIED: This diesel engine complies with or is certified to the following agencies requirements:
 EPA Tier 2 - Model year requirements of the EPA marine regulation (40CFR94)
 EU Stage IIIa - EC Nonroad Mobile Machinery Directive (2004/26/EC)
 IMO Tier II (Two) NOx requirements of International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13



Speed	Full Throttle				Propeller Demand				
	Power		Torque		Power		Torque		Fuel Consumption
	rpm	kw (hp)	N·m (ft·lb)	kw (hp)	N·m (ft·lb)	L/hr (gal/hr)			
1900	559 (750)	2811 (2073)	558.9 (749.5)	2965.0 (2186.9)	140.9 (37.2)				
1800	559 (750)	2966 (2188)	470.8 (631.4)	2644.7 (1950.6)	118.6 (31.3)				
1700	530 (711)	2978 (2196)	392.5 (526.4)	2342.7 (1727.9)	101.5 (26.8)				
1600	505 (677)	3015 (2224)	323.4 (433.7)	2059.0 (1518.7)	83.4 (22.0)				
1500	483 (648)	3062 (2259)	263.0 (352.6)	1793.6 (1322.9)	71.4 (18.9)				
1400	449 (602)	2917 (2151)	210.5 (282.3)	1546.5 (1140.7)	58.0 (15.3)				
1300	397 (532)	2704 (1995)	165.6 (222.1)	1317.8 (971.9)	46.1 (12.2)				
1200	340 (456)	2384 (1758)	127.6 (171.1)	1107.3 (816.7)	35.4 (9.3)				
1100	275 (368)	2071 (1527)	95.8 (128.5)	915.1 (675.0)	26.6 (7.0)				
1000	217 (291)	1707 (1259)	69.9 (93.7)	741.2 (546.7)	19.2 (5.1)				
900	161 (216)	1426 (1052)	49.1 (65.8)	585.7 (432.0)	13.9 (3.7)				
800	120 (160)	1248 (921)	32.9 (44.1)	448.4 (330.7)	10.0 (2.7)				

* Cummins Full Throttle Requirements:

- Engine achieves or exceeds rated rpm at full throttle under any steady operating condition
- Engines in variable displacement boats (such as pushboats, tugboats, net druggers, etc.) achieve no less than 100 rpm below rated speed at full throttle during a dead push or bollard pull
- Engine achieves or exceeds rated rpm when accelerating from idle to full throttle

Rated Conditions: Ratings are based upon ISO 15550 reference conditions; air pressure of 100 kPa [29.612 in Hg], air temperature 25deg. C [77 deg. F] and 30% relative humidity. Power is in accordance with IMCI procedure. Member NMMA. Unless otherwise specified, tolerance on all values is +/-5%.

Full Throttle curve represents power at the crankshaft for mature gross engine performance corrected in accordance with ISO 15550. Propeller Curve represents approximate power demand from a typical propeller. Propeller Shaft Power is approximately 3% less than rated crankshaft power after typical reverse/reduction gear losses and may vary depending on the type of gear or propulsion system used.

Fuel Consumption is based on fuel of 35 deg. API gravity at 16 deg C [60 deg. F] having LHV of 42,780 kJ/kg [18390 Btu/lb] and weighing 838.9 g/liter [7.001 lb/U.S. gal].

Heavy Duty (HD): Intended for continuous use in variable load applications where full power is limited to eight (8) hours out of every ten (10) hours of operation. Also, reduce power operations must be at or below 200 rpm of the maximum rated rpm. This is an ISO 15550 fuel stop power rating and is for applications that operate 5,000 hours per year or less.

