Final

ENVIRONMENTAL ASSESSMENT/ OVERSEAS ENVIRONMENTAL ASSESSMENT

Fiber Optic Communications Undersea System (FOCUS) Replacement
NAVAIR Sea Range, Point Mugu, California

September 2018

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Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
ADI	Area of Direct Impact
AFB	Air Force Base
AICUZ	Air Installation Compatible Use Zone
APE	area of potential effect
ARPA	Archaeological Resources Protection Act
ASBS	Area of Special Biological Significance
AVR	aviation rescue vessel
BMP	best management practice
BP	before the present time
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standard
CARB	California Air Resources Board
CCA	Cowcod Conservation Area
CCC	California Coastal Commission
CCD	Coastal Consistency Determination
CCRWQCB	Central Coast Regional Water Quality Control Board
CDFG	California Department of Fish & Game
CDFW	California Department of Fish & Wildlife
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
C.F.R.	Code of Federal Regulations
CIB	Channel Island Barbed
CINMS	Channel Islands National Marine Sanctuary
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	carbon dioxide equivalent
CPS	coastal pelagic species
PUC	California Public Utilities Commission
CRFS	California Recreational Fisheries Survey
CY	calendar year
CZMA	Coastal Zone Management Act
DoD	Department of Defense
DPR	California Department of Parks and Recreation
DS	Digital Signal Level
DWDM	Dense Wave Division Multiplexing
EA	environmental assessment
EFH	Essential Fish Habitat
EIS	environmental impact statement
EO	Executive Order
EPCRA	Emergency Planning and Community Right to Know Act
ESA	Endangered Species Act
FOCUS	Fiber Optic Communications Underwater System
FONSH	Finding of No Significant Harm
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
H_2S	hydrogen sulfide
HAPC	habitat of particular concern
HARP	Historic and Archaeological Resources Management Plan
HDD	horizontal directional drilling
HF	high frequency
INRMP	Integrated Natural Resources Management Plan
LCU	landing craft utility
MBTA	Migratory Bird Treaty Act
MLPA	Marine Life Protection Act
MMPA	Marine Mammal Protection Act
MPA	Marine Protected Area
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
msl	mean sea level
NAAQS	National Ambient Air Quality Standard
NAVAIR	Naval Air Systems Command
NAWCWD	Naval Air Warfare Center Weapons Division
NBVC	Naval Base Ventura County
NEPA	National Environmental Policy Act
NHPA	National Historical Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NO_X	oxides of nitrogen
NPS	U.S. National Park Service
NRDC	National Resources Defense Council
NRHP	National Register of Historic Places
NRSW	Navy Region Southwest
O_3	ozone
OC	Optical Carrier
OEA	overseas environmental assessment
OEIS	overseas environmental impact statement
OEM	original equipment manufacturer
OPNAVINST	Chief of Naval Operations Instruction
Pb	lead
PLGR	pre-lay grapnel run
$PM_{2.5}$	particulate matter up to 2.5 micrometers in diameter
PM_{10}	particulate matter up to 10 micrometers in diameter
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RDAT&E	research, development, acquisition, test, and evaluation
RO	reverse osmosis
ROV	remotely operated vehicle
SCB	Southern California Bight
SCCAB	South Central Coast Air Basin
SCrI	Santa Cruz Island
SEL	Sound Exposure Level
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SLA	Submerged Lands Act
splice	splice joint
SMCA	State Marine Conservation Area
SME	subject matter expert
SMR	State Marine Reserve
SNI	San Nicolas Island
SO_2	sulfur dioxide
SO_X	oxides of sulfur
SPL	sound pressure level
SSI	sea-to-shore interface
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TSD	treatment, storage, disposal
TSPI	Time-Space Position Information
UHF	ultrahigh frequency
U.S.	United States
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency
VCAPCD	Ventura County Air Pollution Control District
VHF	very high frequency

Abbreviations for Units of Measurement

°C	degrees Celsius	**kHz**	kilohertz
°F	degrees Fahrenheit	**km**	kilometer
µg/m^3	micrograms per cubic meter	**km^2**	square kilometer
µPa	microPascals	**km/hr**	kilometer per hour
ac	acre	**kV**	kilovolt
cm	centimeter	**l**	liter
cm^2	square centimeters	**Lpd**	million liters per day
cm^3	cubic centimeters	**m**	meter
dB	decibel	**m^2**	square meters
dBA	A-weighted decibel	**m^3**	cubic meters
ft	feet	**MB/s**	megabyte per second
ft^2	square feet	**mi**	mile
ft^3	cubic feet	**mi^2**	square mile
gal	gallon	**mph**	miles per hour
GB/s	gigabyte per second	**nm**	nanometer
gpd	gallons per day	**NM**	nautical mile
ha	hectare	**ppm**	parts per million
Hz	hertz	**ppt**	parts per thousand
in	inch	**tpy**	tons per year
in^2	square inches	**yd^3**	cubic yards
in^3	cubic inches		

ENVIRONMENTAL ASSESSMENT/OVERSEAS ENVIRONMENTAL ASSESSMENT

Lead Agency for the EA/OEA:	U.S. Department of the Navy
Title of Proposed Action:	Fiber Optic Communications Undersea System (FOCUS) Replacement, NAVAIR Sea Range, Point Mugu, California
Designation:	**Environmental Assessment/Overseas Environmental Assessment**

ABSTRACT

The Naval Air Systems Command (NAVAIR) Sea Range is located in Ventura and Santa Barbara counties along the Pacific Coast of Southern California and includes onshore locations at Naval Base Ventura County (NBVC) Point Mugu, NBVC San Nicolas Island, and Santa Cruz Island, as well as 36,000 square miles (mi^2, 93,000 square kilometers [km^2]) of Pacific Ocean water surface. This Environmental Assessment/Overseas Environmental Assessment has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321, as amended); regulations implemented by the Council on Environmental Quality (CEQ, Title 40 C.F.R. Parts 1500-1508); Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions*; Navy Procedures for Implementing NEPA (32 C.F.R. Part 775); and Chief of Naval Operations Instruction 5090.1D, *Environmental Readiness Program*. The NEPA process ensures that environmental impacts of proposed federal actions are considered in the decision-making process. Potential environmental impacts have been analyzed for all relevant or otherwise required issue areas, with separate sections on air quality; biological resources; cultural resources; hazardous waste and materials management; infrastructure and utilities; land and water use; marine sediments and water quality; noise; safety; topography, geology, and soils; and visual resources. The proposed construction activities have the potential to temporarily disturb or cause behavioral reactions from local wildlife, including threatened and endangered species at Point Mugu, San Nicolas Island, and Santa Cruz Island. However, with implementation of proposed conservation measures, there would be no significant impacts to wildlife species at Point Mugu, San Nicolas Island, or Santa Cruz Island and no significant harm to the U.S. Exclusive Economic Zone as defined by EO 12114. With the exception of potentially significant impacts to visual resources under Alternative 2 and adverse effects to cultural resources under Alternative 3, no significant environmental impacts to other resources are expected to result from any of the action alternatives or from the No-Action Alternative.

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EXECUTIVE SUMMARY

The Naval Air Systems Command (NAVAIR) Sea Range (Sea Range) is located in Ventura and Santa Barbara counties along the Pacific Coast of Southern California. The Department of Navy (Navy) proposes to replace the existing Fiber Optic Communications Undersea System-I (FOCUS-I) cable between Naval Base Ventura County (NBVC) Point Mugu and NBVC San Nicolas Island (SNI) and the microwave communications system link between NBVC Point Mugu and Santa Cruz Island (SCrI) with a single new system. This new FOCUS, FOCUS-II, will connect NBVC Point Mugu, NBVC SNI, and SCrI via new undersea fiber optic cables. Additionally, under alternatives 1 and 3, a new fresh water supply line will be installed to support operations on SCrI.

This environmental assessment/overseas environmental assessment (EA/OEA) addresses the potential environmental impacts of the cable installation activities and has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. § 4321, as amended); CEQ Regulations for Implementing the Procedural Provisions of NEPA (Title 40 C.F.R. §§ 1500-1508, 1 July 1986); Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions*; Department of the Navy Procedures for Implementing NEPA (32 C.F.R. § 775); and Chief of Naval Operations Instruction (OPNAVINST) 5090.1D, *Environmental Readiness Program*. The NEPA process ensures that environmental impacts of proposed federal actions are considered in the decision-making process.

PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to provide continued reliable operation of the real-time intra-range and inter-range communications capability for the Sea Range with an effective increase in bandwidth required to satisfy operational requirements. This real-time capability includes all data communications between NBVC Point Mugu, NBVC SNI, and SCrI. In order to provide support on SCrI, a reliable long-term delivery system of fresh water to the Navy Site is also necessary.

The communications capability is used to support NAVAIR customers (e.g., U.S. military and allied forces with weapon systems testing needs) who require real-time support of research, development, acquisition, test, and evaluation (RDAT&E) and training data at the Sea Range. This support also requires staff on SCrI, who requires a supply of fresh water for basic needs.

The need for the proposed action is three-fold; 1) reliability of FOCUS-I is degrading; 2) there is a need for increased bandwidth in the SCrI microwave system; and 3) the existing water supply to the SCrI Navy site is aging and could fail.

ALTERNATIVES

The consideration of viable action alternatives focused on means to achieve the purpose and need. The action alternatives include the preferred alternative (Alternative 1) and three action alternatives. These alternatives include:

- Alternative 1 – Preferred Alternative This alternative includes the use of two landing sites at NBVC Point Mugu: one near Building 811 and one at Charlie Pad. The landing site for NBVC SNI would be located near the Coast Guard Jetty. The landing site at SCrI would be located in the Prisoners Harbor area. Each landing site would be used as a horizontal

directional drilling (HDD) pad and equipment staging area. Under this alternative, the FOCUS-II cable will be installed as a four-node ring connecting NBVC Point Mugu, NBVC SNI, and SCrI. This ring would be composed of two cables connecting Point Mugu to SNI utilizing mainland landing sites from the Point Mugu Charlie Pad site to the SNI Coast Guard Jetty site. The NBVC Point Mugu to SCrI cable would utilize mainland landing sites with the Point Mugu Building 811 site connecting to the SCrI Prisoners Harbor landing site. The NBVC SNI to SCrI cable would utilize the SNI Coast Guard Jetty and SCrI Prisoners Harbor landing sites. A new water line would be included with the onshore portion of the FOCUS-II cable at SCrI. On SCrI the onshore cable and water line alignment would be installed in a combination of trenches and an above-ground channel system. The above-ground channel system would follow the base of the hill to the east of the existing well site access road. This alternative would be implemented to the extent that funds are available and only if required approvals for work on SCrI is obtained from the National Park Service (NPS), the Channel Island National Marine Sanctuary CINMS) and the Nature Conservancy (TNC). If any portion of the implementation is delayed beyond five years after a Finding of No Significant Impact (FONSI)/ Finding of No Significant Harm (FONSH) is completed for this EA/OEA, the project data would be reviewed and additional public notice issued.

- Alternative 2 – This alternative is the same as Alternative 1, but would use a route along the edge of the existing well site access road for the above-ground channel system on SCrI.
- Alternative 3 – This alternative includes the use of two landing sites at NBVC Point Mugu: one near Building 811 and one at Charlie Pad. Landing sites for NBVC SNI and SCrI would be located near the Coast Guard Jetty and in the Prisoners Harbor area, respectively. Each landing site would be used as a horizontal directional drilling (HDD) pad and equipment staging area. FOCUS-II will be installed as a four-node ring connecting NBVC Point Mugu, NBVC SNI, and SCrI. This ring will be composed of two cables connecting Point Mugu to SNI utilizing mainland landing sites from the Point Mugu Charlie Pad site to the NBVC SNI Coast Guard Jetty site. The NBVC Point Mugu to SCrI cable will utilize mainland landing sites with the Point Mugu Building 811 site connecting to the SCrI Prisoners Harbor landing site. The NBVC SNI to SCrI cable will utilize the SNI Coast Guard Jetty and SCrI Prisoners Harbor landing sites. A new water line would be included with the onshore portion of the FOCUS-II cable at SCrI. On SCrI the onshore cable and water line alignment would be installed entirely in a trenching corridor, with no elevated channel system. This alternative would be implemented only if required approval for work on SCrI is obtained from NPS, CINMS and TNC.
- Alternative 4 – This alternative includes the installation of two FOCUS II cables connecting NBVC Point Mugu and NBVC SNI. Charlie Pad would be the NBVC Point Mugu landing site, and the Coast Guard Jetty site would serve as the NBVC SNI landing site. No FOCUS-II cables would be installed connecting SCrI to NBVC Point Mugu or NBVC SNI. Since no fiber optic cable would be installed at SCrI, no water line would be added.

In addition to the four action alternatives, Alternative 5 – The No-Action Alternative was analyzed as part of this EA/OEA.

Resources analyzed in this EA/OEA include: air quality; biological resources; cultural resources; hazardous materials and waste management; infrastructure and utilities; land and water use; marine sediments and water quality; noise; safety; topography, geology, and soils; and visual resources. The environmental consequences associated with implementation of the action alternatives and No-Action

Alternatives are presented in Table ES-1. As shown in the table, there are no anticipated significant impacts associated with implementation of Alternative 1, Alternative 4, or the No-Action Alternative. Implementation of Alternative 2 could result in significant impacts to visual resources on SCrI. Implementation of Alternative 3 could result in adverse effects to cultural resources on SCrI. The No-Action Alternative and Alternative 4 would not meet the purpose and need for the proposed action.

For the purposes of this EA/OEA, the land and water use resource area includes the recreational, commercial, and military use of the land and water space of the Sea Range. The associated sections also consider impacts to the coastal zone, as defined by the Coastal Zone Management Act (16 U.S.C. § 1451 *et seq.*).

This EA/OEA does not fully analyze socioeconomics/environmental justice. The proposed action would temporarily bring new personnel to Ventura and Santa Barbara counties to support the installation of FOCUS-II. The individuals can be accommodated without impacts to socioeconomic indicators such as population, employment, income, housing, or schools. New facilities are not necessary to accommodate participants in the installation or operation of FOCUS-II. Therefore, no impacts on minority or low-income populations or populations of children would be expected. Accordingly, the Navy eliminated further detailed examination of environmental justice and socioeconomics in this EA/OEA.

Table ES-1. Environmental Consequences of Alternatives

Resource Area	Alternative 1 Preferred Alternative	Alternative 2	Alternative 3	Alternative 4	Alternative 5 No-Action Alternative
Air Quality & Greenhouse Gases	o	o	o	o	o
Biological Resources *Terrestrial* *Marine* *Threatened & Endangered Species*	 o o o	 o o o	 o o o	 o o o	 o o o
Cultural Resources	o	o	■	o	o
Hazardous Materials & Waste	o	o	o	o	o
Infrastructure & Utilities	o	o	o	o	o
Land & Water Use	o	o	o	o	o
Marine Sediments & Water Quality	o	o	o	o	o
Noise	o	o	o	o	o
Safety	o	o	o	o	o
Topography, Geology, & Soils	o	o	o	o	o
Visual Resources	o	■	o	o	o

Notes: **o** = No significant impact within U.S. territory, significant harm to the overseas environment, or adverse effect to cultural resources.

■ = potentially significant impact, harm to the environment, or adverse effect to cultural resources

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CHAPTER 1 PURPOSE AND NEED

INTRODUCTION

The proposed action would take place at Naval Base Ventura County (NBVC) Point Mugu, NBVC San Nicolas Island (SNI), U.S. National Park Service (NPS) and The Nature Conservancy (TNC) owned Santa Cruz Island (SCrI), and the water space and submerged lands connecting the three sites. SNI is a 22.7-square mile (mi^2) (58.9 square kilometer [km^2]) U.S. Navy-owned island, 57 nautical miles (NM) (106 kilometers [km]) southwest of NBVC Point Mugu.

SCrI is located approximately 20 NM (37 km) west of NBVC Point Mugu. The island has a total area of 96.5 mi^2 (250 km^2). The eastern 26 percent of the island is owned by the NPS, and the western side is TNC. A small inholding, within NPS land, is retained by TNC and leased to the Navy (the Navy Site).

The U.S. Navy proposes to replace the existing Fiber Optic Communications Undersea System-I (FOCUS-I) between NBVC Point Mugu and NBVC SNI and the microwave communications system link between NBVC Point Mugu and SCrI with a single new system. This new system, FOCUS-II, will connect NBVC Point Mugu, NBVC SNI, and SCrI via new undersea fiber optic cables. Additionally, a new water line would be placed on SCrI between Prisoners Harbor and the Navy Site. Figure 1-1 provides a regional overview of the project area and the existing FOCUS-I cable alignment. Chapter 2 of this environmental assessment/overseas environmental assessment (EA/OEA) provides detailed description of the project sites and elements associated with the proposed cable installation.

This EA/OEA addresses the potential environmental impacts of the cable and waterline installation activities and subsequent maintenance and has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. § 4321, as amended); the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (Title 40 C.F.R. §§ 1500-1508, 1 July 1986); Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions*; Department of the Navy Procedures for Implementing NEPA (32 C.F.R. § 775); and Chief of Naval Operations Instruction (OPNAVINST) 5090.1D, *Environmental Readiness Program*. The NEPA process ensures that environmental impacts of proposed federal actions are considered in the decision-making process.

CURRENT CAPABILITY

FOCUS-I

FOCUS-I is comprised of two 80-mile (mi) (130-kilometer [km]) undersea 12-strand fiber optic cables, labeled as FOCUS A and FOCUS B. These cables were installed in 1993 and 1994 and are spliced to 48-fiber cables between the sea-to-shore interface (SSI) manholes and the Communication Buildings at Point Mugu and SNI. FOCUS-I was repaired near the NBVC SNI shore in 2006, involving the installation of a new landing site and onshore buried cable. These repairs are described in the Final Environmental Assessment FOCUS Cable Repair San Nicolas Island EA (Navy 2003). FOCUS-I carries all data between Point Mugu and SNI including:

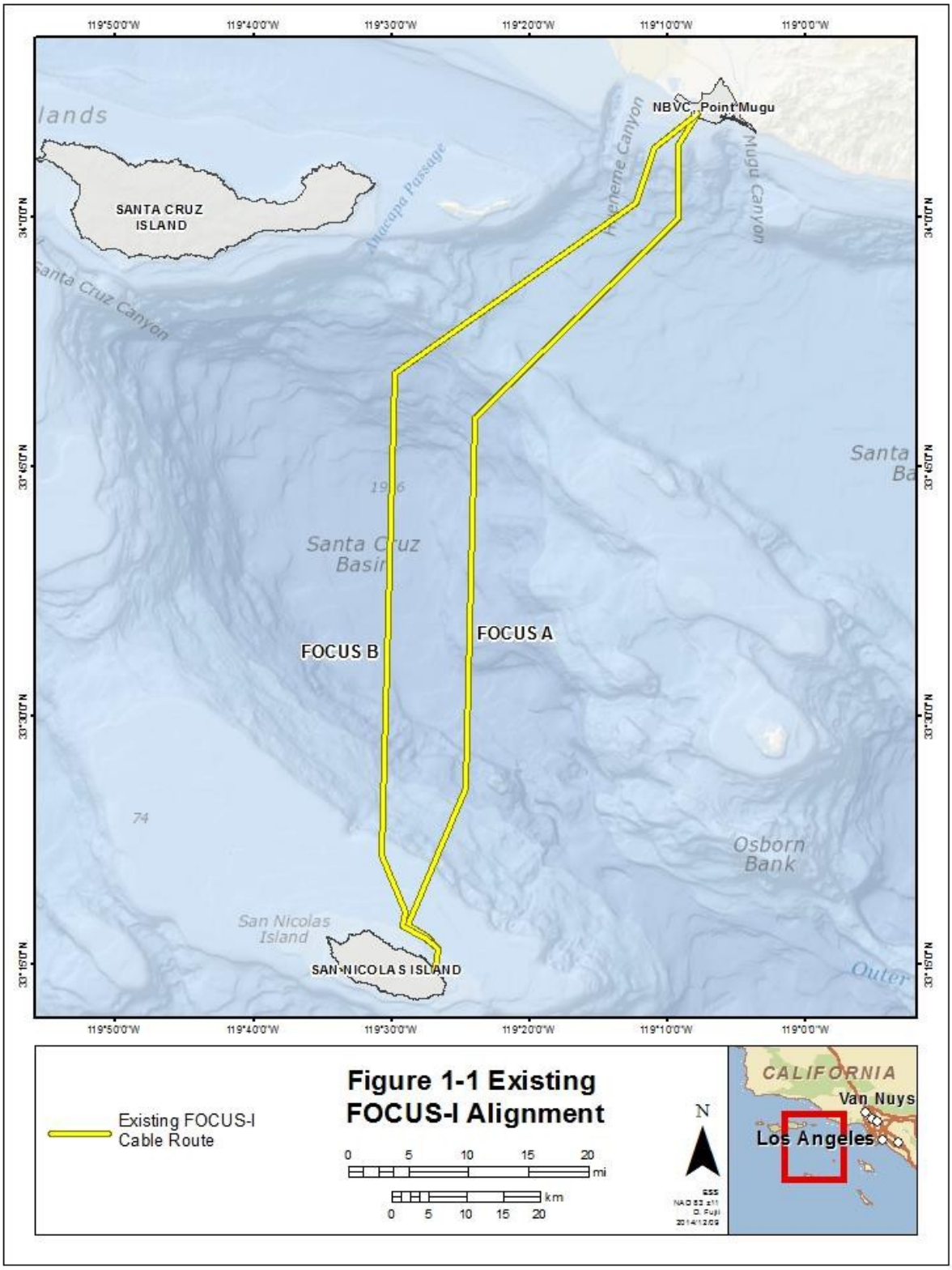


Figure 1-1 Existing FOCUS-I Alignment

- Secure high frequency (HF)/very high frequency (VHF)/ultrahigh frequency (UHF) radio circuits
- Telemetry
- Surveillance
- Remote control
- Video
- Technical networks
- Radar
- Time-Space Position Information (TSPI)
- Telephone

1.2.2 Santa Cruz Island Microwave System

Communications between NBVC Point Mugu and SCrI are conducted via a microwave system. The NBVC Point Mugu and SCrI Navy Site radios are located at the Range Communications Buildings (Building 531 and Building 4, respectively). This system carries all data between NBVC Point Mugu and SCrI including:

- Voice communications
- Telemetry
- Remote control
- Video
- Technical networks
- Surveillance
- Radar
- TSPI
- Telephone

The SCrI Navy Site Terminal System uses two terminals and up to 16 T-1 trunks between SCrI and NBVC Point Mugu.

1.2.3 Santa Cruz Island Water Supply

The current water line connecting the well near Prisoners Harbor to the Navy Site is a metal pipeline laid overland. It was originally installed in 1951. This water line leaks in many locations, leading to significant water losses.

1.3 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to provide continued reliable operation of the real-time intra-range and inter-range communications capability for the Sea Range with an effective increase in bandwidth required to satisfy operational requirements. This real-time capability includes all data communications between NBVC Point Mugu, NBVC SNI, and SCrI.

The communications capability is used to support Naval Air Warfare Center Weapons Division (NAWCWD) customers (e.g., U.S. military and allied forces with weapon systems testing needs) who require real-time support of research, development, acquisition, test, and evaluation (RDAT&E) and training data at the Naval Air Systems Command (NAVAIR) Sea Range. In order to provide support for

Navy personnel on SCrI, a reliable long-term source of fresh water is also required.

The need for the proposed action is three-fold: 1) reliability of FOCUS-I is degrading; 2) there is a need for increased bandwidth in the SCrI microwave system; and 3) the existing water supply to the SCrI Navy site is aging and could fail.

The FOCUS-I cables were installed in 1993 and 1994, with a design life of 20 years. Signal degradation has been observed on FOCUS-I Cable A, and the signal is expected to further degrade without repair or replacement. Failure of FOCUS-I Cable A would lead to loss of system redundancy and could lead to catastrophic failure of FOCUS-I in the instance of interruption of FOCUS-I Cable B capability. Such failure would prevent NAWCWD and the U.S. Navy from completing mission-essential RDAT&E and training operations on the Sea Range. The 2006 FOCUS-I repairs at NBVC SNI provide extended life of a small portion of the system in the vicinity directly adjacent to the island, but the remainder of the system is beyond its design life.

Bandwidth requirements for SCrI have been increasing for telemetry, TSPI, and video. Upgrading the current microwave system is not feasible as the original equipment manufacturer (OEM) does not provide support for the equipment and third-party vendors cannot guarantee the availability of necessary parts. Further, data provided over FOCUS, as opposed to the current microwave system, does not need to be packaged and shipped for processing allowing data availability within required project timeframes.

The existing FOCUS-I and SCrI microwave systems are used to transmit and receive data signals between NBVC Point Mugu, NBVC SNI, and SCrI. Radar and telemetry data signals are collected and transmitted to NBVC Point Mugu where activities throughout the Sea Range are coordinated. Some of these signals are used to track, control, and communicate with air traffic and ship traffic (including military and commercial vessels) in the Sea Range. Loss of these data signals could lead to mishaps resulting in death or injury to personnel or loss of equipment. Consequently, communications facilitated by the existing systems are critical to the daily safe operation of the Sea Range. A loss of communications would result in the shutdown of most, if not all, Sea Range operations until the systems are repaired.

The existing water line provides drinking water to the Navy Site on SCrI. Failure of the water line would require water to be driven from the well at Prisoners Harbor to the Navy Site and could result in the inability to adequately supply water for personnel and equipment. This would lead to an inability to provide continuous support for the systems at SCrI Navy Site.

1.4 DECISION TO BE MADE

As a result of the analysis in this EA/OEA, the Navy will determine if an environmental impact statement/overseas environmental impact statement (EIS/OEIS) is required. An EIS/OEIS must be prepared if significant impacts on the human or natural environment are anticipated as a result of the proposed action. Should an EIS/OEIS be deemed unnecessary, based on the effects analysis of the alternative selected for implementation, the selection would be documented in a Finding of No Significant Impact (FONSI)/ Finding of No Significant Harm (FONSH). The project will be implemented only to the extent that funds are available and if required approval for work on Santa Cruz Island is obtained from the NPS, TNC and CINMS.

1.5 NEPA DOCUMENTS INCORPORATED BY REFERENCE

Material relevant to an EA may be incorporated by reference in accordance with CEQ regulations (40

CFR 1502.21) and with the intent of reducing the document's size. The documents listed below are incorporated by reference due to their relevance to the actions addressed in this EA. A brief description of the contents of each NEPA document is also included.

- Point Mugu Sea Range EIS/OEIS (Navy 2002). This document addresses all activities and their associated environmental impacts within the Point Mugu Sea Range as of 2002. The proposed action included Theater Missile Defense testing and training, accommodating an increase in the level of both Fleet training exercises and special warfare training, and modernizing facilities at Point Mugu and SNI to enhance the Sea Range's capability to support existing and future operations. No significant, immitigable environmental impacts of the Preferred Alternative were identified.
- Final Environmental Assessment FOCUS Cable Repair San Nicolas Island (Navy 2003). This document addresses the repair of the FOCUS cable system by providing a stable environment for the cable segments off the coast of San Nicolas Island by placing the nearshore component of the FOCUS cable beneath the ocean floor to minimize damage caused by the dynamic ocean environment including: Increase training and RDAT&E activities from current levels in order to support the Fleet Response Training Plan; Accommodate mission requirements associated with force structure changes and introduction of new weapons and systems to the Fleet; and Implement enhanced Range Complex capabilities.

1.6 SCOPE OF ANALYSIS

This EA/OEA includes an analysis of the proposed action, three action alternatives, and the No-Action Alternative. NEPA, CEQ regulations, and Navy procedures for implementing NEPA specify that an EA/OEA should address only those resource areas potentially subject to impacts. In addition, the level of analysis should be commensurate with the anticipated level of environmental impact. Resources analyzed in this EA/OEA include air quality; biological resources; cultural resources; hazardous materials and waste; infrastructure and utilities; land and water use; marine sediments and water quality; noise; safety; topography, geology, and soils; and visual resources.

One resource area has not been analyzed in detail in this EA/OEA as the potential impacts are nonexistent or negligible:

- Socioeconomics. The proposed action would temporarily bring new personnel to Ventura and Santa Barbara counties to support the installation of FOCUS-II. The individuals can be accommodated without impacts to socioeconomic indicators such as population, employment, income, housing, or schools. New facilities are not necessary to accommodate participants in the installation or operation of FOCUS-II. For these same reasons, there would be no impact on minority or economically disadvantaged segments of the population, and hence no impacts related to environmental justice (Executive Order [EO] 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*).

1.7 RELEVANT LAWS AND REGULATIONS

The Navy has prepared this EA/OEA based upon federal and state laws, statutes, regulations, and policies that are pertinent to the implementation of the proposed action including, but not limited to:

- NEPA (42 U.S.C. §§ 4321-4370h), which requires an environmental analysis for federal actions that have the potential to significantly impact the quality of the human environment;
- CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 C.F.R. 1500-1508);
- Navy regulations for implementing NEPA (32 C.F.R. § 775), which provides Navy policy for

implementing CEQ regulations and NEPA;

- Clean Air Act (CAA) (42 U.S.C. § 7401 *et seq*.);
- Clean Water Act (CWA) (33 U.S.C. § 1251 *et seq*.);
- Coastal Zone Management Act (CZMA) (16 U.S.C. § 1451 *et seq*.);
- National Historic Preservation Act (NHPA) (16 U.S.C. § 470 *et seq*.);
- Endangered Species Act (ESA) (16 U.S.C. § 1531 *et seq*.);
- Marine Mammal Protection Act (MMPA) (16 U.S.C. § 1361 *et seq*.)
- Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (16 U.S.C. §§ 1801- 24 1884);
- Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703-712);
- National Marine Sanctuaries Act (NMSA) (16 U.S.C. § 1431 *et seq*.)
- Bald and Golden Eagle Protection Act (16 U.S.C. § 668-668d);
- EO 12088, *Federal Compliance with Pollution Control Standards*;
- EO 12114, *Environmental Effects Abroad of Major Federal Actions*;
- EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-income Populations*;
- EO 13112, *Invasive Species*;
- EO 13148, *Greening the Government through Leadership in Environmental Management*, and
- EO 13693, *Planning for Federal Sustainability in the Next Decade*.

Each of the above regulatory requirements is addressed within the context of the relevant section of the EA/OEA.

1.8 INTERGOVERNMENTAL COORDINATION AND PUBLIC PARTICIPATION

NBVC is the host command at Point Mugu and SNI and is the lease-holder for the Navy Site on SCrI, with NAWCWD as a tenant organization. The waters of the Sea Range are managed by NAWCWD. This EA/OEA was prepared by the NAVAIR Ranges Sustainability Office and did not involve any cooperating agencies. The Navy site, an 8-acre (3.2-hectare) inholding, surrounded by National Park Service (NPS) land, is retained by TNC and leased to the Navy. Once complete, the EA/OEA will be submitted to NAVAIR Vice Commander for a potential FONSI/FONSH.

Permits and formal consultations include:

- U.S. Army Corps of Engineers (USACE) Section 10 & 404 permits;
- Essential Fish Habitat (EFH) consultation with the National Marine Fisheries Service (NMFS), as required by the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act;
- Section 304(d) consultation with Channel Islands National Marine Sanctuary required by the National Marine Sanctuaries Act (NMSA) and Sanctuary Management Permit, if required (Title 15, Section 922.74)
- Native American tribal consultation;
- Federal Consistency Determination with the California Coastal Commission (CCC);
- Section 106 consultation with the California Office of Historic Preservation (OHP);
- Section 401 Certification for Discharge into State Waters through consultation with the Los Angeles Regional Water Quality Control Board (LARWQCB) and the Central Coast Regional Water Quality Control Board (CCRWQCB); and
- Stormwater Pollution Prevention Plans and permitting from the State Water Resources Control

Board (SWRCB).

- Application for Transportation and Utility Systems and Facilities on Federal Lands (SF-299) with the NPS, Channel Islands National Park.

Informal regulatory consultations include:

- Real estate agreements needed for Facility Work on Land from TNC, which owns the Navy Site on SCrI;
- Coordination with the Naval Seafloor Protection Office;
- Consultation with the U.S. Department of Interior Bureau of Ocean Energy Management (BOEM) regarding location of the offshore cable routes, existing oil rigs, and pipelines; and
- Coordination with the California Department of Fish and Wildlife (CDFW) to determine if a Lake or Streambed Alteration Agreement is required.

Additionally, coordination with the NPS was initiated to minimize the effects of any temporary modification or restriction of recreational uses of NPS resources on SCrI. This consultation will continue throughout the final design phase of this project and during any construction.

Public participation for this EA/OEA included the publication of the Notice of Availability for the draft EA/OEA in area newspapers, including the *Ventura County Star* and *Santa Barbara News-Press*, for three consecutive days, with the draft EA/OEA placed in local libraries and on the Navy Region Southwest public website for a 30-calendar-day public comment period. The libraries included the Oxnard Public Library, Santa Barbara Public Library, E.P. Foster Library, and Ray D. Prueter Library. The Notice of Availability was also mailed to Navy and NPS stakeholders. No comments were received from the general public during this comment period, although comments were received in response to stakeholder mailings (Appendix A).

CHAPTER 2 PROPOSED ACTION AND ALTERNATIVES

The proposed FOCUS-II would be comprised of interlinked fiber optic cables connecting NBVC Point Mugu to other locations on the Sea Range.

FOCUS-I would be operated and maintained until FOCUS-II is completely installed and its operational status is verified. Following FOCUS-II installation, FOCUS-I would continue to operate and would provide a second level of redundancy until it has degraded beyond the level of service required. Removal of non-functional equipment and evaluation of how to best remove this equipment would be conducted, if required, in the future and is not part of the proposed action of this EA/OEA.

This chapter provides an in-depth discussion of the proposed action and its alternatives. The chapter also discusses the requirements necessary to achieve each of the onshore and offshore alignment alternatives.

2.1 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1.1 Onshore Activities

For the purposes of this EA/OEA, onshore construction would involve three main activities: 1) HDD including drill pad installation, 2) installation of onshore cable conduits, and 3) installation of the water line on SCrI.

2.1.1.1 HDD Activities

HDD Pad Requirements

Each HDD site would temporarily host a drill rig, a portable crane, one 1,000-gallon (gal) (3,785-liter [l]) reservoir for mixing and storing drilling fluid, a mud pump unit, a mud filtering system, a catch basin for drilling mud with approximate dimensions of 13 feet (ft) (4 meters [m])long, 13 ft (4 m) wide, and 3 ft (1 m) deep, a hydraulic power unit, a drill rig control station, a pipe rack for cable conduits, and a tool van. HDD equipment would be delivered to each site on flatbed trailers. Equipment staging areas would be adjacent to or within the vicinity of the drilling pad. Drilling equipment and facilities would be removed upon completion of HDD. All HDD pads will be returned to their original condition. Figure 2-1 provides an image of a typical HDD rig to be used for the proposed action.

HDD Process

The HDD process would involve drilling and horizontal placement of piping into the ground, ultimately an 8-inch (in) (20-centimeter [cm]) HDD bore hole. The placement of the drill rig would require level ground, so some site grading would be required prior to commencement of HDD. The work area would require some special preparations to excavate and place an in-ground buried anchoring system. It would be for two purposes—anchoring the drill rig while drilling to ensure the stability of the equipment with the forces required during the drilling procedure, and hold back for the post laid cables. The area excavated for the anchor system would be approximately 35 ft by 1.5 ft by 3.3 ft (10.7 m by 0.46 m by 1 m) deep. Additionally, a small (approximately 6.6 by 6.6 by 3.3 ft [2 by 2 by 1 m]) sump pit would be

excavated at the bore entry to allow for the recovery of the drilling fluid coming from the borehole back to the surface.

Figure 2-1. Representative HDD Rig

The fluid is picked up by a sump pump and transferred to the solids control unit where the solids contained in the drilling fluid are mechanically separated, allowing the mud to be re-circulated down hole and used again. Most of the erosion control would be installed after all equipment is in place so that any necessary movement during the set-up process would not be impeded. The sump pit would be backfilled with the original soil following completion of the drilling process.

Drilling mud would be injected under pressure into the interior of the drill pipe. Drilling mud consists of a mixture of water and bentonite clay (a substance derived from naturally occurring clay). The drilling fluid (mud and drilling cuttings) would transfer energy to rotate the drill head which would make contact with the soil. Drilling fluid would return back through the HDD bore hole, which would be 1 in (2.5 cm) larger than the diameter of the pipe. The drilling fluid is pumped down the center of the drill pipe, and fluid (mud and cuttings) travel back up along the outside of the drill pipe. Onshore HDD activity would occur for approximately four weeks. A messenger line would be installed within the pipe at the end of the HDD process.

At completion of the HDD, anti-corrosive fluid will be put in the pipe and the pipe is sealed at each end. The fluid will remain in the pipe until the cable deployment starts to prevent internal corrosion. The fluid is a calcium carbonate solution added to freshwater as "slaked lime" and is considered environmentally harmless in water. The fluid will have a pH of 7, closely matching that of sea water. Furthermore, calcium is the 7th most common element in seawater, and bicarbonate is the 3rd most common ionic constituent (by weight), so release of this fluid to the ocean is considered benign. A Safety Data Sheet explaining its properties is included in Appendix E.

Fresh Water Requirements

For planning purposes, it is estimated that approximately 25,000 gal (94,600 l) of water would be required for each day of drilling, with a minimum daily requirement of 10,000 gal (37,900 l) and a maximum of 50,000 gal (189,000 l). If a steady supply of water (i.e., a fire hydrant) is not located nearby, water would be stored near the drilling site in storage bladders. A minimum of 250,000 gal (946,000 l) of fresh water should be present onsite and available for use prior to initiating drilling operations. There are adequate fresh water resources at NBVC Point Mugu to accommodate the proposed operations. Water would be transported to NBVC SNI in the volumes needed to accommodate the proposed drilling operations. Water will be stored in existing water bladders approximately 1,500 ft (457 m) from the proposed HDD site or within bladders transported to NBVC SNI and laid within the footprint of the existing bladders. As salt water will be used for drilling on SCrI, no freshwater will be required.

2.1.1.2 Fiber Optic Cable Conduit Installation

The seashore interface HDD sites would be connected to communications buildings or existing manhole systems via conduits (i.e., casing for fiber optic cable protection). Conduits can be buried, laid upon the ground surface, or supported in above-ground channels. These conduits may include existing fiber optic cable conduits, water lines, or fuel pipelines that are no longer in use. Where needed, trenches would be dug along existing roads and within previously disturbed or developed areas, with widths ranging from four to 20 in (10 to 51 cm) and depths up to 40 in (102 cm). Conduits would then be laid in the trenches and buried. Once the conduit installation is complete, the fiber optic cable would be pulled through the conduit. This cable installation would involve equipment trucks stationed at the terminal location and would be completed within two days for each landing site location. In other areas, conduit would be placed inside protective above-ground channels supported by posts. Section 2.1.4 provides descriptions of the onshore conduit alignments (including the length of new trenching) at NBVC Point Mugu, NBVC SNI, and SCrI.

Manholes and vaults will be placed at intervals of between 100 ft (30.5 m) and 2,500 ft (762 m) to provide for cable pulling stations, strain relief, backflow preventers, and air vacuum release stations. The total number of manholes and vaults will be between 20 and 80, depending on the engineering needs yet to be determined. Trenching will take approximately three months. Trenching equipment and other materials would be staged at turnout locations and parking areas along Navy Road.

2.1.1.3 Water Line Installation

A 3-in (8-cm) polyvinyl chloride (PVC) water line will be installed in trenches or above-ground channels between the SCrI Well Site and the Navy Site. A trench and/or above-ground channels originating at the Well Site will run down the road 930 ft (283 m) connecting to the same 7-mi (11.3-km) trench carrying

the fiber optic cable along the Navy Road. The trenches would be installed with widths ranging from 4 to 20 in (10 to 51 cm) and depth up to 40 in (102 cm).

2.1.1.4 Onshore Maintenance

Routine maintenance of the onshore components will include visual inspection and accessing of vaults and manholes. The water line may be pressure tested and the fiber optic cable tested for continuity and integrity using remote sensors. Any digging, if required, for regular maintenance would be limited to areas previously disturbed during the installation process.

2.1.2 Offshore Activities

2.1.2.1 Installation Sequence

The installation would commence at the shore end of the cable lay, with the installation vessel positioned at the bore tube exit point. An ocean construction dive team would assist in feeding the end of the cable into the bore tube. A messenger line would be attached to draw the cable through the tube to the land-side manhole using a winch. The installation vessel would navigate a defined route slowly while laying out the cable, typically at 0.5 to 3 knots (0.93 to 5.6 km/hour). Full installation will require approximately 7-15 days per individual cable or approximately 60 days for four total cables.

2.1.2.2 Underwater Splice Joint and Trunk Cable Installation

Each cable landing location will contain an HDD pipe with a previously installed messenger line inside it. The messenger line connected to a winch on shore will pull two trunk cables simultaneously through the pipe from a ship. The ship would be located slightly seaward of the HDD pipe's seafloor exit point. The trunk cable is defined as the segment from the in-water splice joint (splice) to a dry termination mounted on the inside wall of the onshore cable vault. One underwater splice will connect one trunk cable to one undersea cable.

The pulling would require emptying the pipe of non-toxic anti-corrosive fluid previously installed during the HDD work. The mix of fresh water and anti-corrosive (1,300 gal [5,000 l]) would be emptied into the sea during the trunk cable installation. Small amounts of lubricant would be added during the pulling process to ensure the cable does not bind or stick during the pulling process. Beyond the splice (towards sea) cable would lie loose on the sea bed or be plowed into sand (section 2.1.2.3).

The splices and trunk cables would be deployed prior to the long haul undersea cable deployment. Each splice at the seaward end is sealed with a lifting pad eye for recovery during the cable deployment. The splice joints are lowered into the water by cable deployment machinery. Divers may use an anchored platform around the breakout to install the splice and its associated cable. The platform would be anchored on the seafloor minimizing placement on corals. Divers will assist in the placement as much as possible.

At each site, two trunk cables exit the directional drilled pipe in a maximum depth of about 85 ft (25.9 m). If the punch-out is short of this depth, the cable will be protected with (9.76-in [24.8 cm]) outer diameter split pipe between the bore exit and the splice joint to a water depth of 85 ft (25.9 m). The splice is a titanium cylinder approximately 6.6 in (16.8 cm) in diameter and 9 in (22.9 cm) long in-line with the cable.

2.1.2.3 Cable Installation on the Seafloor

Fiber optic cables would be laid on the seafloor between the HDD exit sites. These offshore cable alignments would be composed primarily of sandy bottom, with the uncommon occurrence of rock outcroppings along each of the routes. The cable would be plowed into a sandy bottom using a seaplow to a subsurface depth of up to 3 ft (1 m). Due to the technical specification of the seaplow, burial will occur to a water depth of 3,280 ft (1,000 m). Beyond that water depth, the cable would lie directly on the seafloor.

The seaplow, which will be towed by the cable-laying vessel, uses an approximately 12-in-wide (0.3-m-wide), modified hollow-share blade that penetrates the seabed and places the cable. Sediments then settle back over the cable, burying it. The seaplow has skids that are raised to allow the share blade to dig into the seabed to the desired burial depth. Although the share blade is the only portion of the seaplow that penetrates the sediments, the temporary construction area will be 19 ft (5.8 m) wide, encompassing the full width of the seaplow.

Cable tension will be measured aboard the vessel and at the seaplow. During cable burial operations, the vessel will proceed at speeds of approximately 0.62 mi/hr (1 km/hr). Where the cable is laid directly on the seafloor without burial, the vessel can proceed at approximately 6.8 mi/hr (11 km/hr). The actual vessels that will perform the work are not known at this time. The deployment of the cables would utilize conventional cable laying machinery. The machinery provides a gradual, controlled rate of descent to minimize the risk of damage as it lands on the seabed.

It is estimated that 234 NM (433 km) of cable would be needed to fulfill the requirements. Of this, approximately 175.5 NM (325 km) of the cable would be plowed into the seafloor. Internode cable is defined as the cable sections between splices and all subsequent sections between cable landings. The design of the internode cable would be similar to standard submarine telecommunication cables. The cable would be over-armored for protection from the splice to a maximum water depth of 4,920 ft (1,500 m). Over-armor is a sheath of one or more additional layers of steel wires wrapped around the cable. The cable diameter decreases from 1.41 in (3.59 cm) at the splice joint to less than 0.88 in (2.24 cm) in deep water.

The cable routes were determined based on data collected during a high resolution multi-beam hydrographic survey of the FOCUS-II area conducted for each of the proposed routes. The cable routes were selected to avoid steep bathymetry; the spreading out or turning of cables is planned to occur at a constant depth, to avoid placing any cables at angles to the downward slope. The installation of cables parallel to the steep slope of canyons is also avoided. Where cable crossings are necessary, the new cables would lie perpendicular across existing cables to the maximum extent possible. The cable will be deployed to within the greater of ten percent water depth or 164 ft (50 m) of the planned route position lists (documented routes for each alignment) for the cable alignment.

As a means of clearing seabed debris in advance of the towed seaplow operations, pre-lay grapnel run (PLGR) operations will be performed prior to the start of burial operations. The purpose of a pre-lay grapnel run is to clear debris, such as discarded fishing gear, from the seafloor along the corridors where the cables will be buried. To accomplish this, a grapnel, typically of the “flatfish” type, will be dragged along the cable routes before cable installation. The grapnel will be attached to a length of chain to ensure contact with the bottom and towed at a speed of approximately 1 mph (1.6 km/hr). The arms of the

grapnel are designed to hook debris lying on the surface or shallowly buried to approximately 1.3 ft (0.4 m) on the seafloor. If debris is hooked and towing tension increases as a result, towing ceases and the grapnel is retrieved by winch. Any debris recovered to the deck during the PLGR operation will be disposed of in compliance with local laws and regulations.

Route clearance operations are typically performed prior to the start of burial operations as a means of clearing any out of service cables in advance of the towed sea plow. Route clearance operations include the cutting and removal of out-of-service cables along the intended burial route to provide a working corridor for installation and maintenance operations. At the time of this writing no out-of-service cables have been discovered on the burial route. In the event that out-of-service cables are discovered on the route, the cables will be cut and cleared aside to leave a corridor (330 ft) 100 m wide, or less. Bitter ends will be weighted in a manner to reduce the possibility of future entanglements with other seabed users.

Post-lay inspection and burial will take place during or very soon after the main lay operation and is performed to attempt retro-burial of any cable that could not be buried with the seaplow, or to inspect select cable sections. Post-lay inspection and burial is typically performed with a remotely operated vehicle (ROV). Where the plow cannot achieve the targeted burial depth because of bottom conditions, a ROV will be used to attempt to bury the cable. These sections of cable will be laid temporarily on the ocean floor by the cable ship awaiting post-lay burial attempt at a later date by the ROV.

An ROV is a robotic device operated from the vessel. The ROV will be deployed and operated from the main cable ship or a similar vessel. The ROV moves under its own power and is tethered to and guided from the cable ship. ROV jets will loosen the seafloor sediments beneath the cable, allowing it to settle to the desired depth. The disturbed sediments then settle back over the area to their original grade, leaving the cable buried. The cable typically is buried to a depth of 3 to 4 ft (1 to 1.2 m) using this method. The ROV has a nominal speed of 0.35 mph (0.56 km/hr) when jetting. However, the overall rate of forward progress depends on the number of passes needed to attain target burial depths, which in turn is a function of sediment stiffness.

While the post-lay burial of cable by ROV will temporarily disturb the seafloor, this burial will only occur in soft sediment areas where the jets can be used to bury the cable and disturbance is limited to the seafloor, not the water column. The typical width of disturbance associated with this activity is 15 feet (4.6 meters).

2.1.2.4 Post Cable Installation – Sea Floor Stabilization

Stabilization protects not only the equipment but the surrounding environment by eliminating current-induced movement of the cables, which could otherwise cause abrasion of the cables and the substrate. In the sandy bottom portions, the cable segments would be buried in the sediments to a water depth of 3,280 ft (1,000 m) and therefore would not need to be stabilized. In the atypical instances where rocky bottom areas are encountered shallower than 98.4 ft (30 m) water depth, the cable segments would be anchored to the seafloor.

While rocky substrate will be avoided to the maximum extent possible, in cases where hard substrate is unavoidable, all system components, including cables and splices would be secured to the sea floor using conventional stabilization methods and the experience gained with other cable stabilization efforts. These

methods generally involve a diver using handheld hydraulic drills, to drill a 1-in (2.5-cm) hole to a depth of 20 in (51 cm). Loose material is cleared from the hole using compressed air or water jet. A 0.75-in (2-cm) threaded rod is then placed into the hole and secured using a two-part acrylic epoxy.

The epoxy is a rapidly hardening resin/grit compound that is much denser than water and immediately sticks to the substrate upon application by a diver using a handheld applicator gun. The material does not disperse into the surrounding water and is non-toxic. The volume of epoxy required would be approximately 7 cubic inches (in^3) (113 cm^3) per hole. After checking to verify the pull-out strength of the rods, steel clamps are secured to the threaded rods which reduce the movement of the pipes and cables.

2.1.2.5 Offshore Cable Maintenance

Following completion of the FOCUS-II installation, a remote underwater fiber monitoring system will ensure optimal functionality and health of the new offshore cable. The monitoring system operates by continuously sending short laser pulses over the length of the cable and evaluating signal returns for anomalies. Anomalies will be logged, monitored and analyzed to determine the status of the system. Physical repair requiring boats and/or divers may be needed if a fault is detected by the monitoring system.

2.1.3 Conservation Measures

Construction activities associated with the proposed action would be implemented near concentrations of sensitive wildlife species. Western snowy plovers (*Charadrius alexandrinus nivosus*), Ridgway's rails (*Rallus obsoletus*), California least terns (*Sterna antillarum browni*), and salt marsh bird's beak (*Chloropyron maritimum* ssp. *maritimum*, originally listed as *Cordylanthus maritimus* ssp. *maritimus*) are present at NBVC Point Mugu on the beaches and marsh adjacent to the Building 811 and Charlie Pad project sites. However, the terns will be avoided due to the seasonal restrictions described below. Western snowy plovers and San Nicolas Island fox (*Urocyon littoralis dickey*) are located on the beach adjacent to the drilling site on SNI. At the SCrI project sites, the Santa Cruz Island fox (*U. littoralis santacruzae*) is present, and bald eagles *(Haliaeetus albicilla)* are sometimes found in the Prisoners Harbor area. Marine mammals [northern elephant seals (*Mirounga angustirostris*), Pacific harbor seals (*Phoca vitulina richardsi*), and California sea lions (*Zalophus californianus*)] are present on the beaches and/or in the nearshore waters adjacent to the SNI drilling site. A harbor seal haulout location is located within the estuary at Point Mugu, west of the mouth of Mugu Lagoon. In order to protect these species, wildlife conservation measures would be required during construction activities depending on the type of activity, location of the activity, and the time of year. Personnel would be required to stay off sites when construction activities are not being conducted.

The following conservation measures are proposed to protect air quality and sensitive terrestrial and marine species, including federally-listed terrestrial species and preclude economic impacts:

1) Depending on the dryness of soil and wind conditions, ground disturbance areas may be watered with fresh water to minimize fugitive dust generation. If winds have the potential to carry dust into public areas where there may be a risk of nuisance or hazard, operations will cease.

2) The area disturbed by clearing, grading, earth moving, or excavation operations shall be minimized to prevent excessive amounts of dust.
3) Internal combustion engines will be turned off when not in use to minimize emissions of criteria air pollutants. Contractors shall adhere to the Santa Barbara Air Pollution Control District requirements to reduce emissions of particulate matter (as well as of ozone precursors) from diesel equipment (See Appendix A).
4) To avoid marine mammal and listed bird breeding seasons, HDD and construction activities will occur between September 15 and January 31 at Point Mugu and between September 15 and December 15 at SNI.
5) To avoid marine mammal, listed bird breeding seasons, and known seasonal presence of endangered blue and fin whales and threatened humpback whales in the boundary of the Channel Islands National Marine Sanctuary, HDD and construction activities will occur between October 16 and December 15 at SCrI.
6) Project vehicles and equipment will be restricted to existing concrete pads, leveled surfaces, HDD areas, and paved or dirt access roads. Project drivers will be advised not to exceed speeds that could create excessive dust on dirt roads.
7) NBVC Environmental Division will be made aware of any aircraft or barge shipments of equipment to SNI or SCrI to allow for needed biosecurity inspections, as specified in NBVC Instruction 5090.14.
8) All heavy equipment, vehicles, and waste containers will be power-washed prior to delivery to SNI or SCrI. Waste containers and dumpsters will be treated with disinfectant before leaving the mainland.
9) All materials being shipped to SNI and SCrI will be closely inspected and monitored to ensure that no soil, other seed-carrying matrix, insects, or other animals are delivered to the islands.
10) Pre-construction surveys and treatments for invasive weeds will be conducted at the Point Mugu, SNI, and SCrI project sites.
11) Once onshore FOCUS-II installation activities are completed, invasive weed surveys and treatments will be conducted at Point Mugu, SNI, and SCrI. These surveys and treatments will be applied after three weeks following the first rain event of the post-construction rainy season.
12) Shipments to SCrI will adhere to protocols described in the Channel Islands National Park (CINP) Biosecurity Protocols (CINP 2014a).
13) All personnel working on SNI or SCrI and people involved in delivery of project cargo will review biosecurity instructions and will adhere to all biosecurity measures.
14) Vessels delivering equipment and personnel to SNI and SCrI shall have armed bait boxes that are checked monthly. Also, sticky traps should be deployed on every boat and changed monthly.
15) Vessel decks will be washed clean between cargo runs. No soil or other debris should remain on a vessel.
16) If night-time operations are necessary, outdoor lighting will include shielding designs to ensure light entering adjacent nesting habitat is minimized.
17) Trash collection containers will be closed and tightly sealed to reduce attracting island fox and other wildlife.
18) Prior to commencing work on SCrI, a waste management and disposal plan will be developed by the construction contractor and submitted to the Navy, NPS, and TNC for review.

19) Construction personnel will receive training regarding wildlife conservation measures to be applied at the project sites, including the importance of not feeding wildlife such as the island fox.
20) Open pits deep enough to trap island fox will be covered whenever construction operations are not underway.
21) Open pipe ends will be capped to ensure that island fox or other terrestrial species cannot be unintentionally trapped.
22) A Spill Prevention, Control, and Countermeasure Plan, developed by the construction contractor, will be in place to minimize the potential for an oil or hazardous substance spill, to prevent any spill from leaving the confines of the area and impacting listed species habitat, and to ensure that the cause of any spill is corrected.
23) Unless operationally necessary, personnel will not occupy the Charlie Pad, Coast Guard Jetty, or Prisoners Harbor construction areas between dusk and dawn and the area will remain dark (no artificial lighting) to reduce the potential for adverse impacts to listed species in adjacent natural habitat.
24) Erosion control best management practices (BMPs) (e.g., silt screens or other barriers) will be placed along Navy Road and offroad work areas on SCrI to protect sensitive biological resources including the box bedstraw (*Galium buxifolium*), the island manzanita (*Artostaphylos insularis*), Santa Cruz Island bush mallow (*Malacothamnus fasciculatus var. nesioticus*), island rush-rose (*Crocanthemum greenei),* and the Channel Island sweat bee (*Lasioglossum channelense*).
25) Prior to construction on SCrI, biologists will survey along Navy Road and offroad work areas for the box bedstraw, Santa Cruz Island bush mallow, the island manzanita, island rush-rose, and the Channel Island sweat bee and mark any known populations to ensure there is no take.
26) A qualified biologist will be required to monitor construction areas that have listed species with potential to be adversely affected in the immediate vicinity to ensure no impacts occur. If listed species are encountered, work will cease until it is ensured that no effect will result.
27) The Navy will coordinate with NPS and TNC to develop a plan to help avoid limitations on public pedestrian access to the Navy road during installation of the buried cable. The Navy will coordinate with NPS and TNC to ensure that construction operations do not adversely impact required vehicle traffic.

2.1.4 Alternatives

This section includes a description of the criteria used in developing alternatives, lists the onshore and offshore alignment alternatives analyzed in this EA/OEA, describes the No-Action Alternative, and briefly describes alternatives that were considered but not carried forward for analysis.

2.1.4.1 Reasonable Alternative Development Factors

HDD Drill Site Alternative Development Factors

HDD operational requirements and environmental siting limitations have been identified to develop feasible location options for the FOCUS-II cable segments, to minimize potential environmental effects, and to minimize potential impacts from vessel anchors and bottom fishing operations. Siting options were developed based on the following operational requirements and environmental factors:

- Drilling sites should be placed as close as possible to the shoreline to minimize the length of drilling required;

- Elevation of the drill entry should be as low as possible to minimize the angle of drilling;
- Depth of drill exit points should be maximized to as close to 85 ft (26 m) water depth as possible so that cable segment exposure to nearshore currents and wave actions is minimized and divers using conventional air diving methods can install and maintain cable;
- There should be a relatively level cleared area for the HDD pad, particularly for the bentonite recycling system;
- The drilling site should, to the extent possible, be located in a previously disturbed area to minimize environmental disruption;
- The drilling site, to the extent possible, should be situated on level compacted soil; and
- NBVC Point Mugu landing sites should be at least 1 mile (1.6 km) apart to avoid both cables being damaged by a single event (e.g., anchor drag of bottom fishing activities).

Onshore Cable Alignment Development Factors

The following factors were considered in developing onshore cable alignment alternatives between the seashore interface sites and the communication buildings:

- The onshore cable alignment should use existing infrastructure to the maximum extent possible to minimize costs and potential environmental impacts; and,
- Trenching alignments should be designed in a manner that avoids impacts to natural and cultural resources to the maximum extent possible.
- Where necessary, above-ground cable alignments will be designed to minimize impacts to cultural and visual resources and provide continued access to land areas to the extent possible.

Offshore Cable Alignment Development Factors

The following factors were considered in developing offshore cable alignment alternatives:

- Offshore cable alignments should to the extent possible avoid rocky bottom areas that provide habitat to sensitive fish and invertebrates and increase potential wear and tear on the cables;
- Offshore cable alignments should avoid known underwater cultural resources;
- Offshore cable alignments should avoid areas with steep offshore slope or large rocky outcroppings that increase stress on the fiber optic cable;
- Offshore cable alignments should be parallel to the prevailing wave and current direction wherever possible to reduce the stress from strong ocean currents and wave action; and,
- Offshore FOCUS-II cable alignments should avoid crossing FOCUS-I cables in the nearshore environment.

2.1.4.2 Alternatives Analyzed in this EA/OEA

Alternative 1 - Preferred Alternative

Alternative 1 would be comprised of four interlinked fiber optic cables connecting:

1. NBVC Point Mugu and NBVC SNI (two cables)
2. NBVC SNI and SCrI
3. SCrI and NBVC Point Mugu

These three alignments would be interlinked as a four-node ring and FOCUS-II would provide redundant connections between the three sites, should one of the cables be disabled. Under Alternative 1, the installation of FOCUS-II would involve the following action:

- Installation of new seashore interface landings at each of the three sites, utilizing HDD technology. New HDD exit sites would be offshore at depths of approximately 85 ft (27 m).
- Use of existing underground infrastructure and installation of new buried cable at NBVC Point Mugu, connecting the nearshore HDD sites to The Range Communications Building.
- Installation of approximately 500 ft (152 m) of new buried cable at NBVC SNI connecting the nearshore HDD site to an existing concrete bunker. From the bunker, existing underground infrastructure will be used connecting to Building 127.
- Installation of approximately 1,150 ft (350 m) of elevated cable channel, connecting the well site to Navy Road.
- Installation of approximately 7.28 mi (11.7 km) of new buried cable connecting the nearshore HDD site to Building 4 at Navy Site on SCrI.
- Installation of approximately 7.30 mi (11.7 km) of new water line connecting an existing well to Building 4 at the Navy Site.
- Installation of between 20 and 80 new buried concrete vaults along the SCrI alignment with dimensions of 5 ft x 5 ft x 4 ft (1.5 m x 1.5 m x 1.2 m).
- Installation of four new underwater cable alignments (up to 234 NM [433 km]), creating the interlinked communications system between NBVC Point Mugu, NBVC SNI, and SCrI.
- Periodic inspection of the onshore and offshore cable alignments to ensure uninterrupted operation of FOCUS-II and to ensure that biological resources are not adversely impacted by the communications system.
- Repair of the cable at depths shallower than 100 ft to ensure any exposed cable is either properly secured or reburied will occur as needed.
- Remote continuous monitoring of the health and status of the FOCUS-II cable will occur and maintenance is not anticipated at any regular intervals.

If any portion of the above described implementation is delayed beyond five years after a Finding of No Significant Impact (FONSI)/ Finding of No Significant Harm (FONSH) is completed for this EA/OEA, the project data would be reviewed and supplemental analysis will be performed as needed.

The cable landing sites for Point Mugu under Alternative 1 are the Building 811 and Charlie Pad landing sites. The SCrI cable would come ashore at Building 811 and the SNI cables would come ashore at Charlie Pad. These cables would be routed through an existing conduit housed in a manhole system that runs underground at Point Mugu, terminating at the Range Communications Building (Building 531). Figure 2-2 provides an overview of landing sites, HDD routes, and HDD exit sites at NBVC Point Mugu. For each landing site, equipment staging areas are broken out from the drilling site (Figures 2-3 and 2-5). However equipment may be staged within the drilling area, avoiding wetlands and other sensitive areas.

Point Mugu Building 811 Landing Site

The Building 811 site would be used as the landing site for the Point Mugu-SCrI cable. There would be no nearshore crossing of FOCUS-I cables at this landing site. Construction crews would utilize existing parking areas and previously disturbed areas to stage equipment. The drilling location on this site would

be installed on the unpaved area east of the paved parking area (see Figure 2-2). Minor ground disturbance will occur in previously graded areas to create a flat surface for drilling. No road traffic would be disrupted by drilling operations at this site.

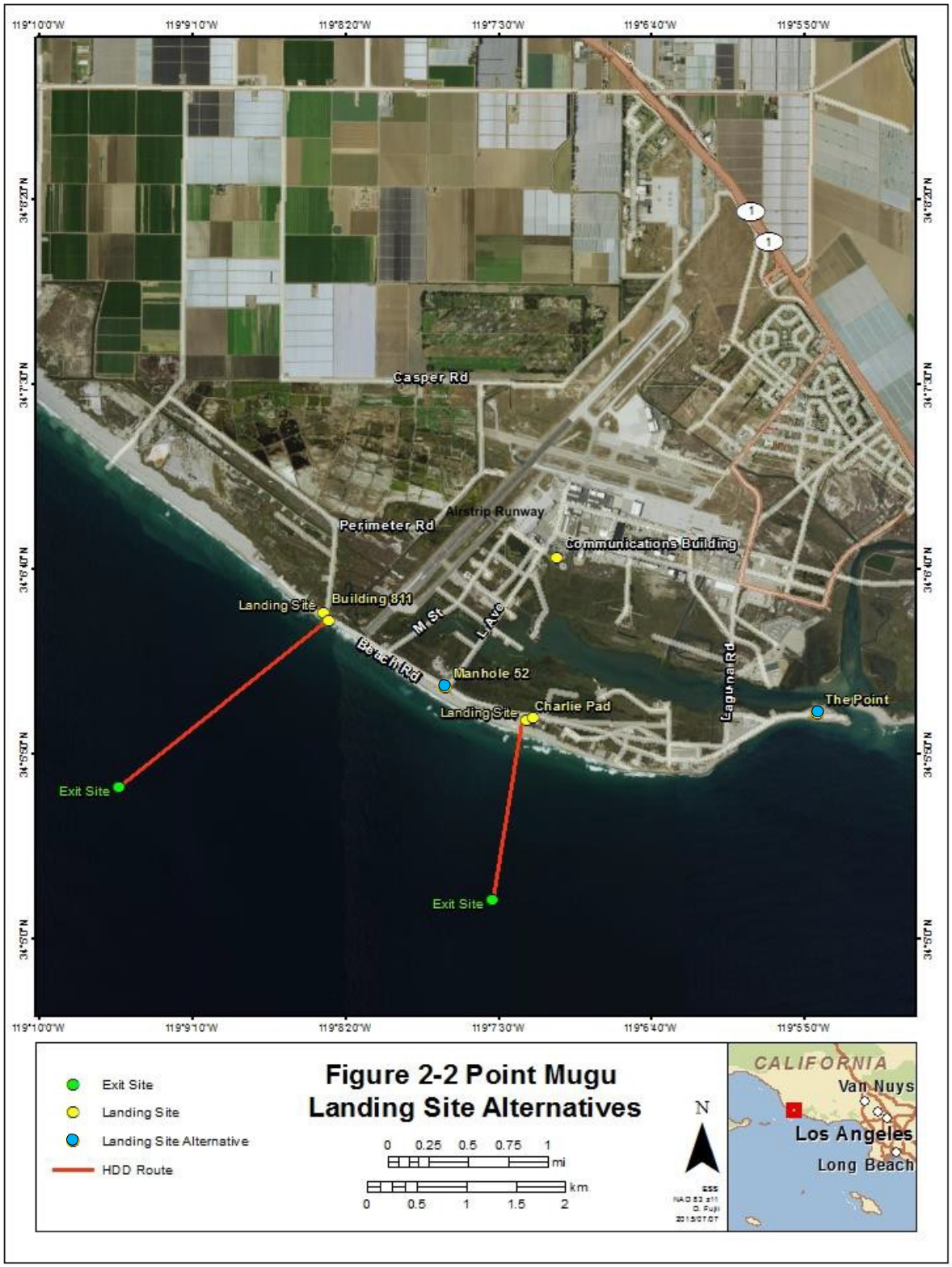
The nearest water source for the Building 811 landing site is a hydrant situated near the end of the NBVC Point Mugu airstrip runway, approximately 1,200 ft (366 m) from the drill site which would be connected to the drilling pad by a 5-in (13-cm) fire hose. Drilling at this location would likely involve installation of an 8-in (20-cm) metal casing for the first 300 ft (91 m) of drilling due to the sandy soils in the vicinity of the drill site. Drilling to a site approximately 7,300 ft (2,225 m) from the HDD site at a water depth of 79 ft (24 m) would take approximately 30 days, including mobilization and demobilization.

This site would require approximately 45 ft (14 m) of trenching to connect to an existing manhole system, terminating at The Range Communications Building. Figure 2-4 provides an overview of the existing manhole system utilized by the proposed action. Trenching would occur on the edges of existing roads and would not affect the adjacent wetlands. The trenching and cable installation operations would take approximately two days.

Point Mugu Charlie Pad Landing Site

The Charlie Pad site would be used as the landing site for the Point Mugu-SNI cables. There would be no near shore crossing of FOCUS-I cables at the Charlie Pad landing site. This landing site alternative would utilize paved launch pad surfaces to stage equipment. The drilling location would be within the Beach Road corridor east of Charlie Pad (see Figure 2-5).

Beach Road would be limited to one lane of traffic during the drilling operations at Charlie Pad. There is a fire hydrant on the launch pad, which would be connected to the drilling pad by a 5-in (13-cm) fire hose. Drilling to a site approximately 4,990 ft (1,520 m) from the HDD site at a water depth of 79 ft (24 m) would take 30 days, including mobilization and demobilization. This site would require approximately 48 ft (14.6 m) of trenching to connect to an existing manhole system, tying into the Manhole 52 link to the Range Communications Building (Figure 2-4). The trenching would be installed with widths ranging from 12 to 20 in (30 to 51 cm) and depth up to 40 in (102 cm) and would take approximately two days.


119°10'0"W
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34°6'40"N
34°5'50"N
34°5'0"N
Casper Rd
Airstrip Runway
Perimeter Rd
Communications Building
Landing Site
Building 811
M St
L Ave
Beach Rd
Manhole 52
Landing Site
Charlie Pad
Laguna Rd
The Point
Exit Site
Exit Site
Exit Site
Landing Site
Landing Site Alternative
HDD Route
Figure 2-2 Point Mugu
Landing Site Alternatives
0 0.25 0.5 0.75 1
mi
0 0.5 1 1.5 2
km
N
CALIFORNIA
Van Nuys
Los Angeles
Long Beach

Figure 2-3 Building 811 Landing Site

Figure 2-4 Existing Point Mugu Manhole System to be Utilized by FOCUS-II

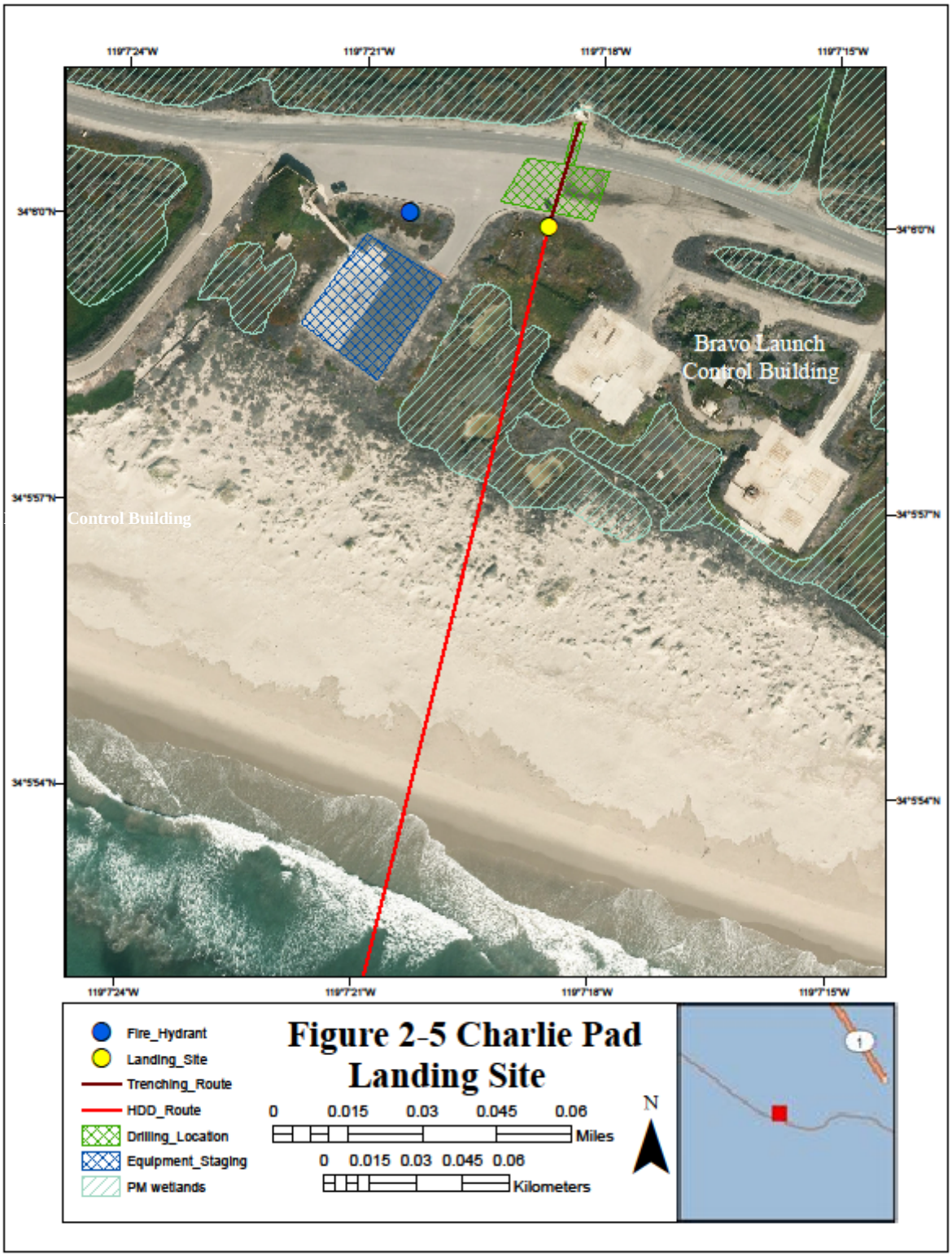


Figure 2-5 Charlie Pad Landing Site

San Nicolas Island Coast Guard Jetty Landing Site

The FOCUS-I cable currently comes ashore on SNI approximately 1,350 ft (411 m) northwest of the Coast Guard Jetty, with a junction box situated offshore, approximately 3,600 ft (1,100 m) northeast of this landing site. A conduit system runs from a manhole near the landing site, under the SNI airstrip, and then connects to the onshore interface site to Building 312. From there, a combination of aboveground and buried conduit connects to Building 127. At this time, an unused 24-fiber land cable runs through the conduit system, connecting the Coast Guard Jetty landing site to Building 127 (Figure 2-6).

Under Alternative 1, a new drilling site would be located directly adjacent to the FOCUS-I landing site (Figure 2-7). The new transition would be drilled in a manner that avoids the FOCUS-I route. The drilling location on this site would be located on the lower parking area, nearer to the shoreline. Equipment would be staged on the higher ground near the roadway. Minor ground disturbance will occur in previously graded areas to create a flat surface for drilling. No road traffic would be disrupted by drilling operations at this site.

Water would be brought to NBVC SNI via barge transport using the existing offloading infrastructure and pump system. Water would be stored in bladders at an existing site located approximately 1,500 ft (457 m) from the drilling site (Figure 2-7). The bladders and drilling equipment would be connected by 5-in (13-cm) fire hose. Drilling to a site approximately 2,960 ft (903 m) from the HDD site at a water depth of 76 ft (23 m) would take 30 days, including mobilization and demobilization.

The Point Mugu-SNI and SCrI-SNI cables would be pulled through a single casing to the Coast Guard Jetty drill site. From there, the cables would run through a conduit connecting to an existing concrete vault currently housing the FOCUS-I transition between the land and sea cables (Figure 2-8), requiring approximately 500 ft (152 m) of trenching. The trenching would be installed with widths ranging from 12 to 20 in (30 to 51 cm) and depth up to 40 in (102 cm). No new concrete vault or manholes would be installed on SNI under this alternative. Trenching would take approximately three days. At the vault, the two FOCUS-II cables (one from NBVC Point Mugu and one from SCrI) would be spliced into the existing 24-fiber land cable.