CHIEF ENGINEER

Propulsion Marine Engine Performance Data

Curve No. M-4533
DS : D19-MX-1
CPL : 3455
DATE: 24-Aug-11

General Engine Data

Engine Model	QSK19-M
Rating Type	Heavy Duty
Rated Engine Power	559 [750]
Rated Engine Speed	1800
Rated Power Production Tolerance	3
Rated Engine Torque	2966 [2188]
Peak Engine Torque @ 1500 rpm.....	3074 [2268]
Brake Mean Effective Pressure	1977 [287]
Indicated Mean Effective Pressure.....	3963 [575]
Maximum Allowable Engine Speed	2450
Maximum Torque Capacity from Front of Crank ²	2339 [1725]
Compression Ratio	15:1
Piston Speed	9.5 [1875]
Firing Order	1-5-3-6-2-4
Weight (Dry) - Engine Only - Average	2200 [4850]
Weight (Dry) - Engine With Heat Exchanger System - Average.....	2336 [5150]
Weight Tolerance (Dry) Engine Only	10.0

Governor Settings

Default Droop Value.....	Refer to MAB 2.04.00-03/23/2006 for Droop explanation	5%
Minimum Droop Allowed.....		0%
Maximum Droop Allowed.....		16%
High Speed Governor Break Point.....		1900
Minimum Idle Speed Setting		550
Normal Idle Speed Variation		±10
High Idle Speed Range Minimum		1900
High Idle Speed Range Maximum		1995

Noise and Vibration

Average Noise Level - Top	(Idle).....	82
	(Rated)	93
Average Noise Level - Right Side	(Idle).....	85
	(Rated)	99
Average Noise Level - Left Side	(Idle).....	85
	(Rated)	98
Average Noise Level - Front	(Idle).....	87
	(Rated)	100

Fuel System¹

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle	99.2 [26.2]
Fuel Consumption at Rated Speed	140.4 [37.1]
Approximate Fuel Flow to Pump	378.5 [100.0]
Maximum Allowable Fuel Supply to Pump Temperature	60.0 [140]
Approximate Fuel Flow Return to Tank	238.1 [62.9]
Approximate Fuel Return to Tank Temperature	51.3 [124]
Maximum Heat Rejection to Drain Fuel	1.4 [78]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

- ¹ Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.
- ² No rear loads can be applied when the FPTO is fully loaded. Max PTO torque is contingent on torsional analysis results for the specific drive system. Consult Installation Direction Booklet for Limitations.
- ³ Heat rejection to coolant values are based on 50% water/50% ethylene glycol mix and do NOT include fouling factors. If sourcing your own cooler, a service fouling factor should be applied according to the cooler manufacturer's recommendation.
- ⁴ Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.
- ⁵ May not be at rated load and speed. Maximum heat rejection may occur at other than rated conditions.

CUMMINS ENGINE COMPANY, INC
 COLUMBUS, INDIANA

All Data is Subject to Change Without Notice - Consult the following Cummins intranet site for most recent data:

<http://marine.cummins.com/>

Propulsion Marine Engine Performance Data

Curve No. M-4533
DS : D19-MX-1
CPL : 3455
DATE: 24-Aug-11

Air System¹

Intake Manifold Pressure	kPa [in Hg]	225 [66]
Intake Air Flow	l/sec [cfm]	756 [1602]
Heat Rejection to Ambient	kW [Btu/min]	50 [2865]

Exhaust System¹

Exhaust Gas Flow	l/sec [cfm]	1814 [3,844]
Exhaust Gas Temperature (Turbine Out)	°C [°F]	454 [849]
Exhaust Gas Temperature (Manifold)	°C [°F]	595 [1,103]

Emissions (in accordance with ISO 8178 Cycle E3)

NOx (Oxides of Nitrogen)	g/kw·hr [g/hp·hr]	6.37 [4.75]
HC (Hydrocarbons)	g/kw·hr [g/hp·hr]	0.08 [0.06]
CO (Carbon Monoxide)	g/kw·hr [g/hp·hr]	1.31 [0.98]
PM (Particulate Matter)	g/kw·hr [g/hp·hr]	0.06 [0.05]

Cooling System¹

Sea Water Pump Specifications	MAB 0.08.17-07/16/2001	
Pressure Cap Rating (With Heat Exchanger Option)	kPa [psi]	103 [15]
Max. Coolant Outlet Pressure from the Engine.....	kPa [psi]	207 [30]
Max. Pressure Drop Across Any External Cooling System Circuit	kPa [psi]	34 [5]

Engines with Low Temperature Aftercooling (LTA)

Single Loop LTA

Coolant Flow to Cooler (with blocked open thermostat).....	l/min [gal/min]	238 [63]
LTA Thermostat Operating Range (Start to Open)	°C [°F]	66 [150]
LTA Thermostat Operating Range (Full Open)	°C [°F]	80 [175]
Heat Rejection to Engine Coolant ³	kW [Btu/min]	446 [25400]
Maximum Coolant Inlet Temperature from LTA Cooler.....	°C [°F]	49 [120]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

¹ Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.

² No rear loads can be applied when the FPTO is fully loaded. Max PTO torque is contingent on torsional analysis results for the specific drive system. Consult Installation Direction Booklet for Limitations.

³ Heat rejection to coolant values are based on 50% water/50% ethylene glycol mix and do NOT include fouling factors. If sourcing your own cooler, a service fouling factor should be applied according to the cooler manufacturer's recommendation.

⁴ Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.

⁵ May not be at rated load and speed. Maximum heat rejection may occur at other than rated conditions.

CUMMINS ENGINE COMPANY, INC
 COLUMBUS, INDIANA

All Data is Subject to Change Without Notice - Consult the following Cummins intranet site for most recent data:

<http://marine.cummins.com/>

Cummins Inc.

Marine Engine General Data Sheet

Engine Model: **QSK 19 MCRS Fuel System**

Data Sheet: **D19-MX-1**
Date: **20-Mar-15**

GENERAL ENGINE DATA

Metric [U.S. Customary]

Type		4 Cycle - In-line
Cylinders.....		6
Bore	mm [in]	159 [6.25]
Stroke	mm [in]	159 [6.25]
Displacement	liter [in ³]	19 [1150]
X Axis Moment of Inertia about Center of Gravity (Roll).....	Kg-m ² [lb-ft ²]	61.1 [1,447]
Y Axis Moment of Inertia about Center of Gravity (Pitch).....	Kg-m ² [lb-ft ²]	162.4 [3,845]
Z Axis Moment of Inertia about Center of Gravity (Yaw).....	Kg-m ² [lb-ft ²]	128.5 [3,042]

ENGINE MOUNTING & ACCESSORY DRIVES

Max. Allowable Bending Moment at Rear Face of Block	N·m [ft·lb]	1356 [1000]
Max. Allowable Axial Thrust Load on Crankshaft	N [lb]	3336 [750]
Min. Axial Clearance at Front Face of Crankshaft for Thermal Expansion	mm [in]	2.02 [0.080]
Crankshaft Radial Load Limit.....	MAB 0.01.09-12/02/2005	
Max. Allowable Radial Load on Front of Crankshaft		
At All Angles	N [lb]	2780 [625]
Max. Allowable Radial Load on Rear of Crankshaft		
At All Angles	N [lb]	2664 [599]
Maximum Operating Angles (see MAB No. 0.16.00-01/18/2007 for definitions and options to gain greater capability)		
Continuous Pitch Angle		
Engine Front Up From Horizontal	Deg.	20°
Engine Front Down From Horizontal	Deg.	0°
Continuous Roll Angle		
"Right" from vertical viewed from flywheel end of engine.....	Deg.	35°
"Left" from vertical viewed from flywheel end of engine.....	Deg.	30°
Intermittent Pitch Angle (intermittent operation less than 1 minute)		
Engine Front Up From Horizontal	Deg.	30°
Engine Front Down From Horizontal	Deg.	30°
Intermittent Roll Angle (intermittent operation less than 1 minute)		
"Right" from vertical viewed from flywheel end of engine.....	Deg.	45°
"Left" from vertical viewed from flywheel end of engine.....	Deg.	45°

FUEL SYSTEM

Maximum Allowable Restriction to Fuel Pump		
Clean Filter	kPa [in Hg]	34 [10]
Dirty Filter	kPa [in Hg]	54 [16]
Maximum Allowable Return Line Pressure	kPa [in Hg]	68 [20]
Maximum Static Pressure at Fuel Pump	kPa [in Hg]	68 [20]
Maximum Height of Fuel In Tank Above Fuel Pump	m [ft]	8.2 [27]