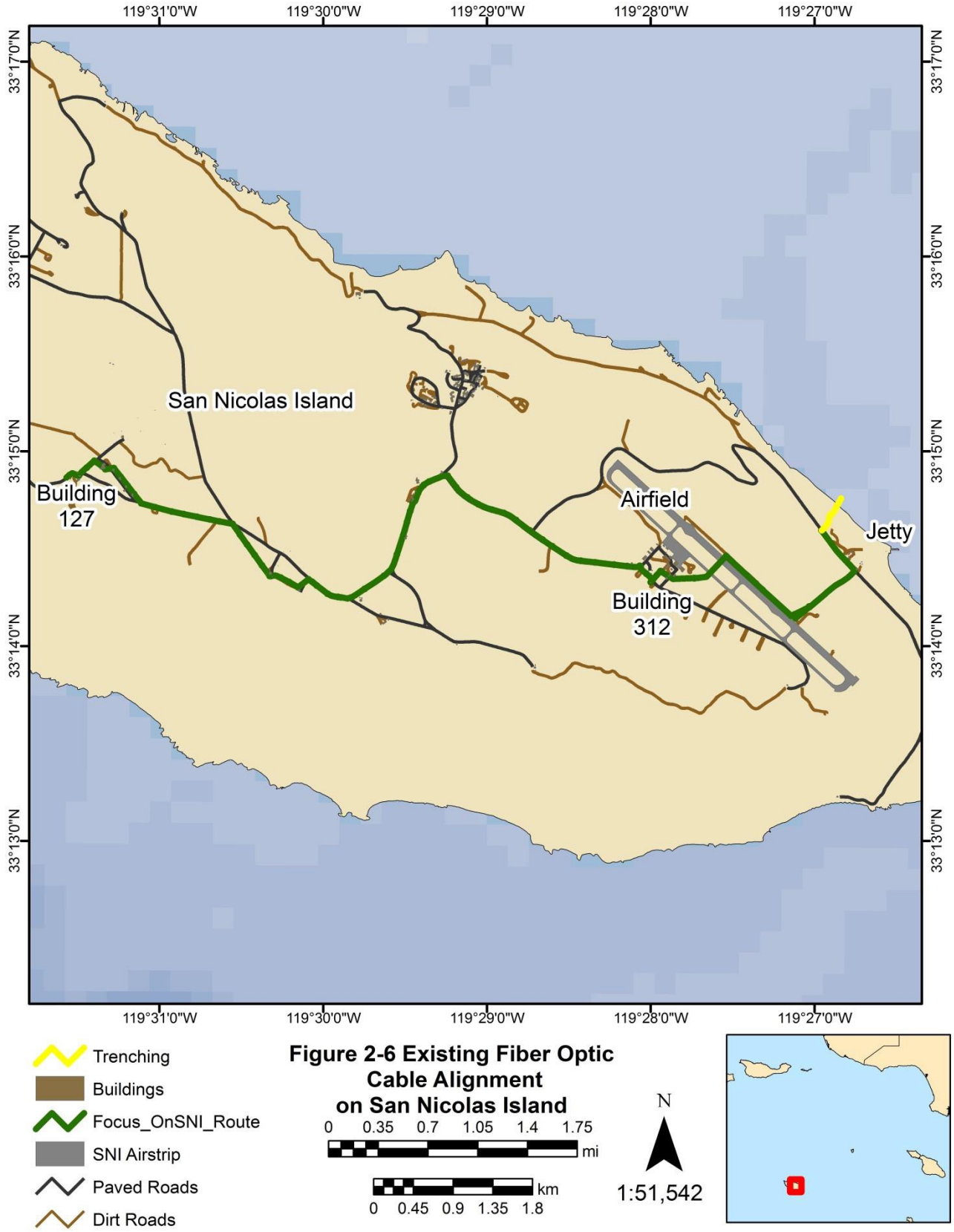


Figure 2-6 Existing Fiber Optic Cable Alignment on San Nicolas Island

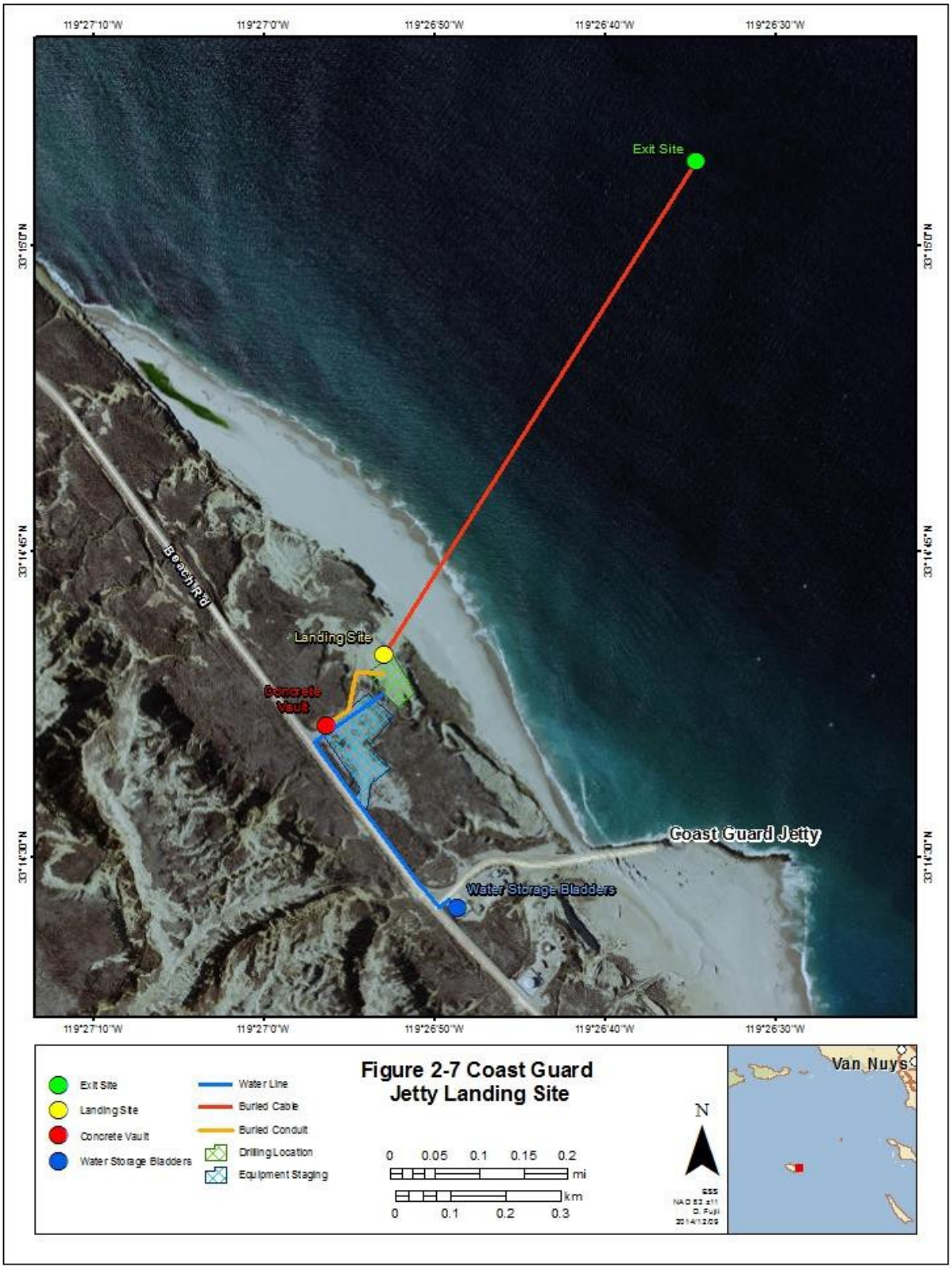


Figure 2-7 Coast Guard Jetty Landing Site

Figure 2-8 Existing Concrete Vault SNI (currently buried)

Santa Cruz Island Prisoners Harbor Landing Site

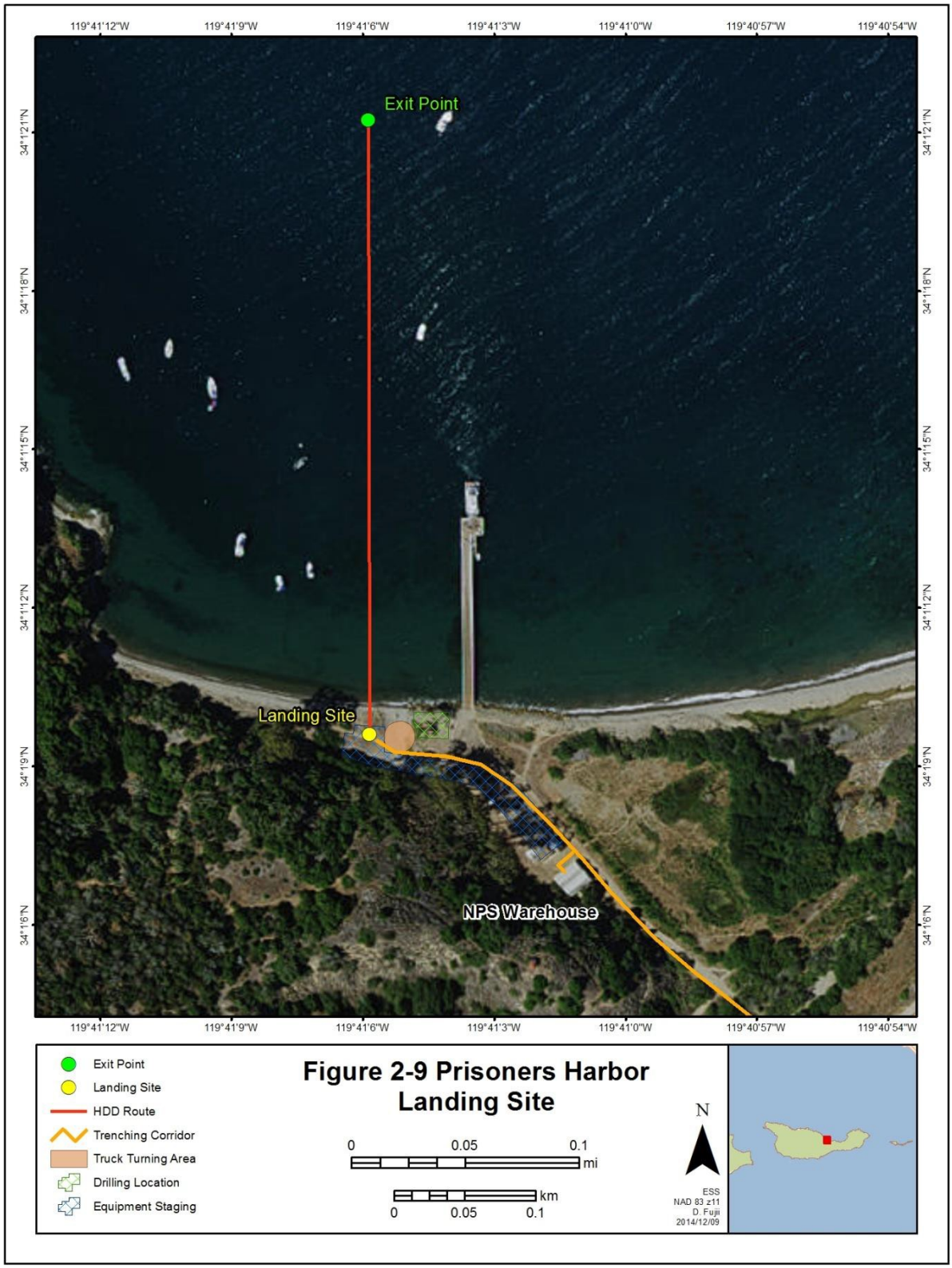
Santa Cruz Island is not currently connected to FOCUS-I via fiber optic cable. Further, there is no existing buried cable or water lines connecting the Navy Site to the SCrI shore. The current water line connecting the well near Prisoners Harbor to the Navy Site is a metal pipeline laid overland. This water line leaks in many locations, leading to significant water losses.

Under Alternative 1, a landing site would be installed at a location approximately 80 ft (24 m) west of the Prisoners Harbor Pier. Equipment would be staged on previously disturbed areas near the pier and the well site (see Figure 2-9 and Figure 2-10, respectively). Some grading would be required to create a flat surface for drilling. Road traffic would not be disrupted by drilling operations at this site; however, recreational access to the Prisoners Harbor Pier may be temporarily affected during the drilling operations. Disruption of access to the Prisoners Harbor Pier would only be for the duration of a single vessel landing. Efforts will be made to schedule such operations outside normal public access schedules and at no time will the pier be closed to public access while other NPS piers are closed.

In addition to the staging and drilling areas, adequate space is needed for semi-truck turning in the vicinity of the drilling area. Additional grading may be required east of the drilling area to accommodate the approximately 45-ft (14-m) turning radius area.

The water supply on SCrI does not have the production or storage capacities to accommodate the drilling operations, and it would be very difficult to bring in fresh water by barge in the quantities needed, as existing offloading and storage facilities and infrastructure do not exist. Considering this, the drilling fluid used on SCrI would be generated using seawater. This seawater would be pumped through a 5-inch (12.7 cm) fire hose running from approximately 50 ft (15 m) offshore to a mixing unit used to mix the drilling fluid. Consistent with NMFS recommendations to limit impacts to EFH, the fire hose end would be equipped with a screen grate to prevent uptake of marine organisms. A velocity cap that reduces horizontal intake currents will be employed and intake velocities across the intake screen will not exceed 0.5 foot per second.

Drilling to a site approximately 1,240 ft (379 m) from the HDD site at a water depth of 79 ft (24 m) would take 30 days, including mobilization and demobilization. The Point Mugu-SCrI and SNI-SCrI sea cables would be pulled through a single casing to the Prisoners Harbor drill site. The two sea cables would be installed in a trench approximately 525 ft (160 m) in length running from the drill site to a NPS-owned warehouse. At the warehouse, a concrete vault ([CV-1], 5 ft x 5 ft x 4 ft [1.5 m x 1.5 m x 1.2 m]) would be constructed in which the two sea cables will be spliced into a single 48-fiber land cable.


119°41'12"W
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119°41'6"W
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119°41'0"W
119°40'57"W
119°40'54"W
34°1'21"N
34°1'18"N
34°1'15"N
34°1'12"N
34°1'9"N
34°1'6"N
Exit Point
Landing Site
NPS Warehouse
Exit Point
Landing Site
HDD Route
Trenching Corridor
Truck Turning Area
Drilling Location
Equipment Staging
Figure 2-9 Prisoners Harbor Landing Site
0
0.05
0.1
mi
km
0
0.05
0.1
N
ESS
NAD 83 z11
D. Fujii
2014/12/09

Figure 2-10 Equipment Staging Near the SCrl Well Site

Santa Cruz Island Land Cable and Water Line Trenching and Elevated Channel System

From the concrete vault, CV-1, at the NPS-owned warehouse, the FOCUS-II cable would be installed in a trench along Navy Road and an unnamed road connecting the well site (Figure 2-10). The trench would be installed with widths ranging from 12 to 20 in (30 to 51 cm) and depth up to 40 in (102 cm). This trenching corridor would be approximately 1,970 ft (600 m) long and would terminate near the well site, where a concrete vault ([CV-2], 5 ft x 5 ft x 4 ft [1.5 m x 1.5 m x 1.2 m]) would be installed, wherein the trenched cable would transition to an above-ground elevated channel system. The channel would be composed of glass fiber-reinforced concrete and would be suspended approximately 1.6 ft (0.5 m) above-ground between galvanized steel stakes placed 6.6 ft (2 m) apart (Figure 2-12). This elevated channel would carry the FOCUS-II cable and a 3-in (8-cm) water line from the well site along the base of the hillside to the east of the access road to a newly installed concrete vault ([CV-3], 5 ft x 5 ft x 4 ft [1.5 m x 1.5 m x 1.2 m]) in the Navy Road shoulder (approximately 1,150 ft [350 m] of elevated channel, Figure 2-11). Additional above ground options may be pursued in coordination with NPS, between the well site and CV-3.

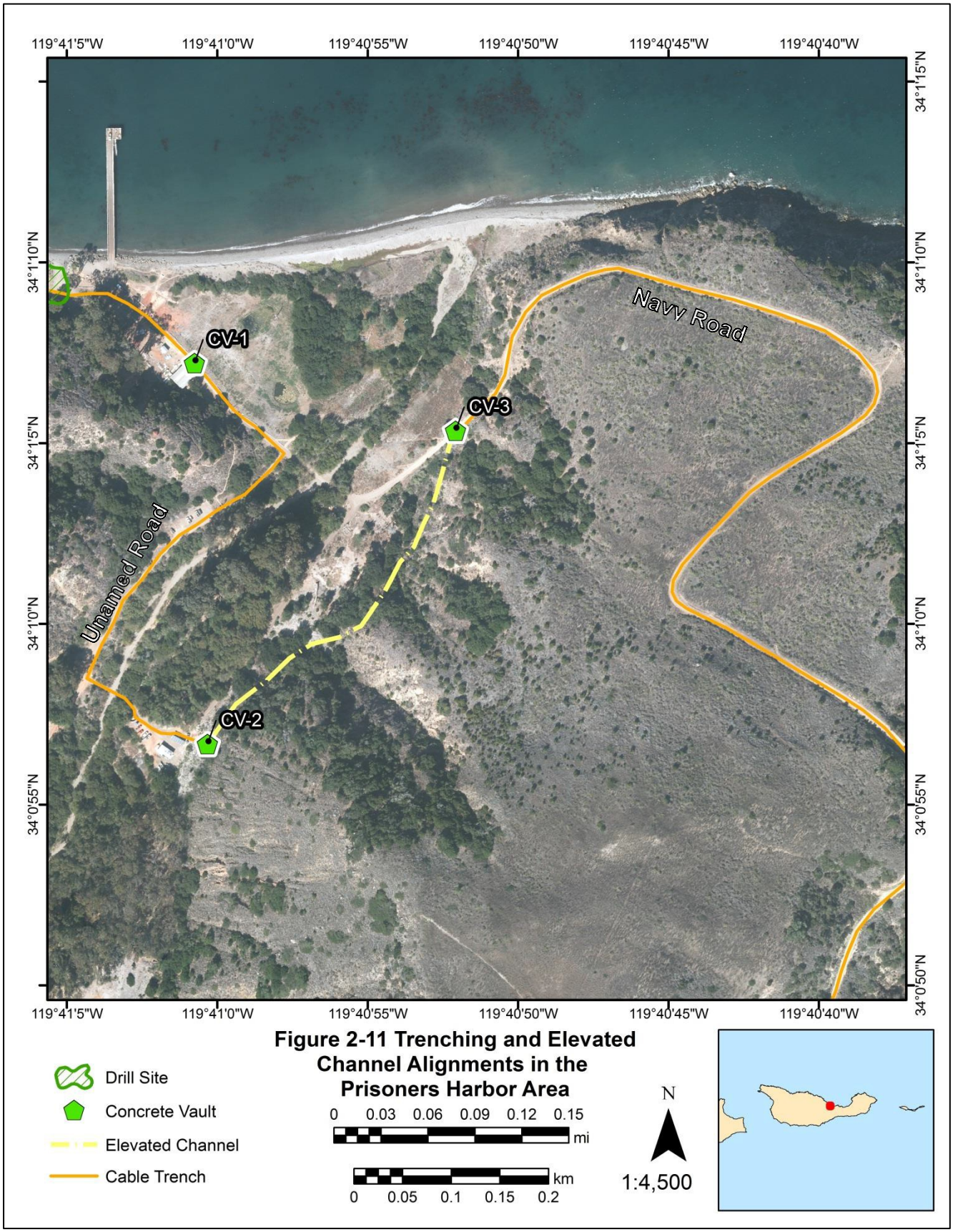

Figure 2-11 Trenching and Elevated Channel Alignments in the Prisoners Harbor Area

Figure 2-12. Example of Typical Elevated Channel System

Between CV-3 and the Navy Site, the FOCUS-II cable and 3-in (8-cm) water line would be installed in a trench with widths ranging from 12 to 20 in (30 to 51 cm) and depth up to 40 in (102 cm). This trench would extend approximately 6.9 mi (11.1 km) to the Navy Site, running through the middle of Navy Road. Manholes and vaults will be placed at intervals of between 100 ft (30.5 m) and 2,500 ft (762 m) to provide for cable pulling stations, strain relief, backflow preventers, and air vacuum release stations. The total number of manholes and vaults will be between 20 and 80, depending on the engineering needs yet to be determined. Trenching will take approximately three months. Trenching equipment and other materials would be staged at turnout locations and parking areas along Navy Road. Portions of the road would be closed to vehicle traffic during trenching operations, with the trenches excavated and covered in segments to maximize road availability. Vehicles will be allowed to pass through the construction areas when active work is not underway. Figure 2-13 provides an overview of the typical SCrI trench cross section. Figure 2-14 provides an overview of the entire SCrI onshore alignment.

To accommodate the mobilization to the Prisoners Harbor, a barge with 4,000 ft^2 (372 m^2) deck space (triple stack capability) will be used to deliver the equipment and supplies needed to initiate the drilling and trenching operations. Subsequent shipments to and from SCrI will be conducted via barge shipments and a landing craft utility (LCU) vehicle operated by the NPS. This vessel has a capacity of approximately one semi-truck load with dimensions of 14 ft x 40 ft (4.3 m x 12.2 m). Upon completion of drilling and trenching operations, construction equipment and materials will be taken off SCrI via the LCU and barge shipments for the large equipment such as a crane and a semi-truck.

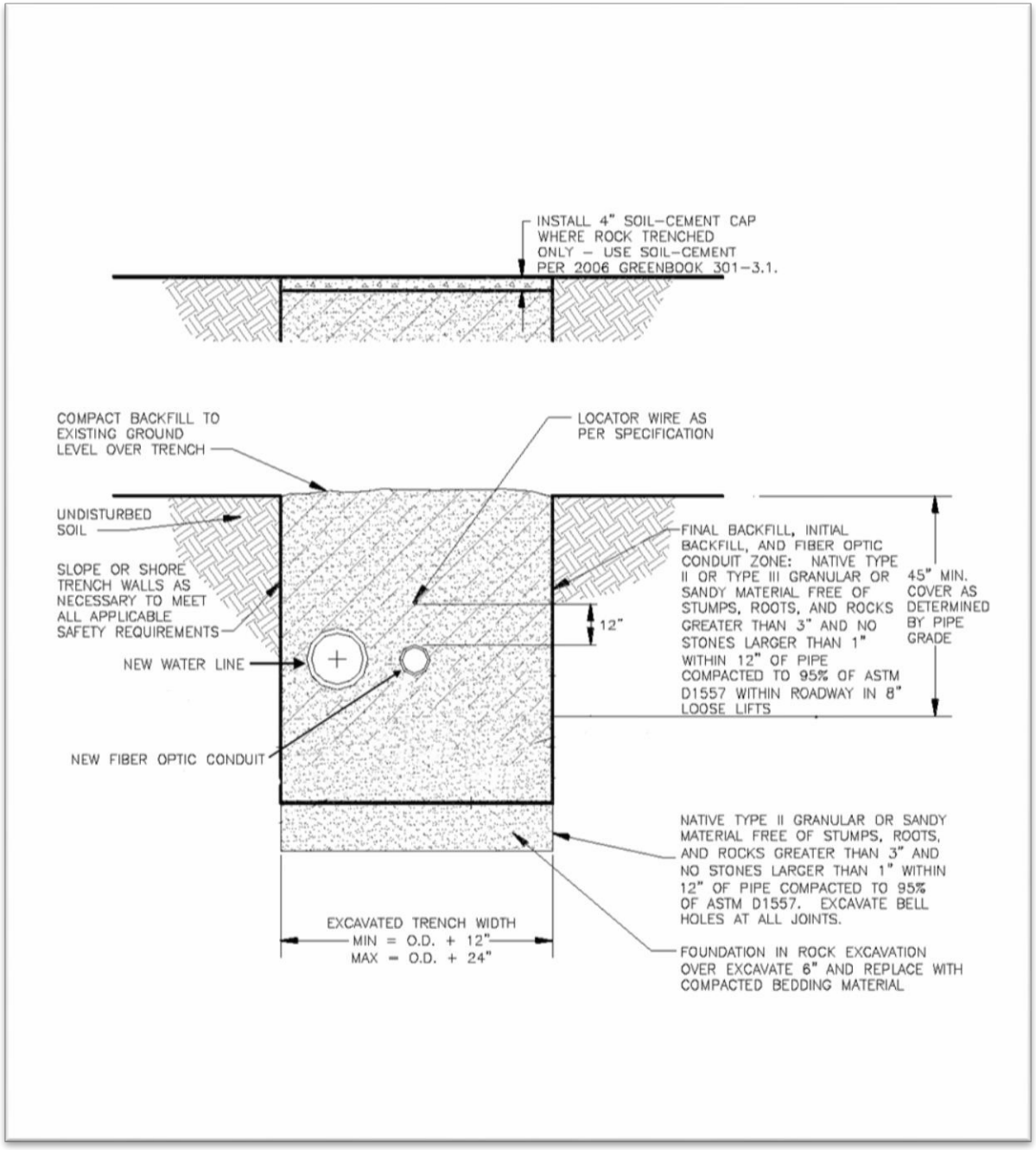

Figure 2-13 Typical SCrI Trench Section

Figure 2-14 Santa Cruz Island Onshore Cable Alignment

Offshore Routes

As described above, FOCUS-II will be installed as a four-node ring connecting NBVC Point Mugu, NBVC SNI, and SCrI. This ring will be composed of two underwater cables connecting NBVC Point Mugu to NBVC SNI utilizing mainland landing sites from the Charlie Pad site to the Coast Guard Jetty site. The NBVC single Point Mugu to SCrI cable will utilize mainland landing sites with the Building 811 site connecting to the SCrI Prisoners Harbor landing site. The NBVC SNI to SCrI cable will utilize the Coast Guard Jetty and Prisoners Harbor landing sites.

Figure 2-15 provides an overview of the Alternative 1 offshore cable routes. Near the NBVC Point Mugu shore, FOCUS-II cables will be laid in a manner avoiding the steep slopes of Mugu Canyon and Hueneme Canyon.

The routes to and from SCrI minimize the distance traveled across the Channel Islands National Marine Sanctuary (CINMS) to the extent possible. Routing the cables farther north, outside CINMS, is precluded by existing oil and gas production platforms and associated cables and pipelines. A route farther east of Anacapa Island, outside the Sanctuary, would coincide with the existing FOCUS I cables and would require crossing a steeper portion of the mouth of the Hueneme Canyon potentially allowing cable to be suspended above the substrate. The SCrI routes will transit soft bottom habitat north around Anacapa Island, eliminating the need to transit through the rocky, high-relief and high current Anacapa Passage.

Point Mugu Nearshore Characteristics

The HDD exit site for the Building 811 location would be situated approximately 7,150 ft (2,179 m) offshore at a water depth of approximately 79 ft (24 m). Down to a water depth of approximately 3,280 ft (1,000 m), the FOCUS-II cable would be plowed into the soft sediment at least 3.3 ft (1 m) below the sediment surface to protect the cable against damage from anchor dragging. The seafloor in the vicinity of the exit site is characterized as sandy substrate with no rocky bottom habitat.

The HDD exit site for the Charlie Pad location would be situated approximately 4,410 ft (1,340 m) offshore at a water depth of approximately 79 ft (24 m). Down to a water depth of approximately 3,280 ft (1,000 m), the FOCUS-II cable would be plowed into the soft sediment at least 3.3 ft (1 m) below the sediment surface to protect it against damage from anchor dragging. The seafloor in the vicinity of the exit site is characterized as sandy substrate with no rocky bottom habitat.

San Nicolas Island Nearshore Characteristics

The HDD exit for the Coast Guard Jetty location would be situated approximately 2,500 ft (762 m) offshore at a water depth of approximately 76 ft (23 m). The exit site is located approximately 500 ft (152 m) west of the FOCUS-I exit site. The Point Mugu-SNI and SCrI-SNI cables will be laid in a manner that avoids crossing over the FOCUS-I cables in the nearshore environment (out to a water depth of approximately 2,000 ft [610 m]). The seafloor in the vicinity of the exit site is sandy bottom with intermittent rock outcrops. Down to a water depth of approximately 3,280 ft (1,000 m), the FOCUS-II cable would be plowed into the soft sediment at least 3.3 ft (1 m) below the sediment surface to protect it against damage from anchor dragging. The cable route will be laid in a manner to avoid the rock outcrops to the fullest extent possible.

Santa Cruz Island Nearshore Characteristics

The HDD exit for the Prisoners Harbor location would be situated approximately 1,160 ft (354 m) offshore at a water depth of 79 ft (24 m). Down to a water depth of approximately 3,280 ft (1,000 m), the FOCUS-II cable would be plowed into the soft sediment at least 3.3 ft (1 m) below the sediment surface to protect it against damage from anchor dragging.

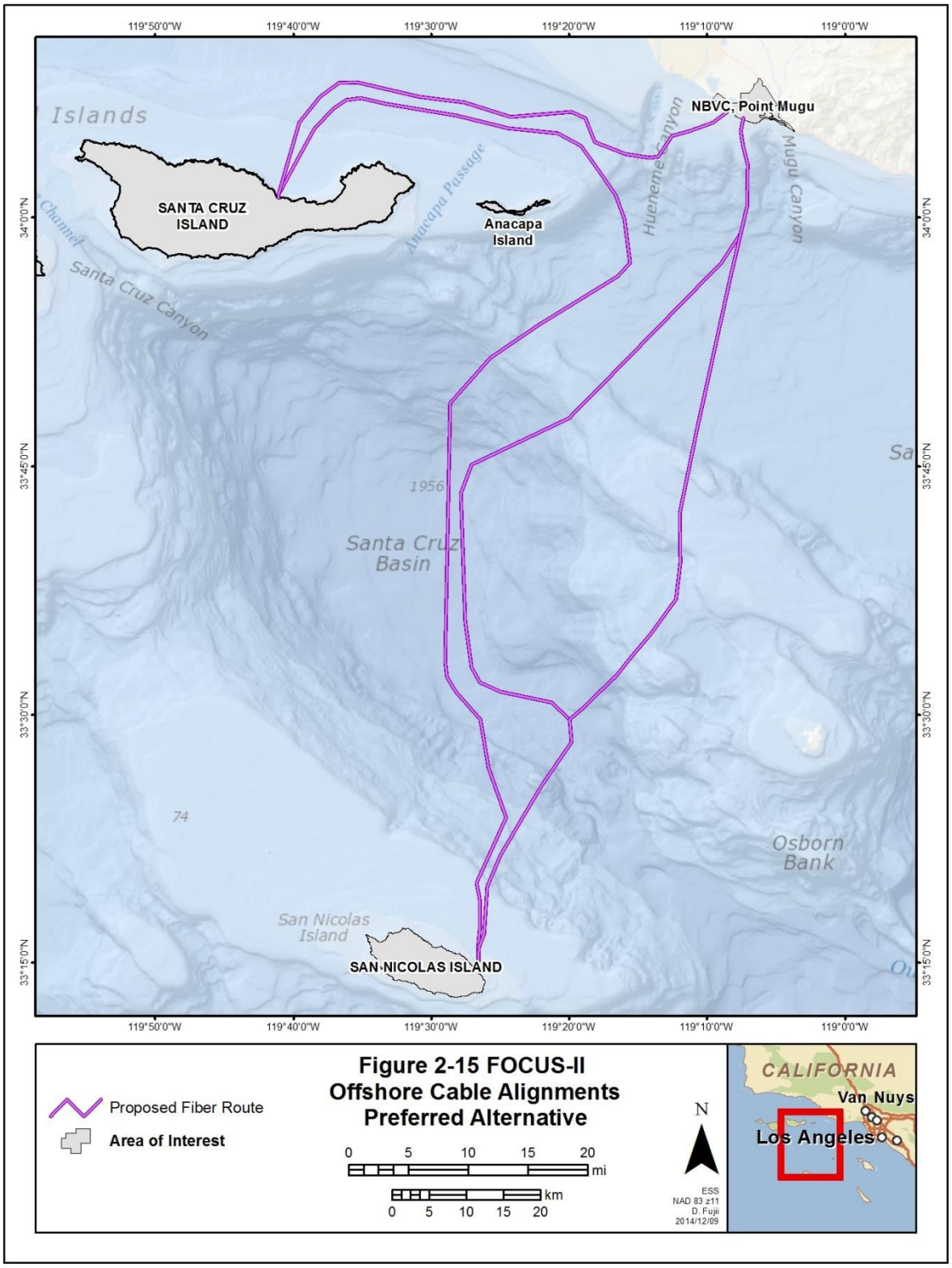

Figure 2-15 FOCUS-II Offshore Cable Alignments Preferred Alternative

Alternative 2

Under this alternative, as in Alternative 1, FOCUS-II would be constructed as a four-node ring and would provide redundant connections between the three sites, should one of the cables be disabled. Under Alternative 2, the installation of FOCUS-II would involve the same actions as Alternative 1, with one exception described below.

Santa Cruz Island Land Cable and Water Line Trenching and Elevated Channel System – Alternative 2

As in Alternative 1, from the concrete vault, CV-1, at the NPS-owned warehouse, the FOCUS-II cable would be installed in a trench along Navy Road and an unnamed road connecting the well site (Figure 2-16). Under Alternative 2, however, the elevated channel would carry the FOCUS-II cable and a 3-in (8-cm) water line from the well site along the roadside of the access road to the newly installed CV-3 (approximately 1,275 ft [388 m] of elevated channel, Figure 2-16).

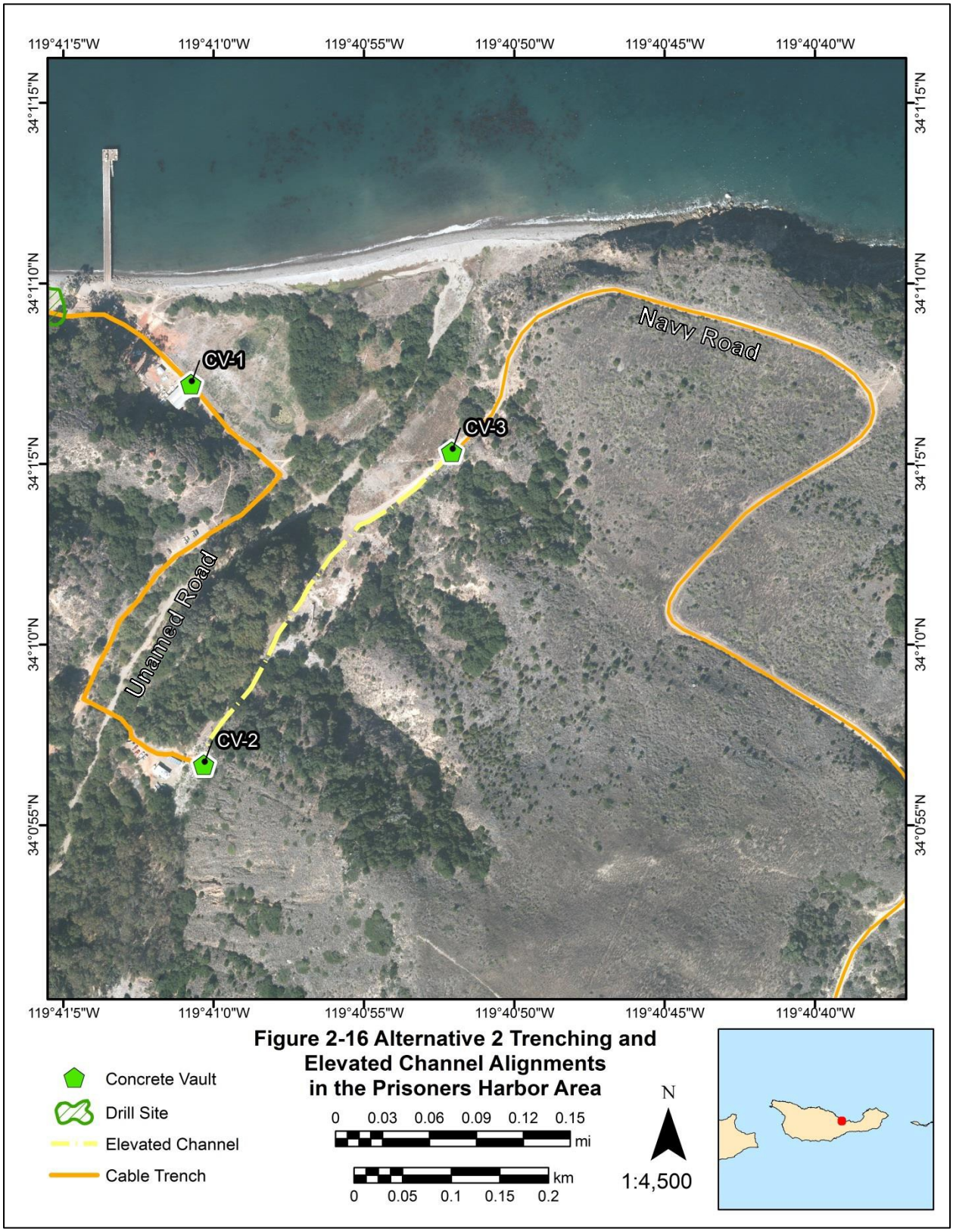

Figure 2-16 Alternative 2 Trenching and Elevated Channel Alignments in the Prisoners Harbor Area

Alternative 3

Under this alternative, similar to Alternative 1, FOCUS-II would be constructed as a four-node ring and would provide redundant connections between the three sites, should one of the cables be disabled. Under Alternative 3, the installation of FOCUS-II would involve the same actions as Alternative 1, with one exception described below.

Santa Cruz Island Landing Site – Alternative 3

Unlike Alternative 1, all onshore cable and water line would be buried in conduit, with no elevated channel. From CV-1 at the warehouse, the land cable will be installed in buried conduit running under Navy

Road (Figure 2-17) to Building 4 on the Navy Site, requiring approximately 7 mi (11 km) of trenching. The trenches would be installed with widths ranging from 4 to 20 in (10 to 51 cm) and depth up to 40 in (102

cm). In addition to the FOCUS-II cable, a water line will be installed inside the trench. This 3-in (8-cm) polyvinyl chloride (PVC) water line will originate at the well site and will run down the road 930 ft (283 m) connecting to the trench at Navy Road. There would be a total of approximately 7.78 mi (12.5 km) of trenching under this alternative. Manholes and vaults will be placed at intervals of between 100 ft (30.5 m) and 2,500 ft (762 m) to provide for cable pulling stations, strain relief, backflow preventers, and air vacuum release stations. The total number of manholes and vaults will be between 20 and 80, depending on the engineering needs yet to be determined. Trenching will take approximately three months. Trenching equipment and other materials would be staged at turnout locations and parking areas along Navy Road. The road would be closed to traffic during trenching operations, with the trenches excavated and covered in segments to maximize road availability.

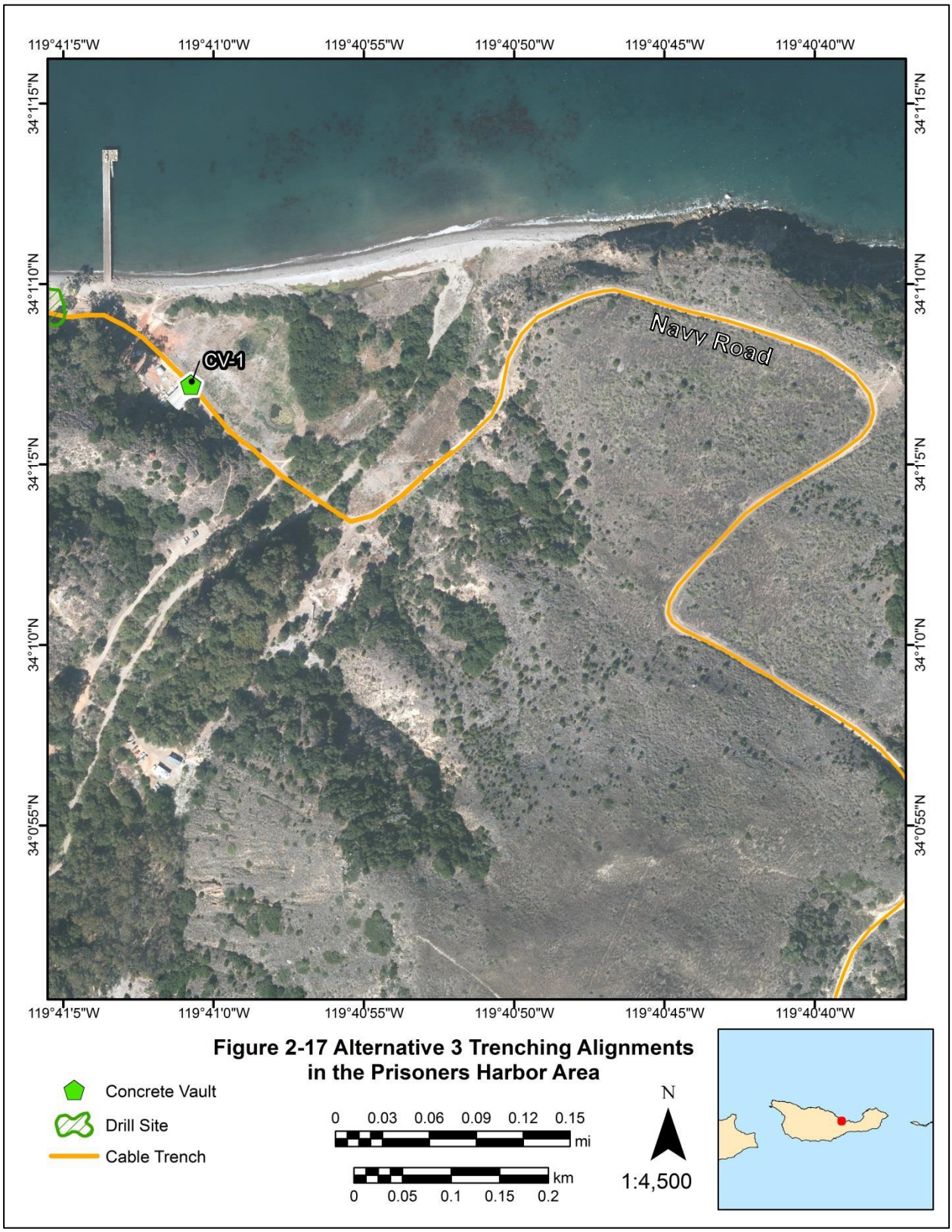

Figure 2-17 Alternative 3 Trenching Alignments in the Prisoners Harbor Area

Alternative 4

Under Alternative 4, the FOCUS-II cable would not connect to SCrI, and communications support between the Sea Range and SCrI would continue to be conducted via microwave radios. Two FOCUS-II cables would be installed between Point Mugu and SNI to provide redundancy between the two sites. No new water line would be installed at SCrI. Alternative 4 does not fulfill the purpose and need of the proposed action, as it relies upon other upgrades or replacement of the SCrI microwave system and water line at a later date. However, this alternative is carried forward to demonstrate the full range of potential environmental impacts should the Navy choose not to improve the communications infrastructure on SCrI.

Under Alternative 4, the installation of FOCUS-II would involve the following actions and differences from Alternative 1:

- Installation of new seashore interface landings at each of the two sites, utilizing HDD technology. New HDD exit sites would be offshore at depths of approximately 79 ft (24 m).
- Use of existing underground infrastructure and installation of new buried cable at NBVC Point Mugu, connecting the nearshore HDD sites to The Range Communications Building.
- Installation of approximately 500 ft (152 m) of new buried cable at NBVC SNI connecting the nearshore HDD site to an existing concrete bunker. From the bunker, existing underground infrastructure will be used connecting to Building 127.
- Installation of two new underwater cable alignments (approximately 138.8 mi [223.4 km]), creating the interlinked communications system between NBVC Point Mugu and NBVC SNI.
- Repair of the cable at depths shallower than 100 ft to ensure any exposed cable is either properly secured or reburied will occur as needed.
- Remote continuous monitoring of the health and status of the FOCUS cable will occur and maintenance is not anticipated at any regular intervals.

Point Mugu Landing Site – Alternative 4

Under Alternative 4, only the Charlie Pad Site would be utilized as the onshore landing site for the FOCUS-II cables. The HDD site would involve the same Charlie Pad location described in Alternative 1. The two cables would be linked at a new junction box approximately 4,990 ft (1,521 m) from the HDD site at a water depth of 79 ft (24 m) and pulled ashore via a single conduit. This site would require approximately 48 ft (14.6 m) of trenching to connect to an existing manhole system, tying into the Manhole 52 link to The Range Communications Building. The trenching and cable installation operations would take approximately two days.

Offshore Routes – Alternative 4

Figure 2-18 provides an overview of the offshore cable routes associated with Alternative 4. Under this alternative, the two FOCUS-II cables connecting Point Mugu to SNI would parallel each other in the nearshore areas with an average distance of 1 mile (1.6 km) between the cables. As the cables approach the Santa Cruz Basin, the cables would diverge with one cable following the east side of the basin and the second following a route around the west side of the basin. Off the Point Mugu shore, the two cables

would be linked at a new junction box approximately 4,410 ft (1,340 m) offshore at a water depth of approximately 79 ft (24 m) and pulled through a single casing to the onshore landing site at Charlie Pad. Off the SNI shore, the cables would be linked at a new junction box approximately 2,455 ft (748 m) offshore at a water depth of approximately 76 ft (23 m) and pulled through a single casing to the onshore landing site at the Coast Guard Jetty Site.

Point Mugu Nearshore Characteristics – Alternative 4

The HDD exit site for the Charlie Pad location would be situated approximately 4,410 ft (1,340 m) offshore at a water depth of approximately 79 ft (24 m). Down to a water depth of approximately 3,280 ft (1,000 m), the FOCUS-II cable would be plowed into the soft sediment at least 3.3 ft (1 m) below the sediment surface to protect it against damage from anchor dragging. The seafloor in the vicinity of the exit site is characterized as sandy substrate with no rocky bottom habitat.

San Nicolas Island Nearshore Characteristics – Alternative 4

As in Alternative 1, the HDD exit for the Coast Guard Jetty location would be situated approximately 2,500 ft (762 m) offshore at a water depth of approximately 76 ft (23 m). The exit site is located approximately 500 ft (152 m) west of the FOCUS-I exit site. The Point Mugu-SNI cables will be laid in a manner that avoids crossing over the FOCUS-I cables in the nearshore environment (out to a water depth of approximately 2,000 ft [610 m]). The seafloor in the vicinity of the exit site is sandy bottom with intermittent rock outcrops. Down to a water depth of approximately 3,280 ft (1,000 m), the FOCUS-II cable would be plowed into the soft sediment at least 3.3 ft (1 m) below the sediment surface to protect it against damage from anchor dragging. The cable route will be laid in a manner to avoid the rock outcrops to the fullest extent possible.

Alternative 5 – The No-Action Alternative

Under the No-Action Alternative, the existing FOCUS-I cables and SCrI microwave systems would continue to be used. The FOCUS-I cable A signal would continue to degrade, and FOCUS-I cables A and B would continue to be utilized past their design lifetimes. Repair of FOCUS-I would not be sufficient due to the extent of the degradation, and the increasing bandwidth requirements for SCrI would eventually not be met. The risk for failure of these systems, and thus communication failure between NBVC Point Mugu, SNI, and SCrI Navy Site, would remain high, potentially resulting in months of down time, significant costs, and loss of military readiness. Should SCrI microwave system failure occur, the downtime could be greatly increased as the OEM does not provide maintenance support, and third party vendors cannot guarantee availability of necessary replacement parts. The No-Action Alternative would not meet the purpose and need of the proposed action. However, the No-Action Alternative is carried forward for analysis in this EA/OEA in accordance with NEPA requirements and represents a baseline for comparison of the effects of the other options.

Table 2-1 provides a summary of the site selection criteria used to determine the preferred HDD locations analyzed in this EA/OEA. For each criterion, each site was graded on a scale of 0 to 2, with 0 not meeting the criterion needs and 2 fully meeting the selection criterion.

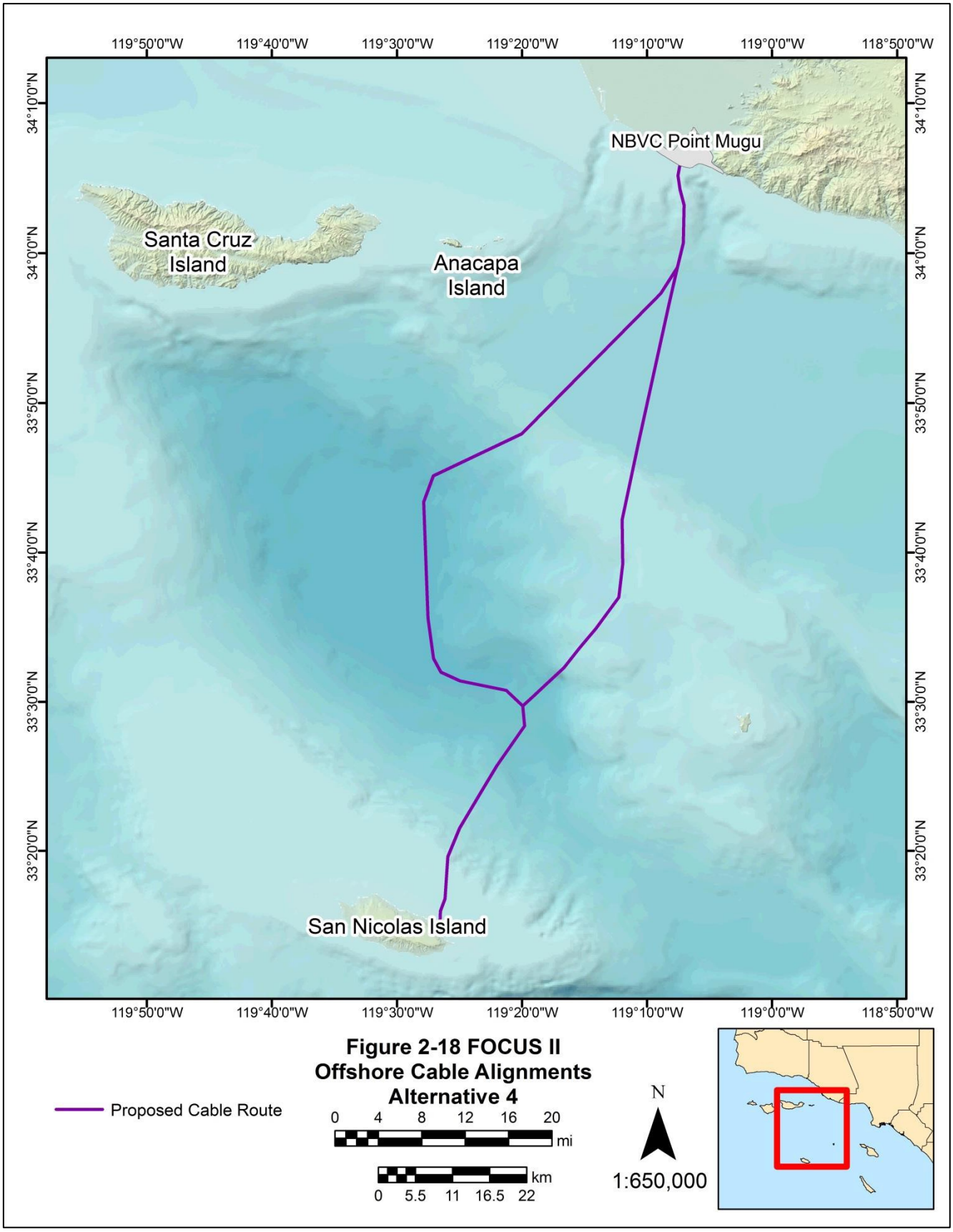

Figure 2-18 FOCUS II Offshore Cable Alignments Alternative 4

Table 2-1 FOCUS-II Landing Site Selection Comparison Matrix

	Site Alternative								
	Point Mugu Sites				**SNI Sites**		**SCrI Sites**		
	Bldg. 811	**Charlie Pad**	**Manhole 52**	**The Point**	**CG Jetty**	**Bldg. 127†**	**Prisoners Harbor**	**Bend Site†**	**Navy Site †**
Drill Site Selection Criteria									
Onshore site close to	2	2	2	2	2	0	2	1	0
Low elevation w/minimum angle	2	2	2	2	2	0	2	0	0
Avoids steep slope between shoreline and offshore exit	2	2	2	2	2	1	2	0	0
Level cleared area for	2	2	2	2	2	2	2	1	2
Drill site on previously	2	2	1	2	2	2	2	0	1
Drilling site not on sandy	1	2	2	2	1	2	1	2	2
One mile distant from other landing	2	2	0	2	2	2	2	2	2
Road traffic would not be	2	1	0	2	2	1	1	2	2
Drill Site Selection	**15**	**15**	**11**	**16**	**15**	**10**	**14**	**8**	**9**
Onshore Cable Alignment Selection Criteria									
Uses existing	2	2	2	1	2	2	0	0	0
Minimizes length of new trenching	2	2	2	0	2	2	0	0	2
Avoids areas of high	2	2	2	0	1	2	1	2	2
Onshore Cable Selection	**6**	**6**	**6**	**1**	**5**	**6**	**1**	**2**	**4**

2 = selection criterion fully met; 1 = selection criterion partially met; 0 = selection criterion not met.
Notes:
† Alternatives not carried forward for further consideration.

As the table reflects, The Point scored highest for NBVC Point Mugu drilling site criteria. The Point, however, would require significant trenching compared to the other sites and is in a high-erosion area. Cable installation at The Point would be at risk of a catastrophic failure in a large storm event. Considering all factors, the Building 811 and Charlie Pad sites were determined to be the best-fit locations for landing sites.

The Coast Guard Jetty and Prisoners Harbor sites on NBVC SNI and SCrI; respectively, were found to be the preferred landing sites due to onshore slope conditions. Drilling at the Building 127, Navy Road Bend Site, or Navy Site locations would be difficult and would pose high risk of spillage due to the high angle of drilling.

Table 2-2 summarizes the alternatives analyzed in this EA/OEA and provides a description of the onshore and offshore installation activities to be taken under each of the alternatives.

Table 2.2 Comparison of Installation Activities by Alternative

Component	Location	Preferred Alternative	Alternative 2	Alternative 3	Alternative 4	The No-Action Alternative
HDD Length	PM Bldg. 811	7,300 ft	7,300 ft	7,300 ft	N/A	No drilling under this alternative
	PM Charlie Pad	4,990 ft	4,990 ft	4,990 ft	4,990 ft	
	SNI Coast Guard Jetty	2,960 ft	2,960 ft	2,960 ft	2,960 ft	
	SCrI Prisoners	1,240 ft	1,240 ft	1,240 ft	N/A	
Water Source	PM Bldg. 811	Hydrant approx. 1,200 ft away	Hydrant approx. 1,200 ft away	Hydrant approx. 1,200 ft away	N/A	No water consumed as no drilling conducted
	PM Charlie Pad	Hydrant less than 50 ft from drilling site	Hydrant less than 50 ft from drilling site	Hydrant less than 50 ft from drilling site	Hydrant less than 50 ft from drilling site	
	SNI Coast Guard Jetty	Water storage bladders approx. 1,500 away	Water storage bladders approx. 1,500 away	Water storage bladders approx. 1,500 away	Water storage bladders approx. 1,500 away	
	SCrI Prisoners	Saltwater from harbor	Saltwater from harbor	Saltwater from harbor	N/A	
Trenching and Elevated Tray	PM Bldg. 811	45 ft	45 ft	45 ft	N/A	No trenching required
	PM Charlie Pad	48 ft	48 ft	48 ft	48 ft	
	SNI Coast Guard Jetty	500 ft	500 ft	500 ft	500 ft	
	SCrI Prisoners Harbor	38,900 ft trenching 1,150 ft elevated channel	38,900 ft trenching 1,275 ft elevated channel	41,080 ft	N/A	
Offshore Routes	PM-SNI	55.8 NM and 64.8 NM	55.8 NM and 64.8 NM	55.8 NM and 64.8 NM	55.8 NM and 64.8 NM	No offshore cable installed
	PM-SCrI	34.1 NM	34.1 NM	34.1 NM	N/A	
	SNI-SCrI	79.1 NM	79.1 NM	79.1 NM	N/A	
Redundancy Provided by:		Four-node connection between PM, SNI, and SCrI	Four-node connection between PM, SNI, and SCrI	Four-node connection between PM, SNI, and SCrI	Two separate fiber optic cables connecting PM and SNI	Redundancy not guaranteed as signal degrades
Meets Purpose and Need?		**Yes**	**Yes**	**Yes**	**No**	**No**

2.1.4.3 Alternatives Considered but not Carried Forward

Point Mugu Onshore Landing Site – Manhole 52

Under this alternative, a site near Manhole 52 would be used as a landing site for either the Point Mugu-SCrI or Point Mugu-SNI cables. FOCUS-I cables would be crossed nearshore using this site as a FOCUS-II landing site. The location is in the vicinity of the existing FOCUS-I landings, which could feasibly lead to an event (e.g., anchor dragging or bottom fishing) that would disrupt both FOCUS-I and FOCUS-II. There is no adequate storage area in the vicinity of the site. Approximately 1,000 ft^2 (93 m^2) would need to be graded and 800 ft^2 (74 m^2) of vegetation would need to be removed to create a flat drilling surface. Traffic on Beach Road would be closed in both directions during HDD activities. For these reasons, this site was eliminated from further consideration in this EA/OEA.

Point Mugu Onshore Landing Site – The Point

Under this alternative, a landing site would be constructed at the Point, a location of recreational uses near the mouth of Mugu Lagoon. This site is previously disturbed and relatively leveled and would require minimal grading to create a level drilling service. The site has adequate space for staging equipment, and

no road traffic would be impacted during drilling operations. However, the site is not near existing manhole systems and would require approximately 1.8 mi (2.9 km) of trenching connecting the existing infrastructure. The Point site is also subject to extreme erosion during storm events, which would likely affect the FOCUS-II cable both on and offshore. For these reasons, this alternative was eliminated from further consideration.

San Nicolas Island Onshore Landing Site – Building 127

Under this alternative, an HDD site would be set up near Building 127, directionally drilling down the southern slope of SNI to a location near a beach on the southern side of SNI. The Building 127 alternative would require approximately 6,500 ft (1,980 m) of near vertical drilling down to the beach site where the directional drilling would then take a near horizontal turn. This alternative was eliminated from further consideration because it was found to be infeasible and would create a significant spillage risk due to the steep angle of the HDD drilling down the SNI slope.

Santa Cruz Island Onshore Landing – Navy Road Bend

This alternative would involve installation of an HDD site on a clearance near a bend in Navy Road, approximately 2,200 ft east of the Prisoners Harbor Pier. This site is situated on a ledge 220 ft (67 m) above sea level. Use of this site would require HDD drilling down the slope of the island with a near horizontal turn at sea level. This would create a significant spillage hazard due to the steep slope. This site would also require clearing of vegetation and grading of an area of approximately 30,000 ft^2 (2,790 m^2) for drilling and equipment staging. The Navy Road Bend site does not have adequate space for water storage, and it would not be possible to pump seawater to the drilling site due to its elevation. For these reasons, this site was eliminated from further consideration in this EA/OEA.

Santa Cruz Island Onshore Landing Site – The Navy Site

Under this alternative, an HDD site would be installed on the Navy-leased land on SCrI. This alternative was removed from further consideration because the HDD drilling would be technically infeasible due to the undulating terrain between the Navy Site and the offshore exit site. This would create a significant spillage hazard due to the steep slope. Additionally the site does not have adequate area for storage of the water needed to complete the drilling, nor is there an adequate water source present. This alternative would require between 10 and 20 daily water shipments via water tank trailer trucks, assuming a maximum capacity of 3,000 gal (11,400 l) per shipment.

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CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter includes a description of the existing environmental conditions and analyzes the potential impacts associated with the proposed action and its alternatives within the Sea Range, NBVC Point Mugu, NBVC SNI, and SCrI. Affected environment information provided in this chapter serves as baseline data to identify and evaluate any potential impacts that could result from the various action alternatives and the No-Action Alternative. Unless otherwise stated, each resource description in this chapter is divided into four distinct areas to facilitate the consistency with the proposed project components. These four areas are:

- NBVC Point Mugu
- NBVC SNI
- SCrI
- Offshore areas within the Sea Range

Background and site-specific information presented for each resource section have been focused to describe only those resource components addressed in the analysis of potential impacts.

3.1 AIR QUALITY

3.1.1 Affected Environment

3.1.1.1 Definition of Resource

Estimated emissions from a proposed federal action are typically compared with the relevant national and state standards to assess the potential for increases in pollutant concentrations. Impacts would occur if the action alternatives would directly or indirectly produce emissions that would be the primary cause of, or would significantly contribute to, a violation of state or federal ambient air quality standards. Emission thresholds associated with CAA conformity requirements are another means of assessing the significance of air quality impacts. A formal conformity determination is required for federal actions occurring in nonattainment or maintenance areas when the total direct and indirect stationary and mobile source emissions of nonattainment pollutants or their precursors exceed *de minimis* thresholds.

Air quality in a given location is defined by pollutant concentrations in the atmosphere and is generally expressed in units of parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). One aspect of significance is a pollutant's concentration in comparison to a national and/or state ambient air quality standard. These standards represent the maximum allowable atmospheric concentrations that may occur and still protect public health and welfare with a reasonable margin of safety. The national standards, established by the United States Environmental Protection Agency (USEPA), are termed the National Ambient Air Quality Standards (NAAQS) (Table 3.1-1). The NAAQS represent maximum acceptable concentrations that generally may not be exceeded more than once per year; the annual standards are never allowed to be exceeded. State standards, established by the California Air Resources Board (CARB), are termed the California Ambient Air Quality Standards (CAAQS). The CAAQS are at least as restrictive as the NAAQS and include pollutants for which national standards do not exist.

Areas that violate ambient air quality standards are designated as nonattainment areas. Nonattainment designations for ozone (O_3) and carbon monoxide (CO) include subcategories indicating the severity of the air quality problem (e.g., the classifications range from *basic* to *extreme* for O_3). Areas that comply with federal air quality standards are designated as attainment areas. Areas that have been redesignated from nonattainment to attainment are designated as maintenance areas. Areas that lack monitoring data to demonstrate attainment or nonattainment status are designated as unclassified and are considered to be in attainment for regulatory purposes.

The air pollutants that are considered in this analysis include volatile organic compounds (VOCs), O_3, CO, nitrogen oxides (NO_X), particulate matter less than or equal to 10 microns in diameter (PM_{10}), and particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$). Emissions are often characterized as being "primary" or "secondary" pollutants. Primary pollutants are those emitted directly into the atmosphere such as CO, sulfur dioxide (SO_2), PM_{10} and $PM_{2.5}$. Secondary pollutants are those formed through chemical reactions in the atmosphere such as O_3 and nitrogen dioxide (NO_2). SO_2 and NO_2 are commonly referred to and reported as generic oxides of sulfur (SO_X) and NO_X, respectively, as SO_2 and NO_2 constitute the majority of their respective oxides. Although VOCs (also referred to as hydrocarbons or reactive organic gases) and NO_X (other than nitrogen dioxide) have no established ambient standards, they are important as precursors to O_3 formation.

3.1.1.2 Regulatory Setting

The General Conformity Rule, as established in Section 176(c) of the CAA (as amended), requires federal agencies to ensure that actions undertaken in nonattainment or maintenance areas are consistent with the CAA and with federally enforceable air quality management plans. The General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emission thresholds that trigger requirements for a conformity analysis are called *de minimis* levels. *De minimis* levels (in tons per year) vary by pollutant and are also subject to the severity of the nonattainment status.

The General Conformity Rule establishes a process that is intended to demonstrate that a proposed federal action would not: 1) cause or contribute to new violations of federal air quality standards; 2) increase the frequency or severity of existing violations of federal air quality standards; and, 3) delay the timely attainment of federal air quality standards. Compliance is presumed if the net increase in direct and indirect emissions from a federal action would be less than the relevant *de minimis* level for the region in which the action is proposed. However, if the increase in emissions for a nonattainment pollutant exceeds *de minimis* levels, a formal conformity determination process must be implemented. For the purposes of this air quality analysis, project emissions would be potentially significant if they exceed federal *de minimis* levels. If emissions exceed their respective *de minimis* levels, further analysis of the emissions and their consequences would be performed to assess whether there is a likelihood of a significant impact to air quality.

<u>State and Local Requirements</u>

The CAA requires each state to develop, adopt, and implement a State Implementation Plan (SIP) to achieve, maintain, and enforce federal air quality standards throughout the state. SIP documents are developed on a pollutant-by-pollutant basis whenever one or more air quality standards are being

violated. In California (NBVC Point Mugu included), the SIP consists of separate elements for each air basin, depending on the attainment status of that air basin. Local governments and air pollution control districts have had the primary responsibility for developing and adopting the regional elements of the California SIP.

Table 3.1-1 California and National Ambient Air Quality Standards

POLLUTANT	AVERAGING	CAAQS[1]	NAAQS[2]	
			Primary	Secondary
Ozone (O_3)	8 hour	0.07 ppm (137	0.07 ppm (137	Same as primary standard
	1 hour	0.09 ppm (180	†	
Carbon Monoxid	8 hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	†
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40	
Nitrogen Dioxide (NO_2)	Annual arithmetic	0.03 ppm (57µg/m^3)	0.053 ppm (100 µg/m^3)	Same as primary standard
	1 hour	0.18 ppm (339	0.100 ppm (188	†
Sulfur Dioxide (SO_2)	Annual arithmetic	†	0.03 ppm (80 µg/m^3)	†
	24 hour	0.04 ppm (105	0.14 ppm (365	†
	3 hour	†	†	0.5 ppm (1,300
	1 hour	0.25 ppm (655	0.075 ppm (196	†
PM_{10}	Annual arithmetic	20 µg/m^3	†	Same as primary standard
	24 hour	50 µg/m^3	150 µg/m^3	
$PM_{2.5}$	Annual arithmetic	12 µg/m^3	15 µg/m^3	Same as primary standard
	24 hour	No separate	35 µg/m^3	
Sulfates	24 hour	25 µg/m^3	†	†
Lead (Pb)	30 day	1.5 µg/m^3	†	†
	Calendar	†	1.5 µg/m^3	Same as primary
Hydrogen Sulfide	1 hour	0.03 ppm (42 µg/m^3)	†	†
Vinyl Chlori	24 hour	0.01 ppm (26 µg/m^3)	†	†

Notes: [1] CAAQS for CO, SO_2, NO_2, O^3, and PM_{10} are not to be exceeded. All other CAAQS are not to be equaled or exceeded. NAAQS are not to be exceeded more than once per year except for annual standards.
ppm = parts per million; µg/m^3 = micrograms per cubic meter; mg/m3 = milligram per cubic meter; † = no standard established
Sources: CARB 2013a; USEPA 2013a.
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The table includes NAAQS and CAAQS for sulfates, Pb, H_2S, and vinyl chloride. The anthropogenic sources of these criteria pollutants are attributed to processes not associated with the proposed action. As an example, the primary industry sources of H_2S include manure handling, oil refineries, pulp and paper mills, and waste water treatment plants. Emissions for these pollutants are not estimated in the analysis provided in Section 3.1.2.

Greenhouse Gas Emissions

Greenhouse gases (GHGs) are pollutants of concern for air quality and climate change. GHGs include water vapor, carbon dioxide (CO_2), methane, NO_X, O_3, and several chlorofluorocarbons. Water vapor is a

naturally occurring GHG and accounts for the largest percentage of the greenhouse effect. Next to water vapor, CO_2 is the second-most abundant GHG and is typically produced from human-related activities. The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. Additionally, a number of specialized industrial production processes and product uses such as mineral production, metal production and the use of petroleum-based products can also lead to CO_2 emissions.

Although regulatory agencies are taking actions to address GHG effects, there are currently no state or federal standards or regulations limiting CO_2 emissions and concentrations in the ambient air. In response to the *FY2008 Consolidated Appropriations Act* (H.R. 2764; Public Law 110–161), the USEPA issued the *Final Mandatory Reporting of Greenhouse Gases Rule* (GHG Reporting Rule), which became effective on December 29, 2009. The GHG Reporting Rule requires annual reporting of GHG emissions to USEPA from large sources and suppliers in the U.S., including suppliers of fossil fuels or industrial GHG; manufacturers of vehicles and engines; and facilities that emit greater than 25,000 metric tons per year (27,558 tons per year) each of CO_2 and other GHGs. The intent of the rule is to collect accurate and timely emissions data to inform future policy decisions and programs to reduce emissions, as well as to fight against the effects of climate change.

Several states have promulgated laws as a means to reduce statewide levels of GHG emissions. In particular, the California Global Warming Solutions Act of 2006 directs the State of California to reduce statewide GHG emissions to 1990 levels by the year 2020. In addition, groups of states formed regional collectives to jointly address GHG pollutants.

In an effort to reduce energy consumption and dependence on petroleum, and increase the use of renewable energy resources in accordance with the goals set by EO 13123, *Greening the Government through Efficient Energy Management*, and the Energy Policy Act of 2005, the Navy has implemented a number of renewable energy projects. Navy Region Southwest (NRSW) provides environmental sustainability support over a complex of 10 naval installations, 64 fleet ships, 556 aircraft, personnel housing, and other activities across California, Nevada, Arizona, Utah, Colorado, and New Mexico. Across the 10 installations, power plant replacement for 12,000 structures and 13,000 housing units has been conducted. These replacement actions have reduced GHG emissions, generated materials and markets for recycled products. Other GHG reduction measures implemented include employee

teleworking, transportation incentives, reduction in air travel, and conversion to low and zero emission plug-in and all-electric fleet vehicles (Navy 2014).

GHG emissions for an action can be inventoried, based on methods prescribed by state and federal agencies. However, the specific contributions of a particular project to global or regional climate change generally cannot be identified based on existing scientific knowledge, because individual projects typically have a negligible effect.

3.1.1.3 Existing Conditions

Climate and Meteorology

Coastal southern California and the adjacent valleys, mountains, and basins experience a "Mediterranean climate" characterized by generally warm, dry summers and cool winters interspersed with wet storms from the Pacific Ocean and dry winds from the interior. During the summer months, a semi-permanent region of high pressure over the Pacific is responsible for creating cooling sea breezes, which tend to keep the coastal strip generally comfortable, while inland areas become very warm. Temperature inversions that occur in the stable air may trap pollutants that become photo-chemically modified in the abundant sunshine. During the winter months, the moderating influences of the ocean together with a protective ring of mountains inland insulate much of southern California from very cold air except far inland and over higher terrain. Most of the precipitation that occurs during the year falls from winter-season storms that traverse the Pacific when the region of high pressure is displaced.

The average annual temperature in the coastal and inland valleys of southern Ventura County ranges from 57ºF (14ºC) at the coast near NBVC Point Mugu to 65ºF (18ºC) in Simi Valley. The average minimum and maximum temperatures are 49°F (9.4ºC) and 70°F (21ºC), respectively. The highest average temperature, 74.3°F (23.5ºC), occurs in August and September. The lowest average temperature, 49.1°F (9.5ºC), occurs in February. Point Mugu receives 14.7 in (37.3 cm) of precipitation per year, with the greatest rainfall occurring in January and February. The dry season occurs between June and August (Western Regional Climate Center [WRCC] 2013a). Prevailing winds are westerly, with an average speed of 7.7 knots (8.8 mph or 14.2 km/hr) (Windfinder 2013a).

On average, the Sea Range surrounding SNI experiences frequent northwesterly surface winds. However, such conditions are interrupted by: 1) seasonal storms (with southerly winds) and periods of dry offshore northeast winds (Santa Ana winds); 2) mainly warm season coastal eddies with southeast winds over the inner waters; and 3) alternating land/sea breeze circulations as one approaches the mainland coast. Due to the influence of the continent on the overall wind flow, in addition to the eddies and other complicating factors nearshore, there is a strong tendency for the relatively persistent northwesterly winds in the outer Sea Range to become more westerly as the air approaches the mainland.

SNI is arid; total precipitation averages 5.23 in (13.3 cm) per year. The dry season occurs between May and September. The rainy season occurs between November and March when SNI receives 77 percent of its total annual rainfall. The month of highest average precipitation is typically December, and the average mean monthly temperature on land is 59 °F (15°C), with a seasonal variation (January to July) of approximately 9°F (5°C). Temperatures during the coolest month average 54.7°F (13°C) and during the warmest month average 65.4°F (19°C) (WRCC 2013b). Prevailing winds are northwesterly, with an average speed from that direction of 11.3 knots (13 mph or 20.9 km/hr). (Windfinder 2013b)

SCrI receives an annual average precipitation of 11.5 in (29.2 cm). The dry season occurs between May and October, with the rainy season occurring between November and January. The month with the highest average precipitation is January. The average maximum temperature is 66.2°F (19.0°C), and the average low temperature is 54.1°F (12.3°C). July has the greatest high temperature average of 71.8°F (22.1°C), and February has the lowest average temperature of 49.6°F (9.8°C) (WRCC 2013c). Prevailing winds are northwesterly, with an average speed from that direction of 5.0 knots (5.7 mph or 9.2 km/hr) (Windfinder 2013c).

Attainment Status and *de minimis* Thresholds

Activities associated with the proposed action would be conducted at NBVC Point Mugu and NBVC SNI, both in Ventura County, and on SCrI in Santa Barbara County. Effective 19 June 2008, Ventura County has been reclassified as a "serious" nonattainment area for the federal 8-hour O_3 standard (*de minimis* thresholds are 50 tons/year for VOCs and NO_X) and is in attainment of all other criteria pollutants (USEPA 2013b, USEPA 2008). Ventura County is classified as a nonattainment area for the state O_3, $PM_{2.5}$, and PM_{10} standards (CARB 2013b).

Although NBVC SNI is part of Ventura County, the USEPA has determined that SNI is separate and distinct from the South Central Coast Air Basin (SCCAB) which includes the Ventura County Air Pollution Control District (VCAPCD). SNI is in attainment/unclassified of the NAAQS for all criteria pollutants (USEPA 2013b); therefore, the provisions of the General Conformity Rule and *de minimis* thresholds do not apply to proposed activities conducted on SNI (VCAPCD 2008). Due to the lack of major emitting sources on SNI in conjunction with predominantly strong winds from the northwest, the likelihood of pollutants remaining in the ambient air of the island is very low.

SCrI is located within Santa Barbara County, which is part of the SCCAB. Santa Barbara County is in attainment or unclassifiable/attainment status of the NAAQS for all criteria pollutants (USEPA 2013b).

As such, the provisions of the General Conformity Rule and *de minimis* thresholds do not apply to proposed activities conducted at SCrI.

Emissions from Stationary Sources

NBVC Point Mugu has a variety of stationary emissions sources including aircraft engine test cells, stationary electric generators, compressors, fuel storage and handling facilities, and gasoline fueling stations. Non-exempt emitting sources at NBVC Point Mugu are permitted under Title V Part 70 Permit 00997 (VCAPCD 2014). This permit limits the total hourly and monthly emissions of criteria pollutants by the listed sources, as well as total fuel use and total power produced (VCAPCD 2014).

Stationary sources on SNI consist of a power plant, a gasoline refueling station, small boilers, several internal combustion engines, and various adhesive and sealant operations. All non-exempt emitting sources on SNI are permitted under Title V Part 70 Permit, Number 1207 (VCAPCD 2007). The permit limits the total hourly and monthly emissions of criteria pollutants by these sources, as well as total fuel use, total power produced, and amount of sealant and adhesive product used (VCAPCD 2007).

Navy-owned stationary sources at SCrI include a power plant, a boiler, and a 15,000-gal (57,000-liter) above-ground fuel storage tank. The equipment is permitted under Santa Barbara County APCD Permits to Operate Numbers 12151-R2, 12153-R2 and 13634. The permits limit the hourly and yearly emissions of criteria pollutants by these sources, as well as pounds of waste incinerated and type of fuel used.

Emissions from Mobile Sources

Mobile sources of emissions at NBVC Point Mugu and NBVC SNI consist of aircraft operations and combustion emissions from vehicles. In addition, test and training operations involve launching missiles and/or targets from both NBVC Point Mugu and NBVC SNI. Emissions are associated with combustion of propellants and/or fuels used to propel the missiles and targets. Emissions from vehicles comprise the mobile sources on SCrI.

3.1.2 Environmental Consequences

3.1.2.1 Assessment Criteria

Criteria pollutant emissions resulting from the proposed construction activities have been evaluated for the proposed action. Air quality impacts would be significant if emissions associated with the proposed action would: 1) increase ambient air pollution concentrations above the NAAQS; 2) contribute to an existing violation of the NAAQS; 3) interfere with, or delay timely attainment of the NAAQS; or, 4) impair visibility within federally-mandated Prevention of Significant Deterioration Class I areas. Additionally, a conformity analysis would be required before initiating any action that may lead to nonconformance with a SIP, an exceedance of *de minimis* criteria pollutant thresholds, or contribution to a violation of the NAAQS.

The evaluation of air quality includes the Conformity and NEPA Air Quality Analysis which addresses the assessment of the air pollutant emissions from activities within U.S. territories and territorial waters. This includes emissions on the mainland and SNI, emissions within the 3-NM (5.6-km) limit of U.S. territorial waters (subject to the General Conformity Rule), and emissions within the 12-NM (22-km) limit of U.S. territorial waters (subject to NEPA).

De minimis levels apply for conformity purposes, which relate to emissions within 3 NM (5.6 km) of the air basin. Since SNI, SCrI, and the offshore regions proposed for FOCUS-II installation are considered in attainment/unclassified for the NAAQS, the provisions of the General Conformity Rule do not apply. Offshore emissions do not follow the *de minimis* and General Conformity Rule significance criteria; project emissions greater than 3 NM (5.6 km) from the continental U.S shore were analyzed as subject to NEPA. The primary sources of project emissions arise from combustion of fossil fuels for heavy equipment use, motorized vehicles, and marine vessels. Fugitive dust emissions generated by heavy equipment and vehicle use were also calculated.