EXHAUST SYSTEM

Maximum Allowable Back Pressure	kPa [in Hg]	10 [3]
Maximum Bending Moment at Turbine Outlet Mounting Flange	N·m [ft·lb]	21.0 [15.5]
Maximum Incremental Direct Load at Turbine Outlet Mounting Flange	kg [lb]	9.1 [20.0]

AIR INDUCTION SYSTEM

Max. Allowable Intake Restriction - Turbocharged		
Clean Filter	kPa [in H ₂ O]	4 [15]
Dirty Filter	kPa [in H ₂ O]	6 [25]
Maximum Air Cleaner Inlet Temperature Rise Over Ambient	°C [°F]	17 [30]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

Cummins Inc.
COLUMBUS, INDIANA

All Data is Subject to Change Without Notice - Consult the following Cummins intranet site for most recent data:

<http://marine.cummins.com>

Cummins Inc.

Marine Engine General Data Sheet

Engine Model: **QSK 19 MCRS Fuel System**

Data Sheet: **D19-MX-1**
Date: **20-Mar-15**

LUBRICATION SYSTEM

Oil Consumption Rate (Volume Percent of Fuel Consumption Rate)	%	0.16
Oil Pressure at Normal Operating Temperature		
Idle Speed - Minimum in Filter Head Upstream of Filter	kPa [psi]	117 [17]
Idle Speed - Minimum in Main Oil Gallery	kPa [psi]	138 [20]
Rated Speed - Measured in Filter Head Upstream of Filter (Low)	kPa [psi]	345 [50]
Rated Speed - Measured in Filter Head Upstream of Filter (High)	kPa [psi]	483 [70]
Rated Speed - Measured in Main Oil Gallery (Low)	kPa [psi]	310 [45]
Rated Speed - Measured in Main Oil Gallery (High)	kPa [psi]	448 [65]
Max. Allowable Oil Temperature (Sump)	°C [°F]	121 [250]
Oil Pan Capacity (Shallow) OP 4088		
Low	liter [gal]	49.2 [13]
High	liter [gal]	60.6 [16]
Total System Capacity (Max. Sump + Filter(s))	liter [gal]	68.1 [18]
Oil Pan Capacity (Deep) OP 4090		
Low	liter [gal]	64.4 [17]
High	liter [gal]	71.9 [19]
Total System Capacity (Max. Sump + Filter(s))	liter [gal]	79.5 [21]
By-Pass Oil Filter Capacity	liter [gal]	2.3 [0.6]
Spin on Filter Capacity.....	liter [gal]	2.5 [0.7]
Eliminator Filter Capacity.....	liter [gal]	5.7 [1.5]

COOLING SYSTEM

Coolant Capacity		
Engine Only	liter [gal]	57.5 [15]
Engine Including Heat Exchanger and Integral Expansion Tank.....	liter [gal]	87.1 [23]
Min. Coolant Makeup Capacity	liter [gal]	5.3 [1]
Max. Pressure Drop Across Any External Cooling System Circuit	kPa [psi]	34.5 [5]
Max. Allowable Block Coolant System Pressure	kPa [psi]	241.3 [35]
Max. Coolant Outlet Pressure from the Engine.....	kPa [psi]	206.8 [30]
Max. Coolant Head From Crankshaft Centerline With 15 psi Pressure Cap	m [ft]	12.5 [41]
Max. Coolant Temperature of the Engine	°C [°F]	96 [205]
Min. Block Coolant Temperature (Warm Engine)	°C [°F]	71 [160]
Min. Allowable Coolant Expansion Space	% of System Capacity	5%
Sea Water Pump Specifications.....	Refer to MAB 0.08.17 - 07/16/2001	

ELECTRICAL AND STARTER SYSTEM

Electrical		24V
Min. Recommended Battery Capacity		
Cold Cranking Amperes Rating (CCA)		900
Marine Cranking Amperes Rating (MCA)		1125
Reserve Capacity (Discharging 25 Amps @ 80°F)	minutes	320
Min. Allowable System Voltage (@ Battery While Running)	Volts	21.0
Min. Allowable System Voltage (@ Battery While Cranking)	Volts	18
Max. Allowable System Voltage (@ Battery While Running)	Volts	31.0
Min. Engine Cranking Torque	ft·lb	200
Min. Break-away Engine Cranking Torque	ft·lb	450
Min. Engine Cranking Speed	rpm	150
Max. Engine (Running) Current Draw	Amps	11
Min. Ambient Temperature for Cold Start (No Aids)	°C [°F]	-18 [0]
Air Starter		
Regulated Pressure for Air Starter System	kPa [psi]	1034 [150]
Min. Air-Flow for Air Starter System	l/sec [cfm]	335 [710]
Min. Recommended Tank Volume	liter [gal]	379 [100]

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Cummins Inc.
COLUMBUS, INDIANA

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<http://marine.cummins.com>

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Local Notice to Mariners (Ref. 7192)

Pratt, Cynthia [FPI] [cpratt@fugro.com]

To: Albert, Alfred K BM1 [Alfred.K.Albert@uscg.mil]
Cc: Villegas, Bradi [FPI] [BVillegas@fugro.com] [Jason Smith [JSmith@aqueossubsea.com]
Attachments: 7192_Notice to Mariners.pdf (3 MB) [Open as Web Page]

Monday, September 12, 2016 4:36 PM

Good Afternoon, Alfred,

Attached is a local notice to mariners for an upcoming ROV inspection project offshore Santa Barbara and Morro Bay.

Please contact me if you have any questions or further requirements.

Kind regards,
Fugro Pelagos, Inc.

Cindy Pratt
Survey Operations Manager - Ventura

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cpratt@fugro.com I www.fugro.com
4820 McGrath Street, Suite 100, Ventura, CA 93003-7778, USA

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Pre-survey notification - Dive Shop (Ref. 7192)

Pratt, Cynthia [FPI] [cpratt@fugro.com]

To: shawnteam@gmail.com
Cc: Villegas, Bradi [FPI] [BVillegas@fugro.com]
Attachments: 7192_HarborMaster_DiveShop.pdf (772 KB) [Open as Web Page]

Tuesday, September 13, 2016 11:48 AM

Good Morning,

Per our geophysical notification requirements by California State Lands Commission (CSLC), I am submitting to you the attached notice for posting.

Please contact me if you have any questions or require further information.

Kind regards,
Fugro Pelagos, Inc.

Cindy Pratt
Survey Operations Manager – Ventura

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Pre-survey notification - Harbor Master (Ref. 7192)

Pratt, Cynthia [FPI] [cpratt@fugro.com]

To: sriedman@santabarbaraca.gov
Cc: Villegas, Bradi [FPI] [BVillegas@fugro.com]
Attachments: 7192_HarborMaster_DiveShop.pdf (772 KB) [Open as Web Page]

Tuesday, September 13, 2016 11:45 AM

Good Morning, Mr. Riedman,

Per our geophysical notification requirements by California State Lands Commission (CSLC), I am submitting to you the attached notice for posting.

Please contact me if you have any questions or require further information.

Kind regards,
Fugro Pelagos, Inc.

Cindy Pratt
Survey Operations Manager – Ventura

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Pre-survey notification - Harbor Master (Ref. 7192)

Pratt, Cynthia [FPI] [cpratt@fugro.com]

To: EEndersby@morro-bay.ca.us
Cc: [Villegas, Bradi \[FPI\] \[BVillegas@fugro.com\]](mailto:Villegas, Bradi [FPI] [BVillegas@fugro.com])
Attachments: [7192_HarborMaster_DiveShop.pdf \(772 KB\) \[Open as Web Page\]](#)

Tuesday, September 13, 2016 11:47 AM

Good Morning,

Per our geophysical notification requirements by California State Lands Commission (CSLC), I am submitting to you the attached notice for posting.

Please contact me if you have any questions or require further information.

Kind regards,
Fugro Pelagos, Inc.

Cindy Pratt
Survey Operations Manager – Ventura

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