3.1.2.2 Alternative 1 – Preferred Alternative

Table 3.1-2 provides a summary of the emissions generated by the FOCUS-II installation operations at the Building 811 and Charlie Pad sites at NBVC Point Mugu. These operations include the site preparation, drilling, and trenching activities, as well as motor vehicle use associated with this alternative. For the sake of analysis, it is assumed that all operations would be conducted within the same reporting year. Emissions for operations out to 3 NM (5.6 km) are provided, as this area is within the SCCAB.

Table 3.1-3 provides a summary of the emissions of operations on NBVC SNI under Alternative 1. The SNI operations include site preparation, motor vehicle usage, and drilling operations plus emissions associated with supply barge transport and the loading and unloading of the barges. Table 3.1-4 provides an overview of the Alternative 1 emissions at SCrI.

Table 3.1-5 provides a summary of the project emissions within U.S. waters between 3 and 12 NM (5.6 to 22.2 km) from the shores of NBVC Point Mugu, NBVC SNI, and SCrI. Table 3.1-6 provides emissions estimates for operations in international waters greater than 12 NM (22.2 km) from shore.

Table 3.1-2 Point Mugu Sites Emissions (within 3 NM) - Alternative 1 and 2

Component	Pollutant (tons/year)					
	VOCs	CO	NO_X	SO_X	PM_{10}	CO_{2e}
Building 811 Site						
Site preparation	0.00223	0.00833	0.0163	0.00003	0.00104	3.02
Drilling operations	0.0559	0.182	0.347	0.00059	0.0197	51.4
Trenching/cable installation	0.00144	0.00945	0.00961	0.00002	0.00602	1.69
On-road vehicles	0.00335	0.0240	0.0179	0.00007	0.00102	7.14
Offshore cable installation	0.824	19.6	2.31	--	0.0165	223
Subtotal	**0.887**	**19.8**	**2.70**	**0.00071**	**0.0443**	**286**
Charlie Pad Site						
Site preparation	0.00891	0.0329	0.0652	0.00012	0.00372	12.0
Drilling operations	0.0559	0.182	0.347	0.00059	0.0197	51.4
Trenching/cable installation	0.00361	0.0236	0.0240	0.00004	0.00690	3.96
On-road vehicles	0.00335	0.0240	0.0179	0.00007	0.00102	7.14
Offshore cable installation	0.824	19.6	2.31	--	0.0165	223
Subtotal	**0.896**	**19.9**	**2.76**	**0.00082**	**0.0478**	**298**
Total for Point Mugu Operations	**1.78**	**39.7**	**5.46**	**0.0015**	**0.0921**	**584**

Table 3.1-3 San Nicolas Island Emissions (within 3 NM) - Alternative 1 and 2

Component	Pollutant (tons/year)					
	VOC	CO	N	SO_X	PM_1	CO
Site preparation	0.00297	0.0110	0.0217	0.00004	0.00138	4.02
Drilling operations	0.0559	0.182	0.347	0.00059	0.0197	51.4
Trenching/cable	0.00144	0.00945	0.00961	0.00002	0.00602	1.69
On-road vehicles	0.00112	0.00800	0.00597	0.00002	0.00034	2.38
Supply barge	0.00098	0.00583	0.0181	0.00090	0.00004	0.875
Offshore cable	1.01	23.9	2.83	--	0.0201	273
Total	**1.07**	**24.1**	**3.23**	**0.0016**	**0.0476**	**333**

Table 3.1-4 Santa Cruz Island Emissions (within 3 NM) - Alternative 1 and 2

Component	Pollutant (tons/year)					
	VOC	CO	N	SO_X	PM_1	CO
Site preparation	0.0297	0.0110	0.0217	0.00004	0.00138	4.02
Drilling operations	0.105	0.457	0.956	0.00193	0.0346	106
Trenching/cable	0.0571	0.372	0.377	0.00068	0.116	59.2
On-road vehicles	0.00323	0.0279	0.00526	0.00006	3.77	6.11
Supply barge	0.00086	0.0109	0.0163	0.00190	0.00005	0.159
Offshore cable	1.01	23.9	2.83	--	0.0201	273
Total	**1.21**	**24.8**	**4.21**	**0.00461**	**3.94**	**448**

Table 3.1-5 Alternative 1 and 2 Emissions (3 < x < 12 NM)

Component	Pollutant (tons/year)					
	VOC	CO	N	SO_X	PM_1	CO
SNI supply barge	0.00294	0.0175	0.0544	0.00270	0.00012	0.262
SCrI supply barge	0.00203	0.0109	0.0380	0.00443	0.00011	0.371
Offshore cable	3.30	78.2	9.26	--	0.0658	893
Total	**3.30**	**78.2**	**9.35**	**0.0071**	**0.0660**	**894**

Table 3.1-6 Alternative 1 and 2 Emissions (> 12 NM)

Component	Pollutant (tons/year)					
	VOC	CO	N	SO_X	PM_1	CO
SNI supply barge	0.00587	0.0350	0.109	0.00540	0.00024	0.525
Offshore cable	5.49	130	15.4	--	0.110	1,490
Total	**5.50**	**130**	**15.5**	**0.0054**	**0.110**	**1,490**

General Conformity Analysis

The estimated emissions associated with Alternative 1 would be below *de minimis* threshold levels of 50 tons per year (tpy) VOCs or NO_X for conformity for the SCCAB (Ventura County, excluding SNI). Therefore, Alternative 1 would conform to the VCAPCD SIP and would not trigger a conformity determination under Section 176(c) of the CAA. In addition, since SNI and SCrI have been categorized as an attainment/unclassified area by the USEPA, they are not subject to the General Conformity Rule.

However, estimated emissions for the proposed undertaking would be below *de minimis* levels; therefore, even if either island was considered a nonattainment or maintenance area, a formal conformity determination would not be necessary. Also, air quality conservation measures would be implemented as needed. These measures would include watering ground disturbance areas, dependent upon dryness of the soil and intensity of winds, as well as turning off internal combustion engines not in use (see section 2.1.3). Accordingly, a Record of Non-Applicability (RONA) has been prepared by the U.S. Navy (Appendix B).

Greenhouse Gases

Appendix A presents calculations estimating GHG emissions generated by the actions associated with Alternative 1, and Tables 3.1-2 thru 3.1-6 provide the results of these calculations. Implementation of Alternative 1 would lead to emissions of approximately 3,349 metric tons (3,692 tons) of CO_{2e}. These data show that the CO_{2e} emissions associated with Alternative 1 would amount to approximately 0.000052 percent of the total CO_{2e} emissions generated by the U.S (6,526 million metric tons) (USEPA 2014). Emissions under Alternative 1 are also below the 25,000 metric tons of CO_{2e} level proposed in the draft NEPA guidance provided by the CEQ.

Therefore, implementation of Alternative 1 would have no significant impact on air quality at or near NBVC Point Mugu, NBVC SNI, or SCrI and would not significantly harm the U.S. exclusive economic zone (EEZ) as defined by EO 12114.

Mitigation Measures

Implementation of Alternative 1 would not result in significant air quality impacts; therefore, no mitigation measures are proposed or required.

3.1.2.3 Alternative 2

Alternative 2 would have the same impacts as Alternative 1 (Tables 3.1-2 through 3.1-6).

General Conformity Analysis

The estimated emissions associated with Alternative 2 are the same as Alternative 1 and would be below *de minimis* threshold levels of 50 tons per year (tpy) VOCs or NO_X for conformity for the SCCAB (Ventura County, excluding SNI). Therefore, Alternative 2 would conform to the VCAPCD SIP and would not trigger a conformity determination under Section 176(c) of the CAA. In addition, since SNI and SCrI have been categorized as an attainment/unclassified area by the USEPA, they are not subject to the General Conformity Rule. However, estimated emissions for the proposed undertaking would be below *de minimis* levels; therefore, even if either island was considered a nonattainment or maintenance area, a formal conformity determination would not be necessary. Also, air quality conservation measures would be implemented as needed. These measures would include watering ground disturbance areas, dependent upon dryness of the soil and intensity of winds, as well as turning off internal combustion engines not in use (see section 2.1.3).

Greenhouse Gases

Tables 3.1-2 thru 3.1-6 provide the results of these calculations. Implementation of Alternative 2 would lead to emissions of approximately 3,349 metric tons (3,692 tons) of CO_{2e}. These data show that the CO_{2e}

emissions associated with Alternative 2 would amount to approximately 0.000052 percent of the total CO_{2e} emissions generated by the U.S (6,526 million metric tons) (USEPA 2014). Emissions under Alternative 2 are also below the 25,000 metric tons of CO_{2e} level proposed in the draft NEPA guidance provided by the CEQ.

Therefore, implementation of Alternative 2 would have no significant impact on air quality at or near NBVC Point Mugu, NBVC SNI, or SCrI and would not significantly harm the U.S. exclusive economic zone (EEZ) as defined by EO 12114.

Mitigation Measures

Implementation of Alternative 2 would not result in significant air quality impacts; therefore, no mitigation measures are proposed or required.

3.1.2.4 Alternative 3

Table 3.1-7 provides a summary of the Alternative 3 emissions generated by the FOCUS-II installation operations at the Building 811 and Charlie Pad sites at NBVC Point Mugu. These operations include the site preparation, drilling, and trenching activities, as well as motor vehicle use associated with this alternative. For the sake of analysis, it is assumed that all operations would be conducted within the same reporting year. Emissions for operations out to 3 NM (5.6 km) are provided, as this area is within the SCCAB.

Table 3.1-8 provides a summary of the emissions of operations on NBVC SNI under Alternative 3. The SNI operations include site preparation, motor vehicle usage, and drilling operations plus emissions associated with supply barge transport and the loading and unloading of the barges. Table 3.1-9 provides an overview of the Alternative 1 emissions at SCrI.

Table 3.1-10 provides a summary of the project emissions within U.S. waters between 3 and 12 NM (5.6 to 22.2 km) from the shores of NBVC Point Mugu, NBVC SNI, and SCrI. Table 3.1-11 provides emissions estimates for operations in international waters greater than 12 NM (22.2 km) from shore.

Table 3.1-7 Point Mugu Sites Emissions (within 3 NM) - Alternative 3

Component	Pollutant (tons/year)					
	VOC	CO	N	SO_X	PM_1	CO
Building 811 Site						
Site preparation	0.002	0.0	0.	0.00	0.00	3.02
Drilling operations	0.055	0.1	0.	0.00	0.01	51.4
Trenching/cable	0.001	0.0	0.	0.00	0.00	1.69
On-road vehicles	0.003	0.0	0.	0.00	0.00	7.14
Offshore cable	0.824	19.	2.	--	0.01	223
Subtotal	**0.887**	**19.**	**2.**	**0.00**	**0.04**	**286**
Charlie Pad Site						
Site preparation	0.008	0.0	0.	0.00	0.00	12.0
Drilling operations	0.055	0.1	0.	0.00	0.01	51.4
Trenching/cable	0.003	0.0	0.	0.00	0.00	3.96
On-road vehicles	0.003	0.0	0.	0.00	0.00	7.14
Offshore cable	0.824	19.	2.	--	0.01	223
Subtotal	**0.896**	**19.**	**2.**	**0.00**	**0.04**	**298**
Total for Point Mugu Operations	**1.78**	**39.**	**5.**	**0.00**	**0.09**	**584**

Table 3.1-8 San Nicolas Island Emissions (within 3 NM) - Alternative 3

Component	Pollutant (tons/year)					
	VOC	CO	N	SO_X	PM_1	CO
Site preparation	0.002	0.0	0.	0.00	0.00	4.02
Drilling operations	0.055	0.1	0.	0.00	0.01	51.4
Trenching/cable	0.001	0.0	0.	0.00	0.00	1.69
On-road vehicles	0.001	0.0	0.	0.00	0.00	2.38
Supply barge	0.000	0.0	0.	0.00	0.00	0.87
Offshore cable	1.01	23.	2.	--	0.02	273
Total	**1.07**	**24.**	**3.**	**0.00**	**0.04**	**333**

Table 3.1-9 Santa Cruz Island Emissions (within 3 NM) - Alternative 3

Component	Pollutant (tons/year)					
	VOC	CO	N	SO_X	PM_1	CO
Site preparation	0.029	0.0	0.	0.00	0.00	4.02
Drilling operations	0.105	0.4	0.	0.00	0.03	106
Trenching/cable	0.060	0.3	0.	0.00	0.12	62.5
On-road vehicles	0.003	0.0	0.	0.00	3.77	6.11
Supply barge	0.000	0.0	0.	0.00	0.00	0.15
Offshore cable	1.01	23.	2.	--	0.02	273
Total	**1.21**	**24.**	**4.**	**0.00**	**3.95**	**452**

Table 3.1-10 Alternative 3 Emissions (3 < x < 12 NM)

Component	Pollutant (tons/year)					
	VOC	CO	N	SO_X	PM_1	CO
SNI supply barge	0.002	0.0	0.	0.00	0.00	0.26
SCrI supply barge	0.002	0.0	0.	0.00	0.00	0.37
Offshore cable	3.30	78.	9.	--	0.06	893
Total	**3.30**	**78.**	**9.**	**0.00**	**0.06**	**894**

Table 3.1-11 Alternative 3 Emissions (> 12 NM)

Component	Pollutant (tons/year)					
	VOC	CO	N	SO_X	PM_1	CO
SNI supply barge	0.005	0.0	0.	0.00	0.00	0.52
Offshore cable	5.49	130	1	--	0.11	1,49
Total	**5.50**	**130**	**1**	**0.00**	**0.11**	**1,49**

General Conformity Analysis

The estimated emissions associated with Alternative 3 would be below *de minimis* threshold levels of 50 tons per year (tpy) VOCs or NO_X for conformity for the SCCAB (Ventura County, excluding SNI). Therefore, Alternative 3 would conform to the VCAPCD SIP and would not trigger a conformity determination under Section 176(c) of the CAA. In addition, since SNI and SCrI have been categorized as an attainment/unclassified area by the USEPA, they are not subject to the General Conformity Rule. However, estimated emissions for the proposed undertaking would be below *de minimis* levels; therefore, even if either island was considered a nonattainment or maintenance area, a formal conformity determination would not be necessary. Also, air quality conservation measures would be implemented as needed. These measures would include watering ground disturbance areas, dependent upon dryness of the soil and intensity of winds, as well as turning off internal combustion engines not in use (see section 2.1.3).

Greenhouse Gases

Tables 3.1-7 thru 3.1-11 provide the results of these calculations. Implementation of Alternative 3 would lead to emissions of approximately 3,349 metric tons (3,692 tons) of CO_{2e}. These data show that the CO_{2e} emissions associated with Alternative 3 would amount to approximately 0.000052 percent of the total CO_{2e} emissions generated by the U.S (6,526 million metric tons) (USEPA 2014). Emissions under Alternative 3 are also below the 25,000 metric tons of CO_{2e} level proposed in the draft NEPA guidance provided by the CEQ.

Therefore, implementation of Alternative 3 would have no significant impact on air quality at or near NBVC Point Mugu, NBVC SNI, or SCrI and would not significantly harm the U.S. exclusive economic zone (EEZ) as defined by EO 12114.

Mitigation Measures

Implementation of Alternative 3 would not result in significant air quality impacts; therefore, no mitigation measures are proposed or required.

3.1.2.5 Alternative 4

Implementation of Alternative 4 would involve only one construction site at NBVC Point Mugu (Charlie Pad). Construction activities at NBVC SNI would be identical to Alternative 1 and no construction impacts would be generated at SCrI. Table 3.1-12 provides a summary of the Alternative 4 criteria pollutant emissions within 3 NM (5.6 km) of the NBVC Point Mugu shoreline.

Table 3.1-12 Point Mugu Emissions (within 3 NM) – Alternative 4

Component	Pollutant (tons/year)					
	VOC	CO	N	SO_X	PM_1	CO
Site preparation	0.008	0.0	0.	0.00	0.00	12.0
Drilling operations	0.055	0.1	0.	0.00	0.01	51.4
Trenching/cable	0.003	0.0	0.	0.00	0.00	3.96
On-road vehicles	0.003	0.0	0.	0.00	0.00	7.14
Offshore cable	0.824	19.	2.	--	0.01	223
Total	**0.896**	**19.**	**2.**	**0.00**	**0.04**	**298**

Table 3.1-13 provides a summary of the emissions of operations on NBVC SNI under Alternative 4. The SNI operations include site preparation, motor vehicle usage, and drilling operations, plus emissions associated with supply barge transport and the loading and unloading of the barges.

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Table 3.1-13 San Nicolas Island Emissions (within 3 NM) - Alternative 4

Component	Pollutant (tons/year)					
	VOC	CO	N	SO_X	PM_1	CO
Site preparation	0.002	0.0	0.	0.00	0.00	4.02
Drilling operations	0.055	0.1	0.	0.00	0.01	51.4
Trenching/cable	0.001	0.0	0.	0.00	0.00	1.69
On-road vehicles	0.001	0.0	0.	0.00	0.00	2.38
Supply barge	0.000	0.0	0.	0.00	0.00	0.87
Offshore cable	1.01	23.	2.	--	0.02	273
Total	**1.07**	**24.**	**3.**	**0.00**	**0.04**	**333**

Table 3.1-14 provides a summary of the project emissions within U.S. waters between 3 and 12 NM (5.6 to 22.2 km) from the shores of NBVC Point Mugu and NBVC SNI. Table 3.1-15 provides emissions estimates for operations in international waters greater than 12 NM (22.2 km) from shore.

Table 3.1-14 Alternative 4 Emissions (3 < x < 12 NM)

Component	Pollutant (tons/year)					
	VOC	CO	N	SO_X	PM_1	CO
SNI supply barge	0.002	0.0	0.	0.00	0.00	0.26
Offshore cable	2.56	60.	7.	--	0.05	694
Total	**2.56**	**60.**	**7.**	**0.00**	**0.05**	**694**

Table 3.1-15 Alternative 4 Emissions (> 12 NM)

Component	Pollutant (tons/year)					
	VOC	CO	N	SO_X	PM_1	CO
SNI supply barge	0.005	0.0	0.	0.00	0.00	0.52
Offshore cable	4.03	95.	1	--	0.08	1,09
Total	**4.04**	**95.**	**1**	**0.00**	**0.80**	**1,09**

Therefore, implementation of Alternative 4 would have no significant impact on air quality at or near NBVC Point Mugu, NBVC SNI and would not significantly harm the U.S. EEZ as defined by EO 12114.

Mitigation Measures

Under Alternative 4, there would be no significant impacts to air quality. Therefore, no mitigation measures are proposed or required.

3.1.2.6 Alternative 5 – The No-Action Alternative

Under the No-Action Alternative, the proposed installation of FOCUS-II would not occur and existing conditions would remain unchanged.

Mitigation Measures

Implementation of the No-Action Alternative would not result in significant air quality impacts; therefore, no mitigation measures are proposed or required.

3.2 BIOLOGICAL RESOURCES

3.2.1 Affected Environment

3.2.1.1 Definition of Resource

Biological resources include plants and animals and the habitats in which they occur. For this analysis, terrestrial and marine biological resources are considered in separate subsections, with some overlap in the coverage of transitional habitats and the associated species of coastal wetlands, tidal flats, and beaches. Terrestrial biological resources discussed include vegetation communities, wildlife, and special status species. Marine biological resources discussed include marine habitats, fish and fisheries, marine birds, marine mammals, and special-status species. Where appropriate, marine biological resources are further categorized by the habitat type in which they occur (rock versus sand). Special topics such as EFH, special aquatic sites, and fisheries are also discussed for the FOCUS-II project areas.

3.2.1.2 Terrestrial Biological Resources

Terrestrial biological resources at NBVC Point Mugu, at NBVC SNI, and at SCrI are discussed below. Vegetation communities, common species and species of special concern are presented and discussed for each of these three areas, as well as the proposed FOCUS-II project areas within them. Additional detail can be found in the Integrated Natural Resources Management Plans (INRMPs) for NBVC Point Mugu and NBVC SNI, respectively (NBVC 2013, 2010).

Terrestrial Vegetation Communities

Point Mugu

Using a modified habitat classification from Zedler et al. (1992), the 2013 NBVC Point Mugu INRMP (NBVC 2013) mapped habitat types based on dominant plant species and physiognomy (Figure 3.2-1). The areas of habitat types and jurisdictional wetlands within the installation as a whole are provided in Table 3.2-1.

Table 3.2-1 Habitat Types at Point Mugu

Habitat Community	Ac
Ocean beach and dunes	29
Brackish marsh	46
Drainage ditches	57
Intertidal mudflat and sandflat	34
Intertidal salt marsh	78
Non-tidal salt marsh	49
Sand nest islands	9
Salt marsh and salt panne	21
Tidal creeks	21
Transitional wetlands	27
Mixed transition disturbed	76

Source: NBVC 2013

Mugu Lagoon is the largest functioning salt marsh along the coast of southern California today (USFWS 2009a), consisting of 2,140 ac (866 hectares [ha]) of marsh lands that provides habitat for numerous invertebrate, fish, bird, and plant species. Coastal salt marsh at Mugu Lagoon is defined by the presence

of hydrophytic halophytes (plants that grow partly or wholly in water and are salt tolerant) and water levels that fluctuate due to tidal action. Coastal salt marsh at NBVC Point Mugu, for mapping purposes, is divided into intertidal salt marsh and salt panne, intertidal mud flat and sand flat, open water and tidal creeks, and non-tidal salt marsh (Navy 2002). Proceeding upward from the high-tide line are unvegetated sand beach and vegetated dune communities, within which can be recognized foredune (unstable habitats characterized by pioneering plant species), backdune (stabilized by perennial plants), and dune swale (wetland) communities, which are important vestiges of the sand dune habitats that have been largely eliminated from southern California. Other prevalent communities at NBVC Point Mugu include developed and/or disturbed habitats. Apart from Mugu Lagoon and dune and beach habitat, the non-wetland areas of NBVC Point Mugu provide relatively minor amounts of plant and wildlife habitat and beach habitats.

The endangered salt marsh bird's beak is the only federally listed plant species that occurs at NBVC Point Mugu (Navy 2002).

San Nicolas Island

SNI has been heavily disturbed by past land uses and exploitation, especially sheep grazing, which caused the removal of native vegetation and subsequent erosion, and contributed to the introduction and spread of non-native plants. Using a modified habitat classification from Halvorson et al. (1996), the 2010 NBVC SNI INRMP (NBVC 2010) calculated areas of habitat types and jurisdictional wetlands provided in Table 3.2-2.

Table 3.2-2 Habitat Types on San Nicolas Island

Habitat Community	Acres
Beaches	234.4
Coastal Dunes	138.6
Inland Dunes	783.2
Coreopsis Scrub	1348.7
Lupine Scrup	2.7
Coastal Scrub	6003.0
Grasslands	1739.3
Barren areas	3469.9
Vernal pools	0.8
Coastal Marshes	9.1
Riparian	201.1
Pine trees (planted)	2.7
Developed areas	324.8

Source: Halvorson et al. 1996 in NBVC 2010

Two hundred seventy-eight vascular plant taxa (species, subspecies and varieties) have been documented on SNI (Junak 2008). SNI has strong floristic affinities with nearby geographic regions, sharing 86 percent of its native plants with the southern California mainland, 85 percent with the four northern Channel Islands, 84 percent with the other three southern Channel Islands, and 53 percent with islands off the Pacific coast of Baja California, Mexico. Compared to the other seven Channel Islands, SNI has a relatively limited richness of native plant species and also has the highest percentage (51 percent) of introduced plant species (NBVC 2010).

Approximately 11 percent of the island's native vascular plant taxa are endemic to the Channel Islands, ranking it in the middle amongst other Channel Islands. Two vascular plant taxa found only on SNI are the SNI buckwheat (*Eriogonum grande* var. *timorum*) and the SNI malacothrix (*Malacothrix foliosa* ssp. *polycephala*) (NBVC 2010). SNI has no federally listed endangered or threatened plant species. Special-status plants on SNI are provided in Table 3.2-3 below.

Figure 3.2-2 shows the vegetation in the vicinity of the proposed SNI landing site based on classification and mapping by Halvorson et al. (1996). Coreopsis scrub is the dominant native vegetation community in the vicinity of the drilling site. Coreopsis scrub is dominated by sea dahlia (*Leptosyne gigantea*) and is found predominantly along the northern slopes of the island.

The majority of the proposed SNI project areas are within barren or sparsely vegetated areas. The proposed onshore cable alignments would either follow existing roads or would use existing infrastructure and alignments for existing cable or pipelines that are located in previously disturbed habitat or areas devoid of vegetation due to the previous construction of pipeline corridors. Disturbed habitat is typified by non-native grasses and invasive weedy species.

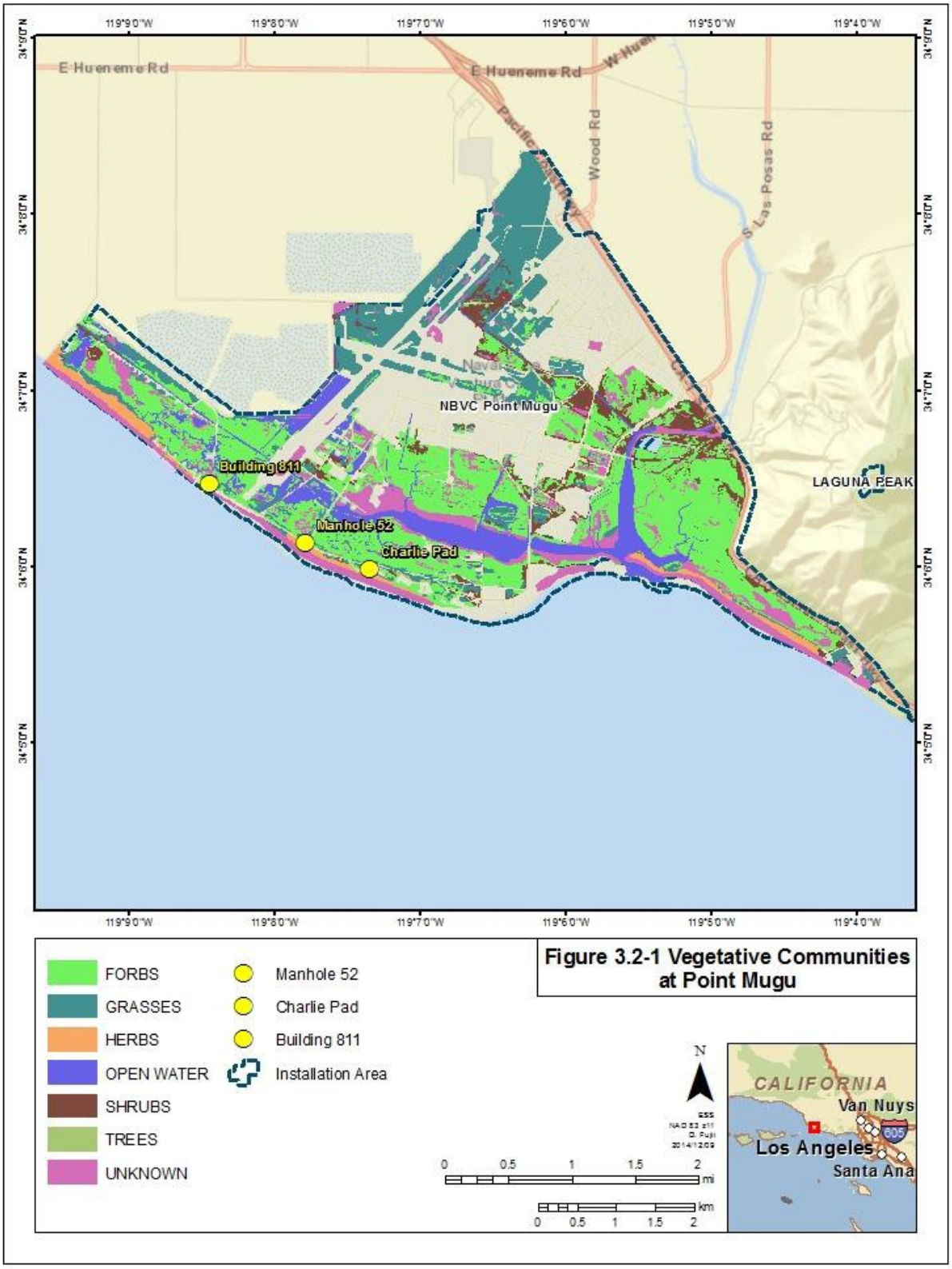


Figure 3.2-1 Vegetative Communities at Point Mugu

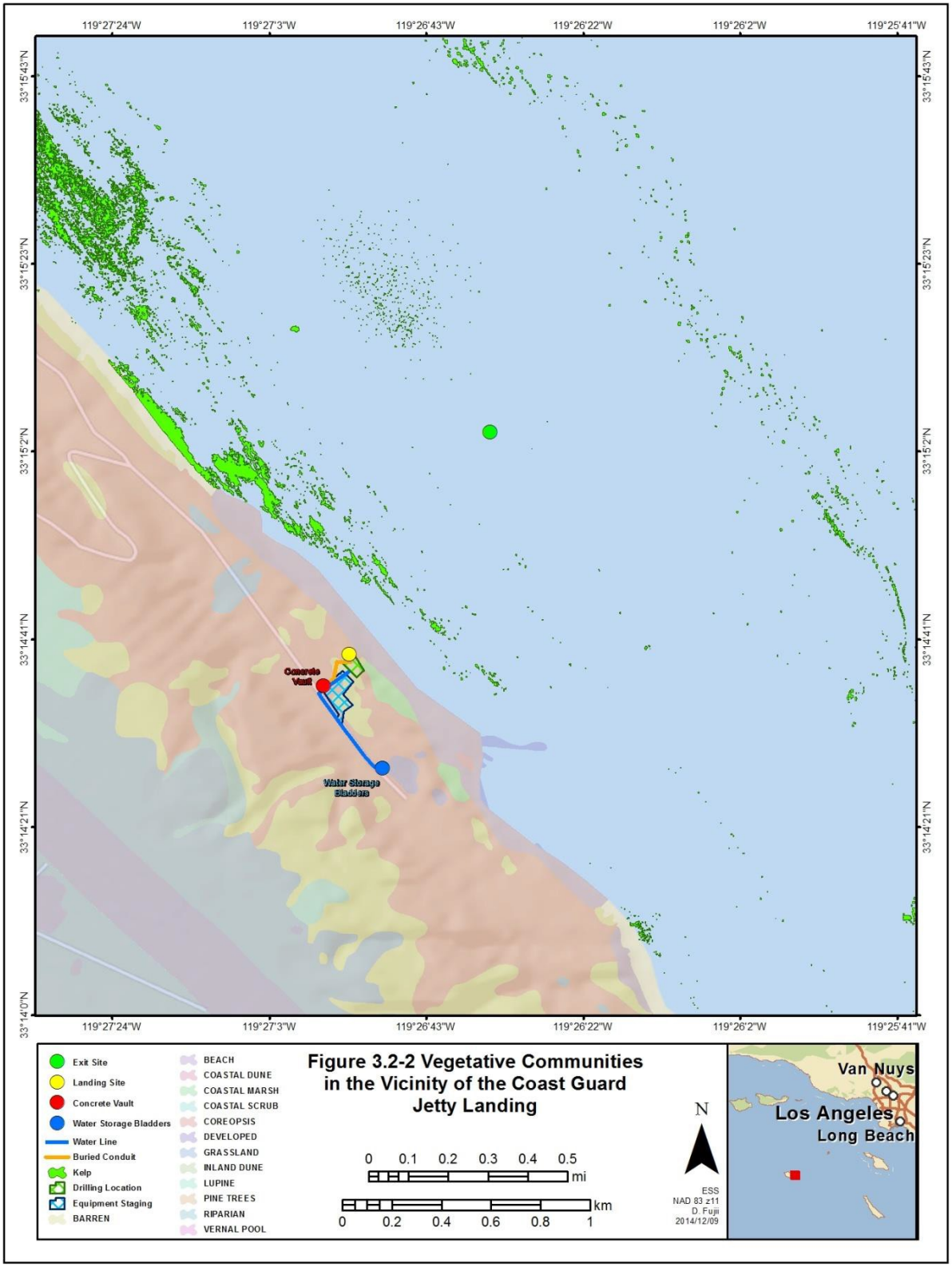


Figure 3.2-2 Vegetative Communities in the Vicinity of the Coast Guard Jetty Landing

Santa Cruz Island

The vegetation of SCrI has been extensively impacted by sheep grazing and pig farming operations on the island. In 1937, the Stanton Ranch controlled 90 percent of the island and attempted to control the island's sheep population through fencing and round up operations. Due to the severe grazing that had occurred, coastal prickly pear (*Opuntia littoralis*), a native cactus and component of island coastal bluff scrub, began to expand. By 1939 the Stanton Ranch estimated that 40 percent of the rangeland on the island was useless because of dense prickly pear stands. By the 1970's, an estimated 263,000 sheep were removed from SCrI and sent to market (NPS 2015). Through a combination of removal methods, all non-native terrestrial grazing animals have been removed from the island.

Approximately 480 native (42 of these endemic) and 170 non-native vascular plant species are known to grow on SCrI. Seven additional species occur on the island but it is unknown whether they are native or non-native. Large portions of the island are currently dominated by grasslands, with remnant areas of coastal bluff scrub, chaparral, coastal sage scrub, coyote-brush scrub, woodlands, and wetlands. The grasslands are present mainly on coastal terraces and broad plateaus on the eastern end of the island and extend up the broader ridges into the steep rocky slopes to the west. (NPS 2015)

The following discussion of SCrI plants is taken from the 2015 Channel Islands National Park Final General Management Plan/Wilderness Study/ Environmental Impact Statement (NPS 2015).

Prevalent non-native annual grasses include ripgut brome (*Bromus diandrus*), soft-chess (*B. hordeaceus*), red brome (*B. madritensis*, ssp. *rubens*), wild oats (*Avena fatua and A. barbata*), ryegrass (*Festuca perennis*), and foxtail barley (*Hordeum murinum*). Following the removal of sheep on the island, natural recovery of perennial grasses has occurred including purple needlegrass (*Stipa pulchra*) and California barley (*H. brachyantherum* ssp. *californicum).* Scattered throughout the grasslands are solitary shrubs such as lemonade berry (*Rhus integrifolia*), manzanita (*Arctostaphylo* spp.), and island wild lilac (*Ceanothus* spp.). (NPS 2002 in NPS 2015)

Island chaparral and oak woodlands are the dominant woody vegetation communities on the isthmus. The island chaparral community differs somewhat from mainland chaparral. Structurally, the dominant island chaparral species can be more arborescent, resulting in a more open woodland appearance, which may be a result of the island's grazing history. Island scrub oak (*Quercus pacifica*) tends to dominate the island chaparral community on the isthmus. Other common species include a prostrate variety of chamise (*Adenostoma fasciculatum* var. *prostratum*), McMinn's manzanita (*Arctostaphylos viridissima*), and toyon (*Heteromeles arbutifolia*). The southern coastal oak woodland community is dominated by coast live oak (*Quercus agrifolia*). This community also grows in a small area on the east end of the island (NPS 2015).

Coastal bluff scrub grows on the steep coastal cliffs and slopes that surround much of the island. Due to their inaccessibility, this plant community has been a refuge for some plant species. With the elimination of grazing, many plant species formerly confined to these coastal bluffs are spreading into other areas of the island. Common plant species found in this community include common yarrow (*Achillea millefolium*), morning glory (*Calystegia macrostegia* ssp. *macrostegia),* giant coreopsis, Greene's Dudleya (*Dudleya greenei*), island hazardia (*Hazardia detonsa*), and island buckwheat (*Eriogonum grande* var. *grande*) (NPS 2015).

Coastal sage scrub grows on dry, rocky slopes across the island, but particularly on south-facing slopes. It intergrades with grasslands on gentle slopes with deeper soils, and with island chaparral on rocky north-facing slopes. Currently much of this community is dominated by nonnative annual grasses due to alteration attributed to the past grazing land use. However, some areas are intact on the slopes east of Valley Anchorage on the isthmus. In these areas, nearly impenetrable 3- to 4-ft-tall thickets of shrubs grow. The dominant species in this community include California sagebrush (*Artemisia californica*), island paintbrush (*Castilleja lanata* ssp. *hololeuca*), SCrI buckwheat (*Eriogonum arborescens*), California brittlebush (*Encelia californica*), sawtooth goldenbush (*Hazardia squarrosa*), coastal prickly pear, lemonade berry, and black sage (*Salvia mellifera*). Coastal sage scrub has recovered significantly since the removal of sheep from the island (NPS 2015).

Coyote-brush scrub is found on SCrI at elevations below 500 ft (152 m) on moderate slopes and flats. This shrubland primarily grows on deep, unstable soils that are continually disturbed by natural forces. Many species found in the community are weedy nonnatives, particularly annual grasses and fennel (*Foeniculum vulgare*). Some areas of annual grassland/Baccharis scrub, such as those in the Rancho De Norte area on the isthmus, are dominated by tall stands of fennel, particularly on intrinsically unstable clay soils that cover much of the area (NPS 2015).

There are two wetland complexes on the island, one of which is within the project area near the Prisoners Harbor landing site (Figure 3.2-3). This complex comprises three contiguous classes of wetlands. The rocky shoreline is classified as marine/ intertidal/rocky shore. Above the shoreline is a zone classified as palustrine/emergent/persistent, palustrine/scrub-shrub/broad-leaved deciduous, and palustrine/forested/broad-leaved deciduous. The remaining wetland area includes the stream channel and channel bottom and is classified as riverine/ lower perennial/rock bottom (NPS 2015).

The Prisoners Harbor wetland complex has been dramatically altered by filling and dredging over the past 100 years. Approximately 60 percent of the original wetland has been filled or dredged over this period. It is thought that the pre-settlement wetland extended over the entire floodplain west of the existing stream channel and northeast of the dock access road. In recent years, corrals have been moved and approximately three acres of new wetland have been created (NPS 2015).

There are two endemic species of manzanita present on SCrI: the island manzanita (*Arctostaphylos insularis*) and McMinn's manzanita. Neither species is state or federally listed as threatened or endangered. There is an old growth grove of island manzanita growing on either side of Navy Road along the ridge near the Navy Site (NPS 2015).

Figure 3.2-3 Wetlands in the Vicinity of the Prisoners Harbor Landing Site

Terrestrial Wildlife

Point Mugu

Numerous wildlife species inhabit the tidal flats, beaches, salt marsh, and adjacent dunes and other upland habitats at NBVC Point Mugu. Mugu Lagoon (including the lagoon and adjacent wetland and upland areas) is the largest and least disturbed coastal wetland ecosystem in southern California.

A total of 351 species of birds have been identified at Mugu Lagoon, including 151 species of water birds (i.e., shorebirds, waterfowl, and wading birds) (Navy 2002). The diversity and abundance of avian species varies seasonally with migration; NBVC Point Mugu experiences the highest bird densities during the spring migration. With the exception of rock doves (*Columba livia*), European starlings (*Sturnus vulgaris*), and house sparrows (*Passer domesticus*), all bird species at Point Mugu are protected under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. § 703 *et seq.*), which prohibits the taking, killing, or possessing of migratory birds or the parts, nests, or eggs of such birds, unless permitted by regulation. Conservation of migratory bird habitats is mandated by EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*.

Amphibians are uncommon in salt marshes but can occur in adjacent habitats. Reptiles are common in the salt marsh. The southern Pacific rattlesnake (*Crotalus organus helleri*) inhabits the upper fringe of intertidal salt marsh habitat. The southern western pond turtle (*Actinemys marmorata*), a California Department of Fish and Wildlife (CDFW) (formerly California Department of Fish and Game) Species of Special Concern (CDFG 2011), occurs in fresh water, brackish, and saline habitats on the base. (NBVC 20 2013)

California ground squirrels (*Ostospermophilus beecheyi*), black-tailed jackrabbits (*Lepus californicus*), and desert cottontails (*Sylvilagus audubonii*) occur in the upper marsh. Other mammals known to inhabit the upland areas of NBVC Point Mugu and Mugu Lagoon include coyote (*Canis latrans*), raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*). Mugu Lagoon also supports numerous terrestrial invertebrates including spiders, wasps, and moths. (Navy 2002)

San Nicolas Island

NBVC SNI has a limited diversity of fauna due to low annual rainfall, small size, isolation from other landmasses and relatively sparse plant cover. Human usage of the island, including the introduction of grazing animals, feral cats, military activities, and the introduction of non-native species, has also impacted native land animal populations. Nevertheless, over 200 species of invertebrates have been documented on NBVC SNI, including 6 native and two non-native species of terrestrial snails. (NBVC 32 2010)

Of the over 300 species of birds known to occur on NBVC SNI, most are not year-round residents but are seasonal visitors, migrants, or vagrants. Twenty species of birds regularly breed on NBVC SNI, including the western gull (*Larus occidentalis*), Brandt's cormorant (*Phalacrocorax penicillatus*), and black oystercatcher (*Haematopus bachmani*). Three species endemic to the Channel Islands are the island horned lark (*Eremophila alpestris insularis*), San Clemente Island house finch (*Carpodacus mexicanus clementae*), and dusky orange-crowned warbler (*Vermivora celata sordid*). Gulls and cormorants

establish large seasonal breeding colonies on the west end of SNI. Numbers of nesting birds have increased in recent years due to protection from human activities (NBVC 2010). Brandt's cormorants are sensitive to disturbance during nesting, but do not nest near the project area. Roosting areas for Brandt's cormorants are shown on Figure 3.2-5. Of the bird species breeding on NBVC SNI, the western snowy plover is the only species protected by the federal ESA; the plover is listed as threatened and is discussed in further detail on page 3-29.

Raptors are uncommon visitors to NBVC SNI, with the exception of American kestrels (*Falco sparverius*) peregrine falcons, (*Falco peregrinus*), and barn owls (*Tyto alba*) which are permanent residents. In addition, NBVC SNI also supports a wintering population of burrowing owls (*Athene cunicularia*) (NBVC 2010). Migratory birds in the project area are protected by the MBTA, which prohibits the taking, killing, or possessing of migratory birds or the parts, nests, or eggs of such birds, unless permitted by regulation. Conservation of migratory birds is also mandated by EO 13186, and is addressed by the Navy for all activities occurring on NBVC SNI (NBVC 2010).

Reptiles on NBVC SNI include three species of lizards: side-blotched lizard (*Uta stansburiana*), southern alligator lizard (*Elgaria multicarinatus*), and the island night lizard (*Xantusia riversiana riversiana*, discussed below). SNI supports two native terrestrial mammalian species, the state-listed threatened San Nicolas Island fox and the endemic San Nicolas Island deer mouse (*Peromyscus maniculatus exterus*), which are widely distributed on the island (NBVC 2010). Bats appear to be rare on SNI, with a few recent observations due to efforts to determine bat use of the island (NBVC 2010).

Santa Cruz Island

Five native reptile and three native amphibian species have been recorded on SCrI. The Channel Islands slender salamander (*Batrachoseps pacificus pacificus*) and the island fence lizard (*Sceloorus occidentalis beckii*) are endemic to the Channel Islands. The Santa Cruz gopher snake (*Pituophis catenifer pumilus*) and Pacific tree frog (*Pseudacris regilla*) occur only on SCrI and Santa Rosa Island. The yellow-bellied racer (*Coluber mormon*) and the black-belly slender salamander (*Batrachoseps nigriventris*) only occur on SCrI. The southern alligator lizard (*Elgaria multicarinata*) occurs on all the channel islands and they side-blotched lizard (*Uta stansburnia*) occurs on Anacapa and SCrI. In addition, the non-endemic Baja California tree frog (*Pseudacris hypochondriaca hypochondriaca*) and San Diego night snake (*Hypsiglena ochrorhyncha klauberi*) have been reported on SCrI. These reptiles and amphibians occur in scattered areas and in limited numbers on the islands**.** The salamanders should be found in most habitats. Very little is known about the Santa Cruz gopher snake. (NPS 2015)

Forty-four native land bird species are known to breed on SCrI. Extensive riparian areas, oak woodlands, chaparral, and pine forests provide habitat for acorn woodpeckers (*Melanerpes formicivorus*), red-breasted nuthatches (*Sitta Canadensis*), northern flickers (*Colaptes auratus*), and the endemic island scrub-jay (*Aphelocoma insularis*), as well as pacific-slope flycatchers (*Empidonax difficilis Insulicola),* black phoebes (*Sayornis nigricans*), and spotted towhees (*Pipilo maculates*). Introduced stands of eucalyptus also provide breeding habitat for northern saw-whet owls (*Aegolius acadicus*). Eight subspecies are endemic to SCrI and one or more of the other northern Channel Islands, while the island scrub-jay lives only on SCrI. Three of the endemic subspecies (horned lark, rufous-crowned sparrow [*Aimophila ruficeps*], and loggerhead shrike [*Lanius ludovicianus anthonyi*, a California species of special

concern (CDFW 2008)]) exist at low population levels. Several pairs of peregrine falcons breed annually on the island. (NPS 2002 in NPS 2015)

Fifteen mammal species are known to live on the island. The relatively large size of the island and the diversity of habitats it supports allow for a relative abundance of terrestrial wildlife species to thrive on SCrI. The Santa Cruz Island deer mouse (*Peromyscus maniculatus santacruzae*) is the most common mammal species. The island spotted skunk (*Spilogale gracilis amphiala*) is only found on SCrI and Santa Rosa Island. The skunks are nocturnal carnivores, preferring ravines, and, to a lesser extent, chaparral and grasslands. A direct competitor of the federally-listed endangered Santa Cruz Island fox, the endemic spotted skunk has always been a common species on SCrI. (NPS 2015)

Bat surveys conducted on the Channel Islands have detected the presence of 11 species of bats in the Channel Islands National Park. These include the California myotis (*Myotis californicus*), Longeared myotis (*M. evotis*), Fringed myotis (M. thysanodes), Townsend's big-eared bat (*Corynorhinus townsendii townsendii*), Big brown bat (*Eptesicus fuscus*), Pallid bat (*Antrozous pallidus*), Silver-haired bat (*Lasionycteris noctivagans*), Hoary bat (*Lasiurus cinereus*), Western bat (*L. blossevillii*), Mexican free-tailed bat (*Tadarida brasiliensis*), and Western mastiff bat (*Eumops perotis*). All of the bat species currently recorded from the park occur on SCrI, suggesting the presence of much suitable habitat for bats on the island. (NPS 2015)

Three mammal subspecies occur only on the island: Santa Cruz deer mouse, Santa Cruz Island harvest mouse (*Reithrodontomys megalotis santacruzae*), and Santa Cruz Island fox. The island spotted skunk (*Spilogale gracilis amphiala*) occurs only on SCrI and Santa Rosa Island. Widespread small mammal monitoring has not been conducted on SCrI, although endemic deer mice would predictably be found in all habitat types on the island. (NPS 2015)

It should be noted that there is one species of bee that is found only on SCrI. The Channel Island sweat bee nests in the ground and can be found in a woody area along one stretch of Navy Road. This endemic species is not state or federally listed. (NPS 2015)

Special-Status Species

Special-status species include those species that are listed, proposed for listing, or are active candidates for listing as threatened or endangered under the federal ESA by the USFWS; or as rare, threatened, or endangered under the California ESA by the CDFW. A summary of special status species is shown in Table 3.2-3. Marine special-status species are discussed separately in section 3.2.1.4 below.

Table 3.2-3 Summary of Threatened and Endangered Species Known to Occur or Potentially Occurring at Point Mugu, San Nicolas Island, and Santa Cruz Island.

Common Name	*Scientific Name*	*Federal Listing*	*State Listin*	*Foun d*
Point Mugu				
Salt Marsh Bird's Beak	*Chloropyron maritimum ssp.*	FE	SE	X
Tidewater Goby	*Eucyclogobius newberryi*	FE	None	--
Ridgway's Rail	*Rallus longirostris levipes*	FE	SE	X
California Least Tern	*Sterna antillarum browni*	FE	SE	X
Least Bell's Vireo	*Vireo bellii pusillus*	FE	SE	--
Western Snowy Plover	*Charadrius alexandrinus ssp.*	FT	None	X
Belding's Savannah	*Passerculus sandwichensis*	None	SE	--
San Nicolas Island				
SNI Buckweat	*Eriogonum grande var.*	None	SE	--
Beach Spectacle-Pod	*Dithyrea maritima*	None	ST	--
Trask's Milkvetch	*Astragalus traskiae*	None	SR	--
Black Abalone	*Haliotis cracherodii*	FE	None	--
White Abalone	*Haliotis sorenseni*	FE	None	U
Western Snowy Plover	*Charadrius alexandrinus ssp.*	FT	None	X
San Nicolas Island	*Urocyon littoralis dickeyi*	None	ST	X
Southern Sea Otter	*Enhydra lutris nereis*	FT	None	X
Santa Cruz Island				
Box Bedstraw (Sea Cliff	*Galium buxifolium*	FE	SR	X
Island Rush-Rose	*Crocanthemum greenei*	FT	None	X
Hoffmann's	*Arabis hoffmannii*	FE	None	--
Island Barberry	*Berberis pinnata ssp.*	FE	None	--
Santa Cruz Island live-	*Dudleya nesiotica*	FT	None	--
Santa Cruz Island bush	*Malacothamnus fasciculatus var.*	FE	None	X
Santa Cruz Island	*Malacothrix indecora*	FE	None	--
Island malacothrix	*Malacothrix squalida*	FE	None	--
Santa Cruz Island	*Thysanocarpus*	FE	None	--
Black Abalone	*Haliotis cracherodii*	FE	None	--
White Abalone	*Haliotis sorenseni*	FE	None	U
Western Snowy Plover	*Charadrius alexandrinus ssp.*	FT	None	X
Bald Eagle	*Haliaeetus leucocephalus*	None	SE	X
Santa Cruz Island	*Urocyon littoralis*	FE	ST	X

Abbreviations Used: FE = Federal endangered; FT = Federal threatened; SE = State endangered; ST = State threatened; SR = State Rare; X = present; -- = not present; U = Unknown but possible. (CNDDB 2016).

Point Mugu

Salt Marsh Bird's Beak – The federally and state-listed endangered salt marsh bird's beak is an annual plant, blooming from May to October. It is found in the upper portions of tidal and salt marshes, especially where there is seasonal fresh water inflow or inundation; low salinities enhance seed germination. This species is hemiparasitic, meaning it augments its nutrient supply by rooting into a host plant. The species is currently known to persist in seven coastal salt marshes in California from San Diego County to San Luis Obispo County (USFWS 2009b). Salt marsh bird's beak is considered sensitive at Mugu Lagoon. The primary distribution is located west of Runway 3 (north-south runway); however, a few remnant populations are located in dispersed areas east of Runway 3 (NBVC 2013).

Figure 3.2-4 provides an overview of the federally listed species found at NBVC Point Mugu, including salt marsh bird's beak habitat. Primary suitable habitat for salt marsh bird's beak on NBVC Point Mugu occurs in salt marsh habitats on the eastern and western arms of Mugu Lagoon. Specific salt marsh bird's beak populations have been identified outside the Building 811 site area and east of the Charlie Pad site.

Ridgway's Rail – The federally and state-listed endangered Ridgway's rail (*Rallus longirostris levipes*, formerly known as light-footed clapper rail) is found in salt marshes dominated by tall, dense vegetation, typically cordgrass (*Spartina foliosa*), which it uses for nesting and cover, and pickleweed (*Salicornia pacifica*), which it uses for foraging and high tide refuge. Due to its secretive nature, the Ridgway's rail is a rarely observed, resident bird at Point Mugu (NBVC 2013).

Ridgway's rails commence breeding activity around mid-February with the establishment of mating pairs. Nesting occurs from mid-March to July, with the majority of eggs laid between April and May. Mugu Lagoon represents a relatively secure breeding and foraging site because public access is restricted (though Ridgway's rails are generally tolerant of human activity if it does not result in habitat degradation [USFWS 2001]), and because of current Navy management policies.

Mugu Lagoon is the northernmost marsh in California occupied by Ridgway's rail and represents over 25 percent of the potential habitat for the species (USFWS 2009a). At Mugu Lagoon, nesting occurs in stands of southwestern spiny rush (*Juncus acutus* spp. *leopoldii*) that afford proximity to foraging habitat in tidal flats and channels. Since doubling in size between 2001 and 2003, the Point Mugu subpopulation fluctuated between 14 and 19 pairs, from 2003 to 2007. It had been much smaller, three to seven pairs for nearly 20 years until augmentations with captive-bred rails fostered its growth. There was a crash in 2008 back to five pairs, but the subpopulation was back up to nine pairs in 2009, 12 pairs in 2010, a minimum of 16 pairs in 2011, 22 pairs in 2012, and an all-time high of 23 pairs in 2013 (CDFW 2013a). Ridgway's rail habitat at Point Mugu is shown in Figure 3.2-4. Much of the lagoon area north of Beach Road has been identified as Ridgway's rail habitat, including areas in close proximity to the Charlie Pad project areas.

Under the Navy's INRMP (NBVC 2013), Ridgway's rail nesting and foraging areas are protected, and additional recovery programs, such as population and nesting monitoring and predator management, are conducted.

California Least Tern – The federally and state-listed endangered California least tern (*Sterna antillarum browni*) nests in open beach habitat adjacent to Mugu Lagoon; birds forage in the shallow open waters of

the lagoon and ocean waters just offshore. California least terns establish nesting colonies on sandy soils with little vegetation along the ocean, lagoons, and bays. Their nests are shallow depressions lined with shells or other debris. Least terns are generally present at nesting areas in California between mid-April and late September, often with two waves of nesting during this time period (CDFG 2012).

In 2011, an estimated 498-703 breeding pairs established 717 nests at Point Mugu for a total of 72 fledglings. The vast majority of breeding pairs and fledglings (467-672 pairs and 59 fledglings) were located at Point Mugu's Ormond Beach East; 28 breeding pairs and 12 fledglings were located at Holiday Beach, two pairs and one fledgling were located at the Holiday Beach Salt Panne, and one pair without fledglings was located at the Eastern Arm of the Mugu Lagoon's barrier beach (CDFG 2012). The Point Mugu Ormond Beach colony is the largest least tern colony in Ventura County. Under the Navy's INRMP (NBVC 2013), least tern nesting and foraging areas are protected, and additional recovery programs, such as population and nesting monitoring and predator management, are conducted.

Least tern breeding and foraging areas at Point Mugu are shown in Figure 3.2-4. Mugu Lagoon and adjacent beaches represent a relatively secure breeding and foraging area for the species due to no public access and current Navy management policies. Least tern nesting habitat can be found in the beach areas adjacent to the project sites.

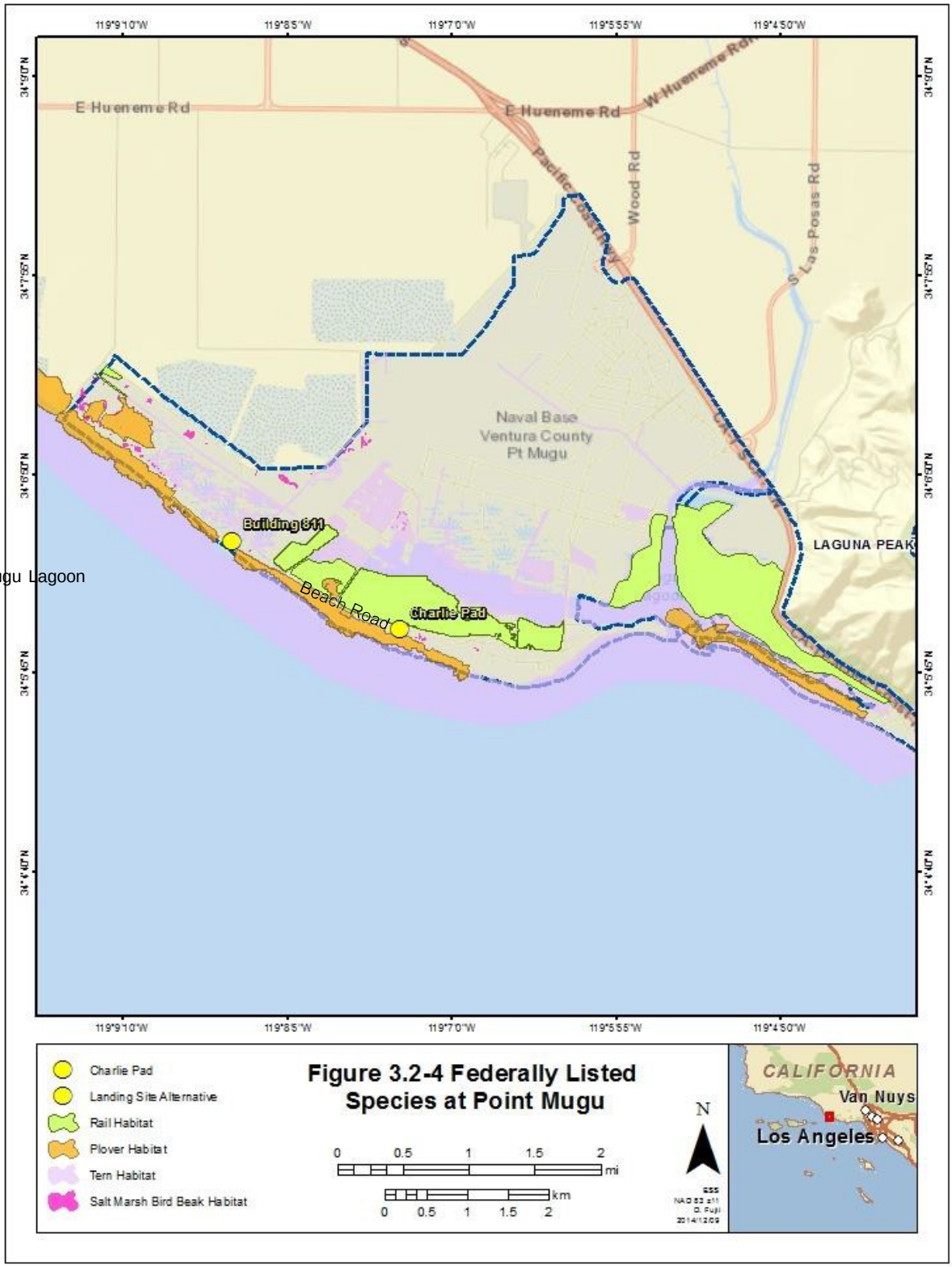
Least Bell's Vireo – The least Bell's vireo (*Vireo bellii pusillus*) was listed as an endangered bird species by the USFWS in June 1986 due to habitat loss restricting their breeding range and nest parasitism by the brown-headed cowbird (*Molothrus ater*). The least Bell's vireo prefers habitat in dense riparian vegetation dominated by willows with a lush understory. Most foraging occurs within riparian vegetation. Occasionally, foraging occurs within oak woodlands and adjacent chaparral; however, these foraging areas are generally situated within 100 ft (30 m) of riparian vegetation (USFWS 1989). There has been only one least Bell's vireo confirmed at NBVC Point Mugu before 2009; however, vireos have been documented at several different locations at the installation between 2009 and 2011. Vireos are irregular visitors at Point Mugu, leaving within a week or two of arrival while traveling to more appropriate breeding locations. None of the project areas associated with the proposed action and its alternatives have suitable habitat or foraging areas for least Bell's vireo. Therefore, the least Bell's vireo is not discussed further in this EA/OEA.

Western Snowy Plover – The federally listed threatened western snowy plover nests on sandy beaches and above-tidal flats adjacent to Mugu Lagoon from the beginning of April to mid-September (Navy 2002). Snowy plovers forage on open flats and beaches above and below the mean high tide water line and in salt pannes, where they pick insects and marine invertebrates from sand surfaces, decomposing kelp, marine mammal carcasses, and foredune vegetation. Nesting generally occurs between March 1 and September 15 of each year, though egg laying in southern California has been documented as early as mid-February, and continues through late July (NBVC 2013).

The majority of the sandy beaches and salt pannes at Point Mugu are utilized for foraging, nesting, and resting by snowy plovers, and these areas are considered essential habitat for the species (Navy 2002; USFWS 2012). The area provides both nesting (for birds of southern latitudes) and wintering areas (for birds of northern latitudes) for snowy plovers. Three primary nesting sites are utilized by snowy plovers on Point Mugu (see Figure 3.2-4), on the western and eastern arms of the Mugu Lagoon barrier beach.

Breeding season surveys at Point Mugu between 1978 and 2011 found a low of 26 adults in 1997 and a high of 87 adults in 2010. In 2011, 55 adults were observed at Point Mugu during the breeding season (USFWS 2011). The beach pads at Point Mugu are located on previously developed and disturbed land that is located within or adjacent to western snowy plover habitat. The highest density of wintering plovers is found on a stretch of beach in front of the Bravo and Charlie Pads. Nesting areas are also found on the beaches adjacent to the Charlie Pad project sites.

In its current designation of critical habitat (USFWS 2012), the USFWS has determined that lands subject to the INRMP for Point Mugu are exempt from critical habitat designation under ESA section 4(a)(3) owing to the effectiveness of Navy conservation measures implemented. Under the Navy's INRMP (NBVC 2013), snowy plover nesting and foraging areas are protected. Additional recovery programs are implemented, such as population and nesting monitoring and predator management.


119°9'10"W
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119°7'0"W
119°5'5"W
119°4'50"W
34°9'0"N
34°7'55"N
34°6'50"N
34°5'45"N
34°4'40"N
E Hueneme Rd
W Hueneme Rd
Pacific Coast Hwy
Wood Rd
S Las Posas Rd
Naval Base
Ventura County
Pt Mugu
Building 311
Mugu Lagoon
Beach Road
Charlie Pad
LAGUNA PEAK
Charlie Pad
Landing Site Alternative
Rail Habitat
Plover Habitat
Tern Habitat
Salt Marsh Bird Beak Habitat
Figure 3.2-4 Federally Listed Species at Point Mugu
0 0.5 1 1.5 2 mi
0 0.5 1 1.5 2 km
N
CALIFORNIA
Van Nuys
Los Angeles

Belding's Savannah Sparrow – The state-listed endangered Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) resides year-round in the coastal salt marshes of southern California and is common throughout Mugu Lagoon, primarily in the pickleweed-dominated areas of the salt marsh. The single largest subpopulation is at Point Mugu, comprising 31 percent of the state total in 2010 (Zembal and Hoffman 2010).

The Belding's savannah sparrow breeding cycle begins in late December with the establishment of male territories. These defended territories are occupied by males that sing (males only use the primary song for territorial displays), perch on prominent areas within the boundaries of the territory, survey the territory, and chase other conspecific sparrows. Nest building starts in mid-to-late March, with egg-laying in early April. Nests are predominately constructed on the ground or in the low branches of salt marsh vegetation, which make them vulnerable to predation and human disturbances. The initial brood hatches in mid-April, and fledging of the chicks occurs in approximately 10 days. Females are able to re-nest up to three times in a breeding season. The nesting season ends in mid-August. (NBVC 2013)

There have been numerous restoration projects at Point Mugu that have brought considerable acreage of wetland under enhanced tidal influence. Consequently, Mugu Lagoon may represent 20-25 percent of the available coastal marsh habitat in southern California. Furthermore, Belding's savannah sparrows are widespread throughout the marsh, perhaps as a product of dampened tidal amplitude (Zembal and Hoffman 2010). Belding's savannah sparrows occupy areas of higher elevation intertidal salt marsh dominated by pickleweed at Point Mugu. Mugu Lagoon represents a relatively secure foraging and nesting area for Belding's savannah sparrows because of restricted public access and current Navy management policies (NBVC 2013).

Tidewater Goby – The tidewater goby (*Eucyclogobius newberryi*) has been designated as endangered by the USFWS since February 1994, due primarily to the modification and loss of habitat as a result of coastal development, channelization of habitat, and diversions of water flows. In a 2011 survey, 11 individuals were located along a 500-ft stretch of Calleguas Creek, approximately 2.4 mi (3.9 km) northeast of Charlie Pad (the nearest project site). The U.S. Geological Survey conducted a tidewater goby survey within the potential habitats within NBVC Point Mugu, and no gobies were observed other than within the location documented in the 2011 survey. Furthermore, it is expected that suitable tidewater goby habitat would not extend past the northern edge of Calleguas Creek within the Point Mugu installation. Individual gobies may venture further downstream during storm events, but even then, tidewater gobies would not be found in proximity to the FOCUS-II project sites nor would the project sites have suitable habitat for tidewater gobies. As such, the tidewater goby is not discussed further in this EA/OEA.

San Nicolas Island

SNI has no federally listed endangered or threatened plant species. Special-status plants on SNI include one state endangered (SNI buckwheat), one state threatened (beach spectacle-pod [*Dithyrea maritima*]), and one state rare (Trask's milkvetch [*Astragalus traskiae*]). In addition, the California Native Plant Society considers five plant species as sensitive and 20 plant species as rare (NBVC 2010). The San Nicolas Island fox is a state threatened species that can be found in the FOCUS-II project site near Coast Guard jetty.

The only terrestrial federally listed wildlife species that may occur in the vicinity of the onshore project areas is the western snowy plover. The 2010 SNI INRMP (NBVC 2010) and the Biological Opinion for Activities on SNI, California (USFWS 2001) were the basis of island-wide information on the status, distribution, and known locations of federally listed species. The island night lizard was formerly federally listed as a threatened species. On 01 April 2014, the lizard was removed from the federal list of threatened and endangered wildlife species (USFWS 2014), with the Navy currently conducting post-delisting monitoring for this species to ensure that populations and habitats remain stable.

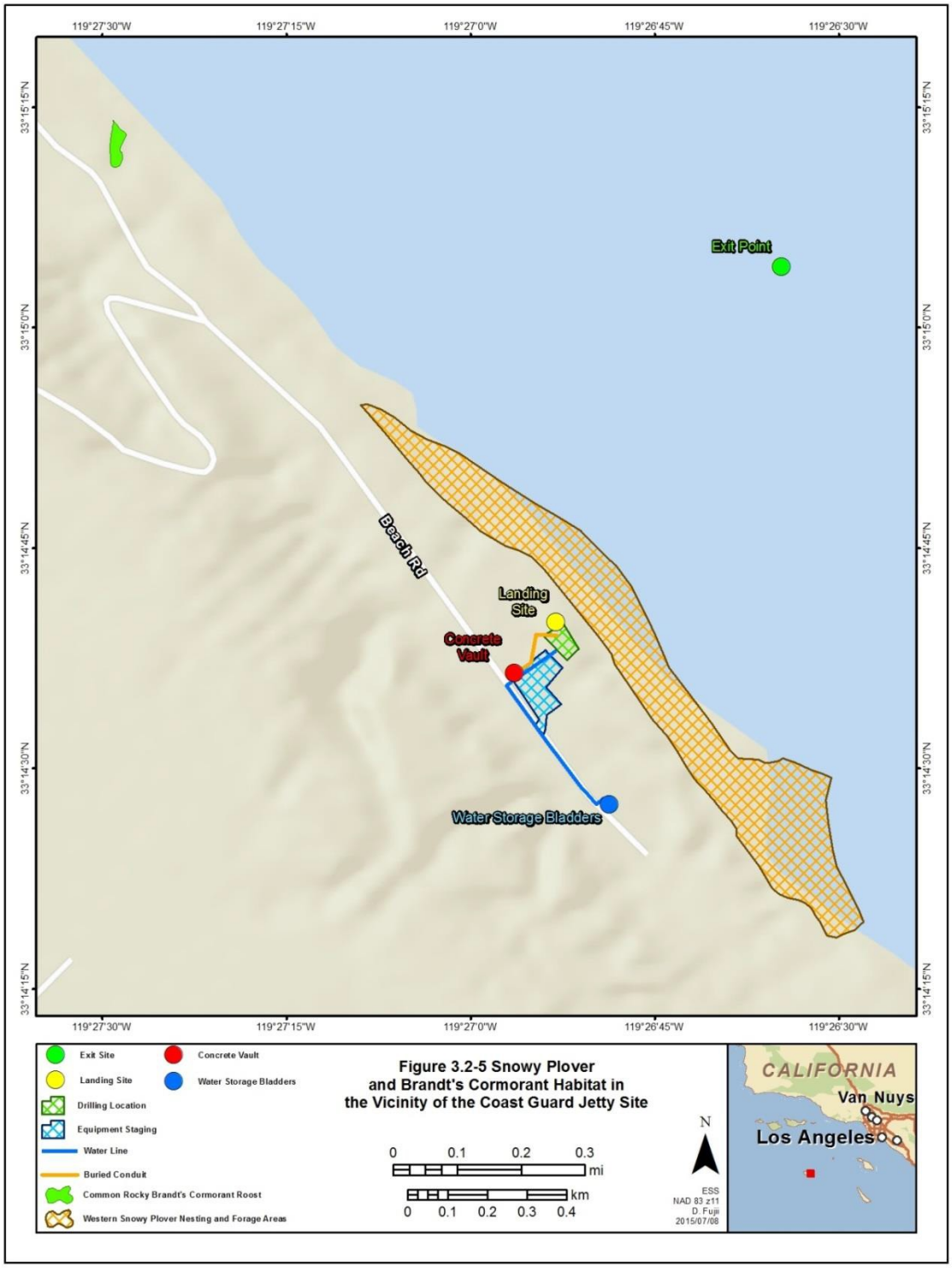
Western Snowy Plover – SNI beaches are exempt from western snowy plover critical habitat designation due to the protections afforded to the species through the 2010 SNI INRMP (USFWS 2012). Snowy plovers are year-round residents of SNI, although wintering populations from other areas are transient. Snowy plovers nest and forage on beaches at SNI (see Figure 3.2-5), including the beaches in the vicinity of the Coast Guard Jetty. The results of snowy plover surveys for the whole of SNI from 2005 through 2011 are shown in Table 3.2-4. Under the Navy's SNI INRMP (NBVC 2010), snowy plover nesting and foraging areas are protected. Additional recovery programs are implemented, such as population and nesting monitoring.

Table 3.2-4 Adult Snowy Plovers Observed on SNI during Winter and Breeding Season Surveys[1], 2005 – 2011

Year	Winter Survey	Breeding Survey
2005	243	62
2006	212	96
2007	182	68
2008	138	45
2009	86	69
2010	99	50
2011	129	42

Surveys conducted by Navy staff in compliance with USFWS Biological Opinion

San Nicolas Island Fox – The island fox (*Urocyon littoralis*) is the largest of the Channel Islands' native mammals. A descendent of the mainland gray fox, the island fox evolved into a unique species over 10,000 years ago. The San Nicolas Island fox subspecies is listed by the state as threatened. San Nicolas Island foxes are omnivorous, foraging on insects, vegetation, mice, lizards (including island night lizards), and seasonally available bird eggs. They occupy all island habitat types, with densities being highest in areas of native vegetation and lowest in barren areas or those comprised primarily of alien annual grasslands. Island fox may be present, but are not common within any of the proposed project areas. The San Nicolas Island fox population appears to be at a high but decreasing density with an estimated population over 400 animals. The San Nicolas Island fox population is affected by disturbance from humans, primarily from vehicle strikes, and was affected by competition with feral cats until their eradication from the island in 2011 (NBVC 2010).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33°14'30"N
33°14'15"N
Exit Point
Beach Rd
Landing Site
Concrete Vault
Water Storage Bladders
Exit Site
Landing Site
Drilling Location
Equipment Staging
Water Line
Buried Conduit
Common Rocky Brandt's Cormorant Roost
Western Snowy Plover Nesting and Forage Areas
Concrete Vault
Water Storage Bladders
Figure 3.2-5 Snowy Plover and Brandt's Cormorant Habitat in the Vicinity of the Coast Guard Jetty Site
0 0.1 0.2 0.3 mi
0 0.1 0.2 0.3 0.4 km
N
ESS
NAD 83 z11
D. Fuji
2015/07/08
CALIFORNIA
Van Nuys
Los Angeles

Santa Cruz Island

The USFWS listed nine SCrI plant taxa as endangered or threatened in 1997 as a result of habitat alteration, low numbers of populations, demographic decline within populations, or continued presence of feral animals (Table 3.2-3). Some of these species may be delisted as populations rebound following removal of feral pigs and sheep from SCrI.

Only three of the federally listed plants have been found near the project area: the box bedstraw, Santa Cruz Island bush mallow, and island rush-rose. The box bedstraw is only found on vertical cliff faces and steep bluff slopes. While an isolated population occurs near the project area at Prisoners harbor, it will be avoided during construction activities (Figure 3.2-6). The island rush-rose has been identified to occur near the Navy Site in surveys conducted prior to calendar year 2000. More recent surveys have located the island rush-rose near Prisoners Harbor (and the Prisoners Harbor landing site). Three sites off the Navy road have been repopulated with Santa Cruz Island bush mallow, but all three are approximately 125 to 350 ft downslope from the road (Figure 3.2-6). These populations will be avoided, as most ground disturbances would be conducted within existing roadways, vehicle traffic will be restricted to the same roadways, and any populations near the project area will be marked and avoided. As such, these populations will not be considered further in this EA/OEA.

No critical habitat for wildlife or vegetative species is located within the project areas on SCrI (NPS 2015).

Western Snowy Plover – On SCrI, western snowy plover forage in the wet sand and amidst surf-cast kelp in the intertidal zone. The plovers can also be found in dry, sandy areas above the high tide. In the non-breeding season, snowy plovers are found on many of the beaches used for nesting, as well as on beaches where they do not nest, and on estuarine sand and mud flats. On SCrI, western snowy plovers have been observed in areas on the western TNC portion of the island (NPS 2015). As such, SCrI populations of western snowy plover are not considered further in this EA/OEA.

Bald Eagle – Bald eagles (*Haliaeetus leucocephalus*) are protected by the MBTA and the Bald and Golden Eagle Protection Act. The species was reintroduced to SCrI beginning in 2002 through cooperative efforts of non-profit and governmental entities. As a result of this effort, bald eagles hatched on SCrI for the first time in half a century in 2006. Adult and juvenile eagles have been observed in the northwest of Prisoners Harbor in the riparian forest above the mouth of Cañada del Puerto near the well site. (NPS 2015)

Santa Cruz Island Fox – The island fox subspecies endemic to SCrI is listed as endangered under the federal ESA due to its limited range and small population numbers. It is also listed as a threatened species under the California ESA in 1987. The Santa Cruz Island fox can be found in nearly all habitats on SCrI, including the Prisoners Harbor area and the length of Navy Road included in the project area. The fox is generally nocturnal but is also active during daylight hours. The island fox is inquisitive and docile. They show little fear of humans. (NPS 2015)

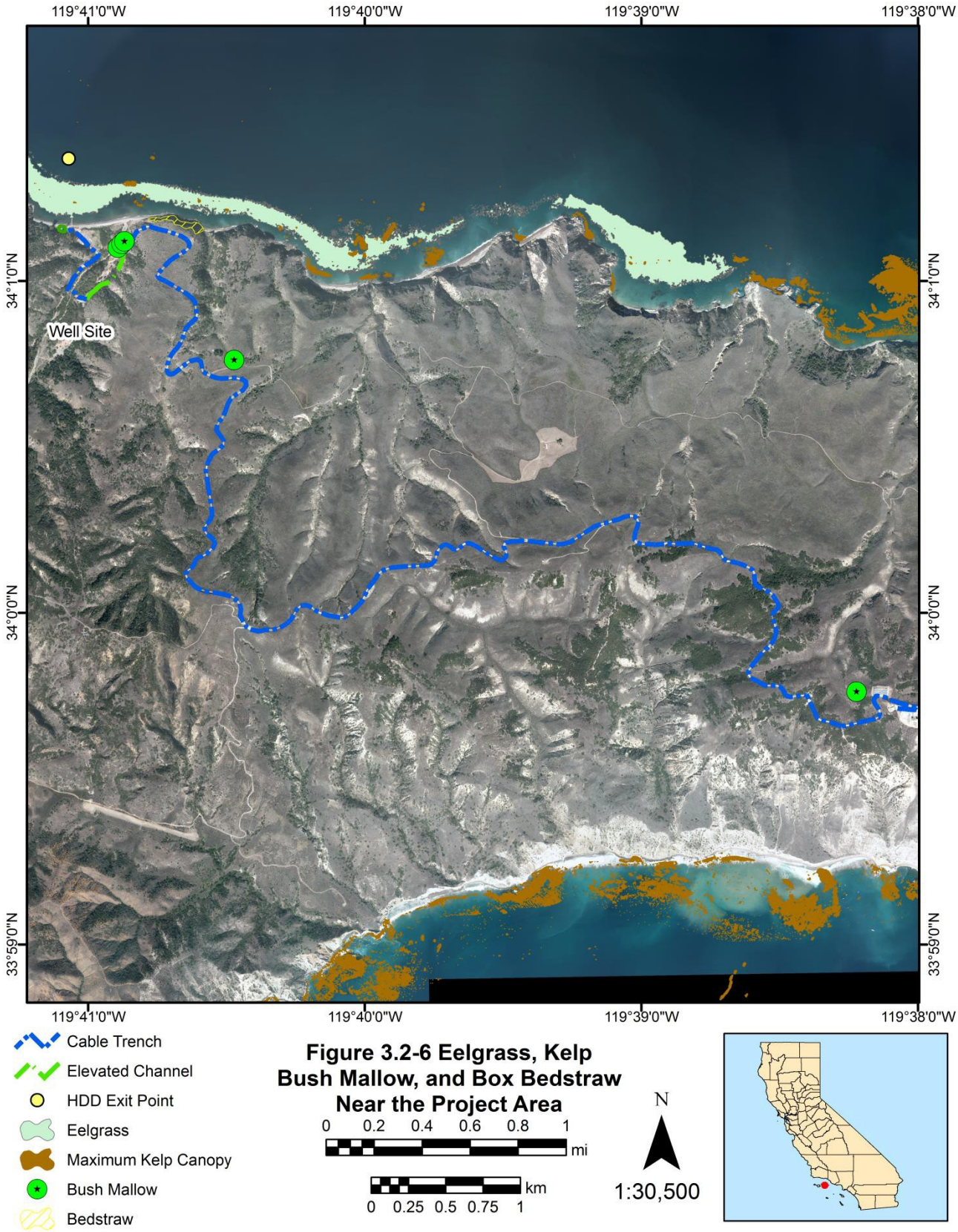

Figure 3.2-6 Eelgrass, Kelp Bush Mallow, and Box Bedstraw Near the Project Area

3.2.1.3 Marine Biological Resources

Marine biological resources within the Southern California Bight (SCB), from Point Conception south to Mexico, are found in diverse habitats, including soft substrates such as sandy beaches, shelves, and slopes that are abundant along the mainland and the offshore islands (Pondella et al. 2012). Hard bottom habitats such as the rocky intertidal, shallow subtidal reefs, deep rock reefs, and kelp beds, are also common along the coasts of the mainland and islands, though less common in deeper water (Pondella et al. 2012). SCB is dominated by sandy beaches, with approximately 15 percent rocky-headlands habitats, compared to remainder of the state where rock is much more abundant (Pondella et al. 2012). Beyond the depths of kelp beds (greater than 100 ft [30 m]), approximately three percent of the sea floor consists of rubble and rocky outcrops inhabited by marine invertebrate assemblages (Dailey et al. 1993). On the continental shelf regions, sand and gravel substrate is typically interspersed between these rocky areas. Deep hard substrates and their biological assemblages in the Sea Range are the least-studied benthic habitats primarily because they exceed typical diving depths (about 100 ft [30 m]) and cannot easily be sampled with coring devices or trawls. The following sections describe marine biological resources found at each of the proposed landing sites and along the proposed offshore route.

Regulatory Setting

Marine Protected Areas (MPAs) are “any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein” (EO 13158, *Marine Protected Areas*). The Marine Life Protection Act (MLPA), California Fish and Game Code Section 2850-2863, directs the state to redesign California's system of MPAs to function as a network in order to: increase coherence and effectiveness in protecting the state's marine life and habitats, marine ecosystems, and marine natural heritage, as well as to improve recreational, educational and study opportunities provided by marine ecosystems subject to minimal human disturbance. The MLPA has clear guidance associated with this MPA network. MPAs are developed on a regional basis with specific goals in mind and are evaluated over time to assess their effectiveness for meeting these goals.

Marine Managed Areas (MMAs) are broader groups of named, discrete geographic areas along the coast that protect, conserve, or otherwise manage a variety of resources and uses, including living marine resources, cultural and historical resources, and recreational opportunities. MMAs are similar to MPAs in that they have conservation or management purpose, defined boundaries, and some legal authority to protect resources. MMAs, however, encompass a wider range of management intents, which include areas of protection for geological, cultural, or recreational resources. MMAs may also include areas that are managed for reasons other than conservation (e.g., security zones, shellfish closures, sewage discharge areas, and pipeline and cable corridors).

The State of California designated 34 coastal regions under the 1972 California Ocean Plan as State Water Quality Protection Area (some known as Area of Special Biological Significance [ASBS]). There are ASBSs near the mouth of Mugu Lagoon extending west to Latigo Point, surrounding SNI, and surrounding SCrI (see section 3.7.1.3).

The offshore route transects the Cowcod Conservation Area (CCA). Cowcod (*Sebastes levis*) is an overfished stock that is being rebuilt under the West Coast Groundfish Fishery Management Plan (FMP) (Pacific Fishery Management Council [PFMC] 2016). Following the first stock assessment of cowcod in 1999, the species was declared “overfished”. In order to rebuild populations, two CCAs were established within the Southern California Bight. SNI lies within the CCA West (Area 1) which spans over 4,200 mi^2 (11,100 km^2). Bottom-fishing of waters deeper than 20 fathoms (36 m) is prohibited within CCAs. Take or possession of other associated species [rockfish (*Sebastes* spp.), lingcod (*Ophiodon elongatus*), cabezon (*Scorpaenichthys marmoratus*), greenlings (*Hexagrammos* spp.), California scorpionfish

(*Scorpaena guttata*), California sheephead (*Semicossyphus pulcher*), and ocean whitefish (*Caulolatilus princeps*)] within CCAs is also prohibited to reduce incidental catches of cowcod.

In addition to these closures, there is also a statewide no-retention fishery for cowcod in both commercial and recreational sectors (CDFW Website 2014). While the presence of a CCA does not regulate or prohibit the placement of undersea cables or other non-fishing impacts, portions of the CCA are designated as Habitat Areas of Particular Concern (HAPCs) within the EFH definition in the PFMC groundfish FMP. EFH guidelines published in Federal regulations (50 CFR 600.815(a)(8)) identify HAPCs as ecologically important, sensitive, stressed, or rare habitats that should be given particular attention when considering potential non-fishing impacts. HAPCs based on habitat type may vary in location and extent over time. For this reason, the mapped extent of these areas offers only a first approximation of their location (CDFW Website 2014). Discrete areas within CINMS and the CCA are designated as HAPCs because they are afforded high levels of protection through their inclusion in a National Marine Sanctuary and/or designation as an ecologically important closed area. The HAPCs adjacent to SCrI are located at Painted Cave, Gull Island and Scorpion MPAs. Painted Cave and Gull Islands are outside the FOCUS project site and landing site near Prisoners Harbor and the project will not impact resources within them. The offshore cable route may cross a portion of the Scorpion MPA in deep water. The offshore cable route will also be adjacent to, but likely not cross, the Anacapa MPAs. The Navy consulted with NMFS regarding potential impacts to EFH (see section 3.2.2).

Because of their ecological uniqueness, the CINMS was established to provide habitat for 492 species of marine algae, four species of seagrasses, over 5,000 species of invertebrates, 481 species of fish, four species of sea turtles, 33 cetaceans, seven pinnipeds, sea otters, and over 195 species of birds (NOAA 2009). The CINMS encompasses waters within 6 NM (11.1 km) of the northern Channel Islands (San Miguel, Santa Rosa, Santa Cruz, and Anacapa islands) and Santa Barbara Island; it does not include the waters surrounding SNI.

California state waters extend 3 NM (5.6 km) from the shores of each of these islands. Five of the northern Channel Islands – Anacapa, Santa Cruz, Santa Rosa, San Miguel, and Santa Barbara – and the rocks, islets, submerged lands, and waters within 1 NM (1.85 km) of each island were designated by Congress as the Channel Islands National Park, owned and managed by the NPS (16 U.S.C §410ff). Within these boundaries, there are several regulatory agencies (i.e., federal, state, and local) that have overlapping jurisdiction and various activities that are prohibited "except as may be necessary for national defense" (Navy 2008). In 2007, NOAA designated the federal portion of the Channel Islands MPA network, consisting of eight marine reserves and one marine conservation area within the CINMS (15 CFR §922(g)) (NOAA 2009). For SCrI, MPAs include Scorpion State Marine Reserve (SMR), Scorpion Federal Marine Reserve, Painted Cave State Marine Conservation Area (SMCA), Gull Island SMR, and the Gull Island Federal Marine Reserve. Although the offshore route will transit the Scorpion SMR, the landing site near Prisoners Harbor is not close to any of these MPAs.

As required under Section 304(d) of 16 U.S.C. 1434(d), the Navy initiated consultation with CINMS regarding potential impacts of the Fiber Optic Communications Underwater System Replacement project to Sanctuary resources on 25 May 2016. The Navy determined that although the project would unavoidably injure Sanctuary resources, these effects would minor be due to their limited geographical extent and temporary in nature. The Navy further determined that the project would not result in adverse effects on shallow, sensitive habitats. As of this writing, CINMS has not formally disagreed with the Navy's determination or initiated formal consultation. Therefore, further 304(d) consultation will be delayed until funding is available for this portion of the FOCUS II project.

Point Mugu Marine Habitats and Species

As described in Section 2.1, it is assumed that two 12-fiber sea cables, one from SNI and one from SCrI, would come ashore at Point Mugu and would transition to two 12-fiber land cables. The Building 811 site would be used as the landing site for the Point Mugu-SCrI cable. This site is located adjacent to a large expanse of sandy beach lined with rip rap for shoreline protection. Beaches are an important habitat at Point Mugu; exposed sandy beaches make up over 85 percent of the mainland shoreline and are biologically less diverse than rocky intertidal areas (Navy 2008).

Coastal wetlands occur on the north side of Beach Road in the vicinity of the Building 811 site (Figure 2-3) and both north and south of the Charlie Pad HDD location (Figure 2-5). Coastal wetlands form the transition zone between terrestrial and marine systems. They can be one of the most productive and diverse natural systems and provide feeding, nesting, shelter, high tide refuge, spawning grounds, nursery habitat, and other benefits for thousands of commercially and recreationally important fish, birds, mammals, and invertebrates (Navy 2008). They also provide vital food and habitat for many invertebrates including clams and crabs, as well as offering shelter and nesting sites for many species of migratory waterfowl along the Pacific flyway.

Vegetation

Kelp beds and other marine vegetation do not exist immediately offshore the Point Mugu landing sites, primarily due to the lack of hard bottom habitat.

Invertebrates

Benthic communities vary in species, densities, and diversity with changes in the physical composition and depth of the substrate. Physical variations include substrate types (sand, clay, mud, cobble, or rocky outcrops), relief structure (high relief and low relief), and the presence or absence of kelp beds and seagrass beds (MBC 1993). Within the surf zone at Point Mugu, marine invertebrates include species common to sandy beaches: clams, sand crabs (*Emerita analoga*), and polychaete worms. Two common clams include the Pismo clam (*Tivela stultorum*) and the bean clam (*Donax gouldii*). The Pismo is the larger of the two and the subject of sport fishing elsewhere. Marine invertebrates of the nearshore continental shelf include several clam species (genera Tellina, Macoma, and Spisula), sand dollars (*Dendraster spp.*), tubicolous polychaetes (genera Diopatra, Nothria, Onuphis, Owenia, and Pista), sea cucumbers (*Parastichopus spp*. and *Eupentacta spp*.), and small bivalve mollusks. Common predatory and opportunistic scavengers include various crabs, hermit crabs, sea stars, and snails. The mainland shelf, with depths from 100 to 492ft (30 to 150m) deep, has high species abundance and diversity relative to other deep benthic areas and similar to that found on offshore shelves. Species composition and abundance decrease with increasing water depth and vary according to changes in substrate relief (NBVC 2013).

Fishes

Fish that are common to inshore sandy beaches of southern California, and the Point Mugu landing sites, include round stingrays (*Urolophus halleri*), thornbacks (*Platyrhinoides triseriata*), shovelnose guitarfish (*Rhinobatos productus*), corbina (*Menticirrhus undulatus*), California halibut (*Paralichthys californicus*), speckled sanddabs (*Citharichtys stigmaeus*), lizard fish (*Synodus lucioceps*), spotted and horny head

turbot (*Pleuronichtys verticalis*.), barred sandbass (*Paralabrax nebulifer*), and surfperch species, such as white seaperch (*Phanerodon furcatus*), and shiner surfperch (*Cymatogaster agreggatta*) (City of Hermosa Beach 2001). These areas also support large populations of croakers such as queenfish (*Seriphus politus*) and white croaker (*Genyonemus lineatus*) (Navy 2008). Grunion (*Leuresthes tenuis*) are a small pelagic fish that swim onto the beaches, including those located near the landing sites at Point Mugu, to spawn during nighttime spring (as opposed to neap) high tides in spring and summer (Navy 2008).

Commercial and Recreational Fisheries

The Point Mugu landing sites are located within CDFW commercial catch block 682 (Figure 3.2-7). Between 2008 and 2013, a total of 43 species/groups were reported within this block, with the top 15 species representing 99 percent of the total commercial catch (Table 3.2-5). Market squid (*Loligo opalescens*) had the highest overall catch of over 100 million pounds, followed by Pacific sardine (*Sardinops sajax*), jack mackerel (*Trachurus symmetricus*), and red sea urchin (*Mesocentrotus franciscanus*). Other species with high catches included Pacific mackerel (*Scomber japonicas*), unspecified rock crabs (*Cancer* spp.), warty sea cucumber (*Parastichopus parvimensis*), northern anchovy (*Engraulis mordax*), yellow rock crab (*Cancer anthonyi*), and brown rock crab (*Cancer antennarius*). Of the species listed above, market squid, Pacific sardine, unspecified rock crabs, California spiny lobster (*Panulirus interruptus*) and warty sea cucumber had the highest total commercial value, with market squid accounting for 99 percent of the total commercial value within catch block 682 (Table 3.2-5).

Table 3.2-5 Total Catch and Value for Fish Landed in CDFW Commercial Catch Blocks within Point Mugu Landing Sites, 2008-2013

Species	Total Catch	Total Value
Market squid	102,709,200	$27,582,497
Pacific sardine	1,053,597	$79,992
Jack mackerel	66,860	$3,631
Red sea urchin	50,772	$31,347
Pacific mackerel	23,426	$835
Unspecified rock crab	15,924	$39,816
Warty sea cucumber	7,769	$32,959
Northern anchovy	7,090	$71
Yellow rock crab	5,849	$8,378
Brown rock crab	4,680	$7,020
White seabass	4,577	$17,420
California spiny lobster	2,591	$34,073
Greenspotted rockfish	2,164	$2,531
Halibut, California	1,413	$8,848
Giant red sea cucumber	1,263	$5,810
Total	103,969,249	$27,861,476

Source: CDFW Data for 2008-2013 from Commercial Landings reported in catch block 682.

The Point Mugu landing sites are located within the California Recreational Fisheries Survey CRFS) Channel Sampling District (RecFin, 2016). While recreational fishing by the general public does not occur in the project area - due to access restrictions, the top ten recreational fish species landed in the

district as a whole (in terms of numbers of individual fish caught) are presented in Table 3.2-6. Barred surfperch (*Amphistichus argenteus*) was caught in the highest number by recreational fishermen, followed by Pacific sardine, Chub (Pacific) mackerel, jacksmelt (*Atherinopsis californiensis*) and walleye surfperch (*Hyperprosopon ellipticum*). Other commonly caught recreational species included rockfish, surfperch (*Embiotocidae*), Pacific sanddab (*Citharichthys sordidus*), vermilion rockfish (*S. miniatus*) and copper rockfish (*S. caurinus*) (Table 3.2-6).

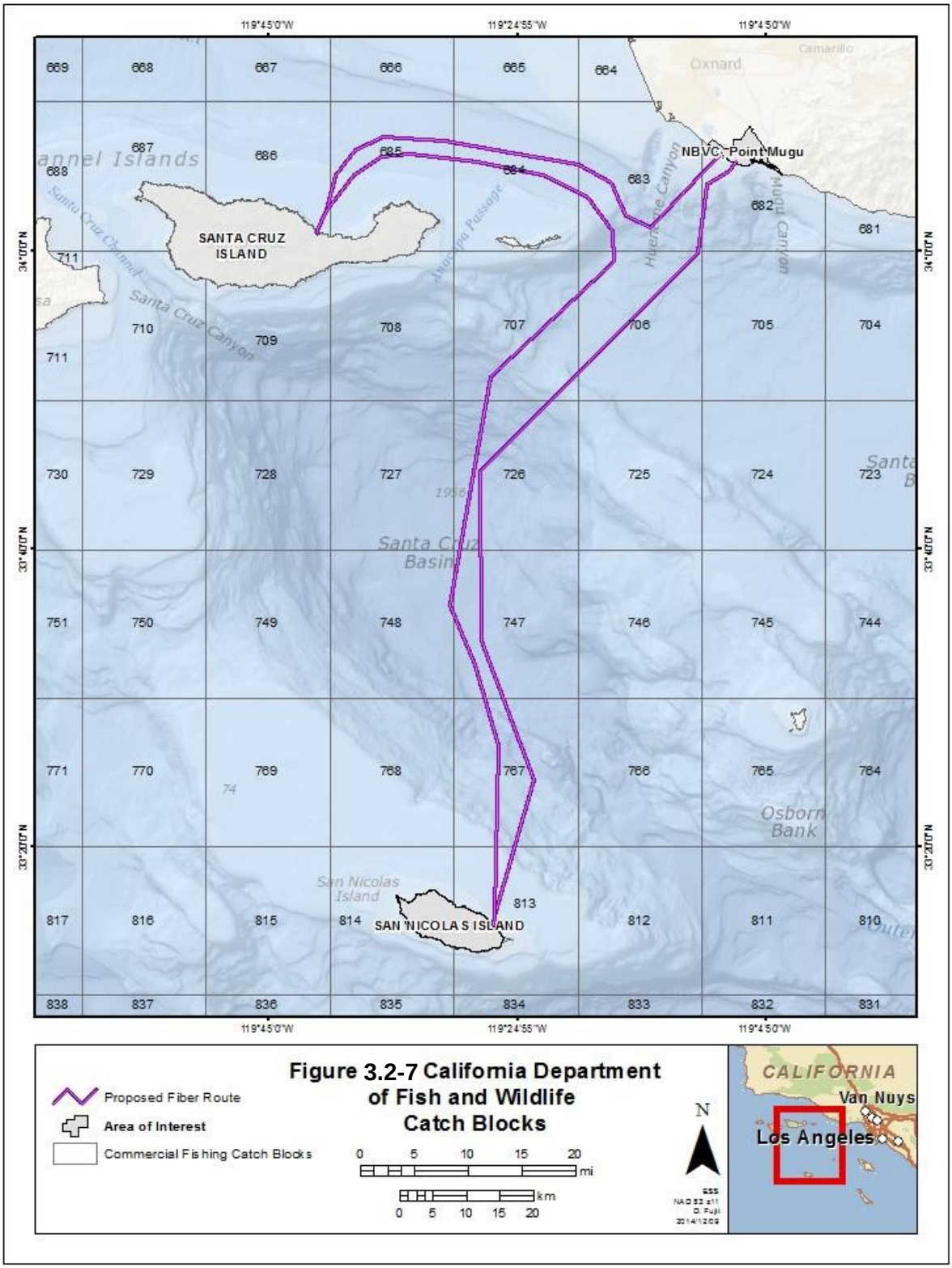

Figure 3.2-7 California Department of Fish and Wildlife Catch Blocks

Table 3.2-6. Top 10 Recreational Fish Species (Number of Fish) Landed by Recreational Anglers in Nearshore Waters around Point Mugu and Santa Cruz Island, 2008-2013

Species	2008	2009	2010	2011	2012	2013	Total
Barred surfperch	271,455	151,638	6,194	324,339	332,551	181,912	1,268,090
Pacific sardine	302,538	41,724	164,043	104,013	367,904	173,089	1,153,312
Chub (Pacific) mackerel	386,045	96,691	35,387	217,177	34,848	30,815	800,963
Jacksmelt	141,732	72,303	24,239	48,361	57,425	112,990	457,050
Walleye surfperch	60,673	23,089	47,600	45,453	129,810	51,077	357,702
Rockfish Genus	23,990	21,292	20,141	73,852	59,527	92,624	291,428
Surfperch Family	67,994	11,525	11,894	42,740	77,035	70,108	281,296
Pacific Sanddab	17,638	6,540	11,692	60,935	68,310	113,193	278,309
Vermilion Rockfish	16,407	11,198	10,142	58,311	92,341	84,230	272,629
Copper Rockfish	24,934	16,032	6,994	40,723	57,383	92,702	238,768
Total	1,771,017	696,953	722,087	1,416,717	1,847,261	1,616,120	8,070,155

Source: RecFIN (http://www.recfin.org/) for California Recreational Fisheries Survey (CRFS) data for Channel Sampling District (Ventura to Santa Barbara and Santa Cruz, Santa Rosa, San Miguel islands). Includes catches less than 3 miles from shore. Rank based on summed total for all years.

San Nicolas Island Marine Habitats and Species

SNI is the most remote of southern California's Channel Islands; both from shore and from the nearest neighboring island (Kenner 2013). The marine habitats surrounding SNI are influenced by the cold, productive waters of the California current. Fish and algal communities resemble more northerly regions such as San Miguel Island and the central California coast. The species diversity and richness at SNI is attributed to the complex oceanographic circulation patterns of the surrounding waters. The coastline is composed of sandy beach, rocky intertidal habitat, coastal marsh, and small bays. Nearshore marine habitats include offshore rocks and islets, rocky reefs, kelp forests, eel grass beds, and soft (mostly sandy) bottom. Sandy subtidal habitat is the dominant substrate along the southeastern portion of SNI, including the preferred landing site near the Coast Guard Jetty (Navy 2010).

Vegetation

Beds of giant kelp (*Macrocystis pyrifera*) and various understory algae are found on hard bottom rocky reefs scattered throughout the area surrounding the preferred landing site at SNI (NBVC 2010). SNI kelp forests are well distributed within the nearshore waters and display temporal and spatial variability between years based on oceanographic circulation, growth conditions, and grazing pressure (NBVC 2010). Rocky habitats around SNI are ideal for giant kelp and numerous species of red, green, and brown algae. Historically, SNI was an important area for commercial kelp harvesting, and large kelp beds were harvested at sites along the northern and southern shores. At present, no commercial kelp harvest occurs at SNI.

Invertebrates

Benthic invertebrates are generally characterized by habitat type (i.e., rocky or sandy) in which they are found. Because rocky habitats are ideal for attachment of sessile (non-motile) invertebrates and are generally more stable than sandy beaches, rocky habitats support more invertebrate species than sandy habitats. Based on the best available data, common invertebrate species that inhabit the shallow sandy areas off SNI are similar to the species found in other beach habitats throughout the SCB, including polychaetes, sea stars, purple olive snails (*Olivella biplicata*), sandstars, short-spined sea stars, brittlestars, maldanid worms, sea pansies, and sea pens (Navy 2008). Abalone (*Haliotis* spp.) are common within the intertidal and subtidal rocky areas of SNI and are represented by several species. These habitats at SNI support one of only a few remaining viable populations of the endangered black abalone (*Haliotis cracherodii*), which occurs in densities high enough for reproduction by broadcast spawning (NMFS 2008a, 2009). These hard bottom areas historically supported the endangered white abalone (*H. sorenseni*), although this species is not known to presently occur at SNI.

Fishes

SNI supports a variety of fish species including benthic and demersal groundfishes (e.g. flatfishes, skates/sharks/chimeras, and rockfishes) and epipelagic fishes that are important recreational and commercial species (Navy 2010). Fish diversity on nearshore reefs at SNI is related to the presence or absence of kelp and substrate topography. Hard substrate is the least common habitat type in the Project Area but is among the most important fish habitat because it supports kelp. Dominant fish species in shallow sandy areas near the cable landing site include various species of flatfishes such as sanddabs (*Citharichthys* spp.), English sole (*Parophrys vetulus*), and blackeye gobies (*Rhinogobiops nicholsii*). Forty-eight fish species were recorded during two early studies at SNI by Cowen and Bodkin (1993) and Engle (1994). The high abundances during these studies were primarily due to large numbers of two resident schooling fishes, senorita and blacksmith, typically accounting for 90 percent of all individuals (Navy 2008).

Commercial and Recreational Fisheries

The SNI landing site is located within CDFW commercial catch block 813 (Figure 3.2-7). Between 2008 and 2012, a total of 47 species/groups were reported within this block, with the top 15 species representing 99 percent of the total commercial catch (Table 3.2-7). Red sea urchin had the highest overall catch of over 500,000 lb (227,000 kg), followed by warty sea cucumber, California spiny lobster, spot prawn, and white seabass (*Atractoscion nobilis*). Other species with high catches included unspecified rock crabs, California halibut, giant red sea cucumber (*Parastichopus californicus*), California sheephead and hagfishes (*Eptatretus* sp.). Of the species listed above, California spiny lobster, spot prawn, warty sea cucumber, red sea urchin, and white seabass had the highest total commercial value (Table 3.2-7).

Table 3.2-7 Total Catch and Value for Fish Landed in CDFW Commercial Catch Blocks within vicinity of SNI Landing Sites, 2008-2013

Species	Total Catch	Total Value (dollars)
Red sea urchin	514,266	$272,590
Warty sea cucumber	136,757	$480,216
California spiny lobster	126,203	$1,887,751
Spot prawn	86,332	$915,795
White seabass	50,826	$178,856
Unspecified rock crab	46,114	$70,617
California Halibut	16,441	$82,944
Giant red sea cucumber	8,807	$34,919
California sheephead	8,428	$35,708
Hagfishes	2,875	$3,284
Pacific Bonito	2,169	$594
Red rock crab	2,096	$2,650
Shortfin mako shark	2,076	$2,499
Ridgeback prawn	1,843	$8,999
Box crab	1,515	$3,343
Total	1,014,293	$4,001,272

Source: CDFW Data for 2008-2013 from Commercial Landings reported in catch block 813.

The SNI landing site is located within the CRFS South Sampling District (RecFin 2016). The top ten recreational fish species landed (in terms of numbers of individual fish caught) are presented in Table 3.2-8. Chub (Pacific) mackerel were caught in the highest number by recreational anglers, followed by Pacific sardine, kelp bass (*Paralabrax clathratus*), California lizardfish, and barred surfperch. Other commonly caught recreational species included barred sandbass, members of the silversides (*Atherinidae*), California scorpionfish, Northern anchovy, and jacksmelt.

Table 3.2-8 Top 10 Recreational Fish Species (Number of Fish) Landed by Recreational Anglers in Nearshore Waters Surrounding San Nicolas Island, 2008-2013

Species	2008	2009	2010	2011	2012	2013	Total
Chub (Pacific)	2,019,261	1,517,142	1,353,882	1,132,406	1,009,350	542,697	7,574,738
Pacific Sardine	301,496	669,972	685,151	401,689	603,973	501,645	3,163,925
Kelp Bass	456,347	515,110	350,276	370,189	371,297	402,464	2,465,684
California Lizardfish	8,397	79,706	317,989	58,265	247,556	605,429	1,317,342
Barred Surfperch	82,939	94,804	34,813	165,502	565,289	307,202	1,250,548
Barred Sandbass	225,184	193,725	185,125	220,770	194,531	108,242	1,127,576
Silverside Family	181,225	228,854	156,409	14,066	60,487	82,976	724,016
California Scorpionfish	111,691	94,174	98,057	127,795	137,579	92,068	661,364
Northern Anchovy	71,438	16,830	35,879	166,622	37,290	324,315	652,375
Jacksmelt	160,324	135,683	71,143	70,667	130,325	56,591	624,734
Total	5,050,580	5,236,755	4,638,348	3,879,440	4,862,431	4,736,299	28,403,85

Source: Data extracted from RecFIN (http://www.recfin.org/) for California Recreational Fisheries Survey (CRFS) data for South Sampling District (Los Angeles County south through San Diego County and San Nicholas, Santa Catalina, and San Clemente Islands). Includes catches less than 3 miles from shore. Rank based on summed total for all years.

Santa Cruz Island Marine Habitats and Species

Although sandy beaches make up approximately 23 percent of the Channel Islands' coastlines (NOAA 2009), the proposed landing site at SCrI, situated 80 ft (24 m) west of the Prisoners Harbor Pier, is composed of cobbles. Other marine habitats in the vicinity of the SCrI landing site are similar to those described above for SNI and include rocky intertidal, sandy beaches and hard and soft substrate subtidal areas.

Vegetation

In the SCB, there are at least 492 species of algae and four species of seagrasses known to occur out of the 673 species described for California (Abbott and Hollenberg 1976; Murray and Bray 1993). Giant kelp, surfgrass and eelgrass are marine plants that provide important habitat to numerous other species within the CINMS. As described above for SNI, kelp beds and various understory algae are found on hard bottom rocky reefs scattered throughout the preferred landing site at SCrI. In addition, one of the largest eelgrass beds in the CINMS occurs at Prisoners Harbor (NOAA 2008). Figure 3.2-6 (above) provides an overview of the eelgrass beds in the vicinity of Prisoners Harbor. The existing eelgrass bed near the proposed landing site starts at a water depth of approximately 10 ft (3.0 m) and is the prominent biological feature to a water depth of approximately 36 ft (11 m) (Ugoretz 2014). Eelgrass is patchier at the upper and lower depth limits, with an estimated cover of 80 percent. Peak eelgrass density along the eastern side of SCrI occurs at a depth of 25 ft (7.6 m), and eelgrass is rarely found at depths greater than 52 ft (15.8 m) in this area (NMFS 2015).

Invertebrates

Invertebrates in the rocky intertidal and subtidal areas at the Prisoners Harbor landing site are similar to other areas of and other islands within the CINMS. These species include sea fans, spiny lobster, crabs, sea urchins, sea cucumbers, sea stars, abalone, nudibranchs, scallops, mussels, squid, clams, barnacles,

snails, scalps, tunicates, jellyfish, sea slugs, worms, and anemones (ONMS 2009). Abalone are common within the intertidal and subtidal rocky areas of SCrI and are represented by several species, including the federally endangered black and white abalone. Kelp forest habitats are dominated by sunflower stars (*Pycnopodia helianthoides*), bat stars (*Patiria miniata*), giant-spined stars (*Pisaster giganteus*), and ochre stars (*P. ochraceus*) (NPS 2015).

Fishes

More than 400 fish species have been observed in the CINMS, and are likely present in the vicinity of the landing site, including several species of rockfish like bocaccio (*Sebastes paucispinis*), blue rockfish (*S. mystinus*), olive rockfish (*S. serranoides*), and kelp rockfish (*S. atrovirens*) (ONMS 2009). Other fish species found in the vicinity of the eelgrass beds near the Prisoners Harbor landing site include blue banded gobies (*Lythrypnus dalli*), black eye goby (*Coryphopterus nicholsi*), island kelpfish (*Alloclinus holderi*), kelp bass, blacksmith (*Chromis punctipinnis*), black perch (*Embiotoca jacksoni*), striped seaperch (*E. lateralis*), opaleye (*Girella nigricans*), garibaldi (*Hypsypops rubicundus*), señiorita (*Oxyjulis californica*), and California sheephead (NPS 2015).

It should be noted that these fish are absent or infrequently observed in the sandy bottom areas outside the eelgrass beds. In a 2014 survey of the area conducted by NPS and CDFW divers, the following was noted. From 10 to 36 ft (three to 11 m), the most notable biological feature was worm tubes that were abundant in the soft mud/silt-like substrate. Crabs were common and consisted mostly of small sheep crabs (*Loxorhynchus grandis*) and graceful rock crabs (*Cancer gracilis*), though other crabs that are most active nocturnally were likely common under the substrate. Fish were rare at depths below 40 ft (12 m). At a water depth of about 55 ft (17 m), some small tufts of brown algae (*Dictyota/Pachydictyon* sp.) were present as well as a thick algal/bacterial film on the substrate. Several clusters of nudibranch eggs (*Navanax inermis* and either *Haminoe virescens* or *Bulla gouldiana*) were present at about a 40 ft (12 m) depth. Fish became more common just before the eel grass started at a water depth of 38 ft (11.6 m) (Ugoretz, 2014).

Commercial and Recreational Fisheries

The Prisoners Harbor landing site is located within CDFW commercial catch block 686 (Figure 3.2-7). Table 3.2-9 presents total fish catch and value provided by CDFW (2016) for the top 15 species (fish and invertebrates) between 2008 and 2013. A total of 52 species/groups were reported within this block, with the top 15 species representing 99 percent of the total commercial catch. Market squid had the highest overall catch of over 19 million pounds, followed by Pacific sardine, red sea urchin, Pacific mackerel, and Pacific bonito (*Sarda chiliensis lineolata*). Other species with high catches included white seabass, warty sea cucumber, California spiny lobster, California halibut, and hagfishes. Of the species listed, market squid, California spiny lobster, red sea urchin, spot prawn, and California halibut had the highest total commercial value, with market squid accounting for more than 90 percent of the total catch by weight and more than 80 percent of the commercial value within catch block 686.

Table 3.2-9 Total Catch and Value for Fish Landed in CDFW Commercial Catch Blocks within vicinity of the SCrI Landing Site, 2008-2013

Species	Total Catch	Total Value
Market squid	19,981,961	$5,876,650
Pacific sardine	702,706	$31,285
Red sea urchin	305,609	$170,715
Pacific mackerel	159,286	$11,888
Pacific bonito	86,163	$29,755
White seabass	47,558	$115,806
Warty sea cucumber	37,723	$113,206
California spiny lobster	26,702	$364,057
California halibut	23,134	$141,298
Hagfishes	15,342	$15,342
Jack mackerel	13,734	$474
Spot prawn	11,513	$141,840
California Sheephead	5,112	$24,091
Northern anchovy	4,134	$115
Unspecified rock crab	2,586	$3,823
Total	21,442,110	$7,078,754

Source: CDFW Data for 2008-2013 from Commercial Landings reported in catch block 686

Recreational catches for SCrI are included in the same CRFS sampling district as Point Mugu. Reported recreational catches for both locations are considered the same for this analysis and are presented in Table 3.2-6 (RecFin, 2016). To reiterate, barred surfperch were caught in the highest number by recreational fishermen, followed by Pacific sardine, chub (Pacific) mackerel, jacksmelt, and walleye surfperch. Other commonly caught recreational species included the rockfish genus, the surfperch family, Pacific sanddab, vermilion rockfish and copper rockfish.

Marine Habitats and Fishes Associated with the Offshore Routes

This section describes the habitats and biological resources that are found along the offshore cable route, from the point at which the cable comes on to the seafloor (pop out point), drilled from the landing site using HDD techniques to approximately 70 to 80-ft (21 to 24-m) water depth.

Marine Habitats

The majority of the sea route (~ 93 percent) is located in deepwater, soft-bottom areas. In general, these offshore areas are characterized by a diversity of habitats, primarily muddy (silt-clay) to sandy shelf and muddy slope environments, but also include areas of deep basins, submarine canyons, shelf-slope break, and near-island habitats (Dailey et al. 1993). A few areas such as near the northern Channel Islands have more extensive hard-bottom features, but these areas would be avoided by the cable route.

Vegetation

Little to no offshore algae or vegetation is present along the cable route. HDD technology will be used at the landing sites to drill offshore below and past the kelp beds and vegetated areas.

Invertebrates

Most of the biological resources that occur commonly along the sea route are found throughout much of southern California, especially at depths below about 656 ft (200 m), where many species tend to be relatively cosmopolitan in distribution along the California coast (SAIC 2000).

Macrofaunal abundance and diversity in shelf areas from 100 to 492 ft (30 to 150 m) typically decrease with increasing shelf depth. Dominant assemblages include polychaetes (*Spiophanes missionensis, Chloeia pinnata, Pectinaria californiensis, Paraprinospio pinnata, Maldane sarsi, Tharyx* spp.), ophiuroids (*Amphiodia urtica*), pelecypods (*Parvilucina tenuisculpta, Cyclocardia ventricosa*), ostracods (*Euphilomedes* spp.), and echiurans (*Listriolobus pelodes*). Assemblages that inhabit offshore shelves, ridges, and banks at depths to about 1,640 ft (500 m) and are much more spatially heterogeneous than those on the mainland shelf (Navy 2002). Dominant assemblages include polychaetes (*Chloeia pinnata*, *Lumbrineris* spp.), ophiuroids (*Amphipholis squamata*, *Amphiodia urtica*), pelecypods (*Parvilucina tenuisculpta*), ostracods (*Euphilomedes* spp.), and amphipods (*Photis californica*) (Navy, 2002).

Offshore lower slope regions, with water depths of 1,640 to 4,921 ft (500 to 1,500 m), consist mostly of randomly dispersed populations, with amphipods (*Byblis* spp.), polychaetes (*Lumbrineris* spp., *Tharyx* spp., Paraonidae, *Phyllochaetopterus limicolus*), and ophiuroids (*Amphipholis squamata*, *Ophiura leptoctenia)* dominating the species assemblages (Navy 2002).

Invertebrate assemblages in most basin areas, at depths between 2,057 to 3,077 ft (627 to 938 m) in nearshore basins and between 4,452 to 8,435 ft (1,357 to 2,571 m) in offshore basins, are dominated by polychaetes (*Lumbrineris* spp., *Thmyx* spp., *Phyllochaetopterus limicolus*, Paraonidae), ophiuroids (*Ophiura leptoctenia*), gastropods (*Mitrella permodesta*), and mollusks (Aplacophora) (Navy 2002). Faunal assemblages in submarine canyons, such as the Mugu submarine canyon, have higher abundances of deposit feeders such as maldanid worms and heart urchins (Navy 2002).

Along much of the California coast, invertebrates associated with hard bottom habitat are generally similar at the same depth and substrate type (SAIC 2000). Epifaunal invertebrate communities on the continental shelf 100 to 500 ft (30 to 150 m) commonly include cup corals (e.g., *Paracyathus* and *Balanophyllia*), hydroids, encrusting sponges, and ascidians.

Fishes

Shallow water areas (235-280 ft [72-85 m] water depth) are typified by sanddabs, rex sole (*Glyptocephalus zachirus*), English sole, and pink surfperch (*Zalembius rosaceus)* along the coast of California. Soft-bottom habitats on the upper and middle slope (water depths from approximately 656 to about 3,281 ft [200 to 1,000 m]) are characterized by moderate numbers of fish species, including flatfishes such as Dover sole (*Microstomas pacificus*), California halibut, rockfishes, Pacific hake (*Merluccius productus*), sablefish (*Anoplopoma fimbria*), and skates (CSLC 2005). At depths over 1,968 ft (600 m), the thornyhead (*Sebastolobus* spp.) is likely common. Rockfishes are commonly observed in areas with hard bottom features.

Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act [16 U.S.C. §§1801-1881, (MSFCMA)], known as the Sustainability Fisheries Act (PL 104-297), require the delineation of "essential fish habitat" for all managed species. Federal action agencies which fund, permit, or carry out activities that may adversely impact EFH are required to consult with NMFS regarding the potential effects of their actions on EFH, and respond in writing to NMFS's recommendations (see page 3-68). In addition, the MSFCMA defines EFH as those waters and substrates necessary (required to support a sustainable fishery and the managed species) to fish for spawning, breeding, feeding, or growth to maturity (i.e., full life cycle). These waters include aquatic areas and their associated physical, chemical, and biological properties used by fish, and may include areas historically used by fish. Substrate types include sediment, hard bottom, structures underlying the waters, and associated biological communities.

The proposed project is located within an area designated as EFH for three FMPs, including Pacific Coast Groundfish (PFMC 2016), Coastal Pelagic Species (PFMC 2011a), and Highly Migratory Species (PFMC 2011b).

The following is a brief description of the managed fish species that potentially occur in the vicinity of the proposed landing sites at Point Mugu, SCrI, and SNI, as well as along the offshore route. A list of FMP managed species is presented in Table 3.2-10.

Groundfishes

All of the 91 groundfish species managed under the Pacific Groundfish FMP are found in diverse habitats at various stages in their life histories throughout the Study Area (proposed landing sites and offshore route). Some species are broadly dispersed during specific life stages, especially those with pelagic eggs and larvae, while other species may have limited distributions (i.e., adult rockfishes in nearshore habitats) with strong affinities to a particular location or substrate type. The overall extent of groundfish EFH for all FMU species is identified as all waters and substrate within the following areas: depths less than or equal to 3,500 m (1,914 fathoms) to mean higher high water level (MHHW) or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 parts per thousand (ppt) during the period of average annual low flow; seamounts in depths greater than 3,500 m as mapped in the EFH assessment GIS; and areas designated as HAPCs not already identified by the above criteria.

Estuaries, sea grass beds, canopy kelp, rocky reefs, and other "areas of interest" (e.g., seamounts, offshore banks, canyons, certain oil platforms, and portions of the CCAs) are designated as HAPCs for groundfish managed species. While the proposed project will avoid rocky reefs and all cable HDD exits will be deeper than canopy kelp or seagrass beds, the cables could potentially cross small rocky outcroppings considered EFH.

Fish species likely found in the Study Area and managed under the Pacific Groundfish FMP include flatfishes (13 species), 39 species of rockfish, two species of thornyheads, roundfishes (six species), cabezon, kelp greenling, lingcod, Pacific cod, Pacific hake, and sablefish (Table 3.2-10). There are also nine species of skates, sharks, and chimeras managed under this plan (Table 3.2-10).

Coastal pelagic Species

The coastal pelagic species (CPS) live in the water column, not near the sea floor, and are usually found from the surface to over 3,000 ft (1,000 m) deep (PFMC 2011a). There are six coastal pelagic species managed under the CPS FMP, including Jack mackerel, Krill (Euphausiids), Pacific mackerel, Pacific sardine, market squid, and Northern anchovy (Table 3.2-10). CPS finfish are pelagic (in the water column near the surface and not associated with substrate), because they generally occur above the thermocline in the upper mixed layer. For the purposes of EFH, the four CPS finfish are treated as a single species complex, because of similarities in their life histories and similarities in their habitat requirements. Market squid are also treated in this same complex because they are similarly fished above spawning aggregations.

The specific description and identification of EFH for CPS finfish accommodates the fact that the geographic range of all CPS finfish varies widely over time in response to the temperature of the upper mixed layer of the ocean, particularly in the area north of Point Arena, California (39° N latitude). This generalization is probably also true for market squid but few data are available. Adult CPS finfish are generally not found at temperatures colder than 10°C or warmer than 26°C and preferred temperatures and minimum spawning temperatures are generally above 13°C. Spawning is most common at 14°C to 16°C. (PFMC, 2011a)

The east-west geographic boundary of EFH for each individual CPS finfish and market squid is defined as all marine and estuarine waters from the shoreline along the coasts of California, Oregon, and Washington offshore to the limits of the exclusive economic zone (EEZ) and above the thermocline where sea surface temperatures range between 10°C to 26°C. The southern boundary of the geographic range of all CPS finfish is consistently south of the US-Mexico border, indicating a consistency in sea surface temperatures at below 26°C, the upper thermal tolerance of CPS finfish. Therefore, the southern extent of EFH for CPS finfish is the United States-Mexico maritime boundary. The northern boundary of the range of CPS finfish is more dynamic and variable due to the seasonal cooling of the sea surface temperature. The northern EFH boundary is, therefore, the position of the 10°C isotherm which varies both seasonally and annually, but is always north of the project area. (PFMC, 2011a).

Highly Migratory Species

EFH for highly migratory species (HMS) is defined on a species-by-species basis and includes portions of all marine waters from the shoreline to 200 NM (370 km) offshore; no HAPCs have been adopted for HMS in the Study Area. There are five species of shark managed under the HMS management plan, including bigeye thresher shark (*Alopias superciliosus*), blue shark (*Prionace glauca*), common thresher shark (*A. vulpinus*), pelagic thresher shark (*A. pelagicus*), and shortfin mako shark (*Isurus oxyrinchus*). In addition, there are five species of tunas managed under this plan, including albacore tuna (*Thunnus alalunga*), bigeye tuna (*T. obesus*), northern bluefin tuna (*T. orientalis*), skipjack tuna (*Katsuwonus pelamis*), and yellowfin tuna (*T. albacares*) (Table 3.2-10). Striped marlin (*Tetrapturus audax*) is the only species of billfish managed under the HMS management plan, while broadbill swordfish (*Xiphias gladius*) is the only species of swordfish, and dorado (*Coryphaena hippurus*) is the only species of dolphinfish managed under this plan (Table 3.2-10).

Table 3.2-10 EFH Species Potentially Located within the Proposed Landing Sites and Along the Offshore Route

Common Name	Scientific Name	Fishery Management Plan
GROUNDFISH SPECIES		
Flatfishes		
Arrowtooth flounder	*Atheresthes stomias*	GMP
Butter sole	*Isopsetta isolepis*	GMP
Curlfin sole	*Pleuronichthys decurrens*	GMP
Dover sole	*Microstomus pacificus*	GMP
English sole	*Parophrys vetulus*	GMP
Flathead sole	*Hippoglossoides*	GMP
Pacific sanddab	*Citharichthys sordidus*	GMP
Petrale sole	*Eopsetta jordani*	GMP
Rex sole	*Glyptocephalus zachirus*	GMP
Rock sole	*Lepidopsetta bilineata*	GMP
Sand sole	*Psettichthys*	GMP
Starry flounder	*Platichthys stellatus*	GMP
Rockfishes		
Aurora rockfish	*Sebastes aurora*	GMP
Bank rockfish	*S. rufus*	GMP
Black rockfish	*S. melanops*	GMP
Black-and-yellow	*S. chrysomelas*	GMP
Blackgill rockfish	*S. melanostomus*	GMP
Blue rockfish	*S. mystinus*	GMP
Bocaccio	*S. paucispinis*	GMP
Bronzespotted	*S. gilli*	GMP
Brown rockfish	*S. auriculatus*	GMP
Calico rockfish	*S. dallii*	GMP
Canary rockfish	*S. pinniger*	GMP
Chameleon rockfish	*S. phillipei*	GMP
Chilipepper	*S. goodei*	GMP
China rockfish	*S. nebulous*	GMP
Copper rockfish	*S. caurinus*	GMP
Cowcod	*S. levis*	GMP
Darkblotched rockfish	*S. crameri*	GMP
Dusky rockfish	*S. ciliatus*	GMP
Dwarf-red rockfish	*S. rufinanus*	GMP
Flag rockfish	S. *rubrivinctus*	GMP
Freckled rockfish	*S. lentiginosus*	GMP
Gopher rockfish	*S. carnatus*	GMP
Common Name	**Scientific Name**	**Fishery Management Plan**
GROUNDFISH SPECIES		
Grass rockfish	*S. rastrelliger*	GMP
Greenblotched	*S. rosenblatti*	GMP
Greenspotted rockfish	*S. chlorostictus*	GMP
Greenstriped rockfish	*S. Elongatus*	GMP
Halfbanded rockfish	*S. semicinctus*	GMP
Harlequin rockfish	*S. variegatus*	GMP
Honeycomb rockfish	*S. umbrosus*	GMP
Kelp rockfish	*S. atrovirens*	GMP
Mexican rockfish	*S. macdonaldi*	GMP
Olive rockfish	*S. serranoides*	GMP
Pink rockfish	*S. eos*	GMP
Pinkrose rockfish	*S. simulator*	GMP
Pygmy rockfish	*S. wilsoni*	GMP
Pacific ocean perch	*S. alutus*	GMP

Quillback rockfish	*S. maliger*	GMP
Redbanded rockfish	*S. babcocki*	GMP
Redstripe rockfish	*S. proriger*	GMP
Rosethorn rockfish	*S. helvomaculatus*	GMP
Rosy rockfish	*S. rosaceus*	GMP
Rougheye rockfish	*S. aleuttianus*	GMP
Sharpchin rockfish	*S. zacentrus*	GMP
Shortbelly rockfish	*S. jordani*	GMP
Shortraker rockfish	*S borealis*	GMP
Silvergray rockfish	*S. brevispinis*	GMP
Speckled rockfish	*S. ovalis*	GMP
Splitnose rockfish	*S. diploproa*	GMP
Squarespot rockfish	*S. hopkinsi*	GMP
Starry rockfish	*S. constellatus*	GMP
Stripetail rockfish	*S. saxicola*	GMP
Swordspine rockfish	*S. ensifer*	GMP
Tiger rockfish	*S. nigrocinctus*	GMP
Treefish	*S. serriceps*	GMP
Vermilion rockfish	*S. miniatus*	GMP
Widow rockfish	*S. entomelas*	GMP
Yelloweye rockfish	*S. ruberrimus*	GMP
Yellowmouth rockfish	*S. reedi*	GMP
Yellowtail rockfish	*S. flavidus*	GMP
Scorpionfish		
California	*Scorpaena guttatta*	GMP
Thornyheads		
Longspine thornyhead	*Sebastolobus altivelis*	GMP
Shortspine thornyhead	*S. alascanus*	GMP
Roundfishes		
Cabezon	*Scorpaenichthvs*	GMP
Kelp greenling	*Hexagrammos*	GMP
Lingcod	*Opiodon elongatus*	GMP
Pacific cod	*Gadus macrocephalus*	GMP
Pacific hake	*Merluccius productus*	GMP
Sablefish	*Anoplopoma fimbria*	GMP
Skates, Sharks and Chimeras		
Big skate	*Raja binoculata*	GMP
California skate	*Raja inornata*	GMP
Finescale codling	*Antimora microlepis*	GMP
Leopard shark	*Triakis semifasciata*	GMP
Longnose skate	*Raja rhina*	GMP
Common Name	**Scientific Name**	**Fishery Management Plan**
GROUNDFISH SPECIES		
Pacific rattail	*Coryphaenoides acrolepis*	GMP
Soupfin shark	*Galeorhinus zyopterus*	GMP
Spiny dogfish	*Squalus acanthias*	GMP
Spotted ratfish	*Hydrolagus colliei*	GMP
COASTAL PELAGIC SPECIES		
Jack mackerel	*Traxchurus symmetricus*	CPMP
Krill	Euphausiids	CPMP
Pacific mackerel	*Scomber japonicus*	CPMP
Pacific sardine	*Sardinops sagax*	CPMP
Market squid	*Loligo opalescens*	CPMP
Northern anchovy	*Engraulis mordax*	CPMP
HIGHLY MIGRATORY SPECIES		
Sharks		
Bigeye thresher shark	*Alopias superciliosus*	HMMP

Blue shark	*Prionace glauca*	HMMP
Common thresher	*Alopias vulpinus*	HMMP
Pelagic thresher shark	*Alopias pelagicus*	HMMP
Shortfin mako shark	*Isurus oxyrinchus*	HMMP
Tunas		
Albacore tuna	*Thunnus alalunga*	HMMP
Bigeye tuna	*T. obesus*	HMMP
Northern bluefin tuna	*T. orientalis*	HMMP
Skipjack tuna	*Katsuwonus pelamis*	HMMP
Yellowfin tuna	*T. albacares*	HMMP
Billfish		
Striped marlin	*Tetrapturus audax*	HMMP
Swordfish		
Broadbill swordfish	*Xiphias gladius*	HMMP
Dolphin-fish		
Dorado (mahi mahi)	*Coryphaena hippurus*	HMMP

Commercial and Recreational Fisheries

The offshore route is located within CDFW commercial catch blocks 683-685, 706, 707, 726, 747, 748, 767, and 813 (Figure 3.2-7). Table 3.2-11 presents total fish catch and value for the top 15 species (fish and invertebrates) between 2008 and 2013. A total of 134 species/groups were reported within these blocks, with the top 15 species representing 99 percent of the total commercial catch. Market squid had the highest overall catch of over 125 million pounds, followed by Pacific sardine, northern anchovy, Pacific Mackerel, and red sea urchin. Other species with high catches included spot prawn, warty sea cucumber, white seabass, California spiny lobster, and California halibut. Of the species listed above, market squid, California spiny lobster, spot prawn, California halibut, and white seabass had the highest total commercial value, with market squid accounting for 78 percent of the total commercial value within catch blocks 683-685, 706, 707, 726, 727, 747, 748, and 767.

Table 3.2-11Total Catch and Value for Fish Landed in CDFW Commercial Catch Blocks along the Offshore Routes, 2008-2013

Species	Total Catch	Total Value
Market squid	125,083,959	$32,989,391
Pacific sardine	4,153,281	$296,340
Northern anchovy	915,825	$272,464
Pacific mackerel	514,628	$36,216
Red sea urchin	375,121	$211,778
Spot prawn	227,378	$2,662,075
Warty sea cucumber	197,015	$492,420
White seabass	185,242	$511,694
California spiny lobster	183,381	$2,783,212
California halibut	170,453	$926,618
Unspecified rock crab	142,610	$241,697
Shortspine thornyhead	65,134	$254,642
Yellow rock crab	62,510	$82,682
Jack Mackerel	36,976	$2,933
Spider crab	33,296	$49,524
Total	132,588,855	$42,363,343

Source: CDFW Data for 2008-2013 from Commercial Landings reported in catch blocks 683-685, 706, 707, 726, 747, 748, 767, and 83.

The offshore route overlaps both the South and the Channel CRFS Sampling Districts (RecFin, 2016). In the South District, the top ten offshore recreational fish species landed (in terms of numbers of individual fish caught) are presented in Table 3.2-12. California scorpionfish were caught in the highest number by recreational fishermen, followed by Pacific sanddab, barred sandbass, vermilion rockfish, and bocaccio. Other commonly caught recreational species included chub (Pacific) mackerel, calico rockfish, rockfish genus, kelp bass, and Pacific barracuda (*Sphyraena argentea*). (RecFin, 2016)

In the Channel District, the top ten offshore recreational fish species landed (in terms of numbers of individual fish caught) are presented in Table 3.2-13. Vermilion rockfish were caught in the highest number by recreational fishermen, followed by bocaccio, Pacific sanddab, greenspotted rockfish, and rockfish genus (unspecified). Other commonly caught recreational species included copper rockfish, starry rockfish (*S. constellatus*), lingcod, speckled rockfish (*S. ovalis*) and brown rockfish (*S. auriculatus*). (RecFin, 2016)

Table 3.2-12 Top 10 Recreational Fish Species (Number of Fish) Landed by Recreational Anglers in CRFS South Sampling District Offshore Waters, 2008-2013

Species	2008	2009	2010	2011	2012	2013	Total
California Scorpionfish	136,582	151,355	173,353	233,326	331,932	407,259	1,433,807
Pacific Sanddab	93,148	114,437	237,579	315,665	259,356	326,488	1,346,673
Barred Sandbass	36,747	34,652	58,157	155,134	41,274	48,224	374,188
Vermilion Rockfish	12,223	19,686	27,864	59,938	111,245	72,000	302,955
Bocaccio	14,312	13,749	18,261	59,000	105,714	58,300	269,335
Chub (Pacific)	60,940	38,205	47,775	25,235	20,486	67,772	260,412
Calico Rockfish	405	2,181	3,359	51,826	198,806	2,409	258,986
Rockfish Genus	26,886	18,340	27,315	37,498	44,513	50,257	204,808
Kelp Bass	32,022	21,073	24,938	36,183	26,111	33,323	173,650
Pacific Barracuda	12,747	26,413	34,325	30,236	28,989	15,287	147,997
Total	604,659	639,598	783,220	1,307,931	1,487,153	1,463,514	6,286,075

Source: RecFIN (http://www.recfin.org/) for California Recreational Fisheries Survey (CRFS) data for South Sampling District (Los Angeles County south through San Diego County and San Nicolas, Santa Catalina, and San Clemente islands). Includes catches greater than 3 miles from shore.

Table 3.2-13 Top 10 Recreational Fish Species (Number of Fish) Landed by Recreational Anglers in CRFS Channel Sampling District Offshore Waters, 2008-2013

Species	2008	2009	2010	2011	2012	2013	Total
Vermilion Rockfish	11,327	6,803	27,278	24,843	19,778	27,462	117,492
Bocaccio	4,419	8,783	16,414	23,902	24,807	8,995	87,320
Pacific Sanddab	7,778	3,119	7,922	30,030	18,983	4,386	72,218
Greenspotted Rockfish	9,312	17,729	14,131	14,655	14,362	831	71,020
Rockfish Genus	3,932	1,416	12,039	15,974	6,771	14,880	55,011
Copper Rockfish	7,527	6,849	13,113	5,057	5,805	3,429	41,779
Starry Rockfish	4,252	5,354	7,060	5,135	3,888	2,398	28,087
Speckled Rockfish	3,042	4,757	10,232	2,806	1,935	1,459	24,230
Brown Rockfish	2,332	2,711	4,799	7	4,799	6,891	21,540
Flag Rockfish	2,184	2,921	3,463	3,489	3,604	1,580	17,239
Total	58,112	62,451	118,461	127,906	106,743	74,325	535,934

Source: RecFIN (http://www.recfin.org/) for California Recreational Fisheries Survey (CRFS) data for Channel Sampling District (Ventura to Santa Barbara and Santa Cruz, Santa Rosa, San Miguel islands). Includes catches greater than 3 miles from shore. Rank based on summed total for all years.

3.2.1.4 Marine Mammals and Special Status Species

Point Mugu

Sandy beaches within Point Mugu, including near the landing sites, are used as an occasional haulout area for individual pinnipeds, including juvenile elephant seals and California sea lions (Navy 2013). In addition, Pacific harbor seals regularly haul out at several locations within Mugu Lagoon, including intertidal mudflats within Mugu Lagoon's Central Basin, for resting, molting, and breeding, (NBVC

2013). Some beaches are used as haulout sites for resting; however, this is very uncommon. Peak counts at Mugu Lagoon have exceeded 500 individuals, representing about 1.46 percent of the seals hauling out along all California shorelines, including offshore rocks and islands (Carretta et al. 2011).

San Nicolas Island

Table 3.2-14 summarizes the seasonal use patterns of pinnipeds on SNI. Three species of pinniped are regularly observed in the vicinity of or onshore at SNI: California sea lion, northern elephant seal, and Pacific harbor seal (Figure 3.2-8). SNI and the surrounding waters provide important foraging, breeding, and haulout areas for these pinnipeds. Carretta (2009) reported a total of 754 harbor seals during May 2009, but the actual number of harbor seals using SNI is probably higher than annual counts because not all seals are detected onshore during any one aerial survey (NBVC 2010). Although no recently published information exists on the number of harbor seals at specific haulout sites on SNI, the total numbers of seals using the island have remained relatively stable between 2002 and 2009, with counts ranging from 584 in 2002 (an El Niño year) to 858 individuals in 2007 (Carretta et al. 2009). Harbor seal haulout sites are irregularly distributed on all shores of SNI with the exception of the northeast stretch.

Table 3.2-14 Seasonal Use Patterns of Pinnipeds on SNI

Species	*Nov*	*Dec*	*Jan*		*Mar*		*May*	*Jun*	*Jul*			
ELEPHANT SEAL	Adult Males											
	At sea		Breed		At sea				Molt		At sea	
	Adult Females											
	At sea		Breed/Pup/Nurse		At sea		Molt		At sea			
	Pups and Weaners											
	At sea			Hauled out			At sea					
HARBOR SEAL	At sea/Hauled out				Breed/Pup/Nurse			Molt	At sea/Hauled out			
CALIFORNIA SEA LION	Adult Males											
	At sea							Breed			At sea	
	Adult Females											
	At sea/Hauled out							Breed/Pup/Nurse			At sea/Hauled out	

Source: NBVC 2010.

Elephant seal haulouts exist along most of the southern, eastern, and western shores. Over the course of the year, more than 32,000 elephant seals may use SNI (Lowry 2002; Barlow et al. 1993), representing about 32 percent of the elephant seals hauling out along all California shorelines. SNI is the second largest elephant seal rookery and hauling ground in southern California.

California sea lions are known to haul out on many beaches along the SNI shoreline, including Coast Guard Beach. Since 2001 the SNI California sea lion population has remained stable between 43,000 and 57,000 individuals, with the exception of the 2002 El Niño year. Recorded pup production on SNI between 2003 and 2008 has consistently been reported between 25,000 and 29,000 individuals, which represents nearly 60 percent of the pups born into the population based on the carrying capacity developed by Carretta et al. (2009).

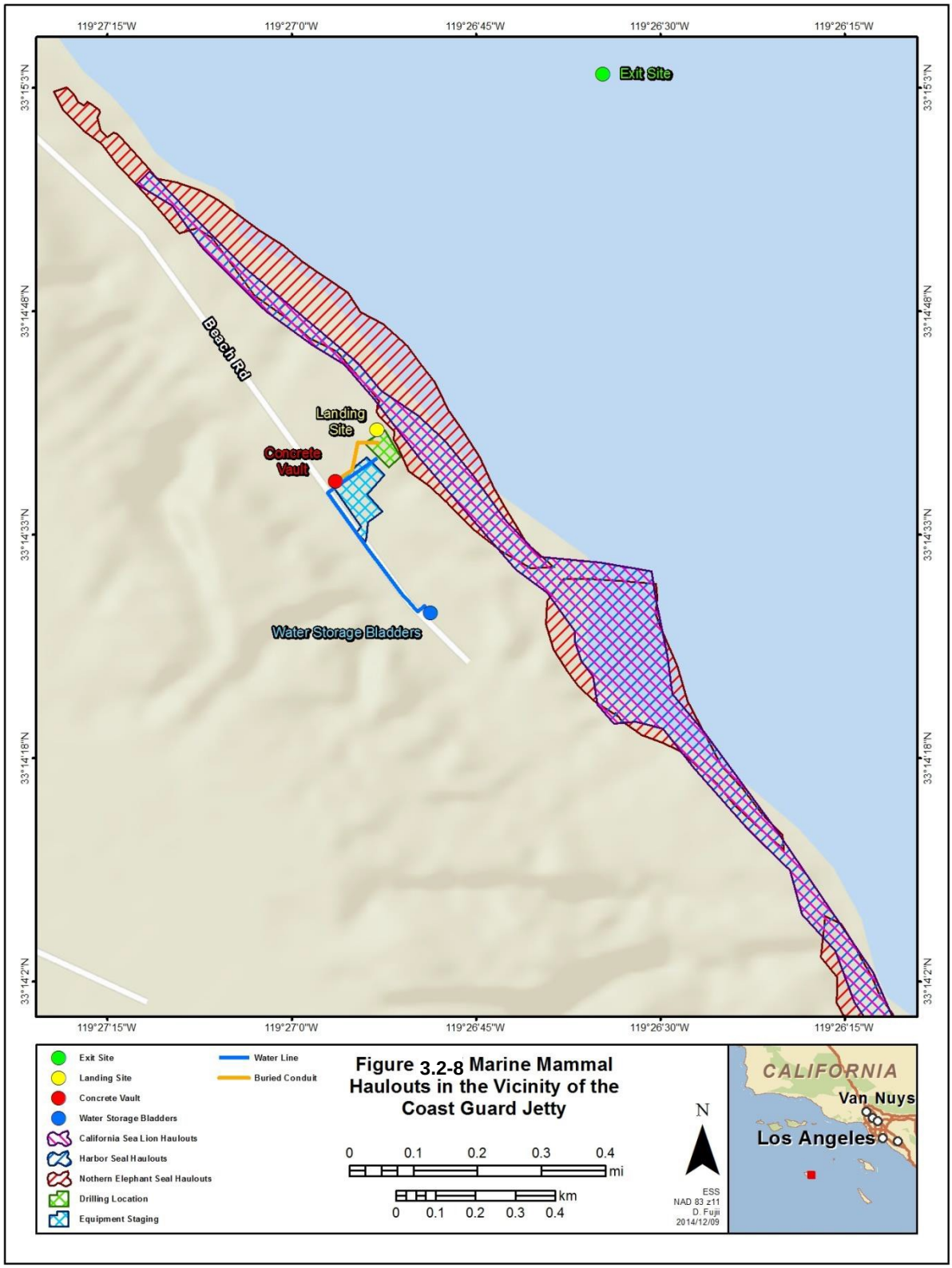

Figure 3.2-8 Marine Mammal Haulouts in the Vicinity of the Coast Guard Jetty

In 2000, SNI was the largest sea lion rookery in the U.S. with 24,167 pups counted (Lowry and Maravilla, 2005). Data collected at SNI over the past ten years suggests that the California sea lion population has leveled off indicating that the surrounding habitat may be approaching its carrying capacity (NBVC 2010). In addition to the three commonly sighted pinnipeds, the Northern fur seal (*Callorhinus ursinus*) and federally threatened Guadalupe fur seal (*Arctocephalus townsendi*) have, on rare occasions, been sighted on SNI (NBVC 2010). There are no known rookeries or haulout sites in California for the Guadalupe fur seal.

The southern sea otter (*Enhydra lutris nereis*) is a federally listed threatened species with the majority of its population occurring north of Point Conception, California. Between 1987 and 2011, USFWS conducted a translocation program governed by Public Law 99-625 and established a small translocated colony of southern sea otters at SNI (USFWS 2003). A total of 140 southern sea otters were relocated to the SNI colony. This program was disestablished in 2011 and the colony is now considered part of the federally threatened population.

As of 2015, population counts yielded a total of 95 individuals (Hatfield, Pers com.). Sea otters feed within kelp beds on various prey items including sea urchins, crabs, and abalone. Therefore, sea otter populations are primarily found in the extensive giant kelp beds located off the northern SNI shoreline, particularly around Rock Crusher (NBVC 2010).

Under the 2016 National Defense Authorization Act (NDAA), the NAVY is required to present a report every three years to Congress with information regarding Navy's management of southern sea otters within established Southern Sea Otter Military Readiness Areas off the coast of southern California. The 2017 Report includes information regarding the development of a comprehensive, multi-agency San Nicolas Island (SNI) Southern Sea Otter Monitoring and Research Plan (MRP), and the initial results from three surveys performed in 2017, which estimated the sea otter population size off SNI at 77 individuals, but that population could have been as low as 65 individuals and as high as 92, due to measurement variability (Navy 2017).

Kelp forests in the vicinity of SNI occupy a physically challenging environment and subsequently contribute significant quantities of wrack (drift algae that breaks off and disperses) throughout the subtidal marine environment. Drift algae is important because it provides food to abalone and other grazers that are limited in their ability to directly graze on the highly nutritional fronds of adult giant kelp plants located near the surface. Abalone, specifically red abalone (*Haliotis rufescens*), white abalone, and black abalone are species of special concern throughout their range because of protection status and historical value as commercial fisheries. Red abalone located in the nearshore waters surrounding SNI represent an important portion of the population located south of Point Conception and are the largest of all abalone species. (NBVC 2010).

White abalone were listed as an endangered species under the ESA in May 2001. White abalone are marine gastropods that grow slowly and have a lifespan of 30 years or more. Juvenile white abalone seek cover in rocky crevices and under rocks, while adults reside in low- to mid-relief rocky areas at the sand/rock interface. White abalone were historically found in waters ranging from 66 to 200 ft (20 to 61 m) but are now found in relatively deep waters ranging from 98 to 200 ft (30 to 61 m) (Butler et al. 2006). White abalone are herbivores that feed on drifting macroalgae and, therefore, are commonly found in association with the brown algae *Laminaria farlowii* and *Agarum fimbriatum* (Hobday and Tegner 2000; Lafferty 2001).

A habitat model for white abalone around SNI was prepared by NOAA using depth ranges and general substrate types as input parameters, but this effort did not include field survey to determine presence/absence of abalone. According to the results, white abalone habitat is most prevalent along the northern shores of SNI, with patches of suitable habitat located along the southern shores and corresponding closely to locations of kelp beds. No white abalone were observed by Pinkard-Meier and Butler (2008) in a 2.5-acre (1-ha) search area during an ROV survey at SNI. Surveys were limited in coverage due to poor weather conditions and ongoing military operations (Pinkard-Meier and Butler 2008).

Black abalone were listed in 2009 as an endangered species (NMFS 2008b, 2009). In the final rule designating critical habitat for the species, SNI was excluded from critical habitat under ESA Section 4(a)(3) based on conservation benefits provided by the revised INRMP (NMFS 2011). Similar to white abalone, black abalone are relatively slow-growing, long-lived marine gastropods with a flattened shell, reaching a diameter of about 4 in (10 cm) at 4-8 years, and growing more slowly thereafter (NMFS 2008b). Black abalone occur primarily in the intertidal zone, but are found to a water depth of 20 ft (6 m) and where exposed bedrock provides a complex surface with ample crevices in which the animals find refuge from predators and exposure at low tides (NMFS 2008b).

The most extensive and rigorous long-term data on the abundance of black abalone come from SNI and have been collected by G. VanBlaricom of the U.S. Geological Survey and University of Washington. Surveys in the intertidal and shallow subtidal habitats on all sides of SNI have been conducted for more than 30 years (VanBlaricom 1993, 2007; G. VanBlaricom, U.S. Geological Survey and University of Washington, unpublished data). The sites with highest densities, on the order of $1/m^2$, are located on the southern shores of SNI. These data show that black abalone populations on SNI have been increasing for more than a decade.

Santa Cruz Island

The Channel Islands and surrounding waters support a great diversity of marine mammals, including whales, pinnipeds, and otters. In general, the abundance and distribution of marine mammals is an indication of the general heath and ecological integrity of the marine ecosystems of the CINMS (ONMS 2009). The CINMS provides vital habitat for pinnipeds, offering important feeding areas, breeding sites, and haulouts. Although six species of pinnipeds, northern fur seal, Guadalupe fur seal, northern elephant seals, Pacific harbor seal, Steller sea lion (*Eumetopias jubatus*), and California sea lion have historically occurred in the northern Channel Islands, the most common pinniped in the region is the California sea lion. No pinniped haulout areas are located at or near the proposed landing site. Both black and white abalone are found in rocky habitats surrounding SCrI.

Special Status Species Associated with the Offshore Routes

Marine mammals reported within the Santa Barbara Channel are represented by more than 40 species, all of which are protected under the MMPA; these include 34 species of cetaceans (whales, dolphins and porpoises) and six species of pinnipeds (seals and sea lions) (Carretta et al. 2005; Leatherwood et al. 1982 and 1987; Leatherwood and Reeves 1983; Reeves et al.1992; and County of Santa Barbara 2011). As discussed above, the southern sea otter is also found in the waters surrounding SNI. Six species of cetaceans are federally listed as endangered, while two species of pinnipeds and the southern sea otter are listed as threatened under the federal ESA.

Although a total of eight species of baleen whales occur in the Southern California Bight (SCB) (Carretta

et al. 2005; Leatherwood et al. 1982 and 1987; Leatherwood and Reeves 1983), including along the proposed offshore route, only four species, the California gray whale (*Eschrichtius robustus*), the humpback whale (*Megaptera novaeangliae*), the blue whale (*Balaeoptera musculus*), and the fin whale (*B. physalus*) (Dohl et al. 1983; Carretta et al. 2005) are commonly sighted. In addition, several dolphin and porpoise species are commonly observed in offshore areas along the proposed cable route, including long-beaked common dolphin (*Delphinus capensis*), short-beaked common dolphin (*D. delphis*), bottlenose dolphin (*Tursiops truncatus*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), Northern right whale dolphin (*Lissodelphis borealis*), and Risso's dolphin (*Grampus griseus*) (ONMS 5 2009).

Four pinniped species are year-round residents in offshore areas of the Santa Barbara Channel, including sea lions, northern fur seals, harbor seals, and northern elephant seals. California sea lions are the most abundant pinnipeds off the shore of California and have their highest densities throughout the year in the Santa Barbara Channel, near the northern Channel Islands. Harbor seals also haul out along the mainland shore of the Santa Barbara Channel, and forage relatively close to shore, remaining within 6.2 mi (10 km) of the shoreline 75 percent of the time (MMS 2001).

3.2.2 Environmental Consequences

3.2.2.1 Assessment Criteria

The factors used to assess the significance of impacts to biological resources include the extent or degree to which implementation of an alternative would result in: 1) substantial loss or degradation of sensitive habitats; or 2) adversely affect a species listed as threatened or endangered by the USFWS or NMFS or protected under the MMPA. This section discusses potential impacts of proposed cable route installation and operation to marine and terrestrial biological resources. Potential impacts to commercial and recreational fisheries are also addressed.

3.2.2.2 Alternative 1 – Preferred Alternative

Terrestrial Vegetation Communities

Point Mugu

The Building 811 and Charlie Pad drillings site would be located within previously disturbed areas devoid of vegetation. The drilling and trenching activities would be conducted in a manner to minimize the impact on vegetation in the vicinity of construction activities. All project vehicles and equipment would be restricted to previously disturbed or graded surfaces. No work will begin in an area adjacent to wetlands until the wetlands have been flagged and all personnel working in the site have had NBVC biologists review appropriate BMPs for the site.

Prior to construction activities, the project sites will be surveyed for invasive weeds and the appropriate treatments will be conducted. The project sites would include the HDD sites, equipment staging areas, and road shoulders disturbed by trenching activities. Once FOCUS-II installation is complete, a second round of invasive weed treatment will be conducted three weeks after the first rain of the subsequent rainy season. Invasive plant species will not be considered as a ground stabilization measure necessary to close out the general construction permit. Therefore, revegetation of areas of ground disturbance may be required.

Trenching between the project sites and existing manhole infrastructure would be conducted in previously

disturbed areas along existing roadways. Soils excavated during the trenching operations would be kept in previously disturbed areas, minimizing impacts to adjacent wetlands. Therefore, implementation of Alternative 1 would have no significant impact on Point Mugu terrestrial vegetation communities.

San Nicolas Island

The drilling site, staging area, and trenching corridor connecting the landing site to the concrete vault would be situated within previously disturbed areas with sparse vegetation. The 5-inch fire hose connecting the HDD site to the water storage area would follow existing road shoulders. All project vehicles and equipment would be restricted to previously disturbed or graded surfaces. In addition, no sensitive vegetation communities have been identified within the vicinity of the proposed sites. To reduce the potential introduction of ecologically harmful non-native flora or fauna, all barge and aircraft shipments to SNI will be conducted in accordance with NBVC Instruction 5090.14, *Biological Resources Security Requirements for Air and Barge Transport of All Cargo to San Nicolas Island, Naval Base Ventura County*. Specific biosecurity measures are described in the conservation measures to be implemented (see Section 2.1.3).

Prior to construction activities, the project sites will be surveyed for invasive weeds and the appropriate treatments will be conducted. The project sites would include the HDD sites, equipment staging areas, and road shoulders disturbed by trenching activities. Once FOCUS-II installation is complete, a second round of invasive weed treatment will be conducted three weeks after the first rain of the subsequent rainy season. Invasive plant species will not be considered as a ground stabilization measure necessary to close out the general construction permit. Therefore, revegetation of areas of ground disturbance may be required. Through the application of these conservation measures, implementation of Alternative 1 would have no significant impact SNI terrestrial vegetation communities.

Santa Cruz Island

The drilling site, staging areas, and trenching corridor connecting the landing site to Building 4 would be situated within previously disturbed areas devoid of vegetation. The above ground elevated channel would follow a path along previously undisturbed oak woodland and grassland. All project vehicles and equipment would be restricted to previously disturbed or graded surfaces. Elevated cable channel support stakes would be installed by hand or using hand-held power tools and no heavy equipment or vehicles. In addition, box bedstraw, bush mallow, and rush-rose have not been identified within the vicinity of the proposed sites. As discussed above erosion control barriers will be placed along Navy Road and offroad work areas and, prior to construction, biologists will survey work areas and mark any sensitive populations to ensure there is no take. Soils excavated during trenching operations would be kept within the Navy Road footprint, minimizing impacts to the Prisoners Harbor wetlands (See Section 2.1.3 Conservation Measures). To reduce the potential introduction of ecologically harmful non-native flora or fauna, all barge and aircraft shipments to SCrI will be conducted in accordance with CINP Biosecurity Protocols (NPS 2014). Specific biosecurity measures are described in the conservation measures to be implemented (see Section 2.1.3).

Prior to construction activities, the project sites will be surveyed for invasive weeds and the appropriate treatments will be conducted. Once FOCUS-II installation is complete, a second round of invasive weed treatment will be conducted three weeks after the first rain of the subsequent rainy season. Invasive plant species will not be considered as a ground stabilization measure necessary to close out the general construction permit. Therefore, revegetation of areas of ground disturbance may be required. Through the

application of these conservation measures, implementation of Alternative 1 would have no significant impact on SCrI terrestrial vegetation.

Terrestrial Wildlife

Terrestrial wildlife, particularly mammals and birds, may be temporarily displaced to nearby areas by noise or visual stimuli associated with project activities, particularly heavy equipment use associated with the drilling process. However, Point Mugu and SNI are currently utilized for various military training activities and Alternative 1 would not significantly increase the overall intensity of activities presently conducted in the area. The project areas on SCrI are located on areas of relatively high vehicle traffic. Furthermore, any disturbance would be highly localized and temporary. Moreover, mammals and birds are highly mobile organisms and are not dependent solely upon the project area. For these reasons, project activities are not expected to lead to substantial disruption of important nesting, resting, or foraging activities and no significant impact on the abundance or distribution of mammals or birds is anticipated. Therefore, implementation of Alternative 1 would have no impact on Point Mugu, SNI, or SCrI wildlife communities.

Terrestrial Special Status Species

Point Mugu

Salt Marsh Bird's Beak – Primary suitable habitat for salt marsh bird's beak on NBVC Point Mugu occurs on the eastern and western arms of Mugu Lagoon. Specific salt marsh bird's beak populations have been identified outside the Building 811 site area and east of the Charlie Pad site. A qualified biologist will survey the proposed ground disturbance areas at the Building 811 and Charlie Pad sites to confirm that the salt marsh bird's beak is not present at the time of construction operations. All other FOCUS-II project activities at Point Mugu would occur on previously disturbed areas. Furthermore, all project personnel, vehicles, and equipment would remain on previously constructed or graded surfaces to the fullest extent possible. Therefore, implementation of Alternative 1 would have no effect on salt marsh bird's beak or its habitat.

Ridgway's Rail – Both Building 811 and Charlie Pad are distant from known populations of Ridgway's rail and activities are not anticipated to impact the species. In addition, by implementing the conservation measures included as part of the proposed action (see Section 2.1.3), HDD and other activities that could disturb a nesting Ridgway's rail would not occur during nesting season. Given the background of prevailing activities, the proposed activities are not expected to have effects on foraging or resting by Ridgway's rails. As such, implementation of Alternative 1 would have no effect on Ridgway's rails.

California Least Tern – Least terns are generally present at nesting areas on the western and eastern arms of the Mugu Lagoon barrier beach between mid-April and late August. Nesting and foraging behavior of least terns can be affected by human activity (USFWS 2006). By implementing the seasonal conservation measures included as part of the proposed action (see Section 2.1.3), HDD and other activities associated with the proposed action would not occur while least terns are present at Point Mugu. Therefore, the proposed action would have no effect on least terns.

Western Snowy Plover –The western snowy plover is a year-round resident on the coast of California. Plovers are sensitive to nest and habitat disturbances. Nesting and foraging behavior of snowy plovers can

be affected by noise and human activity (Lafferty 2001; USFWS 2007). By implementing the conservation measures included as part of the proposed action (see Section 2.1.3), HDD and other activities that could disturb a nesting snowy plover would not occur during nesting season.

The HDD sites on Point Mugu are far enough away from a wrack line where plovers normally roost, so no effects to western snowy plover would be expected. Furthermore, construction crews would not be allowed on the NBVC Point Mugu beach areas. Therefore, implementation of Alternative 1 would have no effect on western snowy plovers.

San Nicolas Island

Western Snowy Plover – The proposed conservation measures (see Section 2.1.3) would require that all activity occur outside of the nesting season. No beach access is required to conduct the HDD activities or installation of cables. Therefore, implementation of Alternative 1 would have no effect on SNI western snowy plovers.

Island Night Lizard – Island night lizards are no longer listed, but are part of an active post-delisting monitoring program and are thus discussed here. High density populations of island night lizard are known to exist in the vicinity of the water bladders and adjacent to the equipment staging area. A survey of the water bladder area would be conducted within seven days prior to use of the water bladders. Additionally, the equipment staging area would be surveyed within seven days of ground disturbance for shrubs that could provide habitat for the island night lizard. Therefore, implementation of Alternative 1 would have no significant impact on island night lizards.

San Nicolas Island Fox – The construction noise and increased human activity could temporarily displace San Nicolas Island foxes from the construction areas. Following the completion of daily construction activities, the inquisitive San Nicolas Island foxes may enter the construction areas. Considering this, conservation measures would be implemented, providing protection to the San Nicolas Island fox. These conservation measures would include daily trash and rubbish removal; securely sealing all trash receptacles; covering pits deep enough to trap foxes; and capping all pipe ends from 2 to 6 inches (5 to 15 cm) in diameter. Construction personnel would not be allowed outside of previously disturbed areas over the duration of proposed drilling and trenching activities. A full list of conservation measures is provided in Section 2.1.3. Therefore, implementation of Alternative 1 would have no significant impact on San Nicolas Island fox.

Santa Cruz Island

Bald Eagle – Noise from construction activities associated with Alternative 1 may generate avoidance reactions by bald eagles at SCrI. However, the construction activities would be located within areas of existing human activity and would be short-term. Though the immediate project area is situated within normal bald eagle foraging areas, equally valuable foraging area is located farther north along the Cañada del Puerto. Considering this, the construction activity would not affect the long term foraging behavior of bald eagles at SCrI. Therefore, implementation of Alternative 1 would have no significant impact on SCrI bald eagles.

Santa Cruz Island Fox – The construction noise and increased human activity may temporarily displace Santa Cruz Island foxes from the construction areas, but this is similar to existing activities and displacement regularly occurring in the area. Following the completion of daily construction activities,

the inquisitive Santa Cruz Island foxes may enter the construction areas. Considering this, conservation measures would be implemented, providing protection to the Santa Cruz Island fox. These conservation measures would include daily trash and rubbish removal; securely sealing all trash receptacles; covering pits deep enough to trap foxes; and capping all pipe ends from 2 to 6 inches (5 to 15 cm) in diameter. Construction personnel would not be allowed outside of previously disturbed areas over the duration of proposed drilling, trenching, and elevated channel installation activities. A full list of conservation measures is provided in Section 2.1.3. Therefore, implementation of Alternative 1 would have no effect on the Santa Cruz Island fox.

Marine Habitats

HDD technology would be used to install the cable beneath the sandy beach and out to approximately 85 ft (26 m) water depth. This technology would avoid (go under) all sensitive nearshore habitats and not significantly impact biological resources in these areas. Drilling fluid releases during HDD activities at the landing and exit sites are unlikely and, if they do occur, would not cause significant impacts to nearshore organisms. This is because of the naturally high dispersion these fluids would experience in this dynamic environment, thereby precluding significant effects from temporary increases in turbidity (e.g., clogging of invertebrate or fish feeding structures or burial) and the lack of significant toxicity of this material. BMPs such as HDD Installation Monitoring will help prevent an accidental discharge into the marine environment.

Impacts to soft sediments where the cable is plowed into the bottom will temporarily be disturbed, but will return to pre-burial conditions almost immediately. The main impact associated with cable installation relates to the physical disturbance of seabed and the subsequent creation of a temporary sediment plume. These impacts are, however, localized in nature and are generally short-term with the seabed usually returning to its original state. When compared with the area affected by other activities (e.g., trawl fisheries), the spatial extent of cable installation is very small (Berr, 2008). In locations where existing cables do not bury, the benthic community on the cables is equal to surrounding communities and often the cable becomes so overgrown that it is indiscernible from surrounding substrate. Kogan, et al. (2006) found that the Acoustic Thermometry of Ocean Climate/Pioneer Seamount (ATOC) cable offshore Pillar Point, California, where exposed, "functions as a colonization surface similar to outcrops and isolated rocks." No significant differences to marine habitats were found in this study (Kogan, et al. 2006). Therefore, implementation of Alternative 1 would have no significant impact on marine habitats and would yield no significant harm to marine habitats within the U.S. EEZ as defined by EO 12114.

Marine Vegetation

Eelgrass and other marine vegetation will not be affected by the proposed project because HDD technology will be used to install the cable offshore and underneath eelgrass beds located in shallow waters at the proposed landing site (Figure 3.2-6, above). Therefore, implementation of Alternative 1 would have no significant impact on marine vegetation such as eelgrass beds.

Invertebrates

Some impacts (e.g., burial, crushing, and/or displacement) would occur to invertebrates in both hard-bottom and soft-bottom areas as a result of cable-laying activities. The significance of the impact depends

on the relative area of disturbance compared to the overall habitat and community, either locally or regionally, and the type of species that may be impacted.

Hard-bottom habitats are anticipated to be limited along the cable route and seafloor mapping will confirm a final route that avoids these habitats to the maximum extent possible. In general, potential impacts from cable installation would not cause significant impacts to sensitive species (as defined) in any unavoidable hard-bottom areas due to the expected low abundance of these organisms along the offshore route, especially since habitat and/or environmental conditions favoring substantial populations of these species do not appear to occur within the potential limited hard-bottom areas along the cable route corridor.

Furthermore, none of these species is recognized as biologically significant in local, state or federal policies, statutes or regulations. The predominant (i.e., non-sensitive) species in these limited hard-bottom habitats are mostly very low profile (e.g., one inch or less) and/or sturdy species such as cup corals and encrusting or turf forms, while species on the soft-bottom habitat are relatively mobile, such as seastars, sea cucumbers, and fishes. Cable laying on these species would have only a temporary and localized scale of disturbance (likely a few inches) and would be inconsequential given the common occurrence of these species throughout these habitats. In the ATOC cable study, no tests evaluating the overall effect of the cable were statistically significant. Actinarians (sea anemones) colonized the ATOC cable when it was exposed on the seafloor, and were therefore generally more abundant on the cable than in surrounding, sediment-dominated seafloor habitats (Kogan, et al. 2006). Therefore, implementation of Alternative 1 would have no significant impact on marine invertebrate populations or habitats and would yield no significant harm to invertebrate populations or habitats within the U.S. EEZ as defined by EO 12114.

Fishes

Temporary displacement of some fishes from the immediate vicinity (e.g., tens of feet) of the cable route would occur during short-term passage of cable installation equipment. These fishes are anticipated to return almost immediately to normal behaviors following the passage of the equipment. In addition, suspended solids are expected in a plume resulting from cable burial by the seaplow and would vary depending on the type of sediment and bottom currents that would serve to transport and disperse the material following the disturbance. Potential impacts to soft-bottom species from turbidity would be localized and short term, with temporary (e.g., hours) and localized (occurring over a very discrete area) impacts. Once the cable is buried by the plow, or settles onto the bottom in deep water, the soft sediment would rapidly return to a normal state. In the ATOC cable study, some fishes were more abundant (not statistically significant) near the cable, apparently due to the higher habitat complexity provided by the cable (Kogan, et al. 2006). Therefore, implementation of Alternative 1 would have no significant impact on fish populations or habitats and would yield no significant harm to fish populations or habitats within the U.S. EEZ as defined by EO 12114.

Commercial and Recreational Fisheries

Types of commercial fishing gear used in the vicinity of the landing sites or offshore route include drift gillnets, longline gear, troll gear, trawls, seining, and traps or pots. As described above, pelagic species are commercially caught in the highest abundances, including market squid, Pacific sardine, northern anchovy, and Pacific mackerel. Commercial and recreational fishing is limited in the vicinity of the

landing sites. Some short-term and temporary impacts on commercial or recreational fisheries could occur from preclusion of fishing during cable installation, operation, repair, and removal activities from the proposed project. The presence of the cable installation vessel and equipment could preclude fishing within a limited area (~1 mi; ~1.6 km) for a temporary period (a few hours to several days based on location). However, advance notice would be given to fishing vessels, via Notice to Mariners, to alert them to the cable installation activities. In addition, commercial fisheries that use equipment that contacts the bottom (e.g., otter trawls) could potentially snag unburied portions of the cable, causing damage to or loss of their fishing gear, or damage to the cable. Otter doors during a "typical" trawl may penetrate the seafloor between 1-2 inches (3-5 cm) when fishing properly or up to 1.6 ft (0.5 m) if doors become buried or fall on their side. The cable is expected to be buried three feet (1 m) below the surface in soft-bottom areas to a water depth of 3,280 ft (1,000 m), so interaction with bottom-fishing gear is not expected. Recreational fishing is limited in the vicinity of the landing sites and along the offshore routes. Recreational anglers would be able to fish in other areas during cable installation. Therefore, implementation of Alternative 1 would have no significant impact on commercial or recreational fishing and would yield no significant harm to commercial and recreational fisheries within the U.S. EEZ as defined by EO 12114.

Essential Fish Habitat

The use of HDD technology will place the fiber optic cable below sensitive habitats between the shoreline and the exit point for the borehole. These distances are sufficiently offshore to avoid all nearshore kelp beds. In addition, the barge landing site used to offload cable installation equipment and supplies on SCrI would follow existing landing routes and would not cause any new impacts on existing eelgrass beds. Based on the best available data, no sensitive plants or habitats occur along the offshore sea route. Additional mapping by the Navy determined the probable areas of hard bottom habitat within the project area and adjusted the route to avoid the maximum amount of predicted hard bottom habitat. During cable installation, the cable ship would not work within any kelp beds. Kelp and seagrasses are not anticipated to be encountered in the cable area, thus precluding any significant impacts or need for mitigation. Shallow-water route surveys have already been conducted in the vicinity of the bore exit points by divers to confirm the presence or absence of kelp beds or other sensitive habitats in those regions (Navy 2003, Ugoretz 2014).

Most of the offshore cable route (~93 percent) occurs over soft bottom where groundfish populations would not be affected. The burial of the cable in waters less than 3,280 ft (1,000 m) deep would not significantly impact groundfish due to the temporary and localized nature of cable installation operations.

Given the broad definition of EFH for groundfish, the entire offshore project area falls within the EFH boundary. There are no estuaries in the proposed project area and canopy kelp is absent in depths greater than 85 ft (26 m) in any of the exit point locations. Seagrass is present nearby the SCrI HDD exit point, though the closest bed is approximately 400 ft (330 m) inshore of the HDD exit point. Rocky substrate will be avoided, though the potential exists to cross limited rocky outcroppings in deeper water. The proposed project area includes portions of the Cowcod Conservation Area, though not those designated as areas of interest by NMFS (Figure 3.2-9). The cable route north of SCrI will likely cross the offshore portion of one of the areas specified in the Federal waters of the CINMS.

The following non-fishing activities have been determined by PFMC as having a potential to impact groundfish EFH: point source discharge; fish processing waste-shoreside and vessel operation; water intake structures/discharge plumes; oil/gas exploration/development/production; habitat restoration/ enhancement; and marine mining. Of these, only water intake structures would be included in the proposed action as a component of the temporary use of seawater in the HDD at SCrI. The groundfish FMP indicates that, in order to avoid such impacts, intake structures should be designed to minimize entrainment or impingement. Velocity caps that reduce horizontal intake currents should be employed and intake velocities across the intake screen should not exceed 0.5 foot per second. These measures will be employed for the HDD seawater intake at SCrI.

The entire proposed offshore project area is included in the CPS EFH definition. It is unlikely, however, that cable-laying activities would have any lasting impacts on CPS species, their spawning, or feeding. If any disruption did occur, it would be temporary and reversible. Commercial fishing for these species would not be altered by the project, because CPS are found and taken by gear that does not interact with bottom habitats (i.e., seines).

The following non-fishing activities have been determined by PFMC as having a potential to impact CPS EFH: dredging, fills/dredge material disposal, oil/gas exploration/production, water intake structures, aquaculture, wastewater discharge, discharge of oil or release of hazardous substances, and coastal development. Of these, only water intake structures would be included in the proposed action as a component of the temporary use of seawater in the HDD at SCrI. The CPS FMP indicates that, in order to avoid such impacts "All intake structures should be designed to minimize entrainment or impingement of prey species…" (PFMC 2011a). As described above, the temporary intake at SCrI will be low-flow rate and screened. Figure 3.2-9 provides an overview of the offshore cable alignments with respect to offshore protected areas.

Based on the individual HMS species EFH definitions, HMS EFH could include many areas within the proposed project area, if not the entire proposed project area. As with CPS, however, it is unlikely that cable-laying activities would have any lasting impacts on HMS species, their spawning, or feeding or fishing activities for these species. If any disruption did occur, it would be temporary and reversible. Therefore, implementation of the project or its alternatives would have minimal and only temporary effects on EFH for HMS species. Environmentally sound engineering practices would be used during cable installation and operating activities to minimize the influence of the cable on EFH.

The Navy consulted with NMFS regarding potential impacts to EFH per requirements in §305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA; 16 U.S.C. 1855(b)). (Appendix C.1). This consultation included classification of benthic habitat along the potential routes of the FOCUS II cable. The overall methodology for classifying the benthos uses Slope Position Index and Rugosity (surface area variations). The bathymetric data for this analysis were collected in a May 2016 hydrographic survey conducted specifically for the FOCUS II cable-laying project. The bathymetric data was processed using hydrographic data cleaning system software. It should be noted that the hydrographic survey model is conservative in its assessment of the possible presence of either rock substrate or coarse sediment on the ocean floor. For example, during the 2003 San Nicolas Island FOCUS Cable repair effort, the Navy took grab samples of the ocean floor material to validate the sonar predictions and confirmed that the sonar images reflected coarse sediments and not rocky substrate as previously modeled. It is possible that the small amount of potential hard bottom may not actually be hard

bottom.

The completed benthic analysis of cable routes A, B, C and D covers the full length of the cable route and classifies the data into six (6) benthic classifications; "Valley / Crevice", "Lower Slope", "Flat / Plain", "Middle Slope", "Upper Slope" and "Peak / Ridge". In this analysis "hard bottom" is defined as "Valley / Crevice" and "Peak Ridges". Unburied cable has an impact of 1/2 the circumference of the cable. The three different cable diameters used throughout the routes are 0.0224 meters, 0.00289 meters and 0.00359 meters. The various cable lengths at these diameters are calculated accordingly.

The amount of EFH impacted for each cable route was calculated for the total length of cable touching the hard bottom, the total surface area of cable touching hard bottom (to include impacts from cable burial), percentage of total route touching hard bottom and the percentage of the total survey area that touches hard bottom. The results for each route are as follows:

Cable A:
1. Total length of cable to touch hard bottom: 4457.1-m
2. Total surface area of cable to touch hard bottom: 1466.99- m^2
3. 3.86 % of total cable route will touch hard bottom
4. 0.000084% of the total survey area/GIS polygon will touch hard bottom

Cable B:
1. Total length of cable to touch hard bottom: 6331.6-m.
2. Total surface area of cable to touch hard bottom: 1920.1-m^2
3. 5.48 % of total cable route that touches hard bottom.
4. 0.000111% of the total survey area/GIS polygon will touch hard bottom

Cable C:
1. Total length of cable to touch hard bottom: 805.73-m
2. Total surface area of cable to touch hard bottom: 45.21- m^2
3. 1.38% of total cable route that touches hard bottom
4. 0.00000262% of the total survey area/GIS polygon will touch hard bottom

Cable D:
1. Total length of cable touching hard bottom: 4,384.82-m
2. Total surface area of cable touching hard bottom: 201.70- m^2
3. 3.02% of total cable route that touches hard bottom
4. 0.000011% of the total survey area/GIS polygon will touch hard bottom

The results of the benthic analysis were used to determine where the FOCUS cable project has potential to cross small rocky outcroppings considered EFH and allowed for slight route adjustments in pivotal areas to avoid potential hard bottom habitat. The anticipated reduction in quality of habitat associated with the placement of the fiber optic cables is not significant. The cable route also avoids the live hard bottom community locations identified previously by the National Oceanic and Atmospheric Administration (Appendix C.1).

NMFS has determined that the Navy satisfactorily implemented the Conservation Recommendations it made in the EFH consultation. Based on Navy commitments to implement a range of Conservation Recommendations, NMFS concluded that the Navy EFH consultation was complete. These Conservation Recommendations include the following efforts on and around SNI:

- Continue supporting USGS Black Abalone surveys at nine sites throughout SNI, an on-going effort designed specifically to survey black abalone populations at SNI. This effort was originally established 37 years ago in conjunction with the introduction of the experimental otter population.
- Continue supporting USGS rocky intertidal surveys documenting changes in the rocky intertidal ecosystem for 37 years and complementing the USGS Black Abalone survey.
- Continue supporting CDFW Black Abalone surveys, continuing to add to a 25 year dataset.Continue participation in the Multi-Agency Rocky Intertidal Network (MARINe) survey, a 2 year dataset. MARINe is a partnership of agencies, universities and private groups committed to determining the health of the rocky intertidal habitat and providing this information to the public.
- Continue supporting USGS subtidal surveys, adding to a 37 year dataset of subtidal rocky bottom habitat and associated ecosystem changes. Continue working with USGS and USFWS to support a 27 year old southern sea otter monitoring program for translocated sea otter population and monitor associated rocky bottom habitat.
- Continue conducting an annual aerial kelp forest survey to determine health of the kelp forest canopy.
- Finally, the Navy will add a component to the subtidal surveys to assess the full abundance and distribution of invasive algae and black abalone in the subtidal zone. An island-wide accounting will be crucial to understand the interplay between competing algal species, their response to sea urchin herbivory, and the potential impacts to this rocky bottom habitat ecosystem.

The potential for impact to EFH has been reduced by the Navy's benthic habitat mapping, analysis, and routing efforts. Implementation of Alternative 1 would not have a significant impact on EFH species or habitats and would yield no significant harm to EFH species or habitats within the U.S. EEZ as defined by EO 12114. Assuming the aforementioned efforts proceed as planned, NMFS considers the Conservation Recommendation provided for the Navy FOCUS EFH Consultation to have been accepted and satisfactorily implemented by the Navy (Appendix C.1).

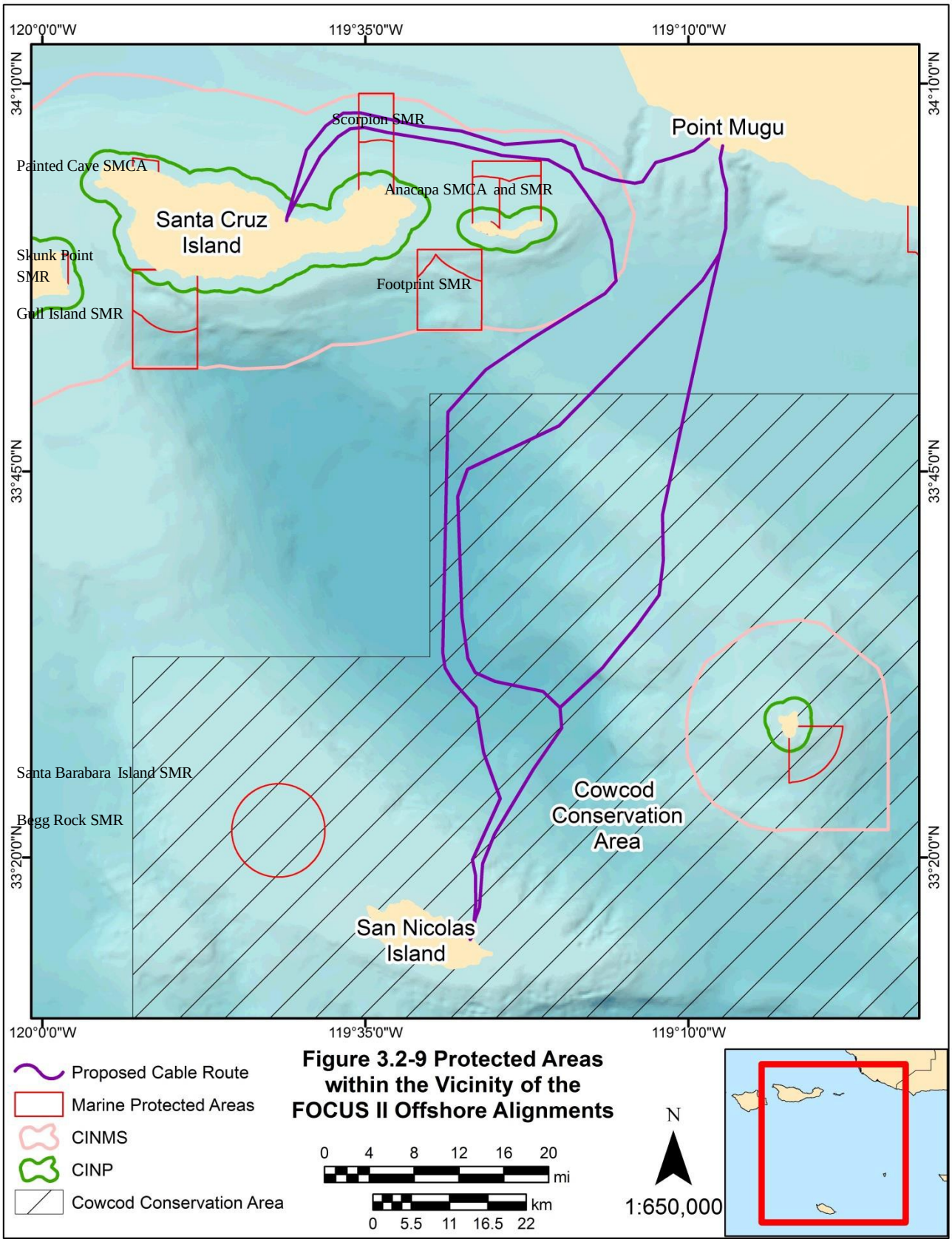

Figure 3.2-9 Protected Areas within the Vicinity of the FOCUS II Offshore Alignments

Marine Mammals and Special Status Species

Drilling activities would occur during the non-breeding season for all pinnipeds potentially present in the project area, so noise from the HDD operation would not impact these communities in the vicinity of the project sites. As provided in 2.1.3, conservation measures would require that all HDD and onshore construction activities on SNI occur between September 15 and December 15, outside sensitive bird breeding and nesting periods as well as marine mammal breeding seasons. Given the distance between the SNI sea otter populations and the project sites, the proposed action would have no effect on sea otters on SNI. As provided in 2.1.3, conservation measures would require that all HDD and onshore construction activities on SCrI occur between October 16th and December 15, to also avoid known seasonal presence of endangered blue and fin whales and threatened humpback whales in the boundary of the Channel Islands National Marine Sanctuary.

No population of a special status species (threatened, endangered, or regulated) would be affected due to the general avoidance of these resources by the sea route and/or low abundance of these organisms in the general vicinity. Moreover, there would be no significant disruption in the migration route of fish or wildlife. This is because the cable installation phase would last only minutes to hours (sea route) to a few days (landing sites) in any one location and would not cause disruption substantially different from normal ship traffic (e.g., noise) through the area. Similarly, the long-term occurrence of the cable on the bottom would not significantly impede migration since it would be buried along most (93 percent) of the route and represent a very low profile (e.g., one to several inches) in hard-bottom areas as a result of careful installation and post-lay inspection/adjustment of the cable in these areas.

While both black and white abalone are found in the waters surrounding SCrI, black abalone are only found in rocky intertidal habitats and white abalone are found in deep rocky habitats that will not be affected by the proposed actions. Black and white abalone habitats would be avoided by cable laying and HDD activities. No white or black abalone have been found at any of the HDD drill sites and deeper rocky habitat will be mapped and avoided. Therefore, implementation of Alternative 1 will have no effect on black or white abalone.

For the reasons described above and with implementation of the proposed conservation measures, implementation of Alternative 1 would have no significant impacts on marine mammal or marine special status species and would yield no significant harm to marine mammal or marine special status species within the U.S. EEZ as defined by EO 12114. Implementation of Alternative 1 would also not result in takes under the MMPA.

Mitigation Measures

The increase in noise levels associated with Alternative 1 construction activities would potentially affect wildlife, including threatened and endangered species at Point Mugu, SNI, and SCrI. Through implementation of conservation measures (see Section 2.1.3), there would be no affect to listed species and no significant impact to wildlife species at Point Mugu, SNI, or SCrI. Therefore implementation of Alternative 1 would have no significant impacts on wildlife and vegetative species, including threatened and endangered species and would yield no significant harm to marine mammal or marine special status species within the U.S. EEZ as defined by EO 12114. As no significant impacts to wildlife and vegetative species are anticipated, no mitigation measures are proposed or required.

3.2.2.3 Alternative 2

Under Alternative 2, construction activities at NBVC Point Mugu and NBVC SNI would be identical to those analyzed under Alternative 1. On SCrI, the elevated cable channel installed between the well site and Navy Road would follow the road bed and no work would be performed in previously undisturbed habitat for its installation. This alternative would have the same four offshore cable routes analyzed in Alternative 1. Therefore implementation of Alternative 2 would have no significant impacts on wildlife and vegetative species, including threatened and endangered species and would yield no significant harm to marine mammal or marine special status species within the U.S. EEZ as defined by EO 12114. Implementation of Alternative 2 would also not result in takes under the MMPA.

3.2.2.4 Alternative 3

Under Alternative 3, construction activities at NBVC Point Mugu and NBVC SNI would be identical to those analyzed under Alternative 1. On SCrI, there would be no elevated cable channel installed between the well site and Navy Road, as the FOCUS-II cable and water line would be installed in trenches following Navy Road starting at the NPS warehouse. This alternative would involve an additional 200 ft (60 m) of trenching along existing road corridors but would not lead to any additional new ground disturbance, as compared to Alternative 1. This alternative would have the same four offshore cable routes analyzed in Alternative 1. Therefore implementation of Alternative 3 would have no significant impacts on wildlife and vegetative species, including threatened and endangered species and would yield no significant harm to marine mammal or marine special status species within the U.S. EEZ as defined by EO 12114. Implementation of Alternative 3 would also not result in takes under the MMPA.

3.2.2.5 Alternative 4

Under Alternative 4, construction at NBVC Point Mugu would be limited to the Charlie Pad site with no construction activities conducted at the Building 811 site. The NBVC SNI activities would be identical to those analyzed in Alternative 1. There would be no project activities conducted at SCrI. Offshore cable installation would be limited to the two routes between NBVC Point Mugu and NBVC SNI. Therefore implementation of Alternative 4 would have no significant impacts on wildlife and vegetative species, including threatened and endangered species and would yield no significant harm to marine mammal or marine special status species within the U.S. EEZ as defined by EO 12114. Implementation of Alternative 4 would also not result in take under the MMPA.

<u>Mitigation Measures</u>

The increase in noise levels associated with the Alternative 4 construction activities would potentially affect wildlife, including threatened and endangered species at Point Mugu and SNI. Through implementation of conservation measures, there would be no effect on wildlife species at Point Mugu or SNI. Therefore, no mitigation measures are proposed or required.

3.2.2.6 Alternative 5 – The No-Action Alternative

Under the No-Action alternative, the proposed action would not occur and existing conditions would remain unchanged. Therefore, no significant impacts to biological resources would occur.

Mitigation Measures

Implementation of the No-Action Alternative would not result in significant biological resources impacts; therefore, no mitigation measures are proposed or required.

3.3 CULTURAL RESOURCES

3.3.1 Affected Environment

3.3.1.1 Definitions and Terminology

The term "cultural resources" is commonly used in the field of historic preservation and encompasses the physical evidence of past human activity; this can be a site, object, landscape, structure, building, or natural feature of significance to a group of people traditionally associated with it. Cultural resources, as defined in this EA/OEA, consist of archaeological resources, built environment resources, and traditional cultural properties.

Archaeological resources consist of the material remains of prehistoric and/or historic human activity and can include, but are not limited to, pottery, stone tools, basketry, bottles, rock art, graves, and skeletal materials. An archaeological site is a location that contains the physical evidence of past human behavior that allows for its interpretation. The phrase "built environment" is also an umbrella term for resources such as habitable buildings, structures, dams, bridges, and canals. Under the National Historic Preservation Act of 1966 (NHPA) resources over the age of 50 years are considered for protection; however, resources under 50 years of age can also be afforded the same protection under special circumstances.

A traditional cultural property (TCP), as defined by the National Park Service, is a property eligible for inclusion in the National Register of Historic Places (NRHP) based on its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community. TCPs are rooted in a traditional community's history and are important in maintaining the continuing cultural identity of the community. The NRHP cannot include such intangible resources. Therefore, a TCP must be a physical property or place- i.e., a district, site, building, structure, or object. Since the practices or beliefs that give a TCP significance are, in many cases, still observed at the time the TCP is being considered, the "50 years of age" rule of thumb would not apply.

3.3.1.2 Regulatory Setting

The NHPA provides for the establishment of the National Register of Historic Places (NRHP) to include districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture. Section 106 of the NHPA (Section 106) requires federal agencies with jurisdiction over a proposed federal project to take into account the undertaking's effect on cultural resources listed or eligible for listing in the NRHP, and affords the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP) an opportunity to comment with regard to the undertaking. In California, the SHPO is the director of the Office of Historic Preservation (OHP) within the California Department of Parks and Recreation.

For the purposes of the proposed action, the Navy is the lead federal agency for the Section 106 consultation. The Navy has delegated consultation with appropriate Tribes for the project to the National

Park Service (NPS) for the project areas currently managed by NPS. As described in 36 Code of Federal Regulations (CFR) 800.8(c), the Navy is using the NEPA public comment process to satisfy the public involvement requirement of Section 106 consultation. In addition to the Section 106 process, other applicable laws and guidelines regarding the management and protection of cultural resources include the following:

- EO 11593, Protection and Enhancement of Cultural Environment (16 U.S.C. 470 [Supp.1, 27 1971]);
- Native American Graves Protection and Repatriation Act (PL 101 – 601, U.S.C. 3001 – 3013);
- Archaeological Resources Protection Act of 1979 (ARPA); and
- DoD Directive 4710.1 (outlines the policy to incorporate historic preservation requirements into all Department of Defense [DoD] activities).

3.3.1.3 Existing Conditions and Previous Cultural Resources Investigations

This section provides details regarding previous cultural resources investigations that have been identified at the project sites: NBVC Point Mugu, NBVC SNI, and SCrI and offshore areas on the Sea Range.

Point Mugu

Previous Cultural Resources Investigation of the Point Mugu Project Areas

There are few areas within NBVC Point Mugu that are considered archaeologically sensitive due to the use of fill soils on most areas of the base range between 3 and 15 feet in depth, providing a measure of protection against encountering buried archaeological resources. Culturally sensitive areas at NBVC Point Mugu include: areas adjacent to known archaeological sites that have been identified along the Base perimeter, areas that are now covered by fill and near water, and areas where, in examining historic maps and aerial photos, indicate human activity may have occurred (NAVFAC 2013). There are currently two recorded archaeological sites within the boundaries of Point Mugu; CA-VEN-187/256 and CA-VEN-1239. Site CA-VEN 187/256 is a prehistoric habitation site, while site CA-VEN-1239 is a historic fish camp. Both sites have been evaluated as eligible for listing on the NRHP; however, neither is within the APE of the NBVC Point Mugu project area.

Among numerous built environment resources recorded at NBVC Point Mugu, currently eleven (11) have been found to be eligible for listing on the NRHP for their association with the development, testing, and tracking of early naval guided missile systems that were developed at NBVC Point Mugu during the Cold War era (NAVFAC 2013). The California State Historic Preservation Office (SHPO) concurred with this determination and concurred that the remainder of the buildings at NBVC Point Mugu were not eligible for listing on the NRHP. Of these, only the Bravo Launching Control Building is within the project area. The Bravo Launching Control Building is a contributing feature to the Baker Complex as a historic district. The Baker Complex was constructed in 1948 and was determined to be eligible for listing on the NRHP as a historic district under Criterion A for the direct association with the testing of the earliest missile systems assigned to NBVC Point Mugu, as well as under Criterion C, as an unusual example of a test launch facility.

San Nicolas Island

Previous Cultural Resources Investigation of the San Nicolas Island Project Areas

There are over 600 archaeological sites recorded on NBVC SNI. In general, these sites are distributed across the island, although most sites are located in the western portion of the island and along the coastal terraces (NAVFAC 2012). There are no NRHP-listed archaeological sites; however, four archaeological sites have been determined to be eligible for listing on the NRHP (NAVFAC 2012).

The first major surveys were conducted by Meighan and Eberhart (1953), Reinman (1962), WESTEC (1978), and Reinman and Lauter (1984). In 2002 Martz provided a detailed history of past archaeological surveys conducted on SNI as well as mapping and recordation of previously recorded and new archaeological (Martz 2002). This major prehistoric archaeological site mapping and recording project included preliminary NRHP eligibility recommendations for all but two of the prehistoric archaeological sites (Martz 2002). The NBVC SNI Integrated Cultural Resource Management Plan (ICRMP) provides a more comprehensive description of the archaeological investigations conducted at NBVC SNI (NAVFAC 2012).

In 1995 JRP Historic Consulting Services prepared an inventory and evaluation of one built environment resource, Building N74, on SNI; it was found to be not eligible for listing on the NRHP (JRP 1995). In 1998, JRP conducted a more comprehensive inventory and evaluation of built environment resources at Naval Air Weapons Station, Point Mugu; which included the documentation and evaluation of 211 buildings on SNI (JRP 1998). The NBVC SNI ICRMP provides a comprehensive description of the investigations of built environment resources at NBVC SNI (NAVFAC 2012).

Santa Cruz Island

Previous Cultural Resources Investigations of the Santa Cruz Island Project Areas

Several previous cultural resource studies have been conducted within the APE; Table 3.3-1 summarizes these investigations. In 1980 the Santa Cruz Island Archaeological District was listed on the NRHP, encompassing the entire island and later, in 2013, the archaeological district's boundaries and documentation were updated (Glassow 2013). In 2002 the National Park Service conducted a cultural landscape inventory for the Santa Cruz Island Ranching District (SCIRD), which was determined eligible for listing on the NRHP (NPS 2004). The SCIRD is located on the eastern side of the island and is a parent landscape with two component landscapes; Rancho del Norte Historic District and Caire-Gherini Ranch Historic District (NPS 2004).

The SCIRD is locally significant as one of the earliest sustained ranches on Santa Cruz Island, with a long history of land use from the rancho period through the modern era. The period of significance of the SCIRD is from 1880 to 1952; a period of development of the island as a premier sheep ranch and winery, The SCIRD is also locally significant as a rare example of vernacular French Alps architecture on the west coast of the United States. The ranch falls under the "Developing the American Economy" thematic context in the area of "Agriculture, Animal Husbandry (Cattle, Horses, Sheep, Hogs, Poultry)" and "The Cattle Frontier, Ranches" as well as the "Expressing Cultural Values" thematic context in the area of "Architecture, Vernacular Architecture." The SCIRD represents the initial ranching developments on Santa Cruz Island as one of several ranches on California's Channel Islands—a unique and specialized livestock raising location (NPS 2004).

Table 3.3-1 Previous Cultural Resource Investigation – SCrI ADI

Study Title	Investigator/ Reference Citation	Study Summary
Archaeological Testing of Exposed Deposits in Support of the Prisoners Harbor Wetlands Restoration Program, Santa Cruz Island, CA	Kelly Minas, Channel Islands Nation Park (Minas 2016)	Unpublished internal report on findings at CA-SCrI 240.
National Parks Service Cultural Landscapes Inventory, Santa Cruz Island Ranching District, Channel Islands National Park	National Park Service (2004)	A comprehensive inventory of the Santa Cruz Island Ranching District, a 14,000-acre vernacular ranching landscape on the portion of the island managed by the Channel Island National Parks.
The Origins of a Pacific Coast Chiefdom: The Chumash of the Channel Islands	Jeanne E. Arnold (Arnold 2001)	Summary of the Chumash people of the Channel Islands.
An Archaeological Overview of the Northern Channel Islands Including Santa Barbara Island	University of California, Santa Barbara (Glassow, n.d.)	Overview of the archaeological research conducted within the Channel Islands, a prehistoric context for the islands, and management recommendations for resources.
Archaeological Survey at a GTE Mobilnet Repeater Site and Two Existing Communication Sites on Santa Cruz Island	Science Applications International Corporation (Sheets 1992)	Results of an intensive pedestrian survey of three small areas on SCrI. Results found no newly identified or previously recorded sites or studies of the project areas.
Untitled summary report	Jeanne Arnold (Arnold 1993)	Summary of SCrI cultural resources surveys conducted between 1981 and 1993.
Phase I Cultural Resources Survey, Santa Cruz Island Acoustic Range Facility Demobilization, Site CA-SCrI-495, Santa Barbara County, California	Fugro West, Inc. (Maki 1996)	Record and mapping of the CA-SCrI-495 site as part of the Santa Cruz Island NRHP District
SE 1 Archaeological Study for the Environmental Assessment of the Blue Site Restoration Project Santa Cruz Island, Santa Barbara County, California	Historical Environmental Archaeological Team (Wlordaski 1997)	Summary report of a survey. Results were negative.
Cultural Resources Monitoring at Site CA-SCrI-495 for the Collection of Soil Samples at the White Site, Santa Cruz Island, Santa Barbara County, California	ENSR (Maki 1999)	Summary report providing results of a contaminating soils sampling project. 39 bore holes were subjected to archaeological monitoring with no adverse effects determination.
Anthropology 181 Field Trip to Santa Cruz Island	University of California, Santa Barbara (Glassow 2000)	Summary report of an archaeological inventory of four areas situated along two adjacent ridges in the isthmus portion of SCrI. 20 sites located and recorded, including two previously recorded sites in one of the survey areas.
Cultural Resources Monitoring for the Collection of Thirteen Soil Samples at the White Site, Santa Cruz Island, Santa Barbara County, California	Conejo Archaeological Consultants (Maki 2001)	Monitoring report for soil sampling project within CA-SCrI-495 boundaries. 13 borings were subjected to monitoring, with a no adverse effects determination.

Study Title	Investigator/ Reference Citation	Study Summary
Follow-Up Field Trip after the 1974 Season Santa Cruz Island Project	Michael A. Glassow (Glassow 1974a)	Summary of results from the collection of column samples taken at CA-SCrI-369 and CA-SCrI-393. Results found limited collection of shells and flakes with some possible artifacts.
A Journal of the Activities of M.A. Glassow and Crew during the 1974 Field Season of the Santa Cruz Island Project	University of California, Santa Barbara (Glassow 1974b)	Summary of the activities and results of fieldwork during the 1974 U.C. Santa Barbara field season. Numerous sites were identified and documented, including CA-SCrI-347 through CA-SCrI-390. The project also relocated sites CA-SCrI-178, -180, -181, -195, -199, -227, -228 and collected column samples. All sites identified are prehistoric, including shell middens, rock shelters, lithic scatters, quarries, and rock platforms.
East of Pelican Bay Survey	University of California, Santa Barbara (Thakar-Hucks 2008)	Summary of a systematic pedestrian survey of selected prehistoric sites on SCrI. Nine newly identified sites were discovered and documented.

Offshore Cultural Resources

Previous Cultural Resources Investigation of the Offshore Cable Alignments

Submerged lands off Point Mugu include the area that extends to the mean high-tide line. Records do not indicate the presence of any underwater cultural resources within the immediate subsurface tidal zone off Point Mugu (Navy 2002).

Archaeological studies focusing on underwater resources near NBVC SNI have identified 45 shipwrecks and 21 downed aircraft in the vicinity of SNI and Begg Rock, dating from the mid-nineteenth century to the late-twentieth century. Thirty-two of the shipwrecks are situated within two miles (3.2 km) of the SNI shoreline. Seven of these ships are reported wrecked on or just off the north side of the island. Most shipwreck remains are likely to be found at harbors and at hazards on the western and eastern ends of the islands. No shipwrecks have been recorded within 1.75 mi (2.7 km) of the proposed offshore cable alignment (NAVFAC 2010).

The NBVC SNI HDD site and exit point are located within areas characterized as having a low-to-moderate potential for submerged sites (Navy 2002). There is a possibility that submerged archaeological sites could exist just offshore from SNI. These sites would have been occupied over 7,000 years ago when sea levels were lower than current levels. Submerged archaeological sites off the coast of SNI are most likely to occur within 1,640 to 3,280 feet (500 to 1,000 m) of fish habitat, within 1,640 feet (500 m) of rocky shore habitat, and within 1,640 feet (500 m) of a fresh water source. The proposed offshore cable alignment within five miles (8.0 km) of SNI occurs in a zone with a low-to-moderate potential for submerged sites, and no underwater archaeological resources have been documented near the proposed offshore cable alignment (Navy 2002).

Based on current knowledge, a total of five submerged vessels including cargo, military, and civilian

wrecks exist off the coast of SCrI, comprising one-quarter of the 20 known shipwrecks associated with the northern Channel Islands. Although it is conceivable that underwater prehistoric archaeological resources may also exist, especially given the extent of human occupation on the Channel Islands, no such resources are currently known to exist, apart from an isolated stone bowl found. Only one of the five resources is a military aircraft (Grumman Guardian). Of the five submerged vessels, which range in age from 1952 to 1980, only three are potentially eligible for nomination to the NRHP based on age alone. Only two of the five resources have been identified or investigated by NPS personnel (Glassow 2010, Morris and Lima 1996).

There have been no offshore cultural resources investigations for the NBVC Point Mugu, NBVC SNI, or SCrI exit sites or along the offshore cable routes. However, there have been numerous documented shipwrecks and plane crashes within the areas surrounding the offshore cable alignments. It should be noted that the cable alignments have been developed to avoid known locations of shipwrecks and plane crashes.

3.3.2 Environmental Consequences

This section outlines the identification and documentation of historic properties, as outlined in Section 106 of the NHPA (36 CFR 800.4) and the environmental consequences with each alternative.

3.3.2.1 Assessment Criteria

Historic properties are defined as any prehistoric or historic site, building, structure, or object included in, or eligible for inclusion in, the NRHP. NPS has provided criteria for evaluating these resources; standards by which every property nominated to the NRHP is judged (36 CFR Part 60). In National Register Bulletin 15 (NPS 1997) the quality of significance in history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and-

A. Association with events that have made a significant contribution to the broad patterns of our history; or

B. Association with the lives of persons significant in our past; or

C. Embodies the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master or that possesses high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction; or

D. That has yielded, or may be likely to yield, information important in prehistory or history.

As stated, Section 106 of the NHPA (Section 106) requires federal agencies with jurisdiction over a proposed federal project to take into account the undertaking's effect on cultural resources listed or eligible for listing in the NRHP, and affords the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP) an opportunity to comment with regard to the undertaking. The following is a detailed summary of the Section 106 compliance for each project considering each alternative.

Area of Potential Effect

Section 106 of the NHPA defines the area of potential effect (APE) as the geographical area(s) within

which an undertaking may cause alterations in the character or use of historic properties. In 2015 NBVC developed a Programmatic Agreement (PA) with California SHPO to streamline the Section 106 consultation process for activities on Port Hueneme and Point Mugu. The PA defines the Section 106 consultation process to be taken for actions within the NBVC area of responsibility, and this process will be followed for the FOCUS-II project sites at NBVC Point Mugu.

As defined in the NBVC PA, the APE for a construction site is defined as the project site and any lay down or staging areas, if the construction is located more than 328 ft (100 m) from a listed or eligible district, building, or structure. When such projects occur within a listed or eligible district or within 328 ft (100 m) of an eligible district, building, or structure, the APE will be defined to include that eligible district, building, and structure as well as the affected property itself.

The NBVC SNI APE includes the drilling area and staging area near the Coast Guard Jetty plus the area within a 50-ft (15-m) radius around the combined area. The Navy also defines the offshore APE as the offshore cable routes with a 50-ft (15-m) buffer on each side of the alignments. Because the entirety of SCrI is an Archaeological District, the APE for SCrI is the entire island; this would also include the boundaries of the SCIRD. For the purposes of analyses at SCrI, the Area of Direct Impact (ADI) will be used.

In addition to the surface footprints described above, the project APEs and ADI include subsurface disturbances comprised of trenching corridors, equipment burial areas for HDD rig stabilization, and drilling bore holes.

3.3.2.2 Alternative 1 – Preferred Alternative

Point Mugu

The APE for the preferred alternative at NBVC Point Mugu consists of the Building PM-811 drilling site and Charlie Pad drilling sites, as well as the equipment staging areas, as shown in Figures 2-3 and 2-5, and a 328-ft (100-m) radius around the Bravo Launching Control Building. The Charlie Pad site is within 328 ft (100 m) of the Bravo Launching Control Building.

No archaeological resource surveys were conducted within for the proposed ADI of NBVC Point Mugu project area since these areas are located within previously disturbed areas; i.e., within areas of extended depths of fill as well as being paved (NAVFAC 2012). The Bravo Launching Control Building, which has been identified as a contributing feature of the Baker Launch Complex historic district, is within 328 ft (100 m) of the APE; however, the proposed action at Point Mugu NBVC will not directly or indirectly cause alteration in the character or use of Bravo Launching Control Building as a historic property and/or a contributing feature of the Baker Launch Complex as a historic district. Therefore, consistent with Stipulation 8B of the 2015 NBVC Programmatic Agreement and 36 CFR 800.5 (b), the project at NBVC Point Mugu will not adversely affect the Bravo Launching Control Building as a historic property.

If potential subsurface archaeological deposits are detected during construction, all work in the discovery area would cease until an archaeologist can provide input regarding the significance of the resource. The NBVC Cultural Resources Manager would be immediately contacted to provide direction regarding the potential resource. The potential resource would be evaluated against the eligibility criteria for inclusion on the NRHP and, if it is found to be eligible, a treatment plan detailing either preservation in-place or mitigation of impacts through data recovery would be developed and implemented. Based on

the previous surveys, tribal consultation, and that both archaeological and Native American monitors will be present during ground disturbing activities, the Navy has determined that a finding of No Adverse Effect is appropriate for this proposed undertaking, and the California SHPO has concurred with this determination (Appendix B). Therefore, implementation of Alternative 1 would have no significant impacts to cultural resources at NBVC Point Mugu.

San Nicolas Island

The APE for the project on San Nicolas Island (SNI) includes the drilling and staging areas near the Coast Guard Jetty plus a 50-ft (15-m) buffer around the two areas combined (Figure 2-7).

No cultural resource surveys were conducted within the ADI on SNI since the project is located within a previously disturbed area. On SNI the new FOCUS cable will connect to the existing FOCUS I cable junction box at the head of the old access road, which has an existing buried conduct across the terrace. All new subsurface disturbance will occur within the prior borrow pit disturbance, which is beneath native soils and/or within the old access road, which has modified an existing erosional channel bisecting the terrace towards the shoreline.

The adjacent areas proposed for staging equipment or laydown areas on the terrace above the borrow pit will not be further developed below the currently disturbed surface. The alignment of the FOCUS II cable within the borrow pit and access road is 200 feet (60 meters) northwest of one recorded archaeological site (CA-SNI-328) and 300 feet (90 meters) southeast of another recorded archaeological site (CA-SNI-001). There is sufficient distance (i.e., more than 100 feet or 30 meters) between the proposed cable alignment and the two recorded archaeological sites (CA-SNI-328 and CA-SNI-001) to avoid any impact from construction activities.

Construction crews will receive training on the avoidance of impacting archaeological sites as well as a qualified archaeologist being available to conduct periodic monitoring. There are also no built environment resources within the APE for SNI, therefore none will be impacted by the project on SNI. If potential subsurface archaeological deposits are detected during construction, all work in the discovery area would cease until an archaeologist can provide input regarding the significance of the resource. The NBVC Cultural Resources Manager would be immediately contacted to provide direction regarding the potential resource. The potential resource would be evaluated against the eligibility criteria for inclusion on the NRHP and, if it is found to be eligible, a treatment plan detailing either preservation in-place or mitigation of impacts through data recovery would be developed and implemented. Therefore, implementation of Alternative 1 would have no significant impacts to cultural resources at SNI.

Santa Cruz Island

The APE for Santa Cruz Island are those areas that will be impacted by the FOCUS II installation, which include;

- The HDD area at Prisoners Harbor;
- Roadways and/or paths, including Navy Road, where the cable will either be trenched or placed in an elevated channel system;
- Heavy equipment storage areas;
- Any access roads used for heavy equipment traffic.

The APE also includes a 50-foot (15-meter) buffer on both sides of the planned construction path. The project calls for the cable to be buried to a depth of approximately 3 feet (102 cm) below the surface on the shoulder of the existing road or in an elevated channel approximately 1.6 ft (50 cm) above the ground (Figures 2-12 and 2-14).

The project area on SCrI is located within the SCIRD as well as within the SCrI Archaeological District; two districts listed on the NRHP. Within these two NRHP-listed districts there are several archaeological and built environment resources that contribute to the significance of both districts as well as possibly being individually significant.

Navy Road

The 2002 Cultural Landscape Inventory of SCIRD describes Navy Road as a primary road connecting all other roads on the isthmus and, while the road was constructed by the Navy, the route is based upon an earlier road and trail patterns that are an integral part of the historic ranching period (NPS 2004). Although the Navy Road on Santa Cruz Island has never been officially recorded or documented; for the purposes of this determination of effect it is assumed eligible for the NRHP. Navy Road has also been determined to be a contributing feature of the SCIRD (NPS 2004:14). The FOCUS-II construction, as planned, will be trenched within, or avoid altogether, the existing roadbed. After construction, the road will largely be returned to its original appearance and the route will not be altered. Therefore, the project will not directly or indirectly cause alteration in the character or use of Navy Road as a historic property nor as a contributing feature to the SCIRD.

Prisoners Harbor Cluster within SCIRD

The Prisoners Harbor cluster composes the primary entrance to SCrI. With the APE the Scale House and Warehouse are contributing features while the Pier, kiosk, picnic area, and restroom building are non-contributing features to the SCIRD as a historic district (JRP 2012). The construction phase would create temporary impacts to the cultural landscape of the SCIRD, and all equipment would be removed and the existing visual environment would be restored following completion of construction activities. The proposed action includes the trenching and installation of a subsurface vault in the vicinity of the Warehouse. The trenching will be filled and compacted to match the existing contours and visual integrity of the SCIRD. The vault will be installed in a manner that minimizes its final profile, preserving the cultural landscape of the area. The Scale House will not be affected by the proposed action.

The proposed action also includes installation of a permanent feature along the 1,150 ft (350 m) elevated channel corridor. This may affect the integrity of the SCRID in the area of the Prisoners Harbor Cluster by introducing a new element into the historic district. However, it is not likely to constitute an adverse effect to the SCIRD historic district. The Navy will consult with the NPS and the CA SHPO to ensure that the elevated channel corridor will not adversely affect the SCRID as a historic district (see Appendix C.2). Therefore, the project will not directly or indirectly cause alteration in the character or use of the above listed contributing and non-contributing features to the SCIRD.

Archaeological Sites

Previous cultural resource investigations have identified five archaeological sites that are transected by the project's ADI: CA-SCrI-96, CA-SCrI-240/439, CA-SCrI-464, CA-SCrI-465, and CA-SCrI-466. Table 3.3-2 summarizes these sites. These archaeological sites are all contributing features of the Santa Cruz Island Archeological District. Site CA-SCrI-240/439 may also be individually eligible as a historic property and

therefore are assessed as such.

Table 3.3-2 Archaeological Sites Within ADI for SCrI

Site Trinomial	Temporal Affiliation	Site Description	NRHP Eligibility Status
CA-SCrI-96	Prehistoric	Lithic scatter with tools	SCrI Archaeological District- contributing feature
CA-SCrI-240/439	Prehistoric	Shell midden with marine mammal bone, tools, and fire-affected rock	SCrI Archaeological District- contributing feature and possibly individually eligible as historic property
CA-SCrI-464	Prehistoric	Lithic scatter with shell	SCrI Archaeological District- contributing feature
CA-SCrI-465	Prehistoric	Lithic scatter with shell and mammal bone	SCrI Archaeological District- contributing feature
CA-SCrI-466	Prehistoric	Shell midden with lithics and marine mammal bone	SCrI Archaeological District- contributing feature

Four of the archaeological sites within the ADI (CA-SCrI-96; CA-SCrI-464; CA-SCrI-465; and CA-SCrI-466) have had their deposits removed with the initial construction in 1940 and subsequent use and maintenance of Navy Road. Navy Road is currently located on bedrock with the exception of the area near Prisoners Harbor. Proposed construction will be restricted to the road surface and its shoulders. Therefore, the ADI transecting these four archaeological sites (CA-SCrI-96, CA-SCrI-464, CA-SCrI-465, and CA-SCrI-466) will not adversely affect these sites since all archaeological deposits within the ADI have been removed during Navy Road's construction and its subsequent use and maintenance.

Of the five archaeological sites, the project has the potential to adversely affect Site CA-SCrI-240/439. The linear ADI crosses approximately 800 ft (240 m) within the current site boundaries of CA-SCrI-240/439. To determine whether the project will adversely impact a portion of Site CA-SCrI-240/439 that contributes to the significance of the site individually as a historic property and/or as a contributing feature to the SCIRD, an archeological testing plan for the FOCUS-II activities on SCrI has been developed. This testing plan was submitted to NPS and California SHPO for review and concurrence. The California SHPO found the testing plan was adequate for identifying and assessing potential project effects on any buried archaeological components, and does not object to the Navy's determination of "No Adverse Effect" for the project (Appendix C.2).

To ensure avoidance of off-road archaeological sites, stakes will be placed around the five documented site boundaries prior to construction. These stakes will mark the presence of a resource with tribal and archaeological monitors present for all installation and maintenance work conducted within the boundaries of the five sites and within a 50-meter buffer for each site. The 50-meter buffers are required because the site boundaries are not known confidently in all directions. Previously undocumented, intact archeological resources were discovered in the vicinity of the proposed alignment on SCrI (Minas 2016); subsurface testing, included in the testing plan cited below, will ensure the final route avoids such resources.

A testing plan for the 1,150 ft (350 m) linear stretch of elevated channel within the CA-SCrI-240/439 ADI with archaeological deposits will be executed to determine the presence or absence of deposits along the trenching corridor, as well as the extent, nature, and integrity of any archaeological deposits within the ADI crossing Site CA-SCrI-240/439. The goal of the investigations is to determine whether the portion of Site CA-SCrI-240/439 within the ADI still exists and, if so, whether any archaeological deposits are intact and retain integrity so as to contribute to the eligibility of Site CA-SCrI-240/439 as a historic property and/or as a contributing feature of the SCrI Archaeological District. These investigations will be supported by an ARPA permit (Permit #PWR-1979-17-CA-12) authorized by NPS as well as fieldwork being monitored by a tribal monitor from the SYBCI.

If the testing results indicate the presence of intact, significant archaeological deposits that will be directly impacted by the project, the Navy will work with the Section 106 consultation parties in an effort to avoid or minimize the potential for adverse effects. If adverse effects are unavoidable, then Navy will consult with NPS, California SHPO, SYBCI, and any other interested parties to assess the effects (36 CFR 800.5) and if the project effects are adverse, then a memorandum of agreement (MOA) with NPS, CA SHPO, SYBCI, will be developed to resolve the adverse effects on historic properties, per 36 CFR 800.6 (c).

If previously unknown, intact archeological deposits are discovered during construction activities, work in the immediate vicinity of discovery will stop and the Navy will either 1) follow stipulations identified in the MOA, or 2) in the absence of an MOA, comply with 36 CFR 800.13. The latter would involve assessing the deposits for integrity and significance in consultation with the Section 106 consultation parties and developing a plan for avoiding, minimizing, or mitigating adverse effects.

Therefore, implementation of Alternative 1 would have no significant impacts to cultural resources at SCrI.

Offshore Cable Alignments

The APE for the preferred alternative for the offshore alignments includes the HDD exit sites and the lengths of cable connecting the exit sites, plus the area within a 50-ft (15-m) radius around each of these project sites. It should be noted that the offshore APE in the vicinity of SCrI starts at a distance of 1 mi (1.6 km) from the high tide line, as the NPS boundaries extend to this distance. This section also provides a summary of the archival research and surveys conducted to identify potentially affected historic properties within the APE.

No offshore cultural resource surveys were conducted specifically for the HDD exit sites or cable alignments due to the depth of the exit sites and cable alignments (79 ft [24 m] or greater) and lack of evidence that sensitive resources exist at the locations. The cable alignments were developed in a manner that avoids known locations of shipwrecks and plane crashes; therefore, no known historic properties are located within the offshore APE.

If potential subsurface archaeological resources are detected during construction, then all work will cease until a qualified archaeologist can assess the significance of the resource. The resource will be evaluated and, if determined to be eligible for listing on the NRHP, a treatment plan detailing either preservation in place or mitigation of impacts through data recovery would be developed and implemented in consultation with California SHPO, SYBCI, and any other interested parties.

Therefore, implementation of Alternative 1 would have no significant impacts to cultural resources within the Offshore Cable Alignments.

3.3.2.3 Alternative 2

Point Mugu

Under Alternative 2, development at NBVC Point Mugu would be the same as described under Alternative 1. The APE for Alternative 2 at this installation would be the same as described under Alternative 1. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, conservation and construction measures described for Alternative 1 would be implemented. Therefore, implementation of Alternative 2 would have no effects on historic properties and no significant impacts to cultural resources at NBVC Point Mugu.

San Nicolas Island

Under Alternative 2, development at NBVC SNI would be the same as described under Alternative 1. The APE for Alternative 2 at this installation would be the same as described under Alternative 1. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, conservation and construction measures described for Alternative 1 would be implemented. Therefore, implementation of Alternative 2 would have no effects on historic properties and no significant impacts to cultural resources at NBVC SNI.

Santa Cruz Island

Under Alternative 2, development at SCrI would be the same as described under Alternative 1 with the exception that all work would be performed within the road bed and along the road shoulder. The ADI for Alternative 2 at SCrI would be the same as described under Alternative 1 for trenching. The ADI for the elevated channel would shift between 30 and 200 ft eastward, but no additional historical properties would be within it. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, conservation and construction measures described for Alternative 1 would be implemented. Therefore, implementation of Alternative 2 would have no adverse effects on historic properties and no significant impacts to cultural resources at SCrI.

3.3.2.4 Alternative 3

Point Mugu

Under Alternative 3, development at NBVC Point Mugu would be the same as described under Alternative 1. The APE for Alternative 3 at this installation would be the same as described under Alternative 1. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, conservation and construction measures described for Alternative 1 would be implemented. Therefore, implementation of Alternative 3 would have no effects on historic properties and no significant impacts to cultural resources at NBVC Point Mugu.

San Nicolas Island

Under Alternative 3, development at NBVC SNI would be the same as described under Alternative 1. The

APE for Alternative 3 at this installation would be the same as described under Alternative 1. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, conservation and construction measures described for Alternative 1 would be implemented. Therefore, implementation of Alternative 3 would have no effects on historic properties and no significant impacts to cultural resources at NBVC SNI.

Santa Cruz Island

Under Alternative 3, the FOCUS-II cable and the water line would be installed in a trench along the entire route between the Prisoners Harbor landing site and the Navy Site. The ADI for this alternative would be slightly different than the preferred alternative. Due to the nature of the ground disturbance along Navy Road, the proposed trenching may impact deposits within the CA-SCrI-240/439 site, which may result in adverse effects to the site. Further archaeological investigations would be necessary to determine whether archaeological deposits are present, and, if so, whether the project would have an adverse effect to site CA-SCrI-240/439 individually or as a contributing feature of the Santa Cruz Archeological District.

There are three contributing elements of the Santa Cruz Ranching District within the ADI: the Warehouse, the Scale House, and Navy Road. The construction phase would create temporary impacts to the cultural landscape of the Ranching District, and all construction equipment would be removed and the existing visual environment would be restored following completion of construction activities. The proposed action includes the trenching and installation of a subsurface vault in the vicinity of the warehouse. The trenching will be filled and compacted to match the existing contours and visual integrity of the Ranching District. The vault will be installed in a manner that minimizes its final profile, preserving the cultural landscape of the area. The Scale House will not be affected by the proposed action.

If previously unknown, intact archeological deposits are discovered during construction activities, work in the immediate vicinity of discovery will stop and the Navy will either 1) follow stipulations identified in the MOA, or 2) in the absence of an MOA, comply with 36 CFR 800.13. The latter would involve assessing the deposits for integrity and significance in consultation with the Section 106 consultation parties and developing a plan for avoiding, minimizing, or mitigating adverse effects.

Therefore, implementation of Alternative 3 would have no significant impacts to cultural resources at Santa Cruz Island.

3.3.2.5 Alternative 4

Point Mugu

Under Alternative 4, development at NBVC Point Mugu would occur in a smaller area than described in Alternative 1. The APE for Alternative 4 at this installation would include only the area within the vicinity of the Charlie Pad site, as no activities would be conducted at the Building 811 site. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, conservation and construction measures described for Alternative 1 would be implemented. Therefore, pending concurrence from SHPO, implementation of Alternative 4 would have no effects on historic properties and no significant impacts to cultural resources at NBVC Point Mugu.

San Nicolas Island

Under Alternative 4, development at NBVC SNI would be the same as described under Alternative 1. The APE for Alternative 4 at this installation would be the same as described under Alternative 1. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, conservation and construction measures described for Alternative 1 would be implemented. Therefore, pending concurrence from SHPO~~,~~ implementation of Alternative 4 would have no effects on historic properties and no significant impacts to cultural resources at NBVC SNI.

Santa Cruz Island

Under Alternative 4, there would be no FOCUS-II activities at SCrI. As there would be no SCrI construction associated with this alternative, recorded historic properties or other cultural resources would not be affected by Alternative 4, and currently unknown subsurface cultural resources sites would not be inadvertently disturbed with this alternative. Therefore, implementation of Alternative 4 would have no effects on SCrI historic properties and no significant impacts to historic properties at SCrI.

Offshore Resources

Under Alternative 4, there would be no offshore cable alignments connecting NBVC Point Mugu and SCrI. The offshore cable alignments between NBVC Point Mugu and NBVC SNI would remain the same as Alternative 1. The same avoidance of submerged resources as described for Alternative 1 would be implemented. Therefore, pending concurrence from SHPO, implementation of Alternative 4 would have no effects on offshore historic properties, no significant impacts to offshore cultural resources, and no significant harm to cultural resources within the U.S. EEZ.

3.3.2.6 Alternative 5 – The No-Action Alternative

Under the No-Action Alternative, the proposed action would not be implemented, and no underground fiber optic cable system would be installed. As there would be no construction associated with this alternative, recorded historic properties or other cultural resources would not be affected by the No-Action Alternative, and currently unknown subsurface cultural resources sites would not be inadvertently disturbed with this alternative. Therefore, implementation of the No-Action Alternative would have no effects on historic properties and no significant impacts to historic properties.

3.4 HAZARDOUS MATERIALS AND WASTE

3.4.1 Affected Environment

3.4.1.1 Definition of Resource

Hazardous materials are defined by 49 CFR § 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR § 172.101), and materials that meet the defining criteria for hazard classes and divisions" in 49 CFR Part 173. Transportation of hazardous materials is regulated by U.S. Department of Transportation regulations at 49 CFR §§ 105–180.

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA) in 42 U.S.C. § 6903(5), as amended by the Hazardous and Solid Waste Amendments, as "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes, and their associated regulatory requirements are specified in 40 CFR § 273. Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances.

Solid wastes that do not contain hazardous components, as defined by RCRA, are not subject to the special management provisions associated with hazardous waste treatment and disposal. Non-hazardous solid wastes include municipal solid waste and industrial waste. Municipal solid waste consists of everyday discarded items including product packaging, grass clippings, furniture, clothing, bottles, food scraps, paper, appliances, paint, and batteries. Municipal solid waste is generated by homes, schools, hospitals, and businesses.

Industrial waste is defined as the solid component of the waste stream arising from commercial, industrial, government, public, or domestic premises that is not collected as municipal solid waste and does not contain listed waste, hazardous waste, or radioactive waste. Under the California Integrated Waste Management Act of 1989, industrial waste is further classified as construction and demolition waste or inert debris. Inert debris is defined as solid waste and recyclable materials that are source separated or separated for reuse and do not contain hazardous waste (as defined in California Code of Regulations, Title 22, §§ 66261.3 et. seq.) or soluble pollutants at concentrations in excess of applicable water quality. Inert debris may not contain any putrescible wastes. Gravel, rock, soil, sand, and similar materials, whether processed or not, that have never been used in connection with any structure, development, grading, or other similar human purpose, or that are uncontaminated, are not inert debris. Such materials may be commingled with inert debris.

Inert debris is further categorized as Type A or Type B inert debris. Type A inert debris contains components such as concrete, asphalt, or fiberglass. This category of waste can only be disposed of at facilities certified by the State of California. Type B inert debris is solid waste that is specifically determined to be inert by the applicable Regional Water Quality Control Board, such as treated industrial wastes and de-watered bentonite-based drilling mud, but excluding Type A inert debris.

3.4.1.2 Regulatory Setting

As defined by the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ([CERCLA], 42 USC §§ 9601 et seq., Sections 101[14] and 101[33]) and the Superfund Amendments

and Reauthorization Act of 1986, (Public Law 99-499), a hazardous material is a substance, pollutant, or contaminant that, due to its quantity, concentration, or physical and chemical characteristics, poses a substantial present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials are managed in accordance with Title III of the Superfund Amendments and Reauthorization Act, also known as the Emergency Planning and Community Right to Know Act (EPCRA). The EPCRA establishes different reporting and planning requirements for businesses that handle, store, or manufacture certain hazardous materials. These plans and reports provide federal, state, and local emergency planning and response agencies with information about the amounts of chemicals that businesses use, routinely release, and spill. Specific requirements of EPCRA include the following:

- Planning for emergency response (Sections 301-303);
- Reporting chemical inventory (Sections 311 and 312);
- Reporting ongoing releases of toxic chemicals (Section 313); and
- Reporting leaks and spills (Section 304).

3.4.1.3 Existing Conditions

Point Mugu

NBVC Point Mugu operates under a Hazardous Waste Management Plan (HWMP) (NAVFAC 2015) that provides guidance and direction for the use, storage, and compliance activities for hazardous materials and wastes at the base. The HWMP provides a comprehensive compilation of procedures and requirements that are mandated by law, directive, or regulation. The plan has a compliance orientation to ensure safe and efficient control, use, transport, and disposal of hazardous materials and waste.

The majority of hazardous materials used at NBVC Point Mugu are managed by the NBVC Environmental Division and stored at the Hazardous Material Minimization Center. Individual shops are authorized to store hazardous materials in small quantities. Generally, these shops are limited to storing one week's worth of hazardous materials needed for routine tasks. There are approximately 40 storage lockers at NBVC Point Mugu.

As indicated in Navy 2002, NBVC Point Mugu generated approximately 826,000 lb (375,000 kg) of hazardous waste in 1996. These wastes consisted primarily of contaminated jet fuel, waste rags, paint, solvents, spill residues and absorbent materials, corrosion prevention compound in aerosol cans, ethylene glycol, batteries, antifreeze, hydraulic fluid, photo processing waste materials, waste cleaning compounds, and debris materials.

Hazardous wastes are generated at most of the industrial shops at NBVC Point Mugu. There are approximately 40 satellite accumulation areas and three less-than-90-day accumulation areas on the base. Hazardous waste is collected at the accumulation sites by the NBVC hazardous waste management

contractor and transported to the less-than-90-day accumulation areas. The NBVC waste transport vehicles are equipped with spill containment systems and emergency spill kits. All hazardous waste is removed from the waste treatment yard and transported to an approved treatment, storage, and disposal (TSD) facility (Navy 2002).

San Nicolas Island

Some hazardous materials are shipped to and stored on NBVC SNI. Hazardous materials used on NBVC SNI are ordered through the NBVC Point Mugu Hazardous Materials Minimization Center and shipped to the island via barge or aircraft. Seven storage lockers are located on the island. The largest quantity of hazardous materials stored is in the form of fuel. Jet fuel and unleaded gasoline are shipped to the island by tanker barge.

NBVC SNI operates under the HWMP for NBVC (NAVFAC 2015). The plan provides guidance and direction for the use, storage, and compliance activities for hazardous materials and wastes at the island. There are satellite hazardous waste storage areas on SNI. Hazardous wastes are stored at these satellite accumulation areas prior to being transported to the less-than-90-day accumulation area on the island. From this accumulation area, the waste is shipped via freight barge to Port Hueneme. After arrival at Port Hueneme, the waste is transported to an approved TSD facility (Navy 2002).

Santa Cruz Island

There are no solid waste landfills, satellite hazardous waste storage areas, or waste management facilities on SCrI. All created wastes are recycled, when appropriate, or are transported off the island and disposed in a mainland facility. The construction contractor shall develop a waste management and disposal plan, with NPS input and approval. The following rules apply to all dumpsters or waste canisters brought to SCrI (NPS 2015):

- Dumpsters may only be used for construction and/or spill cleanup and will be located in a manner in which they will not be used for food materials;
- Under no circumstances shall dumpsters be transported to SCrI containing garbage. The inside and outside, including the wheels of the dumpsters shall be pressure washed and treated with disinfectant before leaving the mainland; and
- Dumpsters must be inspected, emptied, and cleaned before departing the mainland for SCrI.

On SCrI, fuel and hazardous materials would be stored outside the 500-year floodplain in areas approved by the NPS.

3.4.2 Environmental Consequences

3.4.2.1 Assessment Criteria

Navy policy is to comply with EPCRA as required by Executive Order 13148 and to encourage compliance with state and local EPCRA programs to the extent that resources allow and where such compliance does not interfere with command mission accomplishment or other legal obligations. Alternatives have been analyzed to determine any associated materials compliance with Federal and State regulations, and the potential for release as described below.

3.4.2.2 Alternative 1 – Preferred Alternative

Point Mugu

Hazardous materials associated with the proposed action include fuels, lubricants, and solvents used to operate and maintain the construction equipment. The construction crews will store and maintain these materials in accordance with Navy and NBVC protocols and will maintain a copy of material safety data sheets (MSDS) for each hazardous material stored and used on the project sites.

Hazardous wastes generated at the FOCUS-II project sites would include lubricants, solvents, and dirty rags. At the Building 811 and Charlie Pad sites, hazardous wastes generated during equipment maintenance and other construction activities would be accumulated and stored at each site in two 55-gallon (208 l) drums (one for liquids and one for rags). The construction crew will coordinate with the NBVC environmental office to ensure proper handling and storage of the waste and to obtain a waste manifest prior to transportation of the waste. Following completion of the construction activities, the drums would be transported to a hazardous waste accumulation site. From there, NBVC would transport the waste drums to an approved TSD facility.

During HDD operations, drilling fluid would be picked up by a sump pump and transferred to the solids control unit where the solids contained in the drilling fluid would be mechanically separated, allowing the drilling fluid to be recirculated down hole and used again. Once the drilling operations are completed at the Building 811 site, approximately 26,100 gal (98,700 l) of drilling fluid would be collected for disposal in 475 55-gallon (208 l) drums. Approximately 98.4 cubic yards (yd^3) (75.2 m^3) of drilling solids would be accumulated and handled as inert debris. The HDD operations at Charlie Pad would generate approximately 17,800 gal (67,400 l or 324 drums) of drilling fluid and 67.2 yd^3 (51.4 m^3) of drilling solids. The construction crew will coordinate with the NBVC environmental office to ensure proper handling and storage of the waste and to obtain a waste manifest prior to transportation of the waste.

The Navy will coordinate with the LARWQCB to determine if the drilling fluid and solids can be disposed of as Type A or Type B inert debris and identify the appropriate TSD facility to receive and dispose the drilling mud wastes. At the TSD facility the drilling fluid waste would have to be dewatered before it could be considered as Type B inert debris and disposed of as such.

San Nicolas Island

The proposed action would involve the same hazardous materials listed in the NBVC Point Mugu section above and would generate the similar hazardous waste streams. All hazardous materials use and storage on NBVC SNI would be conducted in accordance with Navy and NBVC protocols. The hazardous wastes generated during equipment maintenance and other construction activities would be stored on the construction site in two 55-gallon (208 l) drums. The construction crew will coordinate with the NBVC environmental office to ensure proper handling and storage of the waste and to obtain a waste manifest prior to transportation of the waste. Upon completion of FOCUS-II construction activities, the waste barrels would be transported to a hazardous waste accumulation site on the island prior to being shipped to Port Hueneme via barge. From Port Hueneme, the waste drums would be transported to an approved TSD facility.

During NBVC SNI HDD operations, approximately 10,500 gal (39,900 l or 192 drums) of drilling fluid would be collected for disposal, and approximately 39.7 yd^3 (30.4 m^3) of drilling solids would be generated. The Navy will coordinate with the LARWQCB to determine if the drilling fluid and solids can be disposed of as Type A or Type B inert debris and identify the appropriate TSD facility to receive, treat, and dispose the drilling fluid wastes.

Santa Cruz Island

The proposed action would involve the same hazardous materials listed in the NBVC Point Mugu section above and would generate the similar hazardous waste streams. All hazardous materials use and storage on SCrI would be conducted in accordance with Navy and NBVC protocols. The hazardous wastes generated during equipment maintenance and other construction activities would be stored on the construction site in two 55-gallon (208 l) drums. Upon completion of FOCUS-II construction activities, the waste barrels would be shipped to Port Hueneme via barge. From Port Hueneme, the waste drums would be transported to an approved TSD facility.

During SCrI HDD operations, approximately 4,450 gal (16,900 l or 81 drums) of drilling fluid would be collected for disposal, and approximately 16.8 yd^3 (12.8 m^3) of drilling solids would be generated. The Navy will coordinate with the CCRWQCB to determine if the drilling fluid and solids can be disposed of as Type A or Type B inert debris and identify the appropriate TSD facility to receive, treat, and dispose the drilling fluid wastes.

Under the proposed action, appropriate BMPs would be implemented to minimize the release of hazardous materials to the environment, and the hazardous and non-RCRA wastes generated would be handled in accordance with all federal, state, and local laws and regulations. Therefore, implementation of Alternative 1 would have no significant impacts from hazardous materials and waste.

Mitigation Measures

Implementation of Alternative 1 would not result in significant impacts with respect to hazardous materials or waste management; therefore no mitigation measures are proposed or required.

3.4.2.3 Alternative 2

Under Alternative 2, hazardous materials used and wastes generated would be identical to those associated with Alternative 1. Therefore, implementation of Alternative 2 would have no significant impacts from hazardous materials and waste.

Mitigation Measures

Implementation of Alternative 2 would not result in significant impacts with respect to hazardous materials or waste management; therefore no mitigation measures are proposed or required.

3.4.2.4 Alternative 3

Under Alternative 3, hazardous materials used and wastes generated would be nearly identical to those associated with Alternative 1. Hazardous materials including fuels, lubricants, and solvents would be used at the NBVC Point Mugu, NBVC SNI, and SCrI sites. The construction crews will store and maintain

these materials in accordance with Navy and NBVC protocols and will maintain a copy of MSDS for each hazardous material stored and used on the project sites.

Four drums of hazardous waste would be generated under this alternative: two drums (one for liquids and one for rags) would be generated at each project location site. The construction crew will coordinate with the NBVC environmental office to ensure proper handling and storage of the waste and to obtain a waste manifest prior to transportation of the waste. The waste from the Coast Guard Jetty site would be transported to Port Hueneme via barge prior to delivery to an approved TSD facility.

Once the drilling operations are completed at the Building 811 site, approximately 26,100 gal (98,700 l) of drilling fluid would be collected for disposal in 475 55-gallon (208 l) drums. Approximately 98.4 yd^3 (75.2 m^3) of drilling solids would be accumulated and handled as inert debris. The HDD operations at Charlie Pad would generate approximately 17,800 gal (67,400 l or 324 drums) of drilling fluid and 67.2 yd^3 (51.4 m^3) of drilling solids. During Coast Guard Jetty HDD operations, approximately 10,500 gal (39,900 l or 192 drums) of drilling fluid would be collected for disposal, and approximately 39.7 yd^3 (30.4 m^3) of drilling solids would be generated. The construction crew will coordinate with the NBVC environmental office to ensure proper handling and storage of the waste and to obtain a waste manifest prior to transportation of the waste. The Navy will coordinate with the LARWQCB to determine if the drilling fluid and solids can be disposed of as Type A or Type B inert debris and identify the appropriate TSD facility to receive, treat, and dispose the drilling fluid wastes.

During SCrI HDD operations, approximately 4,450 gal (16,900 l or 81 drums) of drilling fluid would be collected for disposal, and approximately 16.8 yd^3 (12.8 m^3) of drilling solids would be generated. The Navy will coordinate with the CCRWQCB to determine if the drilling fluid and solids can be disposed of as Type A or Type B inert debris and identify the appropriate TSD facility to receive, treat, and dispose the drilling fluid wastes.

Under Alternative 3, appropriate BMPs would be implemented to minimize the release of hazardous materials to the environment, and the hazardous and non-RCRA wastes generated would be handled in accordance with all federal, state, and local laws and regulations. Therefore, implementation of Alternative 3 would have no significant impacts from hazardous materials and waste.

Mitigation Measures

Implementation of the Alternative 3 would not result in significant impacts with respect to hazardous materials or waste management; therefore no mitigation measures are proposed or required.

3.4.2.5 Alternative 4

Under Alternative 4, there would be no project activities conducted at the Building 811 or Prisoners Harbor sites. Hazardous materials including fuels, lubricants, and solvents would be used at the Charlie Pad and Coast Guard Jetty sites. The construction crews will store and maintain these materials in accordance with Navy and NBVC protocols and will maintain a copy of MSDS for each hazardous material stored and used on the project sites.

Four drums of hazardous waste would be generated under this alternative: two drums (one for liquids and one for rags) would be generated at both the Charlie Pad and Coast Guard Jetty sites. The construction

crew will coordinate with the NBVC environmental office to ensure proper handling and storage of the waste and to obtain a waste manifest prior to transportation of the waste. The waste from the Coast Guard Jetty site would be transported to Port Hueneme via barge prior to delivery to an approved TSD facility.

The HDD operations at Charlie Pad would generate approximately 17,800 gal (67,400 l or 324 drums) of drilling fluid and 67.2 yd^3 (51.4 m^3) of drilling solids. During Coast Guard Jetty HDD operations, approximately 10,500 gal (39,900 l or 192 drums) of drilling fluid would be collected for disposal, and approximately 39.7 yd^3 (30.4 m^3) of drilling solids would be generated. The construction crew will coordinate with the NBVC environmental office to ensure proper handling and storage of the waste and to obtain a waste manifest prior to transportation of the waste. The Navy will coordinate with the LARWQCB to determine if the drilling fluid and solids can be disposed of as Type A or Type B inert debris and identify the appropriate TSD facility to receive, treat, and dispose the drilling fluid wastes.

Under Alternative 4, appropriate BMPs would be implemented to minimize the release of hazardous materials to the environment, and the hazardous and non-RCRA wastes generated would be handled in accordance with all federal, state, and local laws and regulations. Therefore, implementation of Alternative 4 would have no significant impacts from hazardous materials and waste.

Mitigation Measures

Implementation of the Alternative 4 would not result in significant impacts with respect to hazardous materials or waste management; therefore no mitigation measures are proposed or required.

3.4.2.6 Alternative 5 – The No-Action Alternative

Under the No-Action Alternative, the proposed action would not occur, and the existing conditions would remain unchanged. Therefore, no significant impacts with respect to hazardous materials or waste would occur.

Mitigation Measures

Implementation of the No-Action Alternative would not result in significant impacts with respect to hazardous materials or waste management; therefore no mitigation measures are proposed or required.

3.5 INFRASTRUCTURE AND UTILITIES

3.5.1 Affected Environment

3.5.1.1 Definition of Resource

For the purposes of this EA/OEA, infrastructure and utilities of concern include transportation of personnel, equipment, and goods to the project sites; road networks; and potable and non-potable water sources.

3.5.1.2 Existing Conditions

Point Mugu

Personnel and Materials Transport

The majority of personnel and materials transport to and from NBVC Point Mugu is carried out via the road network described below. Most ground transport approaches the base on the Pacific Coast Highway (California State Route 1). All vehicles enter NBVC Point Mugu through two guarded gates.

Contractor personnel do not routinely stay on base but lodge in the surrounding communities of Oxnard, Ventura, or Camarillo.

Supplies can also be delivered to NBVC Point Mugu by cargo aircraft landing at the airfield. Shuttle flights connect Point Mugu to SNI and Naval Air Weapons Station China Lake.

Road Networks

NBVC Point Mugu is served by an extensive road system, allowing access to and from base facilities. The Pacific Coast Highway forms the northeastern boundary of the base. The Ventura Freeway (U.S. Highway 101) is located approximately 6 mi (10 km) north of the base and is a major north-south route in the California highway system. Both the Pacific Coast Highway and Ventura Freeway connect Point Mugu to the Los Angeles area. Major roads that run from the Ventura Freeway south from Oxnard, Ventura, and Camarillo include Rice Avenue, Wood Road, Las Posas, and Lewis Road. Direct access to the base is from the frontage road that runs along the Pacific Coast Highway.

The base has four entrance gates: Gates 1, 2, 3, and 5. Two of these gates, Gates 2 and 3, are open for routine base traffic. The majority of traffic flows south to NBVC Point Mugu via the Pacific Coast Highway and Las Posas Road. Gate 2 is known as Main Gate, and Gate 3 is called Las Posas Gate. The Las Posas Gate is open 24 hours a day, and the Main Gate is open during normal business hours.

NBVC Mugu has over 50 mi (80 km) of paved roads. Primary roadways on the base include North Mugu Road, Main Road, Laguna Road, 11th Street, 13th Street and Beach Road. Beach Road is a designated ordnance transportation route. The primary access road to the HDD drilling sites is Laguna Road, which runs along Mugu Lagoon. Figure 3.5-1 provides an overview of the road network on and near NBVC Point Mugu.

Figure 3.5-1 Road Network in the Point Mugu Vicinity

Water

Potable water for NBVC Point Mugu is provided by the Port Hueneme Water Agency, which is the wholesale utility service for the City of Port Hueneme, the Channel Islands Community Services District and NBVC Point Mugu and Port Hueneme. The water agency serves a population of approximately 50,000 and has relatively fixed demand.

The distribution plant at the base is equipped with softening and chlorinating capabilities and two surge protection tanks with capacities of 50,000 and 200,000 gallons (190,000 and 760,000 l). The potable water distribution system supplies the entirety of NBVC Point Mugu, including the Channel Islands Air National Guard Station and Laguna Peak Facilities. The existing system has a capacity of 5.8 million gallons per day (gpd) (22 million liters per day [Lpd]). Average demand is roughly 1.6 million gpd (6.1 million Lpd).

San Nicolas Island

Personnel and Materials Transport

SNI is located approximately 65 mi (105 km) southwest of NBVC Point Mugu. The island is owned and operated by the Navy, and access is strictly controlled. Personnel access is granted for military-related activities and for pre-approved, non-military users for primarily scientific purposes. A scheduled contract aircraft shuttle operates between NBVC Point Mugu and SNI to bring personnel to the island.

Most equipment and material is transported to and from SNI via a contracted barge service, originating from NBVC Port Hueneme, with voyages scheduled every two weeks. The barges have a surface area for transport of materials of approximately 4,000 ft^2 (372 m^2) with a weight limit of 130,000 lb (59,000 kg). Barges are loaded and offloaded at the SNI barge pier. Some materials are transported to SNI via cargo air shipments. To reduce the potential introduction of ecologically harmful non-native flora or fauna, all barge and aircraft shipments to SNI will be conducted in accordance with NBVC Instruction 5090.14, *Biological Resources Security Requirements for Air and Barge Transport of All Cargo to San Nicolas Island, Naval Base Ventura County*. Specific biosecurity measures are described in the conservation measures to be implemented for Alternative 1 (see Section 2.1.3).

Road Networks

There are approximately 22 mi (35 km) of paved roads that generally run southeast to northwest along the axis of SNI. All vehicles on the island are government-owned or controlled. Traffic conflicts occur only when convoys transport ordnance or other hazardous materials. Non-participating vehicles are precluded from operating along roads occupied by the convoys. There is no public roadway on SNI.

Water

Fresh water is a limited resource on SNI and the island does not have any aquifers. There are seasonal water flows, but the water in these ephemeral streams is high in perchlorate and is not potable. The water is sometimes collected and used for construction purposes.

Numerous wells and catchments have been installed at various sites around SNI. Three wells are located in small buildings on the island. There are various types of water catchments on SNI designed to capture underground water seepage and spring water. The water collected from these systems is then collected in tanks and distributed through the water system after treatment. Water distribution is composed of a network of storage tanks, pumps, mains, valves, and hydrants. The main water tanks are located near Building 159.

Two reverse osmosis (RO) desalination units are located at near the jetty at Coast Guard Beach. Each unit has an output capacity of 1,250 gallons per hour (4,730 liters per hour). The raw source water is pumped from ten seawells on the beach. The desalination plant has a production limit of 20,000 to 25,000 gpd of fresh water. Fresh water produced from the RO units is stored in tanks adjacent to the pump house. One tank holds 50,000 gallons (189,000 l) and another can hold up to 10,000 gallons (37,850 l). The fresh water is then pumped to Tank 8 at the main water storage area.

Fresh water is also delivered from off-island sources. Water barges can be moored near the RO plant and off-loaded through a submarine water line to a storage tank near Building 196. A second delivery alternative is to deliver tanker trailers on freight barges.

Santa Cruz Island

Personnel and Materials Transport

Normally scheduled boat trips between Ventura Harbor and SCrI are conducted on Monday mornings and Friday afternoons. These personnel transport vessels are aviation rescue vessels (AVR) and can carry a maximum of 20 passengers and a total cargo of 3,500 lb (1,590 kg). As needed, additional connections between SCrI and the mainland can be arranged using contracted helicopter or boat services. Personnel arrive at the Prisoners Harbor Pier and transit to the Navy site via the Navy Road.

Living quarters for 20 personnel exist at the Navy Site. In addition to berthing, this building houses the messing facilities, lounge, and common head facilities. Meal services are not provided at SCrI, so contractors must bring their own provisions.

In addition to the AVR support, larger landing craft utility (LCU) vessels provide surface transport of materials to the SCrI Navy Site. The contract craft can carry larger cargo, such as fuel trucks, which cannot be delivered via AVR. The LCU craft can carry cargo up to the size of a semi-truck trailer.

LCU landing at SCrI is conducted at a beach site in the Prisoners Harbor area. To facilitate the cargo craft landing, the Navy must maintain this beach site by amassing naturally occurring cobblestones. This maintains the integrity of the beach and ensures safe landing of the cargo craft.

Road Networks

There are numerous unpaved roads on SCrI, totaling 20.2 mi (32.5 km). The main thoroughfare connecting Prisoners Harbor and the Navy Site is Navy Road. The approximately 7-mile (11-km) trip between the sites on Navy Road takes approximately 30 minutes.

As required by their lease agreement with TNC, the Navy maintains Navy Road and other associated service roads on SCrI. The Navy maintains passenger vehicles, a forklift, a bulldozer, a 5-ton 4-wheel drive truck, a 1,800-gallon (6,800 l) water truck used for firefighting, and carts on the island.

Water

Potable water on SCrI is a limited resource. There is a 30,000-gal (113,500-l) water storage tank located at the Navy Site. Any support services could utilize this water, but beyond that resource, any additional water must be delivered to SCrI. The well located near Prisoners Harbor does not have the production capacity to support the FOCUS-II drilling and installation activities. Prisoners Harbor is shallow in the vicinity of the landing site, making mooring a water barge difficult and hazardous to local sea grass beds. Considering this, seawater will be used for SCrI drilling operations.

3.5.2 Environmental Consequences

3.5.2.1 Assessment Criteria

Impacts on infrastructure, utilities, and transportation are evaluated for their potential to disrupt or improve existing levels of service and create additional requirements for energy (e.g., electric, central heating, natural gas, and liquid fuels), water, sanitary sewer/wastewater service, storm water drainage, solid waste management, and the transportation network. In general impacts could arise from needs created by either direct or indirect workforce and population changes related to proposed activities.

3.5.2.2 Alternative 1 – Preferred Alternative

Point Mugu

Personnel and Material Transport

Personnel and material would be transported to and from Point Mugu via local road networks. Personnel would lodge in surrounding communities of Oxnard or Ventura. Therefore, implementation of Alternative 1 would have no significant impacts on local transportation networks.

Road Networks

Under Alternative 1, personnel and material would be transported using the existing road networks in the vicinity of Point Mugu (Figure 3.5-1). The short-term increase in traffic during the drilling and cable installation operations would be insignificant compared to the existing traffic volume. Personnel and deliveries would be conducted through existing approved gates. Drilling operations at Building 811 would not affect local traffic. However, drilling at Charlie Pad would limit traffic on Beach Road to one lane. The construction crew will coordinate with NBVC to ensure that the FOCUS-II construction activities would not impede ordnance transportation on Beach Road. Therefore, implementation of Alternative 1 would have no significant impacts on local road networks.

Water

As a worst-case scenario, drilling operations would require 50,000 gal (189,000 l) of water per day. This would represent approximately 0.86 percent of the total capacity of the Port Hueneme Water Agency or an increase of approximately three percent over the average daily demand. This increased demand would be temporary in nature, lasting up to 60 days for the drilling operations at the Point Mugu sites. Therefore, implementation of Alternative 1 would have no significant impacts on local potable water supplies.

San Nicolas Island

Personnel and Material Transport

Personnel would be transported to and from SNI via the contract air shuttle between Point Mugu and SNI. The personnel would lodge at the Navy Gateway Inn and would have their meals at the SNI dining facilities. Coordination with NAWCWD and NAVFAC would be required to ensure that lodging and supplies would be available for the contractor staff.

Equipment and supplies would be transported to SNI via the contract barge services. It is assumed that the proposed action would require a portion of the barge deck surface for two round-trip voyages. Motor vehicles would be transported via the two barge shipments. Implementation of Alternative 1 would have no significant impacts on local transportation networks.

Road Networks

Under Alternative 1, equipment would be transported between the barge landing pier to the staging area near the Coast Guard Jetty. Contractor staff would utilize vehicles transported to SNI via barge shipments. The increase in traffic associated with the drilling and trenching operations would be insignificant compared to the existing traffic volume. No road traffic would be disrupted due to FOCUS-II installation operations at SNI. Therefore, implementation of Alternative 1 would have no significant impacts on local road networks.

Water

Water for drilling operations will be shipped to SNI via water barge. The water shipments would commence up to six weeks prior to drilling operations, so that water can be pumped to the water storage bladders near the drilling site. Accumulation and storage of at least 250,000 gal (946,000 l) would be required before drilling operations could commence. The water source used would be the same as that used for other fresh water shipments to SNI.

Contractors lodging on SNI would represent an increase in potable water consumption, but this would be insignificant compared to the SNI RO plant output capacity. Therefore, implementation of Alternative 1 would have no significant impacts on SNI potable water supplies.

Santa Cruz Island

Personnel and Material Transport

Personnel would primarily be transported to SCrI via the existing approved NPS transportation vendor or NPS vessels between Ventura Harbor and Prisoners Harbor. When needed, personnel would be transported to SCrI via chartered helicopter service. Contractors would lodge at the Navy Site quarters and would bring their own provisions. Project vehicles would be transported to SCrI via barge, and only approved drivers would be allowed to drive on SCrI roads.

It is assumed that two barge and five LCU round-trip shipments would be needed to complete the drilling and trenching operations at SCrI. Due to the need for oversized equipment and the number of articles, a large barge with an approximate surface area of 4,000 ft^2 (372 m^2) deck space (triple stack capability) would be used to deliver equipment to initiate the drilling operations. One round-trip delivery will be needed to start the operations, and one round-trip delivery will take the large equipment off SCrI. The

large barge shipments will come ashore via beach landings. To reduce the potential introduction of ecologically harmful non-native flora or fauna, all barge and aircraft shipments to SCrI will be conducted in accordance with the CINP Biosecurity Protocols (CINP 2014a). Specific biosecurity measures are described in the conservation measures to be implemented for Alternative 1 (see Section 2.1.3). Therefore, implementation of Alternative 1 would have no significant impacts on local transportation networks.

Road Networks

During the drilling and trenching operations, contracted staff would be required to drive the 7 mi (11.2 km) between the Navy Site and Prisoners Harbor as well as between the Navy Site and trenching operations sites. These trips would be conducted via project vehicles transported to SCrI via barge as described above. Prior to driving on SCrI, contractors would be required to attend safety awareness classes providing details regarding the specific hazards of the SCrI dirt roads and maintaining the Channel Islands National Park character by minimizing fugitive dust generation.

Drilling operations would not affect road traffic on SCrI, but the trenching would require temporary daily closure of portion of the Navy Road to non-authorized vehicles for the three-month duration. Hikers would be asked to take alternative routes to visit the SCrI sites. The trenching would be conducted within the roadway in a manner that will allow vehicles to pass the trenching operations to the greatest extent, and trenches would be filled in or covered every evening. There are secondary routes allowing access to all SCrI sites whenever vehicle passing the trenching operations is not possible. The road closure would be temporary in nature, and all road surfaces would be returned to their original state or better. Therefore, implementation of Alternative 1 would have no significant impacts on the SCrI road network.

Water

Limited resources and lack of delivery options would preclude use of potable water for drilling and other construction operations on SCrI. As a result, seawater will be pumped from Prisoners Harbor and used to generate drilling fluid. Dust control during construction would be accomplished using fresh water trucks transported to SCrI via barge as described above.

Contractors lodging at the Navy Site would represent an increase in potable water consumption, but this would be insignificant compared to the water stored on the Navy Site and the water generated by the well output capacity. Once the water line is installed in the trenches, the efficiency of water delivery to the Navy Site would be improved as the current overland water line has many leaks. The new water line will also allow for NPS and TNC access to potable water at the manholes installed along the route. Therefore, implementation of Alternative 1 would have no significant impacts on SCrI potable water supplies.

Mitigation Measures

Implementation of Alternative 1 would not have significant impacts to infrastructure or utilities. Therefore, no mitigation measures are proposed or required.

3.5.2.3 Alternative 2

Point Mugu

Infrastructure and utilities requirements of Alternative 2 and Alternative 1 would be identical at the NBVC Point Mugu Building 811 and Charlie Pad sites. Therefore, implementation of Alternative 2 would have no significant impacts on Point Mugu infrastructure or utilities.

San Nicolas Island

The Alternative 2 infrastructure and utilities impacts would be identical to the infrastructure and utilities requirements associated with Alternative 1 on SNI. Therefore, implementation of Alternative 2 would have no significant impacts on SNI infrastructure or utilities.

Santa Cruz Island

The Alternative 2 infrastructure and utilities impacts would be nearly identical to the infrastructure and utilities requirements associated with Alternative 1 on SCrI. Therefore, implementation of Alternative 2 would have no significant impacts on SCrI infrastructure or utilities.

Mitigation Measures

There would be no significant infrastructure or utilities impacts associated with Alternative 2; therefore, no mitigation measures are proposed or required.

3.5.2.4 Alternative 3

Point Mugu

Infrastructure and utilities requirements of Alternative 3 and Alternative 1 would be identical at the NBVC Point Mugu Building 811 and Charlie Pad sites. Therefore, implementation of Alternative 3 would have no significant impacts on Point Mugu infrastructure or utilities.

San Nicolas Island

The Alternative 3 infrastructure and utilities impacts would be identical to the infrastructure and utilities requirements associated with Alternative 1 on SNI. Therefore, implementation of Alternative 3 would have no significant impacts on SNI infrastructure or utilities.

Santa Cruz Island

The Alternative 3 infrastructure and utilities impacts would be nearly identical to the infrastructure and utilities requirements associated with Alternative 1 on SCrI. Therefore, implementation of Alternative 3 would have no significant impacts on SCrI infrastructure or utilities.

Mitigation Measures

There would be no significant infrastructure or utilities impacts associated with Alternative 3; therefore, no mitigation measures are proposed or required.

3.5.2.5 Alternative 4

Point Mugu

Infrastructure and utilities requirements of Alternative 4 and Alternative 1 would be identical at the NBVC Point Mugu Charlie Pad site. There would be no construction activity at the Building 811 site. Therefore, implementation of Alternative 4 would have no significant impacts on Point Mugu infrastructure or utilities.

San Nicolas Island

The Alternative 4 infrastructure and utilities impacts would be identical to the infrastructure and utilities requirements associated with Alternative 1 on SNI. Therefore, implementation of Alternative 4 would have no significant impacts on SNI infrastructure or utilities.

Santa Cruz Island

There would be no activities conducted at SCrI under Alternative 4, including the installation of the new water line. Efficiency of water delivery would continue to degrade as leaks in the existing water line would increase. Therefore, implementation of Alternative 4 would have no significant impacts on SCrI infrastructure or utilities.

Mitigation Measures

There would be no significant infrastructure or utilities impacts associated with Alternative 4; therefore, no mitigation measures are proposed or required.

3.5.2.6 Alternative 5 – The No-Action Alternative

Under the No-Action Alternative, the proposed installation of FOCUS-II would not occur and existing conditions as described in Section 3.5.1.3 would remain unchanged, including use of the existing water line. Efficiency of water delivery would continue to degrade as leaks in the existing water line would increase. Therefore, implementation of the No-Action Alternative would have no significant impacts on SCrI infrastructure or utilities.

Mitigation Measures

Implementation of the No-Action Alternative would not result in significant impacts on infrastructure or utilities; therefore, no mitigation measures are proposed or required.

3.6 LAND AND WATER USE

3.6.1 Affected Environment

3.6.1.1 Definition of Resource

Land and water use comprises the natural conditions and/or human-modified activities occurring at a particular location. The terms "land use" or "water use" can also refer to the use of an area by recreational, commercial, and military users.

3.6.1.2 Existing Conditions

Point Mugu

Land Use

Point Mugu comprises approximately 4,490 ac (1,820 ha). Of this, approximately 1,990 ac (805 ha) have been developed and the rest remain in their natural state. Land use at Point Mugu is dominated by natural and operational constraints that require preservation of this open space. Included in the undeveloped area are 2,153 ac (871 ha) of designated wetlands, 200 ac (81 ha) of beach dunes, and 270 ac (109 ha) of grasslands. Much of the open land at Point Mugu is environmentally constrained due to the presence of sensitive environmental resources. Development is also limited by the existence of airfield safety clearance zones.

Land use at Point Mugu is grouped into ten categories: 1) Aircraft Operations, 2) Aircraft Maintenance, 3) Base Support, 4) Test and Evaluation, 5) Administration, 6) Community Support, 7) Housing, 8) Training, 9) Ordnance, and 10) Open Space. Approximately 890 ac (360 ha) are used for administration, operations, and training; 240 ac (97 ha) are used for military housing and recreation.

Aircraft operations and testing, evaluation, and training constitute a major land use of Point Mugu. Recommendations regarding land use compatibility in the immediate vicinity of Point Mugu are established by the Point Mugu Air Installation Compatible Use Zone (AICUZ) Program to prevent incompatible development in high noise exposure areas, to minimize public exposure to potential health and safety hazards associated with aircraft operations, and to protect the operational capability of the air installation.

The USACE has jurisdiction over the two major drainages to Point Mugu – Calleguas Creek and Revolon Slough – as well as Mugu Lagoon and adjacent wetlands.

Water Use

Point Mugu does not have a port and does not directly support ship activity. As described above, a large portion of Point Mugu is designated as wetland. Nearshore activity in the vicinity of Point Mugu includes surfing and swimming at a beach near Mugu Lagoon. However, Point Mugu is designated a classified or secure base, and public admittance is generally not allowed. A few beach areas are open to Department of Defense (DoD) employees, base contractors, and active duty, retired, or reserve personnel (Navy 2002).

San Nicolas Island

Land Use

Located approximately 57 NM (106 km) southwest of Point Mugu, SNI, an island of 14,500 ac (5,890 ha), is owned and operated by the Navy as a major element of the Sea Range. Most of SNI is used as a range instrumentation site to support Point Mugu Sea Range operations. SNI facilities support all aspects of range operations, including missile and target launches. All development on SNI is associated with the military, and land uses are considered either military support or open space. SNI has one minor population center, Nicktown, which is located on the north side of the island. No permanent residences are established on SNI; however, approximately 200 people live as part-time residents at Nicktown. There is no public access to SNI, and the population fluctuates almost daily with visitors from many different activities within the DoD. (Navy 2002)

There are over 150 buildings located on SNI with facilities to transport, house, and support personnel and related materials, in addition to a 10,000-ft (3-km) concrete or asphalt concrete runway and facilities to support testing operations. Adjoining the airfield are a control tower, hangars, ground control approach capabilities, and one fire station. Additional facilities include extensive range, support, and fuel storage facilities; machine/repair shops and storage buildings; and ordnance and launching facilities. (NBVC 17 2010)

Water Use

Due to the distance from the mainland, the area around SNI is primarily used by Navy vessels, commercial fishing boats, and sport fishing boats. Most types of inshore fisheries common in southern California can occur in the nearshore waters of SNI (Navy 2002). Occasional fisheries occurring near SNI include drift sea bass fishing, live fish trapping, hook and line bottom fishing (rock cod), hook and line trolling (halibut and sea bass), open-water trolling (albacore and swordfish), squid purse seining, and crab trapping. However, primary nearshore fisheries at SNI are urchins and lobster. These fisheries occur in less than 120 ft (36.6 m) of water around SNI; fall and winter are the most important seasons for these fisheries. Commercial passenger fishing vessels frequently offer one-day sport fishing excursions either from the Ventura or Santa Barbara harbors.

DoD employees, base contractors, and active duty personnel launch recreational fishing boats from Cissy Cove and fish nearby areas. SNI is surrounded by kelp forests, exhibits an upwelling of nutrients, and has numerous fishing spots along the shoreline. Many of the better areas to fish are identified by fishing signs. Some of the more common species include cabezon, California sheephead, rockfish, white seabass, and kelp (calico) bass. Fishermen must have a California ocean-fishing license to fish on SNI and abide by bag and size limits. The CDFW is responsible for enforcement of fishing regulations on SNI. Fishermen also must abide by SNI area closures due to environmental laws protecting certain wildlife and must respect cultural resources areas, such as Indian middens located near coastal areas. Environmental personnel post flyers in obvious locations around the island regarding fishing on SNI, including specific information on different species of fish and catch limits (NBVC 2010).

For safety purposes, restricted areas have been established in the waters around SNI, extending approximately 3 mi (4.8 km) from the shoreline. There are three sections: Alpha, Bravo, and Charlie

whose boundaries were amended in May 2014 (see Figure 3.6-1). Boats must remain at least 300 yd (274 m) from the shoreline of SNI at all times, and no boats are allowed to anchor within 300 yd (274 m) or land on SNI, except in an emergency. Individual sections of the restricted area can be closed during operations in the vicinity of SNI. No person, vessel, or other craft shall enter the restricted area or designated section(s) during closure periods unless authorized to do so by the Commanding Officer, NBVC or the Officer in Charge, SNI.

Santa Cruz Island

Land Use

SCrI, an island of 61,800 ac (25,000 ha), is approximately 25 mi (40 km) south-southeast of Point Mugu. The island was historically used for farming and ranching, dating back to 1853. In 1978, the Nature Conservancy (TNC) secured permanent protection of the eastern 74 percent of the island. In 1997, NPS acquired ownership of the western 26 percent of SCrI from TNC. The NPS-owned lands were added to CINP.

The Navy established an instrumentation site on SCrI in 1949 to support missile testing at Point Mugu. The Navy leases the Navy Site from the Nature Conservancy. The Navy Site is surrounded by NPS lands.

Five of the northern Channel Islands – Anacapa, Santa Cruz, Santa Rosa, San Miguel, and Santa Barbara – and the rocks, islets, submerged lands, and waters within 1 NM (1.85 km) of each island were designated by Congress as the CINP on March 5, 1980 (16 U.S.C. §410ff). Lands owned by the NPS are open to public visitor access and use. Visitors to SCrI can access the island through chartered boat services or via private watercraft. Chartered services are based in Santa Barbara and Oxnard. Passengers can load and unload at piers at Scorpion and Prisoners Harbor. Beach access is available at Scorpion, Smugglers Cove, and Prisoners Harbor.

There are numerous hiking trails on the island, and camping is allowed in designated campgrounds. Common visitor activities on SCrI include marine mammal and bird watching, photography, and hiking. The trail system on the NPS portion of SCrI is comprised of a combination of unmaintained and unimproved administrative roads. Camping on SCrI is available at Scorpion Ranch and Del Norte, with capacities of 240 and 16, respectively (NPS 2015). Figure 3.6-2 provides an overview of the roads and trails on SCrI as well as recreation sites on the island.

The pier at Prisoners Harbor was originally constructed in 1869 as part of the historic Ranch. over the years, the wharf was modified to facilitate transfer of cargo from vessels to the island. A major modification involved the installation of rails to move merchandise on flatcars from the wharf head to the warehouse. A later modification removed the rails when trucks were used to transfer cargo. During the summer of 1993, limited repairs were made to the wharf as part of a larger maintenance effort. The repairs consisted of the replacement of three pilings, removal and replacement of deck planking, and installation of a rail on the wharf. (Navy 1994)

The pier continues to be used today as one of the two primary access points for SCrI public visitors. It is also used by both NPS and the Navy to offload cargo and other supplies onto the island. (NPS 2015)

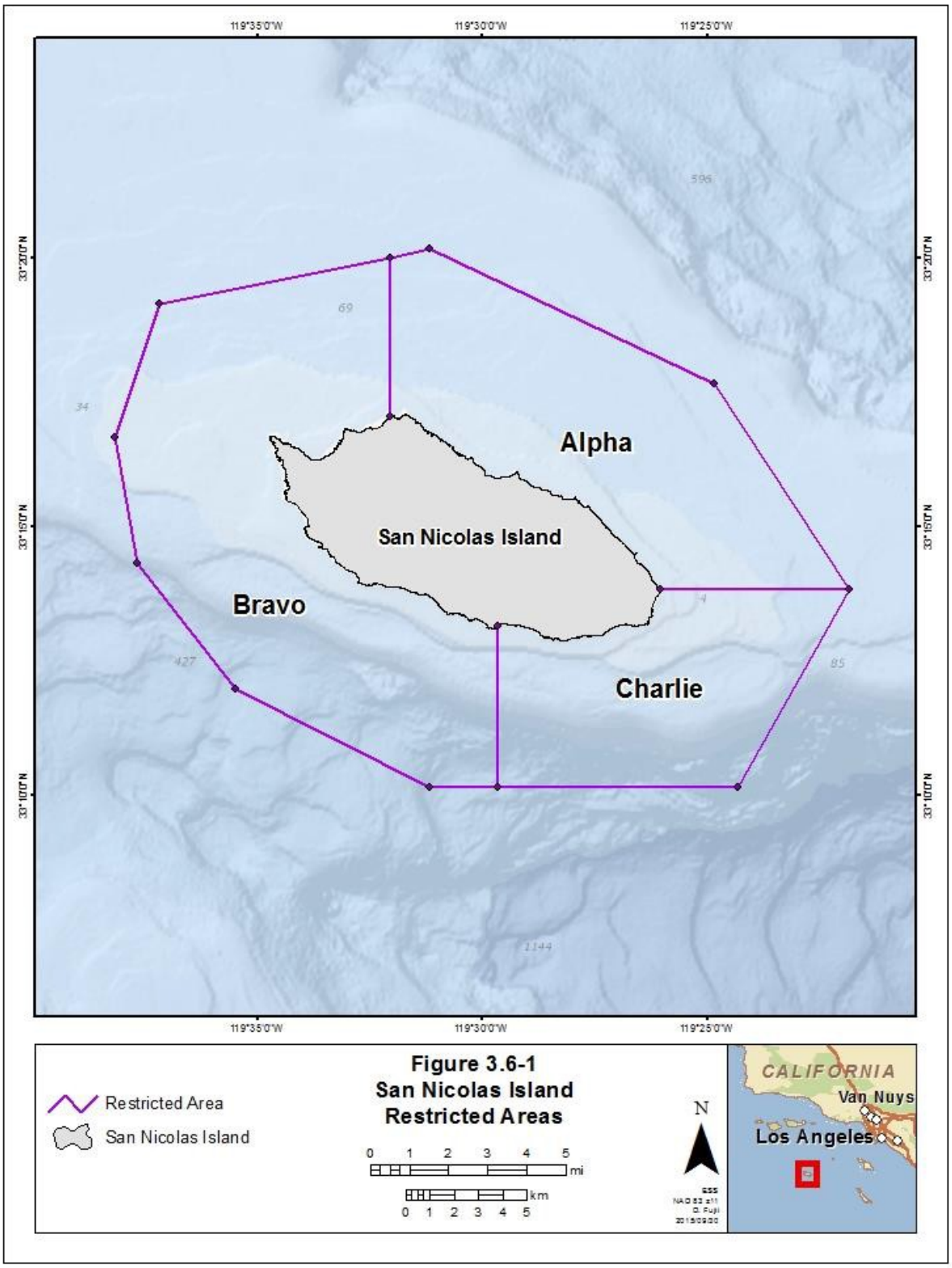

Figure 3.6-1
San Nicolas Island
Restricted Areas

119°42'0"W
119°40'0"W
119°38'0"W
119°36'0"W
119°34'0"W
119°32'0"W
34°0'59"N
34°0'47"N
34°0'35"N
34°0'23"N
34°0'11"N
33°59'59"N
33°59'47"N
33°59'35"N
33°59'23"N
33°59'11"N
Scorpion Campground
Scorpion Pier
Prisoners Harbor Pier
Del Norte Camp
Navy Road
Smugglers Cove
Road
Trail
Figure 3.6-2 Roads, Trails and Recreational Areas of CINP Santa Cruz Island
0 1 2 3 4 mi
0 1 2 3 4 5 km
N
CALIFORNIA
Van Nuys
Los Angeles

Water Use

The area off the SCrI coast is subject to ownership and management protocols of the State of California, the NPS, and NOAA. As described above, the submerged lands within 1 NM (1.85 km) of SCrI is designated as a portion of the CINP. The State of California waters extend 3 NM (5.56 km) from the high tide line of SCrI. Within the state waters, California has established four classifications of Marine Protected Areas (MPA):

- State Marine Reserve (SMR) – An MPA designation that prohibits damage or take of all marine resources (living, geologic, or cultural) including recreational and commercial take;
- State Marine Conservation Area (SMCA) – An MPA designation that may allow some recreational and/or commercial take of marine resources (restrictions vary);
- State Marine Conservation Area (No-Take) – An MPA designation that generally prohibits the take of living, geological, and cultural marine resources, but allows potentially affected and ongoing permitted activities such as dredging and maintenance to continue; and
- Special Closure – An area designated by the Fish and Game Commission that prohibits access or restricts boating activities in waters adjacent to sea bird rookeries or marine mammal haulout sites (restrictions vary).

Designated in 1980, the CINMS consists of an area of approximately 1,471 mi^2 (3,810 km^2) of coastal and ocean waters, and the submerged lands thereunder, off the southern coast of California. The Sanctuary boundary begins at the high tide line and extends seaward to a distance of approximately 6 NM (11.1 km) from the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock. In 2007, NOAA completed the Channel Islands MPA network, consisting of a total of ten marine reserves (no-take zones) and two marine conservation areas (limited take zones) within the CINMS, which was initiated by a unique, community-based process. NOAA and the CDFW cooperatively enforce the Channel Islands MPA network through a combination of federal and state regulations. (NOAA 2009)

The MPAs in the vicinity of SCrI include Scorpion State Marine Reserve (SMR), Scorpion Federal Marine Reserve, Painted Cave State Marine Conservation Area (SMCA), Gull Island SMR, and the Gull Island Federal Marine Reserve. Although the offshore route will transit the Scorpion SMR, the landing site near Prisoners Harbor is not close to any of these MPAs (Figure 3.2-9). The Anacapa SMR and SMCA are adjacent to the offshore route (Figure 3.2-9).

The waters surrounding SCrI are open to private and chartered boats. Water use activities in the vicinity of the island include recreational boating, recreational fishing, kayaking, and wildlife watching.

Offshore Routes

Submerged Land Use

The proposed action would include the offshore alignment corridors connecting the HDD exit sites offshore from NBVC Point Mugu, NBVC SNI, and SCrI. While the ocean floor within 3 NM (5.5 km) of shore is generally subject to the jurisdiction of the State of California as defined by the Submerged Lands Act (SLA, 43 U.S.C. 29), DoD activities within this zone are exempt from SLA. Unless the federal

government consents to state regulation, its "activities ... are free from regulation by any state." (Hancock v. Train [1976] 426 U.S. 167, 178; see also, e.g., Blackburn v. United States [9th Cir. 1996] 100 F.3d 1426, 1435 ["States may not directly regulate the Federal Government's operations or property."]).

As described above, certain activities that may affect the seafloor offshore SCrI do fall under the jurisdiction of the NPS (out to 1 NM [1.85 km] offshore) and the CINMS (out to 6 NM [11.1 km] offshore). The CINP is managed by NPS, and the CINMS is managed by NOAA. Existing DoD activities are exempted from CINMS regulations (15 CFR §922.72), though new activities, including those that require the preparation of an environmental assessment under NEPA, require consultation with NOAA under Section 304(d) of the Sanctuaries Act (16 USC 1434(d)).

Water Use

A large amount of ocean traffic occurs through the Point Mugu Sea Range; more than 7,000 vessel movements through the Sea Range have been estimated for a one-year period (Navy 2002). Of these, approximately 800 are a result of Navy activity. Shipping routes cross the Sea Range through the Santa Barbara Channel and through an area south of the Channel Islands.

NAWCWD utilizes the Sea Range for a variety of uses, although maritime transport and missile launches are two primary uses. Common types of vessels used in the Sea Range include range support boats, larger ships (i.e., cruisers, destroyers, and aircraft carriers), and surface targets.

Non-military activities can occur in all areas within the Sea Range. When U.S. Navy activities require exclusive use of an area, NAWCWPNS notifies mariners by issuing a Notice to Mariners (NOTMAR) and secures the area.

Maritime Shipping. A major shipping channel established by the U.S. Coast Guard is aligned just north of, and roughly parallel with, the northern Channel Islands. This channel is used by commercial cargo vessels traveling between northern Pacific and southern California ports, as well as by traffic destined for remote ports such as the Panama Canal or Asia.

Fishing. Commercial fishing, diving, and trapping occur at various locations off the coast of southern California, including portions of the Sea Range and the Channel Islands, which constitutes an extremely productive commercial fishing area. The nearshore waters along the coast from Ventura to Santa Barbara and the waters just off the Channel Islands contain giant kelp beds that provide habitats for numerous species; the majority of fish are caught within these areas. The top five fisheries based on commercial landings at Ventura Harbor are: squid, lobster, halibut, tuna, and sea cucumber (CDFG 2013).

Oil and Gas Production. Numerous oil platforms are located in the Santa Barbara Channel between Oxnard and Gaviota, both in state waters (out to 3 NM [5.6 km]) and federal waters (beyond 3 NM [5.6km]). There are four offshore drilling rigs (Grace, Gail, Gilda, and Gina) and a network of pipelines connecting the rigs and the mainland within 10 mi (16 km) of the FOCUS-II alignments connecting SCrI to NBVC Point Mugu and NBVC SNI. BOEM provides oversight and management of offshore energy resources. As shown on Figure 3.6-3, the FOCUS-II alignments would remain at least 1 mi (1.6 km) distant from the offshore rigs and pipelines.

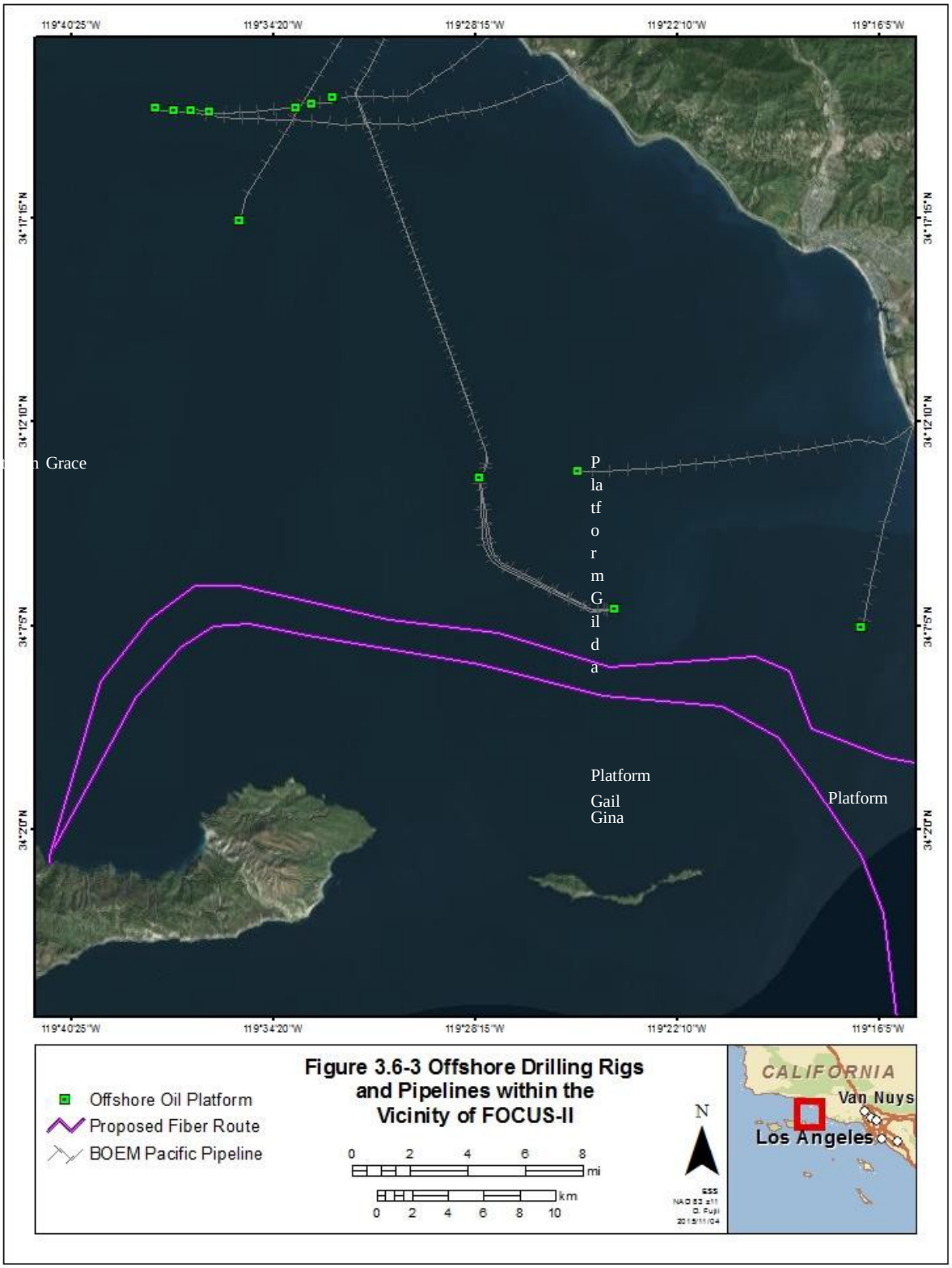

Figure 3.6-3 Offshore Drilling Rigs and Pipelines within the Vicinity of FOCUS-II

Coastal Zone Management Act Federal Consistency

The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. §1451) encourages coastal states to be proactive in managing coastal zone uses and resources. CZMA established a voluntary coastal planning program and participating states submit a Coastal Management Plan to NOAA for approval. Under the CZMA, federal agency actions within or outside the coastal zone that affect any land or water use or natural resource of the coastal zone shall be carried out in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved state management programs. Each state defines its coastal zone in accordance with the CZMA.

As defined in Section 304 of the CZMA, the term "coastal zone" does not include "lands the use of which is by law subject solely to the discretion of or which is held in trust by the Federal Government" (16 U.S.C. §1453). NBVC Point Mugu and NBVC SNI are owned and operated by the Navy as a major elements of the Sea Range, and are therefore excluded from the coastal zone. Although the CINP, including the eastern portion of SCrI, is federal land and excluded from California's coastal zone; the CINP is geographically within the coastal zone. The coastal zone surrounding each site extends 3 NM (5.5 km) seaward from the high tide line and is under the jurisdiction of the State of California. The proposed action would be located within the interior of federally-owned lands and would include offshore actions that would be within the jurisdiction of the State of California. The actions on the upland areas would not be subject to the CZMA, while the offshore exit site and cable alignment would.

The Coastal Commission concurred with the Navy's consistency determination CD-0006-16 (appendix B). The commission determined this project is an allowable use under Coastal Act Section 30233(a)(4), similar to determinations the Commission has made with respect to other Navy fiber optic cable projects in ocean waters off southern California. There are no feasible less environmentally damaging alternatives, and the project incorporates avoidance, conservation, and mitigation measures to minimize adverse impacts to coastal resources, including cable alignments that avoid offshore hard-bottom habitat and environmentally and culturally sensitive nearshore and terrestrial habitats. The Commission found that the project is consistent with the dredge and fill policy of Section 30233(a) of the Coastal Act.

3.6.2 Environmental Consequences

3.6.2.1 Assessment Criteria

The primary factor considered in determining the significance of land and water use effects is the extent or degree to which the action alternatives would disrupt the current use of land and/or water or if they would result in conflicts with planned or adopted land use designations.

3.6.2.2 Alternative 1 – Preferred Alternative

Point Mugu

Land Use

The actions associated with Alternative 1 would be consistent with current land use at the Point Mugu sites, and the presence of drilling equipment would be temporary at each site (approximately 30 days). There would be temporary increase in traffic on Beach Road to each of the sites due to transport of construction equipment and heavy machinery. However this increase in traffic would not create conflicts with other users of Beach Road. Traffic would have to reduce speed in the vicinity of the Charlie Pad site,

as it would be restricted to one lane. There would be no permanent land use changes associated with implementation of Alternative 1 at Point Mugu. Therefore, implementation of Alternative 1 would have no significant impacts on land use at Point Mugu.

Water Use

There would be a temporary disruption of the offshore areas near Point Mugu during the drilling and cable installation activities. However, public access to the nearshore areas off the Building 811 and Charlie Pad sites is restricted. Therefore implementation of Alternative 1 would have no significant impacts on water use near Point Mugu and would yield no significant harm on water use within the U.S. EEZ as defined by EO 12114.

San Nicolas Island

Land Use

Preferred alternative actions at the Coast Guard Jetty site would be consistent with current land use designations, and the presence of drilling equipment would be temporary at the site (approximately 30 days). There would be temporary increase in traffic on Beach Road between the Coast Guard Jetty site and the barge landing pier. However this increase in traffic would not create conflicts with other users of Beach Road. There would be no permanent land use changes associated with implementation of Alternative 1. Therefore, implementation of Alternative 1 would have no significant impacts on land use at SNI.

Water Use

Recreational use of the waters off the Coast Guard Jetty site would be restricted during drilling and cable installation operations. However, this would be temporary in nature. Therefore, implementation of Alternative 1 would have no significant impacts on water use near SNI and would yield no significant harm to water use within the U.S. EEZ as defined by EO 12114.

Santa Cruz Island

Land Use

Under Alternative 1, recreational use of the Prisoners Harbor Pier would be disrupted, but not eliminated, during the drilling operations, or for approximately 30 days. Recreational visitors to SCrI would still be allowed access to the Prisoners Harbor Pier, but the area west of the pier would be not be available for recreational use. The pier at Scorpion Anchorage would still be open for recreational users during this time. Disruption of access to the Prisoners Harbor Pier would only be for the duration of a single vessel landing. The Navy will coordinate with NPS and the public concessionaire to schedule such operations outside normal public access schedules and at no time will the pier be closed to public access while other NPS piers are closed. The trenching operations would close portions of Navy Road to vehicle access, but the Navy will coordinate with NPS to develop a plan to avoid limitations on recreational pedestrian access. Other hiking trails would also remain open. The installation of the elevated channel system may divert travel to other roads connecting to the well site. These closures would be temporary in nature and would not lead to permanent land use changes, and alternative areas would be available in the immediate vicinity. Prior to construction, the Navy will request a Right of Way from NPS and real estate agreement with TNC for access to and construction on their properties on SCrI. Therefore, implementation of Alternative 1 would have no significant impacts on land use at SCrI.

Water Use

Recreational use of the waters off the Prisoners Harbor site would be restricted, but not eliminated, during drilling and cable installation operations. However, this would be temporary in nature. All other waters around the eastern end of the island, including Scorpion Anchorage and Smugglers Cove, would remain open to recreational use (Figure 3.6-2). Therefore, implementation of Alternative 1 would have no significant impacts on water use at SCrI.

Submerged Land Use

Prior to installation of the FOCUS-II cables, the Navy will coordinate with the State of California, through the CZMA federal consistency review process. The Navy and CCC will ensure that the proposed action is consistent with the submerged land use for those areas that fall under the State's jurisdiction. For the submerged lands off the SCrI shore, the Navy will acquire a NPS right-of-way to ensure that the installation and operation of the FOCUS-II system is conducted in a manner that reduces impacts to the submerged lands along the proposed alignments.

The proposed action is not likely to result in permanent destruction or loss of Sanctuary resources but may injure Sanctuary resources, though any effect would be minor due to the limited area impacted, temporary nature of impacts and other factors. As such, the Navy will consult with NOAA's CINMS and request concurrence on potential impacts to Sanctuary resources.

The FOCUS-II cable alignments will pass through three federal offshore drilling units managed by BOEM. However, the cables would remain at least 1 mi (1.6 km) distant from any drilling rig or pipeline. The Navy will coordinate with BOEM prior to FOCUS-II installation activities. Therefore, implementation of Alternative 1 would have no significant impacts on submerged land use and would yield no significant harm to submerged lands within the U.S. EEZ as defined by EO 12114.

Coastal Zone Management Act Consistency Determination

The majority of the proposed action is located on NBVC property (Point Mugu and SNI), on NPS property (HDD site at Prisoner's Harbor and Navy Road), or on land under exclusive use to the Navy (the Navy Site under lease from TNC).

Accordingly, although these sites are considered federal property and therefore excluded from the coastal zone, the Navy nonetheless has conducted an effects analysis for purposes of federal consistency review under the CZMA. The Navy has analyzed the potential effects of this alternative by evaluating reasonably foreseeable direct and indirect effects on coastal zone uses and resources. The Navy determined its preferred alternative would be consistent with the enforceable policies of the California Coastal Management Plan. The Navy prepared a Coastal Consistency Determination and submitted it to the California Coastal Commission for their review and concurrence. The Commission concurred with the Navy's determination (Appendix C).

Mitigation Measures

There would be no significant land or water use impacts associated with Alternative 1; therefore, no mitigation measures are proposed or required.

3.6.2.3 Alternative 2

Under Alternative 2, the same activities to those described in Alternative 1 would be conducted at NBVC Point Mugu, NBVC SNI, and SCrI. Any land and water use impacts would be temporary in nature. Therefore, implementation of Alternative 2 would have no significant impacts on land or water use and would yield no significant harm to water use within the U.S. EEZ as defined by EO 12114.

Mitigation Measures

There would be no significant land or water use impacts associated with Alternative 2; therefore, no mitigation measures are proposed or required.

3.6.2.4 Alternative 3

Under Alternative 3, activities very similar to those described in Alternative 1 would be conducted at NBVC Point Mugu, NBVC SNI, and SCrI. Any land and water use impacts would be temporary in nature. Therefore, implementation of Alternative 3 would have no significant impacts on land or water use and would yield no significant harm to water use within the U.S. EEZ as defined by EO 12114.

Mitigation Measures

There would be no significant land or water use impacts associated with Alternative 3; therefore, no mitigation measures are proposed or required.

3.6.2.5 Alternative 4

Under Alternative 4, activities identical to Alternative 1 would be conducted at NBVC Point Mugu and NBVC SNI, and no actions would be taken at SCrI. All NBVC Point Mugu and NBVC SNI land and water use associated with this alternative would be identical to Alternative 1. Any land and water use impacts would be temporary in nature. Therefore, implementation of Alternative 4 would have no significant impacts on land or water use and would yield no significant harm to water use within the U.S. EEZ as defined by EO 12114.

Mitigation Measures

There would be no significant land or water use impacts associated with Alternative 4; therefore, no mitigation measures are proposed or required.

3.6.2.6 Alternative 5 – The No-Action Alternative

Under the No-Action Alternative, the proposed installation of FOCUS-II would not occur and existing conditions would remain unchanged; therefore, no significant land or water use impacts would occur under the No-Action Alternative.

Mitigation Measures

There would be no significant land or water use impacts associated with the No-Action Alternative; therefore, no mitigation measures are proposed or required.

3.7 MARINE SEDIMENTS AND WATER QUALITY

3.7.1 Affected Environment

3.7.1.1 Definition of Resource

This section describes the general conditions, marine or nearshore water quality, and bathymetry and sediment quality within the Point Mugu Sea Range, Point Mugu, SNI and SCrI. The general description includes the extent of the area as well as currents. Water quality describes the chemical and physical composition of water as affected by natural conditions and human activities. Bathymetry describes the depth of the ocean floor, and sediment quality describes the composition of ocean bottom sediments.

Regulatory Setting

Water resource regulations focus on the right to use water and protection of water quality. The principal federal laws protecting water quality are the Clean Water Act (CWA), as amended (33 U.S.C. §§ 1251 et seq.) and the Safe Drinking Water Act (42 U.S.C. §§ 300f et seq.). Both laws are enforced by the USEPA. The CWA provides protection of surface water quality and preservation of wetlands.

At the state level, the Porter-Cologne Water Quality Control Act (California Water Code 13000- 13953.4) gives the SWRCB and nine Regional Water Quality Control Boards responsibility for protection of the waters within their regions. The regional boards are also responsible for implementing provisions of the CWA delegated to states, such as the National Pollutant Discharge Elimination System, which regulates discharge of pollutants from point sources. The SWRCB adopted the Water Quality Control Plan for Ocean Waters of California in 1974; the amended plan (The Ocean Plan) establishes beneficial uses and water quality objectives for waters of the Pacific Ocean adjacent to the California coast outside of enclosed bays, estuaries, and coastal lagoons (SWRCB 2012). The Ocean Plan prescribes effluent quality requirements and management principles for waste dischargers and specific waste discharge prohibitions. It also contains a prohibition against discharge of specific hazardous substances and sludge, bypass of untreated waste, and discharges that impact designated Areas of Special Biological Significance (ASBSs). However, the SWRCB may grant exceptions to allow a discharge into an ASBS provided that the exception will not compromise protection of ocean waters for beneficial uses, and that the public interest will be served (Navy 2002). The Navy will coordinate with the SWRCB to determine if an exception is required.

Existing Conditions Point

Mugu

General Description

Point Mugu is located on a broad coastal plain adjacent to the Pacific Ocean and the Mugu Lagoon, in Ventura County (see Figure 1-1). Surface currents in this area generally flow southeast along the coastline after mixing further offshore.

A significant water resource at Point Mugu is Mugu Lagoon, which is the largest surface water feature of Point Mugu and is one of the largest salt marshes in southern California, encompassing 350 acres (142 ha) of water and tidal flats. The lagoon runs parallel to the coast for 3.5 mi (5.6 km) and is never greater than 0.6 mi (1.0 km) wide. Mugu Lagoon is a significant ecological resource, is protected by the CWA,

and is adjacent to an ASBS. Unlike most lagoons along the California coast, it is relatively undisturbed and provides a habitat for a diverse assemblage of marine organisms (Section 3.2, *Biological Resources*). Mugu Lagoon is regionally significant as one of the largest lagoons left in southern California containing unique and sensitive resources.

Calleguas Creek, Oxnard Drainage Ditches No. 2 and No. 3, and storm events are important sources of fresh water in Mugu Lagoon, although the lagoon is primarily marine-dominated and tides are responsible for the majority of the day-to-day input and removal of materials. The volume of water moved in and out of the lagoon by tides, the tidal prism, is large compared to the volume retained at lowest level. Very little of the water departing the lagoon on the ebb tide is returned following the flood tide due to the persistent southeast longshore current. Currents are fast near the mouth of the lagoon due to the large tidal exchange and narrow sea opening. Away from the mouth, currents are slow and are likely not to cause much mixing.

Nearshore Water Quality

Water quality in the nearshore area of Point Mugu is dependent upon the presence of particulates and contaminants in the outflow from Mugu Lagoon. In general, dissolved oxygen levels are high and anaerobic conditions do not occur within the lagoon. Concentrations of other nutrients have not been studied. Water temperatures inside the lagoon are usually similar to those of the Sea Range, although they may be higher and much more variable in the lagoon's shallows and salt marsh ponds. The average water temperature for the June-September months is 66°F (19°C); the average water temperature for January is 55°F (13°C). Temperatures up to 85°F (29°C) have been recorded during low tide conditions on hot summer days. Salinities within the lagoon are also generally similar to those of the ocean, with an average daily salinity of about 34 parts per thousand. Due to the lack of fresh water surface flows, there is no reason to expect fresh water dilution except near the mouth of Calleguas Creek and during rainfall events.

Within the SCB, most of the marine water pollution stems from municipal discharges originating on the mainland. Another potential source of water pollution offshore comes from the oil and gas development industry. As activity increases from offshore oil and gas development, the potential for discharge into the Sea Range also increases. In recent years, the increased frequency and extent of regional beach and shellfish-bed closures, coupled with decreases in local fishing catches, are taken as signs of declining water quality (NOAA 2009). However, due to the large diluting volume of the ocean and circulation within the SCB, as stated above, water quality in the nearshore area of Point Mugu is most dependent upon the presence of particulates and contaminants in the outflow from Mugu Lagoon.

Nearshore Bathymetry and Sediments

Bathymetry near Point Mugu drops off steeply into subsurface canyons, reaching depths greater than 2,200 ft (670 m) within 6 NM (11 km). The area that borders Point Mugu adjacent to the ocean is dominated by sandy beach habitat. The topography of the sand beaches is strongly influenced by wave conditions. The beaches, composed of fairly coarse sand, are relatively steep. The foreshore extends out to a water depth of about 10 to 12 ft (3 to 4 m), where the slope of the bottom decreases substantially. This marks the point of transition from beach into shallow shelf. Sand dunes are also present along most of the beaches (Navy 2002).

Fresh Water

NBVC Point Mugu is located in the southeast corner of the Oxnard Plain. Perennial fresh water streams in the Oxnard Plain consist of Calleguas Creek and its tributaries, Revolon Slough, and Conejo Creek, located in the upper reaches of the watershed. These streams drain an area of 380 mi^2 (984 km^2), including mountainous areas and level floodplains in the southern portion of the Oxnard Plain (see Figure 3.7-1). These streams ultimately discharge to and serve as the primary source of fresh water input to Mugu Lagoon. The fitness of the resources at Mugu Lagoon depends in part on the fresh water inflows from the Calleguas Creek watershed. The watershed has been largely converted to agriculture and more recently, to urban development. Along with these changes have come flood control structures, sedimentation, non-native plant species, contaminants such as pesticides, fertilizers, and heavy metals, and changes in the hydrologic regimes. Calleguas Creek perennial flows are largely from discharges permitted through the EPA's National Pollutant Discharge Elimination System, including agricultural and urban runoff and irrigation return flows. Mugu Lagoon is included on the EPA's Section 303(d) list of impaired water bodies because a number of constituent concentrations are exceeded. The most significant sources of impairment are generally considered to be nonpoint sources of toxic pollutants and nitrogen compounds. As a result of listing, and in accordance with CWA regulations, the LARWQCB was tasked with developing technical total maximum daily loads (TMDLs) that will result in the achievement of water quality standards. The Calleguas Creek watershed has TMDLs for nutrients, salts, metals, trash, and legacy pesticides; sediment toxicity and siltation are also identified as impairments. Benchmark conditions for nitrogen, temperature, and dissolved oxygen must also be met. (NBVC 2013)

At present, multiple Calleguas Creek watershed management projects seek to improve the quality of the water flowing into Mugu Lagoon. The Calleguas Creek Watershed Committee works to develop comprehensive solutions to habitat, water quality, erosion, sedimentation, and flooding problems within the watershed. The Calleguas Creek Watershed Management Plan addresses strategies for resource management and protection, with the following land use and water quality focus areas: water resources and water quality; habitat, natural resources, and recreation; flood protection and sedimentation; and public outreach and education. Projects consist of implementing land treatment programs, working with local farmers, and improvements on the streambeds and streambanks. (NBVC 2013)

The majority of NBVC Point Mugu is located within the Calleguas Creek 100-year flood zone. NBVC has taken measures to prevent flooding, including installation of flood barriers surrounding the base. Drainage ditches also contribute fresh water to the lagoon. The ditches that drain nearby agricultural land and portions of the base are subject to tidal influence. Three tide gates installed in Oxnard Drainage Ditch 2 and Oxnard Drainage Ditch 3 control saltwater intrusion that may flood the ditches and upstream farmland. Because mild slopes characterize most of the base, the velocity of surface water flow is slow except during major storms. Large duck ponds, which provide fresh water through culverts and subsurface flow, are located north of the western portion of the base. (NBVC 2013)

The western arm of Mugu Lagoon receives the majority of surface water runoff from storm water at NBVC Point Mugu and an Oxnard drainage ditch. The drainage ditch transports agricultural and storm water runoff from off-base sources. The gradual slope and slow currents in the drainage ditches that empty into the western arm generally limit the carrying capacity for the sediment load. However, the volume of sediment transported to the lagoon and ocean from drainage ditches is unknown. (NBVC 2013)

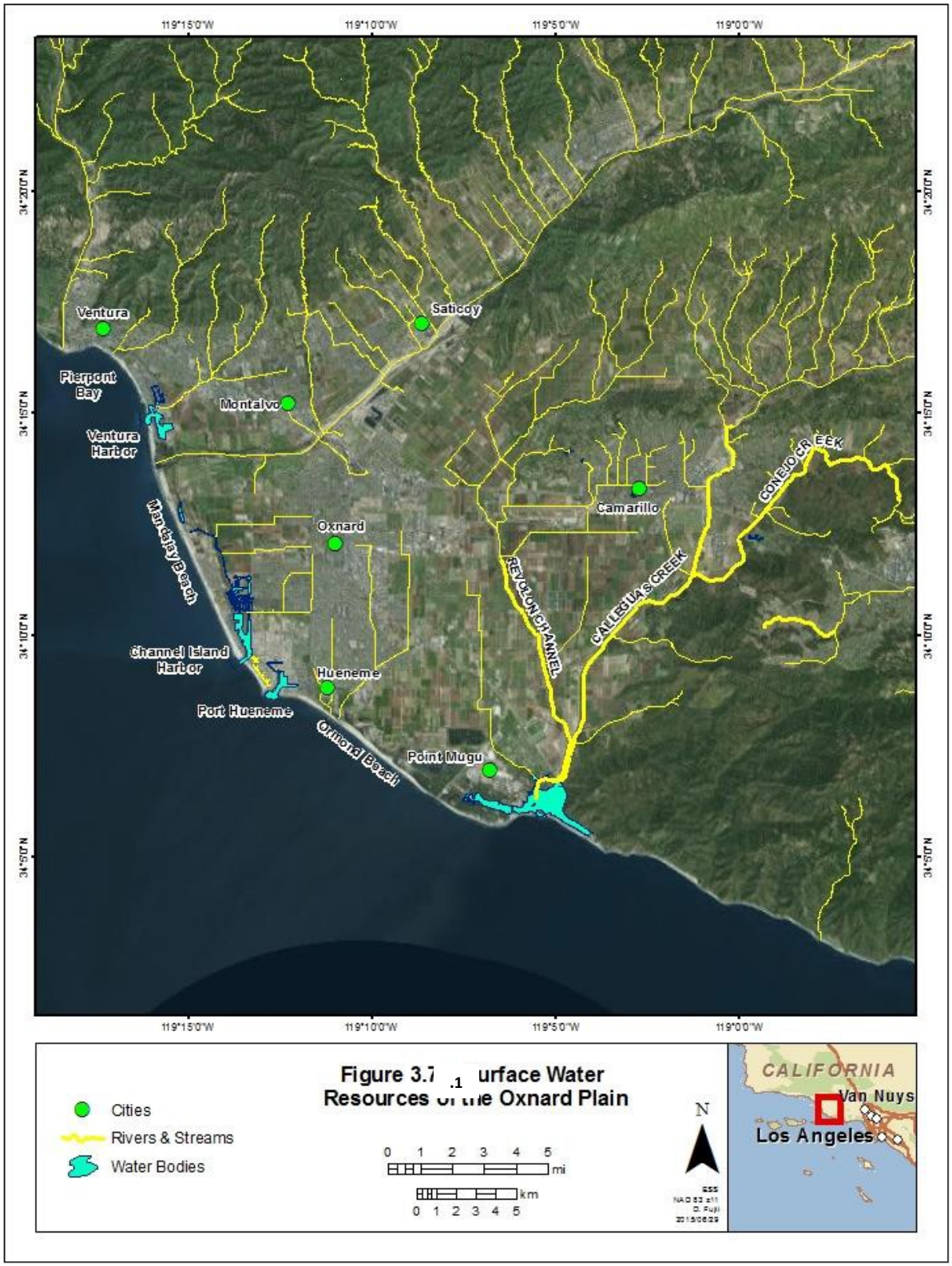

Figure 3.7-1 Surface Water Resources of the Oxnard Plain

The eastern arm of Mugu Lagoon receives limited fresh water input from the adjoining Laguna Peak and Point Mugu State Park to the north. Runoff from those areas flows through a series of culverts south of Highway 1. The eastern arm of the lagoon connects to the central basin via tidal channels and flats that are constantly changing with tides, storm flows, and location of the inlet. During floods, especially those associated with high tides, the marshes on the eastern side of the lagoon are inundated with fresh water. The volume of sediment carried into the lagoon from these runoff sources is unknown. (NBVC 2013)

San Nicolas Island

General Description

The Channel Islands are located in a region of variable mixing between the cold waters of the California Current and the warm nearshore waters of the California Countercurrent. SNI is located far enough offshore and to the south that it is subjected both to the warmer waters of the California Countercurrent and to the colder waters of the California Current. In general, the circulation patterns around the island are similar to the patterns of the two major currents. However, some localized currents and eddies are caused by the island's shape and orientation. (Navy 2002)

The coldest sea surface temperatures occur in March (monthly average 57°F [14°C]), while the warmest temperatures occur in September (66°F [19°C]). Consequently, marine biota of the island has been termed "intermediate" because both cold and warm water species occur at the island. The island is relatively isolated from the effects of human activities that typically occur in the nearshore environments of the mainland. The dry season occurs between May and September, and the wet season occurs between November and March, when SNI receives 87 percent of its total rainfall. The existing beneficial uses for water resources at SNI include navigation, contact water recreation, non-contact water recreation, commercial and sport fishing, shellfish harvesting, and preservation of terrestrial and marine habitats and rare, threatened, or endangered species. Fresh water resources include all surface water and groundwater at SNI. (Navy 2002)

SNI is part of Ventura County and is situated in Watershed 11, which also includes Anacapa, Santa Barbara, San Clemente, and Santa Catalina islands. Ocean waters surrounding SNI and Begg Rock to a distance of 1 NM (1.9 km) offshore or to the 300-ft (91-m) isobath, whichever is greater, have been designated as an ASBS based on their relatively pristine water quality. Discharges incidental to military RDAT&E of, and training with, guided missiles and other weapons systems, fleet exercises, small-scale amphibious warfare training, and special warfare training are allowed within the ASBS. (SWRCB 2012)

Nearshore Water Quality

The quality of ocean water in the immediate area of SNI is relatively pristine. Receiving waters at Blue Whale Cove, located approximately 7 mi (11.3 km) west of the Coast Guard Jetty drilling site represent an area potentially impacted by launch-pad runoff. These waters exceeded the reporting limit for hexavalent chromium (0.01 mg/L) for both the six-month median (0.002 mg/L) and daily maximum (0.008 mg/L) objectives of the Ocean Plan, but were below the instantaneous maximum objective (0.02 mg/L). No other significant concerns were detected within Blue Whale Cove's receiving waters or sediment. Residual chlorine was the only constituent that did not meet Ocean Plan objectives at Corral Beach, located approximately 1.5 mi (2.4 km) from the drilling site (NAVFAC 2007). SNI's distance

from both the mainland and oil and gas developments in the SCB, combined with the large diluting volume of the ocean and the shelves and basins near the mainland where many pollutants settle, ensures high water quality at the island.

Most of the marine water pollution within the SCB area stems from municipal discharges originating on the mainland. Another potential source of water pollution offshore comes from the oil and gas development industry. As activity increases from offshore oil and gas development, the potential for discharge into the Sea Range also increases. In recent years, the increased frequency and extent of regional beach and shellfish-bed closures, coupled with decreases in local fishing catches, are taken as signs of declining water quality (NOAA 2009). However, the distance of SNI from the mainland, the large diluting volume of the ocean, and the shelves and basins near the mainland where many pollutants settle, ensure high water quality at the island.

Nearshore Bathymetry and Sediments

The bathymetry surrounding SNI is irregular in shape. The island is a pinnacle that is surrounded by water depths that quickly slope to greater than 5,200 ft (1,600 m) within 10 NM (18.5 km) of the southeastern portion of the island, whereas a shelf exists to the northwest of the island that gradually slopes to 400 ft (120 m) over 18 NM (33.5 km). The subtidal area nearest the island is characterized by sand, bedrock, or boulder. (Navy 2002)

Fresh Water

No fresh water or drinking water sources are present in the proposed project areas. The nearest fresh water stream on SNI is Tule Creek, which is situated 5.4 mi (8.7 km) from the Coast Guard Jetty drilling site.

Santa Cruz Island

General Description

Prevailing northwest winds dominate the southern California region. The east-west orientation of the shore and the mountainous Channel Islands create a corridor which channels the wind patterns into a more easterly direction, resulting in a divergence over the center of the channel. This creates a wind drift of warmer surface waters towards the mainland coast and towards the northerly edge of the Channel Islands, especially SCrI. (SWRCB 1979)

Nearshore Water Quality

Water quality within the Santa Cruz ASBS is generally good because of the isolated location. However, oil and tar deposition from natural seeps and ship traffic is chronic. Surface seawater temperature around SCrI generally ranges from 55ºF (13ºC) in winter to 65ºF (18ºC) in summer. (SWRCB 1979)

Nearshore Bathymetry and Sediments

The shelf along the northern coast of SCrI falls sharply in two stages. The first flows to the floor of the Santa Barbara Basin, within 0.75 mi (1.25 km) from shore. The bottom depth of this reach is 165 ft (50

m), flattening out into a 2.5-mi- (4-km-) wide ledge. The second stage drops another 500 ft (150 m) to the basin floor within 4.25 mi (6.8 km) of the shoreline. (SWRCB 1979)

The shelf of the southern side of SCrI is wider and extends deeper due to the slope of the Santa Cruz Basin. The 330-ft (100-m) isobaths is 2.75 mi (4.4 km) from shore. At approximately 3 mi (4.8 km) from shore, the shelf drops to a water depth of 800 ft (240 m). At 5 mi (8 km) from the southern shore, the depth is about 4,000 ft (1220 m), and this grade continues downward to the bottom of the Santa Cruz Basin with a maximum depth of 6,200 ft (1,880 m). (SWRCB 1979)

Fresh Water

The largest watershed on SCrI is the Central Valley, which runs east-west and drains at the base of the isthmus at Prisoners Harbor. The island is bisected by a mountain ridge that forms steep slopes forming subdrainages subject to slope failures and leading to sedimentation in the valleys. There are many intermittent streams in the Central Valley and its subdrainages. There are also many fresh water seeps and springs throughout the island. Water quality has been collected on NPS lands on SCrI. In the past, livestock and feral pigs likely were attracted to the springs and streams and probably negatively affected water quality through the addition of wastes and sediments. Sheep, pigs, and cattle have been removed from the island; however the associated changes in conditions that have led to the sedimentation above natural rates are still a concern for water quality. (NPS 2002)

SCrI has three persistent wetlands located at Prisoners Harbor, Scorpion Canyon, and Smugglers Canyon. During the ranching period on SCrI, wetlands were affected by dredging, grading of streambeds, and backfilling (CPUC 2012). The Navy well site is located near the Prisoners Harbor area and supplies drinking water to the Navy Site, which is stored in a 30,000-gal (114,000-l) tank near Building 4.

Offshore Routes

General Description

The Sea Range straddles Point Conception, which is considered a major geographic feature that affects marine water resources. The shape of California's coastline south of Point Conception creates a broad ocean embayment known as the Southern California Bight (SCB). It encompasses the area from Point Conception south to the U.S. Mexico border and is influenced by two major oceanic currents: the southward flowing, cold-water California Current and the northward flowing, warm-water California Countercurrent. North of Point Conception, the marine waters are under the influence of the cold California Current. South of Point Conception, the marine waters are influenced by both the California Current and the northward flowing, warm water California Countercurrent. These currents mix in the bight and strongly influence patterns of ocean water circulation and temperatures. (SWRCB 1979)

Marine Water Quality

Surface temperatures of waters along the coast of the SCB range from approximately 54°F (12°C) in the winter to 70°F (21°C) in the summer. Surface water temperatures can show seasonal variation in association with upwelling, climatic conditions, and latitude. The marine environment has a high hydrogen ion (pH) buffering capacity due to the presence of dissolved elements, particularly carbon and hydrogen, which maintain a pH between 7.5 and 8.5. Surface waters are usually saturated or

supersaturated with dissolved oxygen as a result of photosynthetic activity and wave mixing. Dissolved oxygen levels at the surface fluctuate between 5.4 and 5.9 milliliters per liter (ml/L), while levels at depths below the surface remain more constant, between 0.4 and 0.6 ml/L. Major nutrients include dissolved nitrogen (dominated by nitrate), phosphates, and silicates. (Navy 2002)

The State of California designated 34 coastal regions under the 1972 California Ocean Plan as State Water Quality Protection Area (formally known as ASBS), in an effort to preserve these unique and sensitive marine ecosystems for future generations. There are four ASBS located within or adjacent to the Sea Range (Figure 3.7-2):

- Latigo Point to Mugu Lagoon: Ocean water within a line originating from Latigo Point (eastern boundary), following the mean high-tide line to a distance of 3,280 ft (1,000 m) offshore or to the 100-ft (30-m) isobaths, whichever is greater, to a point lying due south of Laguna Point (western boundary), which is near Surfer's Point (SWRCB 2012); and
- SNI and Begg Rock: Waters surrounding SNI and Begg Rock to a distance of 1 NM (1.9 km) offshore or to the 300-ft (91 m) isobaths, whichever is greater. At the SNI and Begg Rock ASBS, discharges incidental to military research; development, testing and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed (SWRCB 2012),
- The Santa Cruz Island ASBS covers an area of 101,000 acres (40,900 ha) and is officially designated as the waters surrounding SCrI to a distance of 1 NM (1.9 km) offshore or to the 300-foot (91-m) isobaths, whichever is the greater distance. The California Current is the eastern boundary current of the North Pacific Gyre. Circulation in the southern California borderland and continental shelf region is dominated by a large, counterclockwise coastal eddy. The effect of this eddy is to recycle water originally derived from the California Current (SWRCB 1979).
- Santa Barbara and Anacapa Islands: Waters surrounding these two islands to a distance of 1 NM (1.9 km) offshore (SWRCB 2012).

Most of the marine water pollution within the SCB area stems from municipal discharges. The distance from the mainland, the large diluting volume of the ocean, and the shelves and basins near the mainland where many pollutants settle ensure high water quality in the Sea Range (Navy 2002).

Marine Bathymetry and Sediments

Much of the ocean floor in the northern portion of the SCB consists of the Santa Barbara, Santa Cruz, and Santa Monica Basins (Navy 2002). The Santa Barbara Basin has a gradual slope that reaches depths of 1,970 ft (600 m). The relatively wide and irregular Santa Monica Basin has two submarine canyons with depths exceeding 2,300 ft (1,500 m). The Santa Cruz Basin also has a submarine canyon with depths greater than 4,920 ft (1,500 m). A relatively shallow island shelf approximately 330 ft (100 m) deep surrounds the islands, usually extending from 3 to 6 NM (6 to 11 km) from the island coast. Ocean depths quickly increase to more than 12,000 ft (3,700 m) west of a ridgeline that runs parallel to the SCB, approximately 25 to 50 NM (31 to 93 km) southwest of the Channel Islands. Sediment types in these areas are generally composed of 35 to 85 percent fines (silts and clays) and 15 to 65 percent sand. There are no apparent trends in sediment distribution with respect to size, water depth, or distance offshore (Navy 2002).

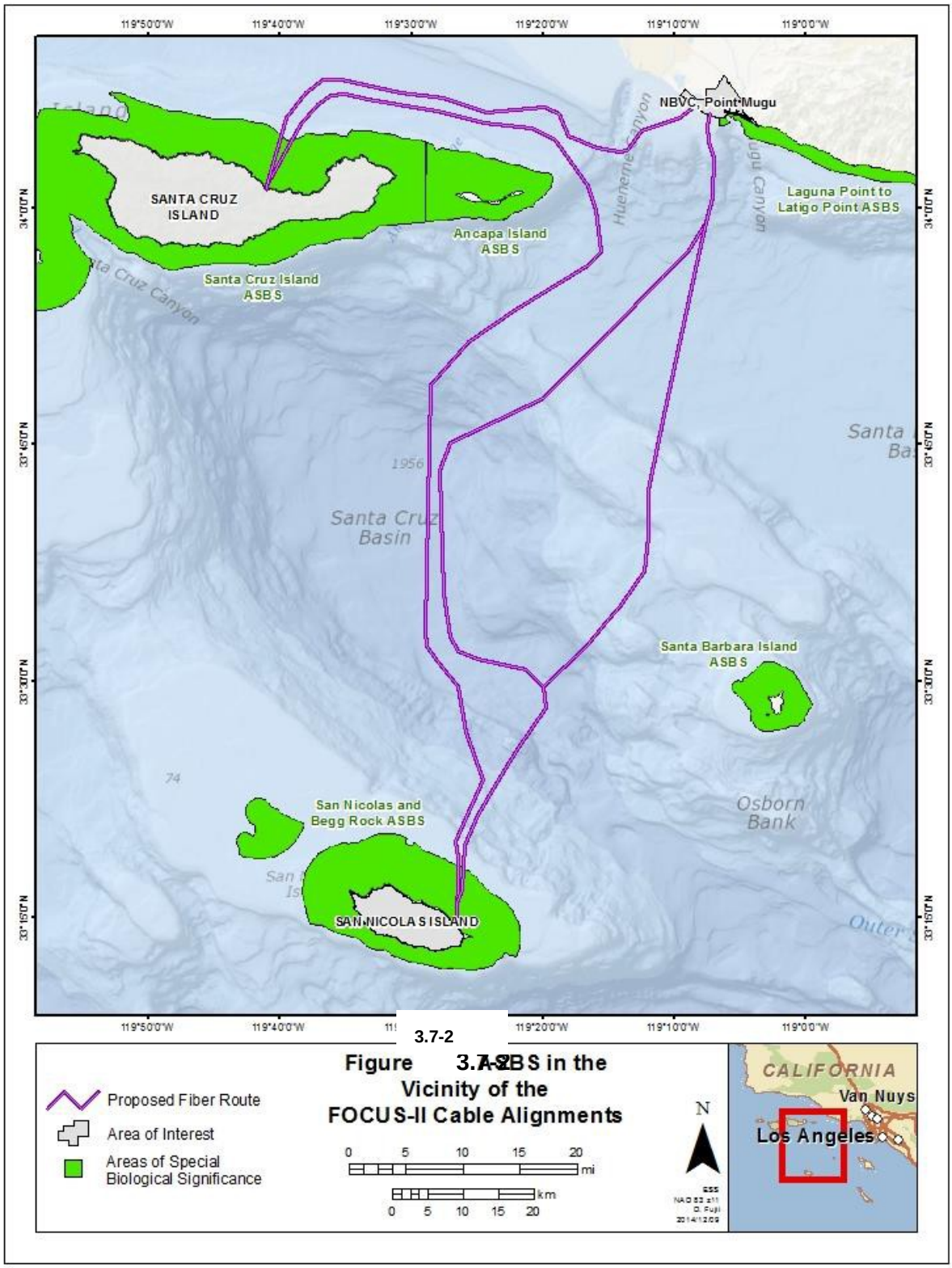

Figure 3.7-2 ASBS in the Vicinity of the FOCUS-II Cable Alignments

3.7.2 Environmental Consequences

3.7.2.1 Assessment Criteria

Proposed project activities were analyzed to determine with long-term irreversible changes to water chemistry, availability of fresh water supply, or overall water quality would occur. In addition, the potential impacts of any temporary water quality changes on living resources beyond those discussed in Section 3.2, *Biological Resources*, above.

3.7.2.2 Alternative 1 – Preferred Alternative

Marine Sediments and Water Quality and Sediments

Proposed project activities would not result in long-term changes to water chemistry (e.g., the pH, temperature, and dissolved oxygen levels), turbidity, or the amount of light in the water column within the project area, including the Latigo Point to Point Mugu ASBS, the SNI and Begg Rock ASBS, and the SCrI ASBS. Section 3.2, *Biological Resources*, discusses the potential biological impacts to the marine environment in detail.

Upon completion of drilling operations, release of drilling fluid could occur by seepage through fractures in the seabed or by pressure discharge when the drill bit penetrates the exit point. It is not planned to discharge of Bentonite during the HDD process. However, there are two scenarios in which a discharge could occur: during the bore exit in the seafloor or a "frac-out." To prevent a bore exit discharge, the drilling fluid will be switched to fresh or salt water prior to the bore exit. This switch would be approximately 151 ft (46 m) before the bore exit. If the drill exited the bore hole unintentionally prior to the switch, a discharge could occur. The drill pipe has an internal diameter of five in (13 cm), so the volume of material that could be released offshore due to hydrostatic pressure is up to 442 gal (1,671 l). In the unlikely event that the drill pipe fractures (a mechanical failure) at or near the lowest point in its trajectory and the drilling was near completion, the volume of mud contained in the HDD bore hole could migrate into the surrounding formation. This volume of material represents a worst-case release of up to 7,443 gal (28,174 l) into the surrounding geology at each HDD site. However, the drilling fluid would remain contained within the subsurface formation and would be unlikely to migrate to the surface or be released offshore. This volume would include approximately 27 ft^3 (less than 1 m^3) of cuttings. Bentonite clay used for directional drilling is a naturally occurring hydrated aluminosilicate composed of sodium, calcium, magnesium, and iron. Bentonite is derived from sediment deposits created by weathering of volcanic ash. The small amount of clay anticipated to exit the borehole is more dense than the surrounding sea water and will settle rapidly to the bottom. Neff (1987) concluded that "water column organisms will never be exposed to drilling fluids long enough and at sufficiently high concentrations to elicit any acute or sub-lethal responses..." Additionally, chronic tests of copepods, amphipods, bivalves and cod fry exposed to "water-based muds" at 10-103mg/l produced no observed effect (Kosheleva, et al. 1997). Therefore water-based bentonite clay mixture and cuttings from the seabed, it would be non-toxic to marine organisms or marine water quality. In addition, every reasonable effort would be made to minimize the unavoidable discharge of drilling fluid. All procedures in the project-specific spill prevention plan would be followed. The Navy will coordinate with the California SWRCB to determine whether the Navy will need to apply for an exception of the California Ocean Plan prohibition against direct discharges of waste to an ASBS.

Frac-out is a phenomenon where drill fluid migrates to the ocean floor surface through fissures in the geologic formation. By monitoring the mud system, HDD personnel can determine the correct properties and pressures needed for different formations. Loss of circulation due to frac-outs can be reduced or eliminated through implementation of proper HDD controls and procedures. Prior to commencement of drilling operations, the construction contractor will develop a bentonite spill prevention plan (or frac-out plan) to establish the monitoring and response criteria that will minimize the release of drilling materials during the HDD process.

A two-part acrylic epoxy grout would be used for the cable anchor holes (1 in [2.5 cm] in diameter and 20 in [51 cm] deep) in the seabed. The volume of grout required would be approximately 7 in^3 (113 cm^3) per hole. It is estimated that approximately 200 to 500 holes could be required for stabilization purposes, resulting in a total of between 0.8 and 2.0 ft^3 (between 22,900 and 57,400 cm^3) of grout. This mixture would be placed in each hole; however, if some were to leak out, it is a fast-curing substance that solidifies within seconds after leaving the caulking gun and would not react with ocean water.

There would be a temporary increase in turbidity in the water columns near the exit points. The turbidity would be expected to settle and dissipate in a short amount of time. Only minimal sediment disturbance would occur along the sandy-bottom areas of the offshore cable alignment while the cable is lowered from the marine vessel and during plowing operations, and the disturbed sediments would quickly settle back to the bottom. No permanent source of turbidity would be associated with proposed cable maintenance and future repairs. Therefore, implementation of Alternative 1 would have no significant impact on marine sediments and water quality and would yield no significant harm to marine sediments and water quality within the U.S. EEZ as defined by EO 12114.

Fresh Water

Excess drilling fluid (drilling mud and cuttings) not recycled into the HDD borehole would be temporarily stored in the catch basins and then disposed at offsite locations. Any potential fuel or oil spill at the construction sites would be cleaned up in accordance with standard procedures for similar activities at Navy sites. The drilling fluid is non-toxic and would not affect water quality if it were to spill out of the catch basins. All procedures in the project-specific spill prevention plan would be followed. There are no groundwater wells, perennial streams, or wetlands in the vicinity of the Coast Guard Jetty site. However, there are wetlands in the near vicinities of the Charlie Pad and Prisoners Harbor drilling sites. Point Mugu and SNI fall within the LARWQCB, and SCrI is located within the CCRWQCB. The Navy will submit water quality certification applications to the LARWQCB and the CCRWQCB in compliance with Section 401 of the CWA. The Navy will also submit permit applications to the USACE in compliance with Section 404 of the CWA and Section 10 of the River and Harbors Act (under USACE Nationwide Permit 12). The Navy will coordinate with CDFW to determine if a Lake or Streambed Alteration Agreement is required.

If ground disturbance at the NBVC Point Mugu or NBVC SNI sites is greater than 2,500 ft^2 (232 m^2), the construction activities must comply with the requirements of the Phase II NPDES MS4 General Permit 2013-0001-DWQ. As the ground disturbance at SCrI would exceed one acre (0.40 ha), a storm water pollution prevention plan must be submitted to the SWRCB, and a storm water construction permit (2009-009-DWQ with amendments) must also be obtained. This plan will include erosion prevention and

sediment control measures as well as other applicable BMPs that will be implemented during the trenching activities on Navy Road on SCrI. Through implementation of these BMPs and control measures Alternative 1 would have no significant impact on fresh water resources.

Mitigation Measures

Implementation of Alternative 1 would not result in significant impacts to marine sediments or water quality; therefore no mitigation measures are proposed or required.

3.7.2.3 Alternative 2

Under Alternative 2, actions taken at NBVC Point Mugu, NBVC SNI, and SCrI would be the same as Alternative 1. The same BMPs and spill prevention plans would be implemented. Therefore, implementation of Alternative 2 would have no significant impact on marine sediments or water quality and would yield no significant harm to marine sediments and water quality within the U.S. EEZ as defined by EO 12114.

Mitigation Measures

Implementation of Alternative 2 would not result in significant impacts on marine sediments or water quality; therefore, no mitigation measures are proposed or required.

3.7.2.4 Alternative 3

Under Alternative 3, actions taken at NBVC Point Mugu, NBVC SNI, and SCrI would be very similar to Alternative 1. The same BMPs and spill prevention plans would be implemented. Therefore, implementation of Alternative 3 would have no significant impact on marine sediments or water quality and would yield no significant harm to marine sediments and water quality within the U.S. EEZ as defined by EO 12114.

Mitigation Measures

Implementation of Alternative 3 would not result in significant impacts on marine sediments or water quality; therefore, no mitigation measures are proposed or required.

3.7.2.5 Alternative 4

Under Alternative 4, actions taken at NBVC Point Mugu and NBVC SNI would be very similar to Alternative 1. The same BMPs and spill prevention plans would be implemented. There would be no activities at SCrI. Therefore, implementation of Alternative 4 would have no significant impact on marine sediments or water quality and would yield no significant harm to marine sediments and water quality within the U.S. EEZ as defined by EO 12114.

Mitigation Measures

Implementation of Alternative 4 would not result in significant impacts on marine sediments or water quality; therefore, no mitigation measures are proposed or required.

3.7.2.6 Alternative 5 – The No-Action Alternative

Under the No-Action Alternative, the proposed installation of FOCUS-II would not occur and existing conditions would remain unchanged. No significant impacts to marine sediments and water quality would occur under the No-Action alternative.

Mitigation Measures

Implementation of either the No-Action Alternative would not result in significant impacts on marine sediments or water quality; therefore, no mitigation measures are proposed or required.

3.8 NOISE

3.8.1 Affected Environment

3.8.1.1 Definition of Resource

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, diminishes the quality of the environment, or is otherwise annoying. Response to noise varies by the type and characteristics of the noise source, distance between source and receptor, receptor sensitivity, and time of day. Noise receptors include humans as well as terrestrial and marine animals.

In-Air Noise

The physical characteristics of sound include its level, frequency, and duration. Sound is commonly measured with instruments that record instantaneous sound levels in decibels (dB), which are based on a logarithmic scale (e.g., a 10-dB increase corresponds to a 100-percent increase in perceived sound). A-weighted sound level measurements (dBA), which de-emphasize low and high frequencies and emphasize mid-range frequencies, are used to characterize sound levels that are heard especially well by the human ear. Average noise exposure over a 24-hour period is often presented as a community noise equivalent level (CNEL). The CNEL is the energy-averaged sound level of all sound exposure level values within a 24-hour period, with a 10-dB penalty assigned to noise events occurring between 10:00 PM and 7:00 AM to compensate for the increased annoyance associated with the occurrence of nighttime noise events. In addition, applications of the CNEL metric to measure noise levels in California include an additional 5-dB annoyance penalty for nighttime occurrences (Title 21, California Code of Regulations, §5001).

Underwater Noise

The units for sound in air and those for sound in water are different. The standard for atmospheric sound is dB with respect to 20 micro-Pascals (dB re 20 µPa); the standard for underwater sound is dB re 1 µPa. To make comparisons for noise levels, 26 dB must be subtracted from water-borne levels (re 1 µPa) to roughly estimate atmospheric noise levels (re 20 µPa) (Natural Resources Defense Council [NRDC] 1999). In this EA/OEA, all references to underwater sound are made in dB re 1 µPa. Sound travels as a series of disturbances compressing and relaxing the medium it travels through, whether air or water. The frequency of a sound wave is the number of disturbances, or cycles, that pass a fixed point per second. Cycles per second are referred to in units of hertz (Hz) or kilohertz (kHz, or 1,000 Hz). Low-frequency sound is considered to be below 1 kHz and is the type of noise produced by large ships and the vocalizations of large whales. Most marine mammals appear to hear or react to low-frequency sound (NRDC 1999). Mid-frequency noise is considered to be within the range of 1 to 10 kHz and is produced by marine mammals (primarily odontocetes, or toothed whales), precipitation, and tactical sonar. High-frequency noise is above 10 kHz and is produced by snapping shrimp, echolocation of marine mammals, ship depth finders, and fish-finding sonar.

3.8.1.2 Regulatory Setting

Noise standards and guidelines have been established at the federal, state, and local government levels to protect people from potential hearing damage as well as other impacts (i.e., annoyance) that can disrupt activities or alter quality of life. DoD lands are required to comply with federal noise standards and

guidelines, such as those set by the Noise Control Act of 1972, as amended (42 U.S.C. §§ 4901 *et seq.*). The Noise Control Act of 1972, as amended, provides a framework for the coordination of federal noise control research, establishes noise emission standards, and provides information to the public. Although the DoD is not subject to state and local noise ordinances, these ordinances are considered when determining the significance of a noise impact in order to avoid or minimize impacts to surrounding land uses, including sensitive receptors.

In accordance with DoD Instruction 4165.57, *Air Installations Compatible Use Zones (AICUZ)*, military installations with airfields are required to establish AICUZ Programs. The goals of the AICUZ Programs are to:

- Protect the health, safety, and welfare of those living and working near military fields; and
- Preserve the military flying mission.

Under the AICUZ Program, the DoD identifies noise zones and accident potential zones as planning tools for local planning agencies. The Federal Aviation Administration and DoD also encourage local communities to restrict development or land uses that could endanger aircraft in the vicinity of the airfield, including lighting (direct or reflected) that would impair pilot vision; towers, tall structures, and vegetation that penetrate navigable airspace or constructed near the airfield; uses that generate smoke, steam, or dust; uses that attract birds, especially waterfowl; and electromagnetic interference with aircraft communication, navigation, or other electrical systems.

3.8.1.3 Existing Conditions

Point Mugu

Point Mugu is surrounded by lands designated generally as residential, commercial, industrial, community services, open space, agriculture, and undeveloped. These surrounding areas are subject to noise from civilian and military aircraft operations, automobile traffic, and construction activities. The Point Mugu airfield supports an annual total of about 36,000 aircraft operations (NBVC 2011). Aircraft noise tends to be the dominant noise source in areas immediately adjacent to airfields and beneath primary flight corridors, although aircraft noise is typically also limited to these areas since it becomes indistinguishable as aircraft gain altitude. The off-base acreage exposed to CNEL values above 65 is about 1,800 acres (730 ha); most of this area is located under the approach and departure routes to the north (onshore) and south (offshore) of the base, although a portion also occurs along the western base boundary. Noise levels and land use compatibility in these areas are addressed in the AICUZ program. Due to the frequent loop patterns around the airfield, all project sites at Point Mugu are located within the 65-70 dB CNEL noise contour, and the area just offshore and south of the project sites is within the 70-75 dB CNEL noise contour.

Missile and target launches at Point Mugu are conducted at the Building 55 Launch Complex, Bravo Pad, and Charlie Pad. Measured missile launch noise durations at Building 55 range from 0.56 seconds to 2.11 seconds. Peak noise levels range from 161 dB re 20 µPa at 50 ft (15 m) to 115 dB re 20 µPa at 3,000 ft (900 m).

San Nicolas Island

Commuter-type aircraft use the SNI airfield several times each day, transporting personnel to and from Point Mugu. Since no year-round human residents occupy areas near the airfield, AICUZ studies have not been performed and baseline noise conditions are assumed to be dominated by F/A-18 aircraft activity. The highest noise levels (80-85 dB CNEL, on an average busy day) are found on or immediately adjacent to the runway. Noise contours would be similar to those of Point Mugu, although they would also be reduced due to the limited number of flights occurring at the island.

Aircraft overflights in support of test operations also occur at various locations away from the airfield at SNI. An F/A-18 overflight for a captive-carry sortie, flown 500 knots (930 km/hr) produced an A-weighted sound pressure level (SPL) at 500 ft (150 m) of 107 dB re 20 μPa. The A-weighted SEL was 109 db re $(20\ \mu Pa)^2 s$.

Santa Cruz Island

The existing ambient noise sources of the Channel Islands National Park, including SCrI, include noise from outdoor activities, ranger stations, campgrounds, visitors, research staff, and residents. The noise sources include people talking, equipment operations, wildlife, recreational activities, and waves crashing. Ambient noise levels typically range from 20 to 70 dBA (California Public Utilities Commission [CPUC] 2012).

3.8.2 Environmental Consequences

3.8.2.1 Assessment Criteria

The primary factor considered in determining the significance of noise effects includes the extent or degree to which implementation of the proposed action would affect baseline noise environments. Both in-air and underwater noise effects are addressed in this section.

Impacts due to vibrations associated with HDD and other construction activities are not analyzed in this EA/OEA, as the vibrations generated by the construction equipment would be similar to current operations. To provide points of reference, Table 3.8-1 provides typical vibration levels for construction equipment at a distance of 33 ft (10 m). As shown in the table, vibration levels due to drilling rig operations are generally one quarter of back hoe operations.

Table 3.8-1 Typical Vibration Levels for Construction Equipment

Equipment	Peak Particle Velocity at 10 m (in mm/sec)
Backhoe	2.1
Excavator with hammer attachment	6.0
HDD drilling rig	0.5

Source: RTA 2001

3.8.2.2 Alternative 1 – Preferred Alternative

In-Air Noise

Implementation of the proposed action would involve temporary increases in noise levels but would not involve any new, permanent sources of noise at Point Mugu, SNI, and SCrI. Noise generated would be

representative of construction activities and operation of heavy equipment such as a drill rig and portable crane. Use of such equipment would generate noise greater than the ambient noise levels. Table 3.8-2 provides a summary of typical noise levels associated with construction equipment at a distance of 50 ft (15 m). Construction noise typically attenuates at a rate of approximately six dB per doubling distance. Therefore truck noise level of 88 dB at 50 ft would result in a noise level of approximately 82 dB at 100 ft (30 m) and 76 dB at a distance of 200 ft (61 m) (FTA 2006).

A drill rig would generate about 80 to 100 dBA while a portable crane would generate a noise level of approximately 83 dBA (sound levels at a distance of 50 feet [15 m]). Average noise levels are not known for the use of the specific construction equipment over an extended period of time. Thus, comparison of these noise levels with averaged aircraft-generated noise associated with airfield activities (see Section 3.8.1.3) is not presented here. However, the drilling activities would be temporary, lasting about 30 days (including setup and demobilization time). Noise from these activities would be similar to occasional construction vehicle and industrial noise that occurs at or near the drilling sites. Although noise levels in the vicinity of the project area would increase temporarily, they would return to their ambient levels following completion of drilling and trenching. Therefore, noise associated with the proposed action would not substantially change the in-air noise environment at the FOCUS-II project sites.

Table 3.8-2 Typical Noise Levels of Construction Equipment

Equipment Type	Noise Level (dBA at 50 ft)
Truck	88
Backhoe	80
Bulldozer	85
Grader	85
Crane (movable)	83
Pump	67
Generator	81
Compressor	72
Pneumatic tools	85
Jack hammers and rock drills	88

Source: FTA 2006.

Underwater Noise

Underwater noise levels produced by the drilling machinery itself and by the drill bit as it passes through the sub-bottom rock are likely to be quite low. The borehole would be only 8 in (20 cm) in diameter, and most of it would be drilled from 20 to 50 ft (6 to 15 m) below the ocean bottom. In comparison, the bore holes made by oil drilling rigs are much larger. Based on an analysis by Malme and Mlawski (1979), underwater noise levels from drill rigs on natural and artificial islands in the Beaufort Sea are low. Noise is transmitted very poorly from the drilling machinery through land into water. Most noise produced by drilling rigs on two gravel islands was below 200 Hz in frequency and lessened to ambient levels within about 0.9 mi (1.5 km) (Malme and Mlawski 1979). Noise levels at distances as close as 1,476 ft (450 m) from two man-made islands in water 39-49 ft (12-15 m) deep were very low and comparable to median ambient levels expected for calm sea states (Davis et al. 1985; Johnson et al. 1986). Drilling produced underwater with median broadband (20-1,000 Hz) levels at 0.3 mi (0.5 km) were 8-10 dB higher.

Broadband received noise levels at 328 ft (1,000 m) from a drill rig, while drilling on an artificial island were about 90 to 100 dB re 1 μPa (Blackwell and Greene 2002).

Sound measurements have also been made for large boring machines with rotating cutter heads that are used to drill tunnels for undersea roads, railways, and sewage outfalls. Malme and Krumhansl (1993) measured sounds in the water above a 50-head Robbins machine boring a tunnel 26 ft (8 m) in diameter that was 262 ft (80 m) below the ocean bottom. Measurements and modeling showed that the combination of sound spreading outward and also being absorbed by the rock resulted in machine noise levels similar to those of normal harbor traffic sources. At a distance of 0.9 mi (1.5 km), received broadband sound levels were about 138 dB re 1μPa.

The peak source level for drilling activities is related to the force applied to the cutter head (Ross 1976; Malme and Krumhansl 1993). Thus, it is expected that the noise produced by the drilling of a 9-in (23-cm) hole would be substantially below that produced by an oil well drilling operation and very much below that produced by a large tunnel boring machine.

The SPL of the spectrum for hydraulic drills that would likely be used to install the seafloor bolts has been measured from about 10 hertz (Hz) to 40 kilohertz (kHz) by several studies (Navy 2003; John J. McMullen 1984). The greatest SPLs occur between 1 kHz and 6.5 kHz. At these frequencies, the mean SPL reported 169 decibels (dB) re: 1 μPa at 6 ft (1.8 m) from the drill. However, more recent studies have reported somewhat lower SPLs. A study by Health and Safety Executive noted the sound pressure level from a Stanley hand drill underwater of 159 dB re 1μPa at 1 m (Anthony, Wright, and Evans 2009). A 2004 review of offshore wind farm-related underwater noise sources reported an average for a variety of hand-held tools of 161 dB re 1μPa at the source (Nedwell and Howell 2004). A recent environmental impact assessment reported that rock socket drilling and drilling for the installation of large piles showed loudest measurement of 163 dB re 1μPa at the source (Nedwell et al. 2003; Ward 2012). Given the information in these reports, the Navy will assume an approximate level of 163 dB re 1μPa at the source for the hand drills to be used for installing the seafloor bolts.

The hydraulic drill is expected to produce sound that has no physical effects on marine mammal hearing, but can be greater than 120 dB re: 1 μPa. The hydraulic drill will be used in the presence of people and operating equipment and vessels. The hydraulic drill would be used for short, punctuated periods—several minutes at a time—instead of a sustained period of time.

Therefore, noise associated with the proposed action would not substantially change the underwater noise environment near the HDD exit point. Although perceptible noise would be generated by the HDD, these noise levels would be minimal and would return to their ambient levels upon completion of HDD activities.

Therefore, implementation of Alternative 1 would have no significant impact on the in-air and underwater noise environments.

Mitigation Measures

Implementation of Alternative 1 would not result in significant impacts to the in-air or underwater noise environments of the Sea Range; therefore no mitigation measures are proposed or required.

3.8.2.3 Alternative 2

Noises generated by implementation of Alternative 2 would be identical to Alternative 1. Noises generated under these alternatives would not substantially change the in-air and underwater environments near the FOCUS-II project sites. Therefore, implementation of Alternative 2 would have no significant impact on the in-air and underwater noise environments.

Mitigation Measures

Implementation of Alternative 2 would not result in significant impacts to the in-air or underwater noise environments of the Sea Range; therefore no mitigation measures are proposed or required.

3.8.2.4 Alternative 3

Noises generated by implementation of Alternative 3 would be nearly identical to Alternative 1. Noises generated under these alternatives would not substantially change the in-air and underwater environments near the FOCUS-II project sites. Therefore, implementation of Alternative 3 would have no significant impact on the in-air and underwater noise environments.

Mitigation Measures

Implementation of Alternative 3 would not result in significant impacts to the in-air or underwater noise environments of the Sea Range; therefore no mitigation measures are proposed or required.

3.8.2.5 Alternative 4

Noises generated by implementation of Alternative 4 would be very similar to Alternative 1. Noises generated under these alternatives would not substantially change the in-air and underwater environments near the FOCUS-II project sites. No impacts would occur at SCrI. Therefore, implementation of Alternative 4 would have no significant impact on the in-air and underwater noise environments.

Mitigation Measures

Implementation of Alternative 4 would not result in significant impacts to the in-air or underwater noise environments of the Sea Range; therefore no mitigation measures are proposed or required.

3.8.2.6 Alternative 5 – The No-Action Alternative

Under the No-Action Alternative, the proposed installation of FOCUS-II would not occur and existing conditions as described in Section 3.8.1.3 would remain unchanged. No significant impacts to the in-air or underwater noise environments would occur under the No-Action alternative.

Mitigation Measures

Implementation of the No-Action Alternative would not result in significant impacts to the in-air or underwater noise environments of the Sea Range; therefore no mitigation measures are proposed or required.

3.9 SAFETY

3.9.1 Affected Environment

3.9.1.1 Definition of Resource

Safety is defined as the protection of workers and the public from hazards. The total accident spectrum encompasses not only injury to personnel, but also damage or destruction of property or products. For worker safety, the boundary of the immediate work area defines the region of influence. For public safety, the region of influence varies depending on the nature of the operation; this area may extend for miles beyond the source of the hazard.

The primary safety issues associated with the proposed action include those inherent to construction projects including operation of heavy equipment, trenching and confined space, and proper use of personal protective equipment. The safety policy of NAWCWD is to take every reasonable precaution in the planning and execution of all operations that occur on the Sea Range, NBVC Point Mugu, SNI, and SCrI to prevent injury to people and damage to property. This involves implementing extensive measures for risk mitigation as well as increased range control in the areas determined to have the highest risk to public safety.

3.9.1.2 Regulatory Setting

The Occupational Safety and Health Administration (OSHA) is responsible for protecting worker health and safety in non-military workplaces. Relevant regulations are found at 20 C.F.R. § 1910. Protection of public health and safety is a responsibility of the USEPA as mandated through a variety of laws, including the Resource Conservation and Recovery Act (42 U.S.C. §§ 6901 et seq.); the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. §§ 9601 et seq., Sections 101[14] and 101[33]) and the Superfund Amendments and Reauthorization Act of 1986, (Public Law 99-499); the CWA; and the CAA. Additional safety responsibilities are mandated by the Department of Transportation, whose regulations can be found at 49 C.F.R. Parts 300-399.

The sections below provide an overview of existing safety and occupational health policies and procedures in place at the Sea Range. Key among these directives are OPNAVINST 5100.23G, *The Navy Safety and Occupational Health Program Manual* (30 Dec 2005) and DoD Directive 3200.11, *Use, Management, and Operation of Department of Defense Major Range and Test Facilities* (27 December 2007).

3.9.1.3 Existing Conditions

Sea Range safety policy, procedures, and guidance are covered in NAVAIR Instruction 3700.3, *Range Safety Policy* (NAVAIR 2007). This document defines range safety requirements, criteria, the safety planning process, and operational procedures. Although the Commander of NAWCWD has the ultimate responsibility for range safety, the authority for execution of these safety programs is delegated to the Sea Range Safety Officer in the Range Safety Office.

The Building 811 site is located within the explosive safety quantity distance (ESQD) arc of a nearby storage bunker. The Charlie Pad site has potential to fall within ESQD arcs of operations conducted at

nearby facilities. As such, the construction activities at these landing sites would be subject to explosives safety site approval.

Public access and proximity to the Sea Range is a principal safety consideration since most of the waters of the Sea Range are open to the public. NAWCWD controls the 36,000 mi^2 (93,200 km^2) of SUA associated with the Sea Range. In addition, the airspace over the Point Mugu airfield, beach, and to 3 NM (5.6. km) offshore is a Restricted Area, and non-participating aircraft are precluded from entering this space.

Access to SNI is strictly controlled. Access is granted for military-related activities and for pre-approved, non-military users, primarily for RDAT&E purposes. Three surface restricted water areas are located around SNI: Alpha, Bravo, and Charlie (Figure 3.6-1). In addition, NAWCWD has established two airspace Restricted Areas over SNI that extend 3 NM (5.6 km) around the island. The two areas are divided by a line that extends from the north side to the south side of SNI where the Bravo boundaries intersect the shorelines; they extend from the surface to 100,000 ft (30.5 km).

Members of the public can access SCrI via private and concession operated boats. Public access to SCrI is limited to the eastern portion of the island, which includes the Prisoners Harbor area and Navy Road. The western nine-tenths of the island are owned by TNC, and public access is not allowed without approval. Personal vehicles are not allowed on SCrI; only government personnel or approved drivers are allowed to operate vehicles on the island.

3.9.2 Environmental Consequences

3.9.2.1 Assessment Criteria

The potential impacts from the Proposed Action were analyzed by considering any impacts associated with human health and safety. This analysis examines how the proposed activities would impact public health and safety and worker health and safety by contact with contaminated materials, ordnance, and explosives safety arcs.

3.9.2.2 Alternative 1 – Preferred Alternative

The safety of members of the public would be ensured through the implementation of public access measures described in the existing conditions section above. Construction activities would be in accordance with Navy, NAWCWD, and NBVC regulations and plans. Personnel involved in grading operations, including contractors and subcontractors, will be advised on required protective equipment and safety measures in accordance with California Division of Occupational Safety and Health regulations. Construction contractors will develop site-specific safety plans, including procedures for job hazard analysis, vehicle and equipment maintenance, and proper use of personal protective equipment. These documents will be developed for each phase of construction, including the offshore cable laying operations. A rescue plan is required for all water operations, with specifications for the retrieval and rescue of offshore personnel. All personnel on the construction sites will be briefed on the safety plans.

NAWCWD will coordinate with NBVC and will apply for explosive safety site approval as needed. This approval application would be subject to review by the Naval Ordnance Safety and Security Activity (NOSSA). Where applicable, construction activities would be conducted in compliance with limitations and restrictions detailed in the explosive safety site approval process. These measures could include

personnel training, maintaining an appropriate distance from explosive materials, as well as other measures identified through the site approval coordination. Additionally, cable-laying vessels will communicate with other mariners in the area regarding the offshore cable installation activities, requesting that boats maintain a safe distance from the cable-laying vessel and cable being installed. Therefore, implementation of Alternative 1 would have no significant impacts on the safety of personnel or members of the public.

Mitigation Measures

Implementation of Alternative 1 would result in no significant safety impacts to the public or personnel. Therefore, no mitigation measures are proposed or required.

3.9.2.3 Alternative 2

The safety impacts to the public and personnel associated with Alternative 2 would be identical to those of Alternative 1. Therefore, implementation of Alternative 2 would have no significant impacts on the safety of personnel or members of the public.

Mitigation Measures

Implementation of Alternative 2 would result in no significant safety impacts on the public or personnel. Therefore, no mitigation measures are proposed or required.

3.9.2.4 Alternative 3

The safety impacts to the public and personnel associated with Alternative 3 would be nearly identical to those of Alternative 1. Therefore, implementation of Alternative 3 would have no significant impacts on the safety of personnel or members of the public.

Mitigation Measures

Implementation of Alternative 3 would result in no significant safety impacts on the public or personnel. Therefore, no mitigation measures are proposed or required.

3.9.2.5 Alternative 4

The safety impacts to the public and personnel associated with Alternative 4 would be very similar to those of Alternative 1, with no impacts at SCrI. Therefore, implementation of Alternative 4 would have no significant impacts on the safety of personnel or members of the public.

Mitigation Measures

Implementation of Alternative 4 would result in no significant safety impacts on the public or personnel. Therefore, no mitigation measures are proposed or required.

3.9.2.6 Alternative 5 – The No-Action Alternative

Under the No-Action Alternative, no FOCUS-II construction and installation activities would occur. Therefore, no significant safety impacts on the public or personnel would occur.

Mitigation Measures

Implementation of the No-Action Alternative would not result in significant safety impacts on the public or personnel. Therefore, no mitigation measures are proposed or required.

3.10 TOPOGRAPHY, GEOLOGY, AND SOILS

3.10.1 Affected Environment

3.10.1.1 Definition of Resource

Geological resources are generally defined as the geology, soils, and topography of a given area. The geology of an area includes bedrock materials and mineral deposits. Soil refers to unconsolidated earthen materials overlying bedrock or other parent material. Topography is typically described with respect to the elevation, slope, aspect, and surface features found within a given area.

Existing Conditions Point Mugu

Point Mugu is situated on the southern portion of the Oxnard Plain, a low-lying, near-level area with a very slight overall upward trend toward the north. The Oxnard Plain is composed largely of floodplain and marine sedimentary deposits. Unconsolidated sediments underlie Point Mugu to a water depth of 1,500 ft (460 m). Sedimentary deposition in the form of fluvial (river), tidal, and beach processes continue to dominate the geologic setting of Point Mugu. Surface elevations at Point Mugu have an average upward slope of approximately one ft (0.3 m) of elevation per 500 ft (1 m per 500 m) of distance from the tidal flats surrounding Mugu Lagoon. Most of the land within Point Mugu is less than 10 feet (3 m) above mean sea level (msl). The nearshore environment is dominated by sandy beaches, the topography of which is strongly influenced by ocean wave and wind action. (Navy 2002)

The soils at Point Mugu generally fall into four categories: fill material, coastal beach sands, tidal flats, and the loamy sands and silty clay loams typical of the Oxnard Plain. Fill material constitutes a large portion of the base soils, but its properties are not well documented. Most of the fill was dredged out of Mugu Lagoon and is presumed to have properties similar to the other soils at Point Mugu. Generally, soils at Point Mugu exhibit poor drainage and slow runoff characteristics, which contribute to ponding and occasional flooding. The erosion hazard is slight, except for the coastal beaches (Navy 2002). The three alternative landing sites are located in tidal flat soils, with coastal beach sands between the drilling sites and the shoreline. (Navy 2002)

San Nicolas Island

SNI is a mesa with a gentle downward slope on the north side, and a steep downward slope on the south side. The long axis of the island is oriented northwest-southeast. The average surface elevation is 500 ft (152 m) above msl, with a maximum elevation of 908 ft (277 m) above msl. The most notable geographic feature of SNI is a series of well-defined marine terraces that are visible on the north side of the island (Navy 2002). Elevations of the terraces range from below sea level to approximately 900 ft (274 m) above msl. Topography on the island is further shaped by surface water runoff to the ocean. The ridgeline between the north and south sides of the island creates a north-south drainage divide for most of the length of the island. The steep southern slopes are deeply incised by the V-shaped canyons of ephemeral drainages. On the broader northern slopes, runoff creates steep walled gullies on the hillsides before spreading out on the marine terraces into indistinct channels among the dunes. The northwestern portion of the island also contains areas of dune topography with elevations in the range of 100 to 200 ft (30 to 60 m) above msl. (Navy 2002)

The SNI soils are predominantly sedimentary in origin with sandstone as their major constituent; the soils also tend to contain a large concentration of ocean salts. These soils are composed of wind-deposited, quartzitic sands that are highly prone to both water (from coastal waves and alluvial processes) and wind erosion. Coast Guard Beach and its vicinity (including the proposed drilling site and staging area) are characterized by wide, previously disturbed beachfronts. The existing SNI landing site and the HDD site on the south side of SNI are located in coastal beach sands. The sand at these drilling sites is coarse with little rock.

Santa Cruz Island

SCrI is the largest of the four northern Channel Islands (Santa Cruz Island, Anacapa Island, Santa Rosa Island, and San Miguel Island). These four islands represent the south-westernmost expression of the Transverse Mountain Range. SCrI has a distinctive coastal geometry, including a thin low-elevation "neck" connecting the western mountains to the eastern mountains. The island has a significantly longer north-south axis in the west, with the exception of a thin peninsula extending off its northwest corner.

The island is bisected by the Santa Cruz Island Fault. This left lateral strike slip fault bounds a prominent strike valley in the central and eastern portions of the island and shows abundant evidence for late Quaternary slip (Pinter et al. 1998). Geologic units exposed south of the fault consist of pre-Jurassic metamorphic rocks and Tertiary volcaniclastic rocks. The geology north of the fault is dominated by two Miocene formations: the Santa Cruz Island Volcanics and the Monterrey Formation (Weaver and Meyer 1969). Diablo Peak rises to an elevation of 2,450 ft (747 m) and is part of the translated terrain, aligning with the peaks of the northern Channel Islands. These peaks are a submerged western extension of the Santa Monica Mountains.

SCrI soils predominantly range from shallow, to deep, to bedrock and are loamy to clayey in texture (argixerolls). Heavy clay soils with high shrink/swell characteristics (vertisols) also occur on the island. On the east end of the island, portions of the Monterey formation are chalky in nature as they are composed largely of calcium carbonate. When occurring on slopes greater than 15 percent, vertisols are prone to piping and slumping, with sinkholes developing in some areas. The majority of the Monterey shale on SCrI is siliceous and weathers into loamy soils lacking high shrink/swell characteristics. (Pinter 28 et al. 1998)

The proposed landing site and the SCrI soils between Prisoners Harbor and the Navy Site are in the isthmus region of the island and are predominantly comprised of Monterey shale. This includes the roads connecting the Navy Site to the Prisoners Harbor. (NPS 2015)

3.10.2 Environmental Consequences

3.10.2.1 Assessment Criteria

The protection of unique geological features, minimization of soil erosion, and changes to sediment quality are considered when evaluating the potential impacts of an action on geological resources. Generally, geological resource impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering components are incorporated into project design.

3.10.2.2Alternative 1 – Preferred Alternative

Point Mugu

At the HDD sites, there would be temporary disturbance to the soils at the previously disturbed sites, near Building 811 and Charlie Pad. Proposed construction activities include:

- Excavation for purposes of anchoring the drill rigs and creating a catch basins for cuttings;
- Site grading to create flat staging areas for drilling; and
- Backfilling the anchor holes and catch basins upon completion of drilling operations.

These activities could temporarily increase erosion on the sandy soils in the vicinity of the drilling sites. However, erosion would be minor, as standard erosion control measures would be implemented. The anchor holes and catch basins would be backfilled with original soils upon completion of drilling operations. Drilling operations would be temporary, lasting approximately 30 days at each site.

Installation of the onshore alignment would use existing infrastructure to the maximum extent possible, reducing the amount of soil disturbance. Under Alternative 1, there would be approximately 100 ft (30 m) of trenching between Building 811 and an existing manhole system. There would be approximately 100 ft (30 m) of trenching required to connect Charlie Pad to existing manhole infrastructure as well.

Considering the short-term nature of the ground disturbance and erosion control measures that would be implemented, preferred alternative actions at NBVC Point Mugu would not lead to significant impacts on geological resources.

San Nicolas Island

On NBVC SNI, the HDD site would lead to temporary disturbance of the soils on the previously disturbed Coast Guard Jetty site. Proposed construction would include the same activities as at the Point Mugu sites, which would lead to a temporary increase in erosion in the vicinity of the drilling site. The anchor holes and catch basins would be backfilled with original soils upon completion of drilling operations. Drilling operations would be temporary, lasting approximately 30 days at each site.

Under Alternative 1, there would be approximately 500 ft (152 m) of trenching connecting the drilling site to an existing concrete vault. At the vault, the two sea cables would be spliced into an existing 24-fiber cable, connecting to Building 127. No further ground disturbance would be needed beyond the concrete vault.

Considering the short-term nature of the ground disturbance and erosion control measures that would be implemented, preferred alternative actions at NBVC SNI would not lead to significant impacts on geological resources.

Santa Cruz Island

There would be temporary disturbance of soils at the HDD site near the Prisoners Harbor Pier. The activities would include those listed for the Point Mugu activities. Trenching along Navy Road and area to the east of the unnamed road from the well site back to Navy Road would include areas of steep slope, requiring additional erosion controls measures and BMPs. Included in these BMPs would be the

requirement that backfilled trenches be compacted to conditions as close to the original state as possible. Additionally, all manholes and vaults along the trenching route will be installed using BMPs such as silt screens and barriers to minimize erosion impacts. All installation activities will be conducted in accordance with all applicable state and Department of Defense construction codes and regulations to ensure that long-term erosion effects would be minimized.

Considering the short-term nature of the ground disturbance and erosion control measures that would be implemented to minimize long-term effects, preferred alternative actions at SCrI would not lead to significant impacts on geological resources.

Offshore Cable Alignments

The specific subsurface geology at the HDD exit sites is unknown but is likely to be sedimentary bedrock, similar to the composition of subsurface geology at the nearshore portion of the existing FOCUS-II onshore landing sites.

The surface geology of the subtidal area nearest the SNI landing site (less than 100 ft [30 m]) is characterized by sand, bedrock, or boulders. Sediment thickness maps show rock outcrop, hard-ground bottom with less than 3 ft (1 m) of sediment around approximately half of SNI. The remaining area, immediately adjacent to the island, has approximately 10-ft- (3-m-) deep sediment deposits (Navy 2002). The portion of the offshore cable alignment from the proposed exit point to the existing FOCUS cables consists primarily of sandy bottom with occasional rock outcroppings.

The construction crew would closely monitor the pressure during drilling; they would also monitor the exit point closely at the completion of the hole to ensure that drilling ceases as quickly as possible after the exit point has been penetrated. Therefore, marine sediments would not be adversely affected by any discharge occurring during or upon completion of the proposed drilling activities. Therefore, impacts on geological resources along the offshore cable alignments would not be significant.

Therefore, implementation of Alternative 1 would have no significant impact on topography, geology, or soils.

Mitigation Measures

Implementation of Alternative 1 would result in no significant geological impacts. Therefore, no mitigation measures are proposed or required.

3.10.2.3 Alternative 2

Geological resource conditions for Alternative 2 would be the same as those associated with Alternative 1. As a result, geological resource impacts would be the same as those described for Alternative 1. Therefore, implementation of Alternative 2 would have no significant impacts on topography, geology, or soils.

Mitigation Measures

Implementation of Alternative 2 would result in no significant geological impacts. Therefore, no mitigation measures are proposed or required.

3.10.2.4 Alternative 3

Geological resource conditions for Alternative 3 would be similar to those associated with Alternative 1. As a result, geological resource impacts would be the same as those described for Alternative 1. Therefore, implementation of Alternative 3 would have no significant impacts on topography, geology, or soils.

Mitigation Measures

Implementation of Alternative 3 would result in no significant geological impacts. Therefore, no mitigation measures are proposed or required.

3.10.2.5 Alternative 4

Geological resource conditions for Alternative 4 would be similar to those associated with Alternative 1. As a result, geological resource impacts would be the same as those described for Alternative 1 with the exception of SCrI, where there would be no impacts. Therefore, implementation of Alternative 4 would have no significant impacts on topography, geology, or soils.

Mitigation Measures

Implementation of Alternative 4 would result in no significant geological impacts. Therefore, no mitigation measures are proposed or required.

3.10.2.6 Alternative 5 – The No-Action Alternative

Under the No-Action Alternative, there would be no HDD operations, trenching for installation of onshore cable alignments, or offshore installation of fiber optic cable. Therefore, there would be no significant impacts on topography, geology, or soils under the No-Action Alternative.

Mitigation Measures

Implementation of the No-Action Alternative would result in no significant geological impacts. Therefore, no mitigation measures are proposed or required.

3.11 VISUAL RESOURCES

3.11.1 Affected Environment

3.11.1.1 Definition of Resource

Visual resources are generally defined as the natural and built features of a landscape that may be viewed by the public and contribute to the visual quality and character of an area. Visual resources form the overall impression that an observer has of an area or its landscape character. Distinctive landforms, water bodies, vegetation, and man-made features that contribute to an area's aesthetic qualities are elements that contribute to an area's visual character. Visual quality is generally defined as the visual significance or appeal of a landscape based on cultural values and the landscape's intrinsic physical elements (USACE 1988).

Several federal agencies have established terminologies and criteria useful for visual resource management and assessment. These include:

- Bureau of Land Management, *Manual 8400 Visual Resource Management* (BLM 1984);
- U.S. Forest Service, *Landscape Aesthetics: A Handbook for Scenery Management*, Agricultural
- Handbook Number 701 (USFS 1995);
- Federal Highway Administration, *Visual Impact Assessment for Highway Projects*, Publication 17 No. FHWA-HI-88-054, (FHWA 1981); and
- U.S. Army Corps of Engineers, Visual Impact Assessment Procedures for U.S. Army Corps of Engineers, (USACE 1988).

Based on the above sources, generally, the appearance of the landscape is described using the dominance elements of form, line, color, and texture, as appropriate. These dominance elements are the basic components used to describe visual character and quality for most visual assessments.

To assess impacts a proposed action may have on visual resources, three criteria are applied: visual sensitivity, viewer sensitivity, and viewer exposure.

Visual sensitivity is a measure of a viewer interest and concern for the visual quality of the landscape and potential changes to it. Visual sensitivity is determined based on the types of viewers, activities they may be engaged in, and the expressed or anticipated level of public interest and concern for visual resources and quality. Viewer exposure considers the numbers of viewers and the frequency and duration of views.

Viewer sensitivity varies for individuals and groups, depending on the activities viewers are engaged in, their values and expectations related to the appearance and character of the landscape, and their potential level of concern for changes to the landscape. High viewer sensitivity is typically assigned to viewer groups engaged in recreational or leisure activities, those traveling on scenic routes for pleasure, viewers experiencing or traveling to or from projected natural or historical areas, or viewers experiencing views from resorts or their residences. Low viewer sensitivity is typically assigned to viewer groups engaged in work activities or commuting to or from work.

Viewer exposure varies for any particular view location or travel route depending on the number or volume of viewers, the frequency of views (i.e., how often is the view experienced), and the duration of the views (i.e., the length of time the view is experienced). Viewer exposure would typically be highest

for views frequently experienced by large number of people for long periods. Other factors, such as viewing angle and viewer position relative to a feature or area, can also be contributing factors to viewer exposure.

3.11.1.2 Affected Environment

Point Mugu

Building 811 Site

The Building 811 site is located near the southwest corner of the NBVC Point Mugu installation. On-installation land use of the site includes airfield operations and munitions storage. Off-installation land use in the area includes two game reserves to the north of the NBVC Point Mugu boundaries. The site and its surroundings are characterized by the wetlands northeast of Beach Road, the Building 811 storage building, the Point Mugu Airfield, and the rock revetment southwest of the site. The wetlands, buildings, and rock revetment provide a diverse combination of color, form, and texture. Access to the site is provided by the paved two-lane Ditch and Beach Roads. As the site is located on station, public access to the site is restricted.

This site is not visible from the established communities of Port Hueneme and Oxnard, which would have high viewer sensitivity. The 811 Building site would not be visible to boaters off the NBVC Point Mugu shore due to the rip rap sea wall. Views of the project site would only be from users of nearby buildings or users of Ditch and Beach Roads. Viewers working on the installation are considered to have moderate concern for changes to the landscape on the installation and, thus, have moderate viewer sensitivity. Figures 3.11-1 and 3.11-2 provide views from the Building 811 site.

Figure 3.11-1. Building 811 HDD Site Facing Southeast down Beach Road

Figure 3.11-2. Building 811 Site Facing Northeast towards Laguna Peak

Charlie Pad Site

The Charlie Pad site is located in the south-central area of the NBVC Point Mugu installation. On-installation land use of the site and its vicinity is generally weapons and targets launching and testing. The site and its surroundings are characterized by the wetlands and Mugu Lagoon to the north, beach and the Pacific Ocean to the south, and test facilities in the vicinity.

The most visually prominent landmarks in the area include Anacapa Island, Santa Cruz Island, and offshore drilling rigs to the west of the site and Laguna Peak northeast of the site. The offshore features are visible for many miles outside the project area due to their height and strong contrast in color, form, and texture relative to the surrounding water landscape and blue sky. Laguna Peak is distinct due to its strong contrast in height, color, and unique facilities located on its peak.

There is one group with high viewer sensitivity in the vicinity of the Charlie Pad site, recreational users with base access located at the Point Mugu RV Park approximately 1.1 mi (1.7 km) to the east. However, the Charlie Pad site is not visible from this vantage. The Charlie Pad site would not be visible to nearby communities (i.e., Oxnard, Port Hueneme, and Camarillo). Views of the project site would only be from users of nearby military facilities or offshore boaters. These viewers are considered to have moderate concern for changes to the landscape on the installation and, thus, have moderate viewer sensitivity. Figures 3.11-3 and 3.11-4 provide representative views from the Charlie Pad site.

Figure 3.11-3. View to the West near the Charlie Pad Site

Figure 3.11-4. View of Laguna Peak from the Charlie Pad Site

San Nicolas Island

Coast Guard Jetty Site

The Coast Guard Jetty site is located on the northeast coast of SNI. The on-installation land use in the area is military testing and installation utilities. The site is characterized as Coreopsis Shrub, bluffs overlooking the Pacific Ocean, disturbed land, and beach environment. Access to the site is provided by Beach Road, a two-lane paved road.

The most visually prominent landmarks in the area include the bluffs overlooking the Pacific Ocean, elephant seals occupying the beach north of the project site, and a tank farm to the east of the equipment staging area. On clear days, the Santa Monica Mountains can be seen approximately 100 mi (160 km) to the northeast. The bluffs provide a distinct view due to the strong contrast in color and texture with the beach surroundings, the ocean, and the blue sky. Views of the elephant seals are unique due to number of animals present and their rareness on the mainland.

Due to its remoteness and visitor controls in place, the Coast Guard Jetty site is not visible to any high sensitivity viewers. Views of the project site would only be from users of nearby military facilities or travelers on Beach Road. These viewers are considered to have moderate concern for changes to the landscape on the installation and, thus, have moderate viewer sensitivity. Figures 3.11-5 through 3.11-7 provide views from the equipment staging area. Figures 3.11-8 through 3.11-13 represent typical views from the Coast Guard Jetty HDD site.

Figure 3.11-5. View Southwest from Coast Guard Jetty Site Staging Area

Figure 3.11-6. View Northeast from Coast Guard Jetty Staging Area

Figure 3.11-7. NBVC SNI Tank Farm from Coast Guard Staging Area

Figure 3.11-8. View of the Coast Guard Jetty HDD Site Facing East

Figure 3.11-9. Coast Guard Jetty HDD Site Facing Southeast

Figure 3.11-10. Road Connecting HDD Site to Staging Area Facing South

Figure 3.11-11. Elephant Seals Northeast of HDD Site

Figure 3.11-12. Coreopsis Shrub North of HDD Site

Figure 3.11-13. Bluff Overlook Northwest of HDD Site

Santa Cruz Island

Prisoners Harbor Landing Site

The Prisoners Harbor landing site is near the northeast corner of the NPS-owned lands on SCrI. The area is characterized by natural and manmade features. The predominant natural features include the Pacific Ocean, bluffs overlooking the ocean, and diverse vegetation. Manmade features include the Prisoners Harbor Pier, buildings, unpaved roads, picnic tables, vehicles, and introduced eucalyptus trees.

The site is visited by high sensitivity viewers including recreational visitors to the island and employees of the NPS, TNC, and the Navy. Therefore, the Prisoners Harbor area is considered to have a high visual sensitivity. Prominent landmarks of the area include the pier, the historic NPS-owned warehouse, the area canyons and bluffs, and vistas of the Pacific Ocean. Figures 3.11-14 through 3.11-18 provide typical views from the Prisoners Harbor HDD site.

Figure 3.11-14. Prisoners Harbor Pier from the HDD Site

Figure 3.11-15. Prisoners Harbor HDD Site Facing West

Figure 3.11-16. Prisoners Harbor HDD Site Facing Northwest

Figure 3.11-17. View East of Prisoners Harbor Pier

Figure 3.11-18. View South of Prisoners Harbor HDD Site

Elevated Channel Connecting Well Site to Navy Road

The majority of the corridor connecting the well site to Navy road is restricted to personnel working for the Navy, NPS, and TNC. The well site itself is characterized by a storage building, the well site, solar panels, vehicles parked at the site, and views of the Cañada del Puerto. Only a small portion of the unnamed roads connecting to Navy Road is visible from recreational visitors hiking along Navy Road towards the Del Norte Camp and other sites of interest. This area is considered an area of high viewer sensitivity. Figures 3.11-19 and 3.11-20 provide views of the well site. Figures 3.11-21 through 3.11-25

provide views of the road adjacent to the elevated channel corridor, connecting the well site to Navy Road. As discussed below, the hillside route for the elevated channel in Alternative 1 is not generally visible to the public.

Figure 3.11-19. The Well Site

Figure 3.11-20. Storage Building and Solar Panel near the Well Site

Figure 3.11-21. View North along Navy Road

Figure 3.11-22. View South along Unnamed Road Connecting to Well Site

Figure 3.11-23. View from CV-2 Location

Figure 3.11-24. View North from Well Site towards Navy Road

Figure 3.11-25. Southwest View from Navy Road

Navy Road Corridor to the Navy Site

The 6.8-mi (11-km) stretch of Navy Road connecting concrete vault CV-3 to the Navy Site mainly follows ridgelines with vistas of native and invasive vegetation species, bluffs and valleys of SCrI, and views of the Pacific Ocean. This corridor is used mainly by NPS and Navy employees. The road is used occasionally by recreational hikers, accessing the Del Norte Camp and other sites on SCrI. Figures 3.11-26 through 3.11-28 provide typical views from Navy Road. Figures 3.11-29 through 3.11-31 provide typical views in the vicinity of the Navy Site.

Figure 3.11-26. Typical View from Navy Road

Figure 3.11-27. Fennel near Navy Road Shoulder

Figure 3.11-28. Pacific Ocean Vista from Navy Road

Figure 3.11-29. Navy Site from Navy Road

Figure 3.11-30. Building 4 at Navy Site

Figure 3.11-31. View South from Navy Site

3.11.2 Environmental Consequences

3.11.2.1 Assessment Criteria

The existing visual character and quality and viewer sensitivity in a given project area provide the baseline for determining impacts to visual resources from implementation of a proposed action. Visual impacts are assessed based on the level of contrast of this action with existing conditions and their visibility and proximity to sensitive viewers. For the purposes of impact analysis, visual contrast is assessed based on a projects contrast in form, line, color, and texture with landscape features of topography, water, vegetation, and structures.

The degree of contrast that would be introduced by the project is assessed using the following ratings, as defined by the Bureau of Land Management Manual Handbook 8431-1 (BLM 1986):

- Strong: the element contrast demands attention, will not be overlooked, and is dominant in the landscape;
- Moderate: the element contrast begins to attract attention and begins to dominate the characteristic landscape;
- Weak: the element contrast can be seen but does not attract attention; and
- None: the element contrast is not visible or perceived.

In addition to contrast, impacts are also assessed in terms of glare introduced by the project actions. Glare is reflective light that can be visually unpleasant or possibly unsafe due to the potential for temporary blindness. Glare may be caused by light from artificial sources or the sun reflecting off of light colored or smooth surfaces such as metal, glass, water, or polished stone. Glare intensity varies depending on the source and intensity of light, time of day, time of year, angle of reflectance, weather, atmospheric conditions, color and texture of the material surface finish, length of exposure, nature and sensitivity of

receptors, and other factors. Due to the high number of variables, glare is not measured quantitatively, but rather is assessed qualitatively in this visual impacts assessment.

3.11.2.2 Alternative 1 – Preferred Alternative

Point Mugu

Under Alternative 1, construction activities would include HDD operations and trenching at the Building 811 and Charlie Pad sites. The project would not be easily visible to sensitive viewers outside or on the NBVC Point Mugu installation and would be considered a moderate concern for changes to the landscape on the installation. Equipment used at each site would include a drilling rig, a mud pump unit, a mud filtering system, a catch basin for drilling mud, a hydraulic power unit, a drill rig control station, a pipe rack for cable conduits, an excavator, and a tool van. During the construction, the equipment's height, form, lines, and color would result in weak contrast with the existing landscape, in that the element contrast will be seen but will not attract attention. There is some potential for glare to be produced off the construction equipment, but the effects of this are expected to be minor due to the temporary nature of the construction activities (approximately 30 days at each site) and the low number of on-installation viewers near the project sites.

Following construction activities the project sites would be returned to their original state; therefore, there would be no permanent impacts to visual resources. Given the construction activities' weak contrast with the existing landscape, minor potential for glare, and temporary nature of the project impacts, implementation of Alternative 1 would have no permanent or significant visual resources impacts at NBVC Point Mugu.

San Nicolas Island

Under Alternative 1, construction activities would include HDD operations and trenching at the Coast Guard Jetty site. The project would not be visible to sensitive viewers outside the installation and would be considered a moderate concern for changes to the landscape on the installation. Equipment used at each site would include a drilling rig, a mud pump unit, a mud filtering system, a catch basin for drilling mud, a hydraulic power unit, a drill rig control station, a pipe rack for cable conduits, an excavator, and a tool van. During the construction, the equipment's height, form, lines, and color would result in weak contrast with the existing landscape, in that the element contrast will be seen but will not attract attention. There is some potential for glare to be produced off the construction equipment, but the effects of this are expected to be minor due to the temporary nature of the construction activities (approximately 30 days at the site) and the low number of on-installation viewers near the project site.

Following construction activities the project site would be returned to its original state; therefore, there would be no permanent impacts to visual resources. Given the construction activities' weak contrast with the existing landscape, minor potential for glare, and temporary nature of the project impacts, implementation of Alternative 1, would have no permanent or significant visual resources impacts at NBVC SNI.

Santa Cruz Island

On SCrI, construction equipment would be visible to sensitive viewers from the Prisoners Harbor Pier and along the trenching and elevated channel corridors along Navy Road and the unnamed roads

connecting to the well site. The equipment's height, form, lines, and color would result in moderate contrast to the existing landscape due to the sensitive viewers' proximity to the project site and the contrast would attract attention and could begin to dominate the characteristic landscape of the Prisoners Harbor area. There is some potential for glare to be produced off the construction equipment, but the effects of this are expected to be minor due to the temporary nature of the construction activities and the valley characteristics of the Prisoners Harbor area that would restrict the angle of reflectance for much of the typical day. The vaults and manholes placed within the roadbed would not extend above the roadbed, would be neutral in color and would not alter the overall viewshed or public experience.

Following construction activities, the HDD site and trenching corridors would be returned to their original state. There would be the installation of a permanent feature along the 1,150 ft (350 m) elevated channel corridor. The majority of this channel would be behind low brush and large trees. The elevated channel will stand approximately 1.6 ft (0.5 m) high and will be neutral in color to blend in with the existing vegetation as much as possible (Figure 2-11). Due to its location away from the roadside, height, form, lines, and color the elevated channel system would result in weak contrast with the existing landscape, in that the element contrast will be seen but will not attract attention from the existing landscape. Furthermore, the elevated channel and stakes will have low potential to cause glare due to the materials that comprise the system. It is unlikely that the elevated channel would be significantly visible from areas where the public can access. Therefore, implementation of Alternative 1 would not have significant impacts to the visual resources of SCrI.

3.11.2.3 Alternative 2

Point Mugu

Alternative 2 activities at NBVC Point Mugu would be identical to those described in Alternative 1. Therefore, there would be no permanent or significant visual resources impacts at NBVC Point Mugu due to implementation of Alternative 2.

San Nicolas Island

Alternative 2 activities at NBVC SNI would be identical to those described in Alternative 1. Therefore, there would be no permanent or significant visual resources impacts at NBVC SNI due to implementation of Alternative 2.

Santa Cruz Island

Under Alternative 2, construction equipment would be visible to sensitive viewers from the Prisoners Harbor Pier and along the trenching corridor along Navy Road and the unnamed road connecting to the well site. The equipment's height, form, lines, and color would result in moderate contrast to the existing landscape due to the sensitive viewers' proximity to the project site and the contrast would attract attention and could begin to dominate the characteristic landscape of the Prisoners Harbor area. There is some potential for glare to be produced off the construction equipment, but the effects of this are expected to be minor due to the temporary nature of the construction activities and the valley characteristics of the Prisoners Harbor area that would restrict the angle of reflectance for much of the typical day.

Following construction activities, the HDD site and trenching corridors would be returned to their original state. A permanent feature would be installed along the 1,800-ft (550-m) elevated channel corridor.

Approximately 939 ft (283 m) of the elevated channel would be visible to sensitive viewers using Navy Road. While the elevated channel will stand 2.5 ft (0.76 m) high and will be neutral in color to blend in with the existing vegetation as much as possible (Figure 2-11), it would remain visible along the roadside and change the existing conditions. Therefore, implementation of Alternative 2 would have potentially significant impacts to the visual resources of SCrI.

3.11.2.4 Alternative 3

Point Mugu

Alternative 3 activities at NBVC Point Mugu would be identical to those described in Alternative 1. Therefore, there would be no permanent or significant visual resources impacts at NBVC Point Mugu due to implementation of Alternative 3.

San Nicolas Island

Alternative 3 activities at NBVC SNI would be identical to those described in Alternative 1. Therefore, there would be no permanent or significant visual resources impacts at NBVC SNI due to implementation of Alternative 3.

Santa Cruz Island

Under Alternative 3, construction equipment would be visible to sensitive viewers from the Prisoners Harbor Pier and along the trenching corridor along Navy Road and the unnamed road connecting to the well site. The equipment's height, form, lines, and color would result in moderate contrast to the existing landscape due to the sensitive viewers' proximity to the project site and the contrast would attract attention and could begin to dominate the characteristic landscape of the Prisoners Harbor area. There is some potential for glare to be produced off the construction equipment, but the effects of this are expected to be minor due to the temporary nature of the construction activities and the valley characteristics of the Prisoners Harbor area that would restrict the angle of reflectance for much of the typical day.

Following construction activities, the HDD site and trenching corridors would be returned to their original state and no elevated channel would be installed; therefore, there would be no permanent impacts to visual resources. The construction activities would generate moderate contrast to high sensitivity viewers over a short period of time and would have limited potential to generate glare. Therefore, implementation of Alternative 3 would not have significant impacts to the visual resources of SCrI.

3.11.2.5 Alternative 4

Point Mugu

Alternative 4 activities at NBVC Point Mugu would be similar to those described in Alternative 1. However, there would be no construction activities conducted at the Charlie Pad site. The construction equipment's height, form, lines, and color would result in weak contrast with the existing landscape, in that the element contrast will be seen but will not attract attention. There is some potential for glare to be produced off the construction equipment, but the effects of this are expected to be minor due to the temporary nature of the construction activities (approximately 30 days at each site) and the low number of on-installation viewers near the project sites.

Following construction activities the project sites would be returned to their original state; therefore, there would be no permanent impacts to visual resources. Given the construction activities' weak contrast with the existing landscape, minor potential for glare, and temporary nature of the project impacts, there would be no permanent or significant visual resources impacts at NBVC Point Mugu due to implementation of Alternative 4.

San Nicolas Island

Alternative 4 activities at NBVC SNI would be identical to those described in Alternative 1. Therefore, there would be no permanent or significant visual resources impacts at NBVC SNI due to implementation of Alternative 4.

Santa Cruz Island

Under Alternative 4, there would be no construction or operational activities conducted at SCrI. Therefore, implementation of Alternative 4 would have no visual resources impacts at SCrI.

3.11.2.6 Alternative 5 – The No-Action Alternative

Under the No-Action Alternative, the proposed activities would not be implemented at NBVC Point Mugu, NBVC SNI, or SCrI. The existing visual resources would not change; therefore, the No-Action Alternative would have no impacts to visual resources.

CHAPTER 4 CUMULATIVE IMPACTS

CEQ regulations implementing the procedural provisions of NEPA define cumulative impacts as:

"…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 C.F.R. 1508.7)

Each resource, ecosystem, and human community must be analyzed in terms of its ability to accommodate additional effects, based on its own time and space parameters. Therefore, cumulative effects analysis normally will encompass a Region of Influence (ROI) or geographic boundaries beyond the immediate area of the proposed action, and a time frame including past actions and foreseeable future actions, to capture these additional effects.

For the proposed action to have a cumulatively significant impact on an environmental resource, two conditions must be met. First, the combined effects of all identified past, present, and reasonably foreseeable projects, activities, and processes on a resource, including the effects of the proposed action, must be significant. Second, the proposed action must make a substantial contribution to that significant cumulative impact. In order to analyze cumulative effects, a cumulative effects region must be identified for which effects of the proposed action and other past, present, and reasonably foreseeable actions would occur.

For purposes of this cumulative effects analysis, the ROI includes the drilling sites and cable alignment corridors at Point Mugu, San Nicolas Island, and Santa Cruz Island as defined in Section 2.1.3 of this EA/OEA. This analysis depends on the availability of data and the relevance of effects of past, present, and future actions. Although certain data (e.g., extent of forest cover) may be available for extensive periods in the past (i.e., decades), other data (e.g., water quality) may be available for much shorter periods. Because specific information and data on past projects and action are usually scarce, the analysis of past effects is often qualitative (CEQ 1997).

Table 4-1 lists the past, present, and reasonably foreseeable future actions within the ROI that have had, continue to have, or would be expected to have some impact on the natural and human environment. The projects in this table are limited to those implemented in the last five years or those with ongoing contributions to environmental effects. Projects with measureable contributions to impacts within the ROI for a resource area were included in the cumulative analysis.

Table 4.1 Reasonably Foreseeable Actions on the Sea Range

Project Title	Project Description	Project Timeframe		
		Past	Present	Future
Laser Testing on the Sea Range	Laser testing and training under various weather conditions on the Point Mugu Sea Range and SNI (including Tender Beach), and includes lasers integrated onto aircraft, ships, and land-based platforms.		✓	✓
San Nicolas Island Reverse Osmosis and Brine and Filter Backwash Discharge	The proposed project consists of increasing brine and filter backwash discharge at the existing reverse osmosis facility. Proposes to increase generation rates to 216,000 gallons (818,000 liters) per day.		✓	✓
SNI Natural Resource Management Program	Development of SNI INRMP to describe existing and anticipated Navy operations and recommendations to protect and enhance environmental resources.	✓	✓	✓
Integrated Natural Resource Management Plan Naval Base Ventura County Point Mugu and Special Areas California	Development of an INRMP for all lands owned, leased, withdrawn, or otherwise used for military training by NBVC, with the exception of NBVC SNI and NBVC Port Hueneme.	✓	✓	✓
Development of Wind Energy Facilities on SNI	Construction of up to 11, 155-ft (47-m) tall, 100-kilowatt wind turbines; an energy storage system; and underground utility conduit connections on SNI. Seven wind turbines and the underground utility connections were completed in July 2016.		✓	✓
SNI Directed Energy Testing Site	Construction and operation of Directed Energy Test Facilities at Tender Point at SNI. Components of the proposed action include a shooter site (location where laser and HPM equipment would be placed for testing and training), a target site (location of laser and HPM targets), and four calibration target sites.		✓	✓
Countermeasures Testing on the Sea Range	Countermeasures testing and training on the Sea Range consisting of five components: lethal and non-lethal directed energy (i.e., high-energy lasers [HEL] and high-power microwave systems), small arms, missiles, flares, and electronic support systems.		✓	✓
San Nicolas Island Roads and Airfield Repair	Maintenance and improvement of mission-critical infrastructure project at NBVC SNI, which includes repairing the roads and the airfield.		✓	✓
Collection of Sea Lions from SNI	Space and Naval Warfare Systems Command program obtaining a sufficient number of California sea lions to support the mission requirements of the Navy Marine Mammal Program.	✓	✓	✓
West Coast Home Basing of the MQ-4C UAS at NBVC Point Mugu, California	Establishing facilities and functions to support the west coast home basing and maintenance of four MQ-4C Triton Unmanned Aircraft Systems (Triton UAS), which were formerly known as the Broad Area Maritime Surveillance UAS (BAMS UAS), at NBVC Point Mugu.		✓	✓

Table 4.1 Reasonably Foreseeable Actions on the Sea Range cont'd

Project Title	Project Description	Project Timeframe		
		Past	Present	Future
Expansion of Unmanned Systems on the Sea Range	An extension of the Navy's UAS RDAT&E operations and training capability, and the introduction of unmanned maritime system operations are proposed for the Sea Range. The proposed action includes construction of new support facilities at NBVC Point Mugu and SNI.		✓	✓
FOCUS Cable Repair, San Nicolas Island, California	Repair of the existing FOCUS-I system by the installation of a new landing for the FOCUS-I cable on the northeast side of SNI near the Coast Guard Jetty.	✓		
NBVC Shoreline Protection	Improvements to shoreline revetments and other resources to protect mission-critical infrastructure and valuable ecological resources along the most at-risk locations of the NBVC Point Mugu coastline.		✓	✓
Conduct Restoration Planning for an Omega 707 Air Tanker Crash Site	The Navy intends to conduct restoration planning and prepare a Damage Assessment Restoration Plan (DARP). This DARP will have the goal of quantifying injuries to natural resources and potential remedies to these injuries attributed to a May 2011 air tanker crash in Mugu Lagoon.		✓	✓
NPS Channel Islands National Park General Management Plan	Determination of lands within the Channel Islands National Park appropriate for wilderness designation. The project also identifies the land management principles and guidelines to be implemented to preserve the designated wilderness areas.	✓	✓	✓
Management of Non-Native Argentine Ants on SCrI	Prevention of additional introduction or human-assisted spread of Argentine ants on SCrI. The project also identifies methods for control and/or elimination of current infestations of Argentine ants.		✓	✓

4.1 Air Quality

The proposed action would conform to the applicable State Implementation Plan and would not trigger a conformity determination under Section 176(c) of the CAA. The Navy has prepared a Record of Non-Applicability for CAA Conformity in the SCCAB (Appendix A). Moreover, these negligible impacts, when added to the impacts from the other listed projects, would account for a very small percentage increase of overall air emissions budgets for the air basin. As a result, the emissions associated with the proposed action would not have a cumulative impact on air quality.

The potential effects of GHG are global by nature, as individual GHG emission sources are generally not large enough to have an appreciable effect on climate change. An appreciable impact on climate change would only occur when proposed project GHG emissions are combined with GHG from other GHG emissions on a global scale. The proposed action would generate 3,404 metric tons (3,753 tons) of CO_{2e}, which is approximately 14 percent of the 25,000 metric tons (27,600 tons) the CEQ advises federal agencies to use as an indicator threshold for significant effects. Considering this, the proposed action would not yield GHG emissions that would be a significant contributor to global climate change.

4.2 Biological Resources

Implementation of the proposed action would have no effect on sensitive plant species and no significant effect to threatened or endangered animals. Hence there is no potentially significant interaction with the effects of actions on the native plants and animals of Point Mugu, SNI, SCrI, and the Sea Range. This project, with its minimal impacts to natural resources for project sites, should not have a cumulative effect on natural resources due to activities conducted by the Navy or other agencies. Therefore, when combined with the effects of other past, present, and foreseeable project activities, implementation of the proposed action of either action alternative is unlikely to have any additional cumulative effect on plant and animal populations at Point Mugu, SNI, and SCrI.

4.3 Cultural Resources

Implementation of the proposed action would not adversely impact cultural resources. The proposed action would result in disturbance of known archaeological sites at SCrI. However, monitoring and mitigation measures ensure that impacts would be reduced to the fullest extent feasible. There would be no adverse effect to sites at NBVC Point Mugu and NBVC SNI. The Navy's cultural resource management program assures that potentially significant cultural resources are protected and are not subject to incremental degradation. Therefore, the proposed action, when combined with other past, present, and foreseeable activities, would not result in cumulative impacts to cultural resources.

4.4 Hazardous Materials and Waste Management

Implementation of the proposed action would not result in significant hazardous material and waste management impacts. Appropriate BMPs would be implemented to minimize the release of hazardous materials to the environment, and the hazardous and non-RCRA wastes generated would be handled in accordance with all federal, state, and local laws and regulations. The waste generated during the proposed construction activity is insignificant when compared to existing waste generation levels at NBVC Point Mugu and NBVC SNI. The volume of waste generated during SCrI activities would be low and well-managed. Therefore, the proposed action when combined with other past, present, and foreseeable activities, would not result in cumulative impacts on hazardous materials and waste management.

4.5 Infrastructure and Utilities

Implementation of the proposed action would not adversely impact infrastructure and utilities at the three onshore project sites or offshore resources of the Sea Range. Transportation along the Beach Road Corridors at Point Mugu and SNI will be temporarily impacted during drilling and trenching operations, but alternative routes are available for both.

The trenching operations would close portions of Navy Road to vehicle access, but the Navy will coordinate with NPS to develop a plan to avoid limitations on recreational pedestrian access. Other hiking trails would also remain open. The installation of the elevated channel system may divert travel to other roads connecting to the well site. These closures would be temporary in nature and would not lead to permanent infrastructure or utility changes.

Sea level rise may expose some of the trench-buried fiber optic cables at NBVC Point Mugu, NBVC SNI, and SCrI; however, the cable in these low-lying areas would be armored sea cables and would not be

affected by exposure to the elements. Exposure of the fiber optic cables would not affect existing infrastructure and utilities at the project sites. Therefore, the proposed action when combined with other past, present, and foreseeable activities, would not result in cumulative impacts on infrastructure and utilities.

4.6 Land and Water Use

Implementation of the proposed action would not result in significant land and water use impacts. Existing land use designations would not change as a result of the proposed action, and the existing land uses within the project area would continue to be used for the same purposes. The proposed action would impose temporary restrictions on the public's right of access to the sea offshore in the vicinity of the HDD sites at Point Mugu and SCrI.

For safety purposes, restricted areas have been established in the waters around SNI, extending approximately 3 mi (4.8 km) from the shoreline. Boats must remain at least 300 yd (274 m) from the shoreline of SNI at all times, and no boats are allowed to anchor within 300 yd (274 m) or land on SNI, except in an emergency. Individual sections of the restricted area can be closed during operations in the vicinity of SNI. No person, vessel, or other craft shall enter the restricted area or designated section(s) during closure periods unless authorized to do so by the Commanding Officer, NBVC or the Officer in Charge, SNI.

The proposed action would be consistent with the provisions of the California Coastal Act. The CCC's concurrence with the negative determination will be added once received by the Navy. The concurrence letter would indicate that proposed construction activities at Port Mugu, SNI, and SCrI would have no effects on the coastal zone of California. Therefore, the proposed action, in conjunction with other past, present, and foreseeable activities, would not result in significant cumulative impacts on coastal zone resources.

The proposed action would not significantly affect coastal resources and their uses. Therefore, implementation of the proposed action, or either action alternative when combined with other past, present, and foreseeable actions would not result in cumulative impacts on airspace, land, or water use.

4.7 Marine Sediments and Water Quality

The proposed action would have only short-term, localized effects, if any, on sediment and water quality. Due to the limited scope of potential sediment and water quality impacts associated with the proposed action, the action would have only minor, temporary effects, if any, and would not measurably add to quantities of pollutants in the marine environment. Therefore, there would be no cumulative impact on marine sediments and water quality.

4.8 Noise

The proposed action would have only short-term, localized noise effects. Moreover, these short-term impacts, when added to the impacts from the other listed projects, would account for a relatively small change to the overall noise environment. As a result, the proposed action would not have a significant cumulative impact on noise.

4.9 Safety

Implementation of public access controls would ensure that the safety of members of the public would not be affected by the proposed action activities. As a result, implementation of the proposed action would not have a cumulative effect on public safety. Construction activities would be conducted in accordance with Navy, NAWCWD, and NBVC regulations and plans, ensuring that project personnel's safety would be protected. As a result, the proposed actions would not significantly impact the safety of members of the public or personnel conducting the proposed action construction activities.

4.10 Topography, Geology, and Soils

The proposed action would have only short-term, localized effects, if any, on geology and soils. Such effects are limited to ground disturbance during operation and occasional maintenance activities. Due to the limited scope of potential impacts associated with the proposed action, the action would have only minor, temporary effects, if any, and would not measurably add to effects from other activities. Therefore, there would be no cumulative impact on topography, geology, and soils.

4.11 Visual Resources

Implementation of the proposed action would have temporary visual resource impacts at the NBVC Point Mugu, NBVC SNI, and SCrI sites. There would be no long-term visual resource impacts at NBVC Point Mugu and NBVC SNI, as all construction areas would be returned to their original state. There would be the installation of a permanent feature along the 1,150 ft (350 m) elevated channel corridor on SCrI. A small portion of the elevated channel at its start and end points would be visible to hikers using Navy Road. The majority, however, will be located along the slope base, behind brush and trees and likely not visible from hiking trails and the Navy Road. Where visible, the elevated channel will stand 2.5 ft (0.76 m) high and will be neutral in color to blend in with the existing vegetation as much as possible. Due to its height, form, lines, and color the elevated channel system would result in weak contrast with the existing landscape, in that the element contrast will be seen but will not attract attention from the existing landscape. Furthermore, the elevated channel and stakes will have low potential to cause glare due to the materials that comprise the system. Therefore, there would be no cumulative visual resource impacts.

CHAPTER 5 OTHER CONSIDERATIONS REQUIRED BY NEPA

5.1 Consistency with Other Federal, State and Local Laws, Plans, and Regulations

Implementation of the alternatives would comply with existing federal regulations and state, regional, and local policies and programs, while maintaining the Navy's mission. The project would be completed in accordance with the environmental compliance requirements provided in Table 5-1.

5.2 Irreversible and Irretrievable Commitment of Rresources

Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. This includes the use of non-renewable resources such as metal, fuel, and other natural or cultural resources. These resources are non-retrievable in that they would be used for this project when they could have been used for other purposes. Human labor is also considered a non-retrievable resource. Another topic that falls under this category is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

Under the proposed action, construction activities associated with the FOCUS replacement would be conducted on the Sea Range, Point Mugu, SNI, and SCrI. The construction project would not result in a significant irreversible or irretrievable commitment of resources. Fuel for the necessary heavy equipment, vessels, motorized vehicles, and electric generators would be a commitment of resources; however, the use of fuel for the construction project would have a negligible impact on fossil fuel resources and human labor associated with Navy mission operations on the Sea Range.

5.3 Adverse Impacts that Cannot be Avoided or are not Amenable to Mitigation

This EA/OEA identified adverse effects on cultural resources, associated with the implementation of the proposed action. However, mitigation measures identified through consultation with SHPO would be implemented. Therefore, there are no probable adverse environmental that cannot be avoided or are not amenable to mitigation.

Table 5-1 Summary of Environmental Compliance for the Proposed Action

Plans, Policies, and Controls	Responsible Agency	Status of Compliance
Clean Air Act (CAA) (42 U.S.C. §§7401 et seq.) CAA General Conformity Rule (40 C.F.R. §93[B]) State Implementation Plan (SIP)	USEPA	The proposed action would not conflict with attainment and maintenance goals established in SIPs. A CAA conformity determination will not be required because emissions attributable to the alternatives, including the proposed action, would be below *de minimis* thresholds.
Clean Water Act (CWA) (33 U.S.C. 1251 et seq.)	USACOE	The Navy will submit permit applications to the USACE in compliance with Section 404 of the CWA and Section 10 of the River and Harbors Act (under USACE Nationwide Permit 12)
NEPA of 1969 (42 U.S.C. §§4321, et seq.) Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 C.F.R. §§1500–1508) Navy Procedures for Implementing NEPA (32 C.F.R. §775)	Navy	This EA/OEA has been prepared in accordance with NEPA, Council on Environmental Quality regulations, and the Navy's NEPA procedures. The proposed action would not result in significant impacts, and thus an EIS/OEIS is not required.
Endangered Species Act (ESA) (16 U.S.C. §§1531 et seq.)	USFWS	The proposed action would have no effect on federally-listed species. No further consultation with the USFWS is required.
Marine Mammal Protection Act (MMPA) (16 U.S.C. §§1361–1407)	NMFS	The proposed action is not expected to result in injury or harassment of any marine mammal as defined by the MMPA.
Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§703–712)	USFWS	The proposed action would not have a significant impact on migratory birds and would comply with applicable requirements of the MBTA.
National Historic Preservation Act (36 C.F.R. §800)	Navy/NPS/ SHPO	The proposed action would not have a significant impact on cultural resources and would comply with applicable NPS and SHPO requirements. Completion of the test plan and a MOA between NPS and SHPO is required prior to construction.
Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§1801– 1891)	NMFS	The proposed action would not have a significant impact on EFH due to the limited area impacted, temporary nature of impacts and other factors. EFH consultation with NMFS is complete.
Coastal Zone Management Act (CZMA) (16 U.S.C. 1456, 15 C.F.R. part 930)	NOAA	The Navy determined the proposed action was consistent with the enforceable policies of California Coastal Management Program and submitted a consistency determination which incorporated avoidance, conservation, and mitigation measures to minimize adverse impacts to coastal resources. The California Coastal Commission has concurred with the Navy's determination found in Appendix C.
Sanctuaries Act (16 U.S.C. §1461 et seq.)	NOAA	The proposed action may affect Sanctuary resources, pending outcome of a NMSA 304(d) Consultation, which will not be completed until funding is available for this portion of the project.
EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (58 FR 7269 [16 February 1994])	Navy	The proposed action would not result in any disproportionately high and adverse human health or environmental effects on minority or low-income populations.

5.4 Relationship between Short-Term Use of the Environment and Long-Term Productivity

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing a single development option reduces future flexibility in pursuing other options, or that giving over a parcel of land or other resource to a certain use often eliminates the possibility of other uses for that site.

The proposed action would, reversibly, dedicate areas of land, equipment, and other resources to a particular use during a limited period of time. These resources would not be available for other productive uses throughout the duration of construction of FOCUS-II. However, these impacts are considered negligible, as the facilities and geographic areas associated with the proposed action are designated for and have historically accommodated the types of uses proposed. Therefore, the proposed action would not result in any impacts that would reduce environmental productivity or permanently narrow the range of beneficial uses of the environment.

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Appendix A: Comments Received on Draft EA, October 2016

October 2016 Draft Environmental Assessment / Overseas Environmental Assessment - FOCUS Replacement

Comment #	Reviewer	Page	Line # Start	Line # End	Section/ Table/ Figure	Comment	Response	Change to Document
1	Northern Chumash Tribe	All				This project isn't considered to be in our homeland, so please contact the families and tribes who are closer to that area.	Thank you for the comment. The Navy is consulting with the Santa Ynez Band of Chumash Indians	None
2	Northern Chumash Tribe	All				I would like to state that there would be concerns about the impacts of this proposed project including the installation of a new fresh water supply line to support operation on Santa Cruz Island.	Thank you for the comment. The Navy is consulting with the Santa Ynez Band of Chumash Indians	None
3	Ventura County Watershed Protection District	All				The District has reviewed the document with regard to potential hydraulic and hydrology issues, and has no comments at this time	Comment noted.	None
4	Ventura County Air Pollution Control District	All			3.4	District recommends the following conditions be placed on each phase and location of the project to minimize fugitive dust, particulate matter and creation of ozone precursor emissions that may result from replacing FOCUSI with FOCUSII: 1. The area disturbed by clearing, grading, earth moving, or excavation operations shall be minimized to prevent excessive amounts of dust; 2. Signs shall be posted onsite limiting traffic to 15 miles per hour or less. 3. All clearing, grading, earth moving, or excavation activities shall cease during periods of high winds. During periods of high winds, all clearing, grading, earth moving, and excavation operations shall be curtailed to the degree necessary to prevent fugitive dust created by onsite activities and operations from being a nuisance or hazard, either offsite or onsite. 4. Personnel involved in grading operations, including contractors and subcontractors, should be advised to wear respiratory protection in accordance with California Division of Occupational Safety and Health regulations.	1. Comment noted, the minimum area required for clearing, grading, earth moving, or excavation will be minimized. 2. No public roadways will be used. Vehicle drivers will be informed to maintain speeds below 15 miles per hour. 3. If winds have the potential to cary dust into public areas where there may be a risk of nuisance or hazard, operations will cease. 4. All state and federal safety and health requirements will be followed.	1. Added conservation measure as #2 in section 2.1.3 2. Added conservation measure to measure #5 in 2.1.3 3. Added conservation measure to measure #1 in 2.1.3 4. Clarifying statement added to section 3.9.2.2.
5	Channel Islands National Marine Sanctuary	1-6			1.7	Add National Marine Sanctuaries Act	Added	Added NMSA to bulleted list in Section 1.7
6	Channel Islands National Marine Sanctuary	1-7			1.8	Add National Marine Sanctuaries Act (NMSA) Consultation Section 304(d) (16 USC 1434(d)) and a Sanctuary Management Permit (Title 15, Sections 922.74)	Added	Added consultation requirement to list of required consultations and removed from list of informal consultations.
7	Channel Islands National Marine Sanctuary	2-4			2.1.2.2	"The pulling would require emptying the pipe of non-toxic anti-corrosive fluid previously installed during the HDD work. The mix of fresh water and anti-corrosive (1,300 gal [5,000 l]) would be emptied into the sea during the trunk cable installation." Please provide additional details on the type of anti-corrosive fluid.	The anti-corossive used is S-69, which is mixed with water. It is labeled for field use, Nitrite, chromate, and heavy metal-free and environmentally friendly. MSDS sheet is attached. The process will also use a poly water lubricant that is put in the pipe when pulling the cable. Minor amounts might leak into the seawater. This product is non-toxic and used in similar applications for other cables. MSDS sheet is attached.	MSDS sheets added to response to comments section
8	Channel Islands National Marine Sanctuary	2-7			2.1.2.5	(m)aintenance will be conducted by divers; "most likely annually". Please specify if surveys will be done on cables beyond the 100 ft. depth, and if not, please detail how and on what time-scale maintenance below the 100 ft. depth would occur.	No planned maintenance is anticipated below 100 ft. Information has been added to the EA. Inspection would only occur in the event of cable signal degredation or cable failure.	Added statement to section 2.1.2.5
9	Channel Islands National Marine Sanctuary	2-11 and elsewhere				Similarly, in each alternative there is a reference to "periodic maintenance" (e.g. pg. 2-11). "Periodic maintenance and inspection of the onshore and offshore cable alignments to ensure uninterrupted operation of FOCUS-II and to ensure that biological resources are not adversely impacted by the communications system." Please clarify the timeframe and methods for "periodic maintenance" and detail how maintenance below the 100 ft. depth would occur.	No planned maintenance is anticipated below 100 ft. Information has been added to the EA.	added statement to section 2.1.4.2, alternatives 1 and 4

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10	Channel Islands National Marine Sanctuary	2-8			2.1.3	"3) To avoid marine mammal and listed bird breeding seasons, HDD and construction activities will only occur between... September 15 and December 15 at SNI and SCrI." Endangered blue and fin whales and threatened humpbacks are known to congregate off of SCrI through late October. The proposed project route is also located near a seasonal Voluntary Speed Reduction Zone to reduce the risk of ship strikes. Given the historical presence of the whales in the Fall we recommend pushing the start date to late October.	Vessel operations required to install the FOCUS II cable will be at speeds well below the recommend speed reduction. Cable will not be loose as it will be continuously connected to the ship, so entanglement is not an issue. There is no potential impact to whales. No additional protective measures for whales are required.	None
11	Channel Islands National Marine Sanctuary	2-29			2.1.4.2	Please elaborate on how the proposed routes to and from SCrI minimize the distance traveled across the Channel Islands National Marine Sanctuary in the preferred alternative. If the cable route stayed outside the sanctuary boundary to the point where it could run due south to Prisoner's Harbor, then it would minimize the distance traveled across the sanctuary. It is not clear in the EA why the route needs to run within the sanctuary boundary east and north of Anacapa Island and Santa Cruz Island all within the sanctuary boundary.	A route farther to the north, outside the Sanctuary Boundary, would unnecessarily cross several pipelines and cables connecting gas and oil production platforms to the mainland. A route farther east of Anacapa island would coincide with the existing FOCUS cable and would require crossing a steeper portion of the mouth of the Hueneme Canyon. The proposed route has been optimized both for distance and to avoid obstacles such as this as well as avoiding steep canyon walls, which occur to the north of the [illegible]	Details added to page 2-29 in the description of the offshore routes.
12	Channel Islands National Marine Sanctuary	3-38			3.2.1.3	"For SCrI, MPAs include Scorpion State Marine Reserve (SMR), Painted Cave State Marine Conservation Area (SMCA), and Gull Island SMR. Although the offshore route will transit the Scorpion SMR, the landing site near Prisoners Harbor is not close to any of these MPAs." Add "federal" MRs to Scorpion and Gull Island.	Added	Added federal marine reserves
13	Channel Islands National Marine Sanctuary	3-38			3.2.1.3	It appears the proposed route crosses the Scorpion Federal Marine Reserve. The anticipated take of sanctuary resources associated with this route will need to be addressed in the consultation and permitting processes with the sanctuary.	Page 3-38, lines 22-24 and 40-41 indicate that the route will cross the Scorpion MPA and that the Navy will consult with NMFS regarding potential impacts to EFH. The Navy will also consult with CINMS regarding impacts to Sanctaury resources in this area and has added language indicating this to the EA.	Added consultation with CINMS regarding Sanctuary Resources.
14	Channel Islands National Marine Sanctuary	3-111			3.6.1.1	"The MPAs in the vicinity of SCrI include Scorpion SMR, Painted Cave SMCA, and Gull Island SMR. The offshore route will transit near the Scorpion SMR." Add "and federal MR" to Scorpion and Gull Islands MPAs.	Added	Added federal marine reserves
15	Santa Barabara Air Pollution Control District	3-3			3.1.1, Table 3.1-1	The EPA strengthened the 8-hour federal ozone standard from the 2008 level of 0.075 ppm to 0.070 ppm on December 28, 2015. Designations for the 2015 standard will be finalized in 2017. Please update the table to reflect the current federal 8-hour ozone standard	Table has been updated	Table 3.1-1 edited
16	Santa Barabara Air Pollution Control District					Standard dust mitigations (Attachment A) are recommended for all construction and/or grading activities. The name and telephone number of an on-site contact person must be provided to the APCD prior to grading/building permit issuance.	Comment noted. Dust control measures will be used. On-site contacts will be provided if permits are required.	See changes to section 2.1.3 in comment 4 above
17	Santa Barabara Air Pollution Control District					APCD Rule 345, Control of Fugitive Dust from Construction and Demolition Activities establishes limits on the generation of visible fugitive dust emissions at demolition and construction sites. The rule includes measures for minimizing fugitive dust from on-site activities and from trucks moving on- and off-site.	With the exception of Santa Cruz Island, project sites are not in areas visible to the general public. Where necessary, dust control measures will be used.	See changes to section 2.1.3 in comment 4 above

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18	Santa Barabara Air Pollution Control District					The State of California considers particulate matter emitted by diesel engines carcinogenic. Therefore, during project grading, construction, and hauling, construction contracts must specify that contractors shall adhere to the requirements listed in Attachment B to reduce emissions of particulate matter (as well as of ozone precursors) from diesel equipment. Recommended measures should be implemented to the maximum extent feasible.	Recommended protective measures will be used wherever feasible.	None
19	Santa Barabara Air Pollution Control District					All portable diesel-fired construction engines rated at 50 bhp or greater must have either statewide Portable Equipment Registration Program (PERP) certificates or APCD permits prior to grading/building permit issuance. Construction engines with PERP certificates are exempt from APCD permit, provided they will be on-site for less than 12 months.	Comment noted. Permits will be acquired where required.	
20	The Nature Conservancy					While we noted that the Navy plans to use salt water for the drilling part of the project, it does not specify what water will be used to keep dust down during the project. Calculating the amount of water needed from some earlier Navy documentation suggests that tens of thousands of gallons may be needed. But the EA does not list the amount of water to be used... Salt water cannot be used for the purpose, as the amounts needed would alter the soil salinity and salt spray potentially drift to rare and protected species along the route of the cable.	Freshwater from trucks brought to SCrI via barge will be used as needed.	Section 2.1.3, item 1 added "with fresh water" to clarify that salt water will not be used. Section 3.5.2.2, added the following to SCrI Water: "Dust control during construction would be accomplished using fresh water trucks transported to SCrI via barge as described above."
21	The Nature Conservancy					The EA needs to address plans for the removal of obsolete water lines. These metal structures will degrade over time and corrosion damage may pose a risk to wildlife. Holes and jagged edges will become traps and sources of injury to the rare endemic animals on the island.	The Navy does not own the obsolete lines and has no plans to remove them.	None
22	The Nature Conservancy					The EA needs to address the risks of drilling operations impacts on eel grass beds at Prisoners Harbor. A "frack out" could potentially dump tons of mud into this environment, and wiping out the eel grass beds. These eel beds are extremely important, and fragile habitats for the near shore marine ecosystem, and loss would have exponential impact on near shore ecology	The EA does address both potential impacts to eel grass beds and the potential for frac-out. The commenter is incorrect that "tons of mud" could be released. In a worst-case scenario, The volume of material potentially released would be up to 7,443 gal (28,174 l). However, the drilling fluid would remain contained within the subsurface formation and would be unlikely to migrate to the surface or be released offshore. This volume would include approximately 27 ft3 (less than 1 m3) of	Added information on switching to water/sea water prior to exiting the bore hole in section 3.7.2.2
23	The Nature Conservancy					The Island Foxes are addressed, but the EA does not do not specify if trash cans will be raven or fox proof.	Any trash receptacles brought to the site will be raven and fox proof. See section 2.1.3, protective measure #15.	None
24	The Nature Conservancy					Traffic will be closed during construction, but there is no mention of where traffic will be rerouted to. This is of high importance to us due to TNC operations on the Main Ranch	Roads will be closed to the public to ensure safety. The Navy will coordinate with the National Park Service and Nature Conservancy to ensure that construction operations do not adversely impact required	added details on required vehicle traffic to conservation measure #26 in section 2.1.3
25	The Nature Conservancy					TNC is also an easement holder on the Navy Road. As such, we'd like to be notified on operations and FOCUS cable project activities on the road	Notification will be provided	

Comment #	Reviewer	Page	Line # Start	Line # End	Section/ Table/ Figure	Comment	Response	Change to Document
26	The Nature Conservancy					They do not include the populations of the federally endangered Malacothamnus that occur at Prisoners or along the Navy Road.	Table 3.2-3 will be updated and text added to identify the population.	Updated table 3.2-3, figure 3.2-6 and text to indicate the presence and need to protect Malacothamnus sp
27	The Nature Conservancy	3-103	25	30		There is no mention of water use for keeping dust down that is mentioned previously. What is the total amount of water need for the life of the project? This is not specified and should be stated. Overdrafting the Prisoners Well can result in saltwater intrusion. This has not been addressed in the document.	See comment 20	
28	The Nature Conservancy	3-103	16	16		What is the alternate route? How will issues be mitigated?	Hikers can use routes on Nature Conservancy property with approval from the Nature Conservancy and/or hike at other island locations such as Scorpion Anchorage.	None
29	The Nature Conservancy	3-65	33	33		Impacts to Marine Vegetation- what is the possibility of a "frack out" within the eel grass beds at Prisoners Harbor? What is the impact of the drill clay coming up within the eel grass beds?	See comment 22	See comment 22
30	The Nature Conservancy	3-36			Figure 3.2-6	Figure does not show site of the federally endangered Malacothamnus at base of hill of Navy Road.	Figure 3.2-6 will be updated	Figure 3.2-6 updated
31	The Nature Conservancy	3-27 and 3-35	6 on 3-35		Table 3.2-3	Helianthemum should read Crocanthemum	Text will be updated	Updated table and text
32	The Nature Conservancy				Figure 2-12	How will the Navy address the added traffic through the Main Ranch when the Navy Road is closed to traffic?	This comment is likely in regards to figure 2-14. See comment 28. The road will only be temporarily closed and vehicle traffic by NPS, Navy, and TNC employees will be	None
33	The Nature Conservancy				Figure 2-12	Navy needs to remove abandoned water line.	The existing water line is not Navy property and not part of this project	None
34	The Nature Conservancy	2-9	13	14	2.1.3	Navy will also consult with TNC as the Navy Road is our easenient	The Navy will coordinate with both TNC and NPS. Text added.	Added text to section 2.1.3
35	The Nature Conservancy	2-9	7	8	2.1.3	Since the biologist will be surveying for both plants and sweat bee- biologists will need to be both a botanist and an entomologist.	Biological surveys will be conducted by appropriately trained and qualified staff.	None
36	The Nature Conservancy	2-9	7	8	2.1.3	When will the Navy Road be surveyed? This will determine what is found. Multiple surveys may need to be conducted.	Surveys will occur just prior to construction to ensure that current populations are known.	None
37	The Nature Conservancy	2-9	3	6	2.1.3	Should also include the Santa Cruz Island bush mallow- (Malacothamnus fasciculatus var. nesioticus)	Added	Added text to section 2.1.3
38	The Nature Conservancy	2-8	37	38	2.1.3	All pipe ends should be covered as Prisoners Harbor is only one of two locations where the endemic Santa Cruz Island Harvest Mouse is found.	Conservation measure changed to indicate that all pipe ends will be covered to protect from unintentional entrapments	changed to all pipes in conservation measure #20
39	The Nature Conservancy	2-8	33	34	2.1.3	Training should also include how to prevent ravens accessing food containers and trashcans.	Comment noted. The measure includes feeding of wildlife as an example, but the training will be comprehensive.	None
40	The Nature Conservancy	2-8	31	32	2.1.3	TNC should also review the waste management and disposal plan.	TNC will be consulted. Text added.	Added TNC to conservation measure 17.
41	The Nature Conservancy	2-8	29	30	2.1.3	Trashcans should be fox and raven proof, and daily litter abatement surveys should be conducted.	Comment noted. The conservation measure is intended to provide this protection.	None
42	The Nature Conservancy	2-8	14	15	2.1.3	When will surveys be conducted? Surveys should be conducted in the spring when invasive plants are present, not in winter or fall when they may not be as readily apparent or ideal to treat.	This measure is not intended to lead to full removal of such species, but rather to reduce the potential for their spread. Surveys and treatment will occur prior to construction and treatments made to readily apparent population that could be spread by	None

Comment #	Reviewer	Page	Line # Start	Line # End	Section/ Table/ Figure	Comment	Response	Change to Document
43	The Nature Conservancy				2.1.3	What is the range of amounts for water usage? Will fresh or sea water be used? If fresh, where will the water come from? The Prisoners well cannot support the amount of water needed for this project and over drafting may cause saltwater intrusion. If sea water- no salt water should be used for dust control due to alteration of soil salinity and potential drift to listed and rare plant species growing along the Navy Road.	See comment 20	
44	The Nature Conservancy				2.1.2.3	How will submerged archeological resources be addressed?	No submerged archeological resources have been identified in the project APE and these areas have a low- to moderate potential to hold any such resources. The Navy has determined that no affect to submerged resources will occur. See section 3.3.3.2, which describes procedures if previously undetected resources are discovered.	None
45	The Nature Conservancy					The Navy should be responsible for removal of and disposal of abandoned water-line to Navy Site from Prisoner's Well.	The existing water line is not Navy property and not part of this project.	None
46	The Nature Conservancy					HDD Process- Site grading may impact archeological sites on Santa Cruz Island.	Site grading for HDD will occur in an area with no known archeological resources. Testing will confirm this.	None
47	The Nature Conservancy					All HDD Pad equipment need to be inspected for introduced species (biosecurity protocols need to be listed)	See conservation measures 5-7 on page 2-8. All equipment shipped to Santa Cruz or San Nicolas Islands will be properly inspected per NBVC biosecurity intstruction 5090.14	None
48	The Nature Conservancy					The Navy should coordinate with NPS regarding conservation action restrictions as well as recreational uses.	Comment noted. The Navy will coordinate with NPS for any activities on NPS property.	None
49	The Nature Conservancy					EO 13112 Invasive Species- Need to address biosecurity issues, and maintenance of site due to disturbance.	See comment 47	None

Appendix B: RONA and Air Quality Calculations

DEPARTMENT OF THE NAVY
NAVAL AIR WARFARE CENTER WEAPONS DIVISION
1 ADMINISTRATION CIRCLE
CHINA LAKE, CA 93555-6100
575 I AVENUE SUITE 1
POINT MUGU, CA 93042-5049

IN REPLY REFER TO:
5090
Ser 52F00ME/043
28 Aug 18

MEMORANDUM FOR THE RECORD

From: Head, NAVAIR Ranges Sustainability Office

Subj: FIBER OPTICS COMMUNICATIONS UNDERSEA SYSTEM REPLACEMENT – RECORD OF NON-APPLICABILITY FOR CLEAN AIR ACT CONFORMITY

Ref: (a) U.S. Environmental Protection Agency, Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule, published in the Federal Register on 30 Nov 93 (40 CFR, Parts 6, 51, and 93)

(b) U. S. Environmental Protections Agency, Revisions to the General Conformity Regulations; Final Rule, published in the Federal Register on 5 Apr 10 (40 CFR, Parts 51 and 93)

(c) OPNAV M 5090.1, Environmental Readiness Program Manual, dtd 10 Jan 14

(d) Navy Guidance for Compliance with the Clean Air Act General Conformity Rule, 30 Jul 13

Encl: (1) Fiber Optics Communications Undersea System Replacement Emissions Analysis for Clean Air Act Conformity Applicability

1. References (a), (b), (c), and (d) provide implementing guidance for documenting Clean Air Act (CAA) Conformity Determination requirements. The General Conformity Rule applies to federal actions proposed within areas which are designated as either non-attainment or maintenance areas for a National Ambient Air Quality Standard (NAAQS) for any of the criteria pollutants.

2. Activities associated with the Proposed Action would be conducted at Naval Base Ventura County (NBVC) Point Mugu and San Nicolas Island (SNI). Effective 19 June 2008, Ventura County has been reclassified as a "serious" nonattainment area for the federal 8 hour O_3 standard (de minimis thresholds are 50 tons/year for VOCs and NOx) and is in attainment of all other criteria pollutants. Ventura County is classified as a nonattainment area for the state O_3, $PM_{2.5}$, and PM_{10} standard.

Subj: FIBER OPTICS COMMUNICATIONS UNDERSEA SYSTEM REPLACEMENT – RECORD OF NON-APPLICABILITY FOR CLEAN AIR ACT CONFORMITY

Although NBVC SNI is part of Ventura County, the United States Environmental Protection Agency has determined that SNI is separate and distinct from the South Central Coast Air Basin which includes the Ventura County Air Pollution Control District. SNI is in attainment/unclassified of the NAAQS for all criteria pollutants, therefore, the provisions of the General Conformity Rule and de minimis thresholds do not apply to proposed activities conducted on SNI. Due to the lack of major emitting sources on SNI in conjunction with predominately strong winds from the northwest, the likelihood of pollutants remaining in the ambient air of the island is very low.

3. An emissions analysis for the installation of Fiber Optic Communications Undersea System (FOCUS) connecting NBVC Point Mugu and NBVC SNI is presented in the enclosure. De minimis thresholds do not apply to actions taken on SNI since the island and the offshore regions proposed for the FOCUS installation are considered in attainment/unclassified for the NAAQS. However, emission estimates for the proposed action events at both sites have been compared to de minimis thresholds of a basic nonattainment area for planning purposes. De minimis thresholds for criteria pollutants would not be exceeded as a result of implementation of the Proposed Action and a formal Conformity Determination is not considered necessary.

4. The information presented in this Record of Non Applicability is correct and accurate, and I concur in the finding that implementation of the Proposed Action does not require a formal CAA Conformity Determination.

DWIGHT A. DEAKIN

FIBER OPTICS COMMUNICATIONS UNDERSEA SYSTEM REPLACEMENT EMISSIONS ANALYSIS FOR CLEAN AIR ACT CONFORMITY APPLICABILITY

INTRODUCTION

The U.S. Environmental Protection Agency (USEPA) published *Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule*, in the Federal Register on 30 November 1993 (40 CFR Parts 6, 51, and 93). USEPA published *Revisions to the General Conformity Regulations; Final Rule*, in the Federal Register on 5 April 2010 (40 CFR Parts 51 and 93). The U.S. Navy published Navy Guidance for Compliance with the Clean Air Act General Conformity Rule, dated 30 July 2013. These publications provide implementing guidance to document Clean Air Act Conformity Determination requirements. Regulations within the General Conformity Rule state that no department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license to permit, or approve any activity that does not conform to an applicable implementation plan. It is the responsibility of the federal agency to determine whether a federal action conforms to the applicable implementation plan, before the action is taken (40 CFR Part 1 51.850[a]).

The General Conformity Rule applies to federal actions proposed within areas which are designated as either non-attainment or maintenance areas for a NAAQS for any of the criteria pollutants. Former non-attainment areas that have attained a NAAQS are designated as maintenance areas. Emissions of pollutants for which an area is in attainment are exempt from conformity analyses.

Activities associated with the Proposed Action would be conducted at Naval Base Ventura County (NBVC) Point Mugu and NBVC San Nicolas Island (SNI), both in Ventura County, and on Santa Cruz Island (SCrI) in Santa Barbara County. Effective 19 June 2008, Ventura County has been reclassified as a "serious" nonattainment area for the federal 8-hour O_3 standard (*de minimis* thresholds are 50 tons/year for VOCs and NO_X) and is in attainment of all other criteria pollutants. Ventura County is classified as a nonattainment area for the state O_3, $PM_{2.5}$, and PM_{10} standard.

Although NBVC SNI is part of Ventura County, the USEPA has determined that SNI is separate and distinct from the South Central Coast Air Basin (SCCAB) which includes the Ventura County Air Pollution Control District (VCAPCD). SNI is in attainment/unclassified of the NAAQS for all criteria pollutants therefore, the provisions of the General Conformity Rule and *de minimis* thresholds do not apply to proposed activities conducted on SNI. Due to the lack of major emitting sources on SNI in conjunction with predominantly strong winds from the northwest, the likelihood of pollutants remaining in the ambient air of the island is very low.

SCrI is located within Santa Barbara County, which is part of the SCCAB. Santa Barbara County is in attainment or unclassifiable/attainment status of the NAAQS for all criteria pollutants. As such, the provisions of the General Conformity Rule and *de minimis* thresholds do not apply to proposed activities conducted at SCrI.

An emissions analysis for the installation of a replacement FOCUS is provided below. Emissions estimates for the Proposed Action have been compared to *de minimis* thresholds of a nonattainment area. *de minimis* thresholds for criteria pollutants would not be exceeded as a result of implementation of the Proposed Action and a formal Conformity Determination is not considered necessary.

PROPOSED ACTION

Action Proponent: Naval Air Warfare Center Weapons Division (NAWCWD).

Location: The Point Mugu Sea Range, NBVC Point Mugu, NBVC SNI, and SCrI, California

Proposed Action Name: Directed Energy Test Site, San Nicolas Island

Proposed Action Summary: NAWCWD proposes to replace the existing FOCUS-I between NBVC Point Mugu and NBVC SNI and the microwave communications system link between NBVC Point Mugu and SCrI with a single new system. This new system, FOCUS-II, will connect NBVC Point Mugu, NBVC SNI, and SCrI via new undersea fiber optic cables. Onshore activities will include horizontal directional drilling from the onshore landing sites to offshore exit sites and installation of fiber optic cables in conduits. Offshore activities will include laying cable between offshore exit sites, connecting to onshore transition cables, and stabilization of the fiber optic cables on the seafloor.

Air Emissions Summary: Emission sources associated with the Proposed Action involve construction activities and operations. Annual emissions from all construction activities were calculated by assuming that all activities would occur within one 12-month period. Based on the air quality analysis for the Proposed Action, the maximum estimated emissions would be below conformity *de minimis* levels. Table 1 provides a summary of the air emissions associated with the proposed action for the onshore area at Point Mugu out to an offshore distance of 3 nautical miles (NM), which are subject to the General Conformity Rule. Since SNI, SCrI, and the offshore regions proposed for FOCUS-II installation are considered in attainment/unclassified for the NAAQS, the provisions of the General Conformity Rule do not apply. Tables 2 through 5 provide summaries of the emissions at SNI, SCrI, and within the offshore regions, which are not subject to the General Conformity Rule.

Affected Air Basin: South Central Coast Air Basin

Table 1 Point Mugu Sites Emissions (within 3 NM) – Proposed Action

Component	Pollutant (tons/year)					
	VOCs	CO	NO_X	SO_X	PM_{10}	CO_{2e}
Building 811 Site						
Site preparation	0.00223	0.00833	0.0163	0.00003	0.00104	3.02
Drilling operations	0.0559	0.182	0.347	0.00059	0.0197	51.4
Trenching/cable installation	0.00144	0.00945	0.00961	0.00002	0.00602	1.69
On-road vehicles	0.00335	0.0240	0.0179	0.00007	0.00102	7.14
Offshore cable installation	0.824	19.6	2.31	--	0.0165	223
Subtotal	**0.887**	**19.8**	**2.70**	**0.00071**	**0.0443**	**286**
Charlie Pad Site						
Site preparation	0.00891	0.0329	0.0652	0.00012	0.00372	12.0
Drilling operations	0.0559	0.182	0.347	0.00059	0.0197	51.4
Trenching/cable installation	0.00361	0.0236	0.0240	0.00004	0.00690	3.96
On-road vehicles	0.00335	0.0240	0.0179	0.00007	0.00102	7.14
Offshore cable installation	0.824	19.6	2.31	--	0.0165	223
Subtotal	**0.896**	**19.9**	**2.76**	**0.00082**	**0.0478**	**298**
Total for Point Mugu Operations	**1.78**	**39.7**	**5.46**	**0.0015**	**0.0921**	**584**
de minimis threshold	50 *	N/A	50 *	N/A	N/A	N/A
Exceeds *de minimis* threshold?	No	No	No	No	No	No

Note: * Effective June 19, 2008, Ventura County (excluding SNI) has been classified as a "serious" nonattainment area for the 8-hour federal O_3 standard; VOCs and NO_X are precursors to the formation of O_3.

Table 2 San Nicolas Island Emissions (within 3 NM) - Alternative 1

Component	Pollutant (tons/year)					
	VOCs	CO	NO_X	SO_X	PM_{10}	CO_{2e}
Site preparation	0.00297	0.0110	0.0217	0.00004	0.00138	4.02
Drilling operations	0.0559	0.182	0.347	0.00059	0.0197	51.4
Trenching/cable installation	0.00144	0.00945	0.00961	0.00002	0.00602	1.69
On-road vehicles	0.00112	0.00800	0.00597	0.00002	0.00034	2.38
Supply barge	0.00098	0.00583	0.0181	0.00090	0.00004	0.875
Offshore cable installation	1.01	23.9	2.83	--	0.0201	273
Total	**1.07**	**24.1**	**3.23**	**0.0016**	**0.0476**	**333**

Note: The General Conformity Rule is not applicable since SNI is in attainment/unclassified of the NAAQS for all criteria pollutants. Emissions are presented for planning purposes only.

Table 3 Santa Cruz Island Emissions (within 3 NM) - Alternative 1

Component	Pollutant (tons/year)					
	VOCs	CO	NO_X	SO_X	PM_{10}	CO_{2e}
Site preparation	0.0297	0.0110	0.0217	0.00004	0.00138	4.02
Drilling operations	0.105	0.457	0.956	0.00193	0.0346	106
Trenching/cable installation	0.0571	0.372	0.377	0.00068	0.116	59.2
On-road vehicles	0.00323	0.0279	0.00526	0.00006	3.77	6.11
Supply barge	0.00086	0.0109	0.0163	0.00190	0.00005	0.159
Offshore cable installation	1.01	23.9	2.83	--	0.0201	273
Total	**1.21**	**24.8**	**4.21**	**0.00461**	**3.94**	**448**

Note: The General Conformity Rule is not applicable since SCrI is in attainment/unclassified of the NAAQS for all criteria pollutants. Emissions are presented for planning purposes only.

Table 4 Alternative 1 Emissions (3 < x < 12 NM)

Component	Pollutant (tons/year)					
	VOCs	CO	NO_X	SO_X	PM_{10}	CO_{2e}
SNI supply barge	0.00294	0.0175	0.0544	0.00270	0.00012	0.262
SCrI supply barge	0.00203	0.0109	0.0380	0.00443	0.00011	0.371
Offshore cable installation	3.30	78.2	9.26	--	0.0658	893
Total	**3.30**	**78.2**	**9.35**	**0.0071**	**0.0660**	**894**

Note: *de minimis* thresholds do not apply to offshore (>3 nm) emissions.

Table 5 Alternative 1 Emissions (> 12 NM)

Component	Pollutant (tons/year)					
	VOCs	CO	NO_X	SO_X	PM_{10}	CO_{2e}
SNI supply barge	0.00587	0.0350	0.109	0.00540	0.00024	0.525
Offshore cable installation	5.49	130	15.4	--	0.110	1,490
Total	**5.50**	**130**	**15.5**	**0.0054**	**0.110**	**1,490**

Note: *de minimis* thresholds do not apply to offshore (>3 nm) emissions.

Emission Calculations – Proposed Action

Onshore Operations

Emission Factors – From SCAQMD Off-Road Mobile Source Emission Factors for Fleet Year 2017

Grading Equipment

	max hp	TOC	CO	NOX	SOX	PM10	CO2	CH4
Rubber tired dozer	500	2.66E-01	1.10E+00	2.09E+00	2.60E-03	8.49E-02	2.65E+02	2.40E-02
Grader	500	1.50E-01	5.34E-01	1.11E+00	2.30E-03	4.00E-02	2.29E+02	1.35E-02
Loader	500	1.51E-01	5.41E-01	1.13E+00	2.30E-03	4.05E-02	2.37E+02	1.37E-02
Dump Truck	500	1.75E-01	5.68E-01	1.10E+00	2.70E-03	3.97E-02	2.72E+02	1.58E-02

Drilling Equipment

	max hp	TOC	CO	NOX	SOX	PM10	CO2	CH4
HDD rig (small)	175	5.19E-02	7.54E-01	3.59E-01	1.60E-03	1.21E-02	1.41E+02	4.70E-03
HDD rig (large)	500	9.55E-02	5.51E-01	5.04E-01	3.10E-03	1.45E-02	3.11E+02	8.60E-03
Mud pump	120	7.60E-02	4.80E-01	5.72E-01	9.00E-04	4.00E-02	7.79E+01	6.90E-03
Generator	250	9.26E-02	3.99E-01	1.10E+00	2.40E-03	3.07E-02	2.13E+02	8.40E-03
Slurry plant	120	1.33E-01	4.48E-01	7.59E-01	7.00E-04	7.35E-02	6.07E+01	1.20E-02
Shale shaker	50	1.65E-01	4.11E-01	3.30E-01	4.00E-04	3.75E-02	3.03E+01	1.49E-02
Crane	250	8.30E-02	2.57E-01	6.83E-01	1.30E-03	2.35E-02	1.12E+02	7.50E-03

Trenching Equipment

	max hp	TOC	CO	NOX	SOX	PM10	CO2	CH4
Backhoe	120	7.60E-02	5.04E-01	4.84E-01	9.00E-04	3.40E-02	7.36E+01	6.90E-03
Ditch Witch	50	5.21E-02	2.57E-01	2.08E-01	3.00E-04	1.28E-02	2.50E+01	4.70E-03
Loader	175	9.54E-02	6.23E-01	6.57E-01	1.20E-03	3.62E-02	1.06E+02	8.60E-03
Grader	175	1.14E-01	7.30E-01	7.78E-01	1.40E-03	4.29E-02	1.24E+02	1.02E-02

EFs for On-Road Vehicles

Scenario Year: **2017**

All model years in the range 1973 to 2017

Passenger Vehicles (pounds/mile)	
CO	5.38E-03
NOx	5.13E-04
ROG	6.01E-04
SOx	1.08E-05
PM10	9.45E-05
PM2.5	6.19E-05
CO2	1.11E+00
CH4	5.30E-05

Delivery Trucks (pounds/mile)	
CO	9.98E-03
NOx	1.07E-02
ROG	1.50E-03
SOx	2.72E-05
PM10	4.31E-04
PM2.5	3.46E-04
CO2	2.84E+00
CH4	6.66E-05

Scenario Year: **2017**

All model years in the range 1973 to 2017

HHDT-DSL	
CO	6.51E-03
NOx	1.69E-02
ROG	1.45E-03
SOx	4.03E-05
PM10	8.49E-04
PM2.5	6.97E-04
CO2	4.21E+00
CH4	6.72E-05

HHDT-DSL, Exh	
PM10	7.09E-04
PM2.5	6.51E-04

Fugitive Dust assumed values

Soil % silt, s	8
Soil % moisture, M	2
Fraction of TSP, J	0.5
Mean vehicle speed, S	5
Dozer path width (ft)	10
Drop height (ft)	3

Grading = 0.0306 x S^2 in lb/hr

Dozing = 0.75 x s^1.5/M^1.4 in lb/VMT

Trenching = 0.75 x 0.0021 x d^0.7 x M^0.3

Grading	0.765	lb/hr	4	hr/acre	3.06	lb/acre
Dozing	6.43E+00	lb/VMT	0.83	VMT/acre	5.34	lb/acre
Trenching	4.18E-03	lb/ton			2.11	lb/day

Support vessel (assume rigid hull inflatable boat with 240 hp engine

		EF in lb/hp-hr		VOC	NOX	CO	PM	CO2	Class
RIB	260 hp	diesel	OB	7.78E-03	1.28E-02	2.65E-01	1.32E-05	1.85E+00	MO4D

EF in lb/hr

	VOC	NOX	CO	PM	CO2
RIB	1.01E+00	1.67E+00	3.45E+01	1.72E-03	2.40E+02

Barge shipments - assume barge uses tug boat with 2500 hp main engine and 150 hp auxiliary engine

EF (g/hp-hr)

Engine	Fuel	# active	VOC	CO	NOX	SOX	PM10	CO2
Main	D	1.00E+00	1.80E-01	1.17E+00	3.90E+00	5.00E-03	5.00E-03	1.79E+00
Aux	D	2.00E+00	3.60E-01	1.33E+00	3.90E+00	5.00E-03	5.00E-03	1.79E+00

Source: EPA Nonroad Engine Guidelines

EF (lb/hr)

Engine	# active	VOC	CO	NOX	SOX	PM10	CO2
Main	1	3.97E-01	2.58E+00	8.60E+00	2.00E-01	1.11E-02	9.88E+00
Aux	2	1.19E-01	4.40E-01	1.29E+00	3.00E-01	1.67E-03	1.23E+00

Forklift to unload barge

EF (lb/hr)

hp	TOC	CO	NOX	SOX	PM10	CO2	CH4
175	4.25E-02	3.32E-01	2.69E-01	6.00E-04	1.46E-02	5.61E+01	3.80E-03

As defined in AP-42, 13.2.2 Unpaved Roads

Fugitive dust EF (lb/VMT) = [k(s/12)^a * (S/30)d]/(M/0.5)^0.2

k = 1.8, s=8, S=20mph, d=0.5, M=2, c=0.2

EF = 0.743 lb/VMT

Landing craft assume 2 diesel engines (470 hp each)

EF (lb/hr)

Engine	# active	VOC	CO	NOX	SOX	PM10	CO2
DD	2	1.38E-02	3.88E-02	3.28E-01	1.08E-01	2.75E-04	3.71E+00

Building 811 Site – Onshore Emissions

Site Preparation (grading & bulldozing)

Grading Equipment	days	hr/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4	FD (PM)
Rubber tired dozer	1	6	1.60E+00	6.58E+00	1.25E+01	1.56E-02	5.09E-01	1.59E+03	1.44E-01	5.34E-01
Grader	1	6	8.98E-01	3.21E+00	6.68E+00	1.38E-02	2.40E-01	1.37E+03	8.10E-02	3.06E-01
Loader	1	6	9.08E-01	3.25E+00	6.77E+00	1.38E-02	2.43E-01	1.42E+03	8.22E-02	
Dump Truck	1	6	1.05E+00	3.41E+00	6.62E+00	1.62E-02	2.38E-01	1.63E+03	9.48E-02	
	Total	lb	4.45E+00	1.64E+01	3.26E+01	5.94E-02	2.07E+00	6.02E+03	4.02E-01	8.40E-01
	Total	ton	2.23E-03	8.22E-03	1.63E-02	2.97E-05	1.04E-03	3.02E+00	2.01E-04	

FD = fugitive dust

Drilling ops

Drilling Equipment	days	hr/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4
HDD rig (small)									
HDD rig (large)	30	8	2.29E+01	1.32E+02	1.21E+02	7.44E-01	3.48E+00	7.46E+04	2.06E+00
Mud pump	30	8	1.82E+01	1.15E+02	1.37E+02	2.16E-01	9.60E+00	1.87E+04	1.66E+00
Generator	30	10	2.78E+01	1.20E+02	3.30E+02	7.20E-01	9.21E+00	6.39E+04	2.52E+00
Slurry plant	30	8	3.20E+01	1.07E+02	1.82E+02	1.68E-01	1.76E+01	1.46E+04	2.88E+00
Shale shaker	30	8	3.96E+01	9.86E+01	7.92E+01	9.60E-02	9.00E+00	7.27E+03	3.58E+00
Crane	30	5	1.25E+01	3.86E+01	1.02E+02	1.95E-01	3.53E+00	1.68E+04	1.13E+00
Support vessel	5	4	2.02E+01	3.34E+01	6.90E+02		3.44E-02	4.80E+03	
	Total	lb	1.12E+02	3.64E+02	6.94E+02	1.18E+00	3.94E+01	1.03E+05	1.01E+01
	Total	ton	5.59E-02	1.82E-01	3.47E-01	5.90E-04	1.97E-02	5.14E+01	5.05E-03

Trenching/cable installation

Trenching Equipment	days	hr/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4	FD (PM)
Backhoe	2	8	1.22E+00	8.07E+00	7.74E+00	1.44E-02	5.44E-01	1.18E+03	1.10E-01	1.06E+01
Ditch Witch										
Loader	2	4	7.63E-01	4.99E+00	5.26E+00	9.60E-03	2.90E-01	8.48E+02	6.88E-02	1.53E-01
Grader	2	4	9.08E-01	5.84E+00	6.22E+00	1.12E-02	3.43E-01	9.92E+02	8.16E-02	1.53E-01
	Total	lb	2.89E+00	1.89E+01	1.92E+01	3.52E-02	1.20E+01	3.02E+03	2.61E-01	1.09E+01
	Total	ton	1.44E-03	9.45E-03	9.61E-03	1.76E-05	6.02E-03	1.69E+00	1.30E-04	5.43E-03

On-road vehicles

Vehicle	# vehicles	days	miles/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4
Passenger vehicles	5	35	30	3.16E+00	2.82E+01	2.69E+00	5.67E-02	4.96E-01	5.81E+03	2.78E-01
Delivery vehicle	4	10	30	1.80E+00	1.20E+01	1.28E+01	3.27E-02	5.18E-01	3.41E+03	8.00E-02
Semi-trucks	10	4	30	1.74E+00	7.81E+00	2.03E+01	4.84E-02	1.02E+00	5.05E+03	8.07E-02
		Total	lb	6.70E+00	4.80E+01	3.58E+01	1.38E-01	2.03E+00	1.43E+04	4.39E-01
		Total	ton	3.35E-03	2.40E-02	1.79E-02	6.89E-05	1.02E-03	7.14E+00	2.19E-04

Charlie Pad Site – Onshore Emissions

Site Preparation (grading & bulldozing)

Grading Equipment	days	hr/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4	FD (PM)
Rubber tired dozer	3	8	6.38E+00	2.63E+01	5.01E+01	6.24E-02	2.04E+00	6.36E+03	5.76E-01	1.60E+00
Grader	3	8	3.59E+00	1.28E+01	2.67E+01	5.52E-02	9.60E-01	5.50E+03	3.24E-01	9.18E-01
Loader	3	8	3.63E+00	1.30E+01	2.71E+01	5.52E-02	9.72E-01	5.69E+03	3.29E-01	
Dump Truck	3	8	4.21E+00	1.36E+01	2.65E+01	6.48E-02	9.53E-01	6.53E+03	3.79E-01	
	Total	lb	1.78E+01	6.58E+01	1.30E+02	2.38E-01	4.92E+00	2.41E+04	1.61E+00	2.52E+00
	Total	ton	8.91E-03	3.29E-02	6.52E-02	1.19E-04	3.72E-03	1.21E+01	8.04E-04	1.26E-03

Drilling ops

Drilling Equipment	days	hr/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4
HDD rig (small)									
HDD rig (large)	30	8	2.29E+01	1.32E+02	1.21E+02	7.44E-01	3.48E+00	7.46E+04	2.06E+00
Mud pump	30	8	1.82E+01	1.15E+02	1.37E+02	2.16E-01	9.60E+00	1.87E+04	1.66E+00
Generator	30	10	2.78E+01	1.20E+02	3.30E+02	7.20E-01	9.21E+00	6.39E+04	2.52E+00
Slurry plant	30	8	3.20E+01	1.07E+02	1.82E+02	1.68E-01	1.76E+01	1.46E+04	2.88E+00
Shale shaker	30	8	3.96E+01	9.86E+01	7.92E+01	9.60E-02	9.00E+00	7.27E+03	3.58E+00
Crane	30	5	1.25E+01	3.86E+01	1.02E+02	1.95E-01	3.53E+00	1.68E+04	1.13E+00
Support vessel	5	4	2.02E+01	3.34E+01	6.90E+02		3.44E-02	4.80E+03	
	Total	lb	1.12E+02	3.64E+02	6.94E+02	1.18E+00	3.94E+01	1.03E+05	1.01E+01
	Total	ton	5.59E-02	1.82E-01	3.47E-01	5.90E-04	1.97E-02	5.14E+01	5.05E-03

Trenching/cable installation

Trenching Equipment	days	hr/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4	FD (PM)
Backhoe	5	8	3.04E+00	2.02E+01	1.94E+01	3.60E-02	1.36E+00	2.94E+03	2.76E-01	1.06E+01
Loader	5	4	1.91E+00	1.25E+01	1.31E+01	2.40E-02	7.24E-01	2.12E+03	1.72E-01	1.53E-01
Grader	5	4	2.27E+00	1.46E+01	1.56E+01	2.80E-02	8.58E-01	2.48E+03	2.04E-01	1.53E-01
	Total	lb	7.22E+00	4.72E+01	4.81E+01	8.80E-02	1.38E+01	7.54E+03	6.52E-01	1.09E+01
	Total	ton	3.61E-03	2.36E-02	2.40E-02	4.40E-05	6.90E-03	3.77E+00	1.85E-01	5.43E-03

On-road vehicles

Vehicle	# vehicles	days	miles/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4
Passenger vehicles	5	35	30	3.16E+00	2.82E+01	2.69E+00	5.67E-02	4.96E-01	5.81E+03	2.78E-01
Delivery vehicle	4	10	30	1.80E+00	1.20E+01	1.28E+01	3.27E-02	5.18E-01	3.41E+03	8.00E-02
Semi-trucks	10	4	30	1.74E+00	7.81E+00	2.03E+01	4.84E-02	1.02E+00	5.05E+03	8.07E-02
		Total	lb	6.70E+00	4.80E+01	3.58E+01	1.38E-01	2.03E+00	1.43E+04	4.39E-01
		Total	ton	3.35E-03	2.40E-02	1.79E-02	6.89E-05	1.02E-03	7.14E+00	2.19E-04

San Nicolas Island Emissions

Site Preparation (grading & bulldozing)

Grading Equipment	days	hr/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4	FD (PM)
Rubber tired dozer	1	8	2.13E+00	8.78E+00	1.67E+01	2.08E-02	6.79E-01	2.12E+03	1.92E-01	7.10E-01
Grader	1	8	1.20E+00	4.28E+00	8.91E+00	1.84E-02	3.20E-01	1.83E+03	1.08E-01	4.07E-01
Loader	1	8	1.21E+00	4.33E+00	9.03E+00	1.84E-02	3.24E-01	1.90E+03	1.10E-01	
Dump Truck	1	8	1.40E+00	4.54E+00	8.83E+00	2.16E-02	3.18E-01	2.18E+03	1.26E-01	
	Total	lb	5.94E+00	2.19E+01	4.35E+01	7.92E-02	1.64E+00	8.02E+03	5.36E-01	1.12E+00
	Total	ton	2.97E-03	1.10E-02	2.17E-02	3.96E-05	1.38E-03	4.02E+00	2.68E-04	5.59E-04

Drilling ops

Drilling Equipment	days	hr/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4
HDD rig (small)									
HDD rig (large)	30	8	2.29E+01	1.32E+02	1.21E+02	7.44E-01	3.48E+00	7.46E+04	2.06E+00
Mud pump	30	8	1.82E+01	1.15E+02	1.37E+02	2.16E-01	9.60E+00	1.87E+04	1.66E+00
Generator	30	10	2.78E+01	1.20E+02	3.30E+02	7.20E-01	9.21E+00	6.39E+04	2.52E+00
Slurry plant	30	8	3.20E+01	1.07E+02	1.82E+02	1.68E-01	1.76E+01	1.46E+04	2.88E+00
Shale shaker	30	8	3.96E+01	9.86E+01	7.92E+01	9.60E-02	9.00E+00	7.27E+03	3.58E+00
Crane	30	5	1.25E+01	3.86E+01	1.02E+02	1.95E-01	3.53E+00	1.68E+04	1.13E+00
Support vessel	5	4	2.02E+01	3.34E+01	6.90E+02		3.44E-02	4.80E+03	
	Total	lb	1.12E+02	3.64E+02	6.94E+02	1.18E+00	3.94E+01	1.03E+05	1.01E+01
	Total	ton	5.59E-02	1.82E-01	3.47E-01	5.90E-04	1.97E-02	5.14E+01	5.05E-03

Trenching/cable installation

Trenching Equipment	days	hr/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4	FD (PM)
Backhoe	5	8	3.04E+00	2.02E+01	1.94E+01	3.60E-02	1.36E+00	2.94E+03	2.76E-01	1.06E+01
Ditch Witch										
Loader	5	4	1.91E+00	1.25E+01	1.31E+01	2.40E-02	7.24E-01	2.12E+03	1.72E-01	2.03E-01
Grader	5	4	2.27E+00	1.46E+01	1.56E+01	2.80E-02	8.58E-01	2.48E+03	2.04E-01	1.53E-01
	Total	lb	7.22E+00	4.72E+01	4.81E+01	8.80E-02	1.38E+01	7.54E+03	6.52E-01	1.09E+01
	Total	ton	3.61E-03	2.36E-02	2.40E-02	4.40E-05	6.92E-03	3.78E+00	3.26E-04	5.45E-03

On-road vehicles

Vehicle	# vehicles	days	miles/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4
Passenger vehicles	5	35	10	1.05E+00	9.41E+00	8.98E-01	1.89E-02	1.65E-01	1.94E+03	9.28E-02
Delivery vehicle	4	10	10	6.01E-01	3.99E+00	4.28E+00	1.09E-02	1.73E-01	1.14E+03	2.67E-02
Semi-trucks	10	4	10	5.81E-01	2.60E+00	6.76E+00	1.61E-02	3.40E-01	1.68E+03	2.69E-02
		Total	lb	2.23E+00	1.60E+01	1.19E+01	4.59E-02	6.77E-01	4.76E+03	1.46E-01
		Total	ton	1.12E-03	8.00E-03	5.97E-03	2.30E-05	3.39E-04	2.38E+00	7.31E-05

Barge shipments and loading/unloading

	hr	TOC	CO	NOX	SOX	PM10	CO2	CH4
Barge main engine	36	1.43E+01	9.28E+01	3.10E+02	7.20E+00	4.00E-01	3.56E+02	0.00E+00
Barge aux engine	36	4.28E+00	1.58E+01	4.64E+01	1.08E+01	6.00E-02	4.44E+01	0.00E+00
Forklift	24	1.02E+00	7.97E+00	6.44E+00	1.44E-02	3.50E-01	1.35E+03	9.12E-02
Total	lb	1.96E+01	1.17E+02	3.62E+02	1.80E+01	8.10E-01	1.75E+03	9.12E-02
Total	ton	9.79E-03	5.83E-02	1.81E-01	9.01E-03	4.05E-04	8.75E-01	4.56E-05

Santa Cruz Island Emissions

Site Preparation (grading & bulldozing)

Grading Equipment	days	hr/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4	FD (PM)
Rubber tired dozer	1	8	2.13E+00	8.78E+00	1.67E+01	2.08E-02	6.79E-01	2.12E+03	1.92E-01	7.10E-01
Grader	1	8	1.20E+00	4.28E+00	8.91E+00	1.84E-02	3.20E-01	1.83E+03	1.08E-01	4.07E-01
Loader	1	8	1.21E+00	4.33E+00	9.03E+00	1.84E-02	3.24E-01	1.90E+03	1.10E-01	
Dump Truck	1	8	1.40E+00	4.54E+00	8.83E+00	2.16E-02	3.18E-01	2.18E+03	1.26E-01	
	Total	lb	5.94E+00	2.19E+01	4.35E+01	7.92E-02	1.64E+00	8.02E+03	5.36E-01	1.12E+00
	Total	ton	2.97E-03	1.10E-02	2.17E-02	3.96E-05	1.38E-03	4.02E+00	2.68E-04	5.59E-04

Drilling ops

Drilling Equipment	days	hr/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4
HDD rig (small)	40	8	1.66E+01	2.41E+02	1.15E+02	5.12E-01	3.87E+00	4.51E+04	1.50E+00
HDD rig (large)									
Mud pump	40	8	2.43E+01	1.54E+02	1.83E+02	2.88E-01	1.28E+01	2.49E+04	2.21E+00
Generator	40	10	3.70E+01	1.60E+02	4.40E+02	9.60E-01	1.23E+01	8.52E+04	3.36E+00
Slurry plant	40	8	4.26E+01	1.43E+02	2.43E+02	2.24E-01	2.35E+01	1.94E+04	3.84E+00
Shale shaker	40	8	5.27E+01	1.32E+02	1.06E+02	1.28E-01	1.20E+01	9.70E+03	4.77E+00
Crane	40	5	1.66E+01	5.14E+01	1.37E+02	2.60E-01	4.70E+00	2.24E+04	1.50E+00
Support vessel	5	4	2.02E+01	3.34E+01	6.90E+02		3.44E-02	4.80E+03	
	Total	lb	2.10E+02	9.14E+02	1.91E+03	2.37E+00	6.92E+01	2.12E+05	1.72E+01
	Total	ton	1.05E-01	4.57E-01	9.56E-01	1.19E-03	3.46E-02	1.06E+02	8.59E-03

Trenching/cable installation

Trenching Equipment	days	hr/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4	FD (PM)
Backhoe	85	8	4.89E+01	3.25E+02	3.12E+02	5.80E-01	2.19E+01	4.74E+04	4.44E+00	1.70E+02
Ditch Witch	5	8	1.97E+00	9.73E+00	7.89E+00	1.14E-02	4.85E-01	9.47E+02	1.78E-01	1.00E+01
Loader	80	4	2.89E+01	1.89E+02	1.99E+02	3.64E-01	1.10E+01	3.21E+04	2.61E+00	3.08E+00
Grader	80	4	3.44E+01	2.21E+02	2.36E+02	4.24E-01	1.30E+01	3.76E+04	3.09E+00	2.32E+00
	Total	lb	1.14E+02	7.45E+02	7.54E+02	1.38E+00	4.63E+01	1.18E+05	1.03E+01	1.85E+02
	Total	ton	5.71E-02	3.72E-01	3.77E-01	6.89E-04	1.16E-01	5.92E+01	5.16E-03	9.26E-02

On-road vehicles

Vehicle	# vehicles	days	miles/ day	TOC	CO	NOX	SOX	PM10	CO2	CH4
Passenger vehicles	5	130	15	5.86E+00	5.24E+01	5.00E+00	1.05E-01	9.21E-01	1.08E+04	5.17E-01
Delivery vehicle	4	10	5	3.00E-01	2.00E+00	2.14E+00	5.45E-03	8.63E-02	5.68E+02	1.33E-02
Semi-trucks	10	4	5	2.90E-01	1.30E+00	3.38E+00	8.07E-03	1.70E-01	8.42E+02	1.34E-02
		Total	lb	6.45E+00	5.57E+01	1.05E+01	1.19E-01	1.18E+00	1.22E+04	5.44E-01
		Total	ton	3.23E-03	2.79E-02	5.26E-03	5.94E-05	3.77E+00	6.11E+00	2.72E-04

Fugitive dust unpaved rds.

VMT	lb/VMT	lb	ton
10150	0.743	7541.45	3.770725

Barge shipments and loading/unloading Assumes 1 large barge RT delivery + 10 landing craft RT deliveries

	hr	TOC	CO	NOX	SOX	PM10	CO2	CH4
Barge main engine	8	3.17E+00	2.06E+01	6.88E+01	1.60E+00	8.89E-02	7.90E+01	
Barge aux engine	8	9.50E-01	3.52E+00	1.03E+01	2.40E+00	1.33E-02	9.88E+00	
Landing Craft	80	1.11E+00	3.10E+00	2.63E+01	8.64E+00	2.20E-02	2.97E+02	
Forklift	12	5.10E-01	3.99E+00	3.22E+00	7.20E-03	1.75E-01	6.73E+02	
Total	lb	5.74E+00	3.12E+01	1.09E+02	1.26E+01	2.99E-01	1.06E+03	0.00E+00
Total	ton	2.87E-03	1.56E-02	5.43E-02	6.32E-03	1.50E-04	5.29E-01	0.00E+00

Offshore Emissions

Offshore Barge - SNI

	TOC	CO	NOX	SOX	PM10	CO2
<3 nm	9.79E-04	5.83E-03	1.81E-02	9.01E-04	4.05E-05	8.75E-02
3< x < 12	2.94E-03	1.75E-02	5.44E-02	2.70E-03	1.22E-04	2.62E-01
>12 nm	5.87E-03	3.50E-02	1.09E-01	5.40E-03	2.43E-04	5.25E-01

Barge - Offshore SCrI

	TOC	CO	NOX	SOX	PM10	CO2
<3 nm	8.61E-04	4.69E-03	1.63E-02	1.90E-03	4.49E-05	1.59E-01
3< x < 12	2.01E-03	1.09E-02	3.80E-02	4.43E-03	1.05E-04	3.71E-01

Emission Factors (lb/hp-hr)

IN/OB	VOC	NOX	CO	PM	CO2	Class
IN	6.66E-03	1.87E-02	1.58E-01	1.32E-04	1.79E+00	MS4D

Vessel engines:

5x 2,668 hp KRGB-9 Bergen engines (main engines)
2x 2,280 hp Ulstine thrusters (forward and bow)
2x 4,157 azimuth thrusters

Daily operations (assume 16 hours per day)

Engine	% power	hrs/day	VOC	NOX	CO	PM	CO2
main	66	24	2.81E+02	7.90E+02	6.68E+03	5.63E+00	7.64E+04
f/b thrust	33	6	3.01E+01	8.44E+01	7.13E+02	5.96E-01	8.08E+03
azi thrust	33	6	5.48E+01	1.54E+02	1.30E+03	1.09E+00	1.47E+04
		total	3.66E+02	1.03E+03	8.69E+03	7.31E+00	9.92E+04

PM (<3 nm)

9 days	VOC	NOX	CO	PM	CO2
lb	1.65E+03	4.63E+03	3.91E+04	3.29E+01	4.46E+05
ton	8.24E-01	2.31E+00	1.96E+01	1.65E-02	2.23E+02

SCrI & SNI (<3 nm)

5.5 days	VOC	NOX	CO	PM	CO2
lb	2.01E+03	5.66E+03	4.78E+04	4.02E+01	5.45E+05
ton	1.01E+00	2.83E+00	2.39E+01	2.01E-02	2.73E+02

Takes an extra day due to branching

(3 < x < 12 nm)

18 days	VOC	NOX	CO	PM	CO2
lb	6.59E+03	1.85E+04	1.56E+05	1.32E+02	1.79E+06
ton	3.30E+00	9.26E+00	7.82E+01	6.58E-02	8.93E+02

(>12 nm)

30 days	VOC	NOX	CO	PM	CO2
lb	1.10E+04	3.09E+04	2.61E+05	2.19E+02	2.98E+06
ton	5.49E+00	1.54E+01	1.30E+02	1.10E-01	1.49E+03

Appendix C: Agency Communications

Appendix C.1: EFH Consultation

DEPARTMENT OF THE NAVY
NAVAL BASE VENTURA COUNTY
311 MAIN ROAD, SUITE 1
POINT MUGU, CA 93042-5033

IN REPLY REFER TO:
5090
Ser N0000CV/0271
March 29, 2016

National Marine Fisheries Service
Attn: Mr. Chris Yates
Assistant Regional Administrator
Protected Resources Division
501 W. Ocean Blvd., Suite 4200
Long Beach, CA 90802-4213

Dear Mr. Yates:

SUBJECT: ESSENTIAL FISH HABITAT (EFH) CONSULTATION FOR FIBER OPTIC COMMUNICATIONS UNDERWATER SYSTEM (FOCUS) REPLACEMENT ON POINT MUGU SEA RANGE

The United States (U.S.) Navy is initiating this Essential Fish Habitat (EFH) consultation per the requirements of the Magnuson-Stevens Fishery Conservation and Management Act as authorized under 50 CFR Section 600.920(e)(3). Pursuant to the Navy's review of impacts enclosure (1), the Navy has concluded that while the proposed action may adversely affect EFH, any effect would be minor due to the limited area impacted, temporary nature of impacts and other factors. The Navy is preparing an Environmental Assessment/Overseas Environmental Assessment (EA/OEA) for the proposed action, and this EA/OEA will serve as the Navy's record of determination. A copy of the Draft EA/OEA is attached as enclosure (2).

The Navy proposes to replace the existing Fiber Optic Communications Underwater System-I (FOCUS-I) between Naval Base Ventura County (NBVC) Point Mugu and NBVC San Nicolas Island (SNI) and the microwave communications system link between NBVC Point Mugu and Santa Cruz Island (SCrI) with a single new system. This new FOCUS (FOCUS-II) will connect NBVC Point Mugu, NBVC SNI, and SCrI via new undersea fiber optic cables.

This letter and the EA/OEA provide a list of the fishery management plans (FMPs) that apply to the project area, a map of the project area, and an evaluation of the proposed action impacts on EFH. This evaluation describes the proposed action and reviews relevant biological information on EFH species and habitats affected by the proposed action and potential impacts to those species from construction and subsequent operations. Detailed information on existing EFH species and potential impacts from the proposed action are provided in enclosure (1).

The Navy has determined that the project may have an adverse effect on EFH species due to unavoidable impacts to the seafloor. These effects, however, would be minor due to the limited area impacted, temporary nature of impacts and other factors. Based on the location of the proposed FOCUS II cables and installation methods, the Navy has determined that there will be no adverse effect on shallow sensitive habitats, such as eelgrass and kelp. The project as a whole, however, will cross through EFH including portions of the Cowcod Conservation Areas and would have unavoidable adverse effects on small areas of EFH. Based on the nature of the project, its technical requirements, and impact avoidance measures, these effects would be

limited in scope and severity. Detailed information on existing biological resources and potential impacts from the proposed action are provided in enclosure (1).

The Navy requests your concurrence on this proposed project. Should you have any questions or need further information, please contact Mr. John Ugoretz at john.ugoretz@navy.mil or (805) 989-4852.

Sincerely,

C. D. JANKE
Captain, U.S. Navy
Commanding Officer

Enclosures: 1. FOCUS Replacement EFH Consultation
2. Draft Environmental Assessment/Overseas Environmental Assessment Fiber Optic Communications Underwater System (FOCUS) Replacement NAVAIR Sea Range, Point Mugu, California

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

July 11, 2016

In response, refer to:
WCR-2016-4927

C. D. Janke
U.S. Department of the Navy
Captain
Commanding Officer
Naval Base Ventura County
311 Main Road, Suite 1
Point Mugu, California 93042-5033

Re: Essential fish habitat consultation response letter for the Fiber Optic Communications Underwater System Replacement on Point Mugu Sea Range

Dear Mr. Janke:

On April 5, 2016, NOAA's National Marine Fisheries Service (NMFS) received your letter requesting to initiate essential fish habitat (EFH) consultation per the Magnuson-Stevens Fishery Conservation and Management Act (MSA) for the U.S. Navy's (Navy) Fiber Optic Communications Underwater System (FOCUS) Replacement on Point Mugu Sea Range (proposed project). In addition to the letter requesting consultation, we received the EFH Assessment and Draft Environmental Assessment/Overseas Environmental Assessment (EA/OEA) for the proposed project, as well as supplemental information provided by the Navy via email on June 20, 2016, to inform our consultation process. This response to your request was prepared by NMFS pursuant to section 305(b)(4)(A) of the MSA and the Fish and Wildlife Coordination Act (FWCA). Because the proposed project occurs in areas where species listed under the Endangered Species Act (ESA) or marine mammals may be found, we also provide general comments pursuant to our authorities under the ESA and Marine Mammal Protection Act (MMPA).

Proposed Action

The Navy is proposing to replace the existing FOCUS I between Naval Base Ventura County (NBVC) Point Mugu and NBVC San Nicolas Island and the microwave communications system link between NBVC Point Mugu and Santa Cruz Island with a single new system, FOCUS II. The FOCUS II would be comprised of four interlinked undersea fiber optic cables connecting NBVC Point Mugu and NBVC San Nicolas Island, San Nicolas Island and Santa Cruz Island, Santa Cruz Island and Point Mugu. This configuration would provide redundant connections between the three sites in case any one of the links was disabled. Installation of FOCUS II would include the following actions:

Onshore Actions

- Installation of new seashore interface landings at each of the three sites, utilizing horizontal directional drilling (HDD) technology.
- Use of existing underground infrastructure and installation of new buried cable at Point Mugu, connecting the nearshore HDD site to the building termination site.
- Installation of approximately 500 feet [ft, 152 meters (m)] of new buried cable at San Nicolas Island connecting the nearshore HDD site to an existing concrete bunker. From the bunker, existing underground infrastructure will be used that connects to the building termination site.
- Installation of approximately 7 miles (mi, 11 kilometers [km]) of new buried cable connecting the nearshore HDD site to the building termination site.
- Installation of approximately 7 mi (11 km) of new buried water line in the same trench as the cable.

Offshore Actions

- HDD bore holes exiting the seafloor at depths of approximately 80-85 ft (24-26 m) in each of the three drill locations.
- Installation of four new underwater cable alignments (approximately 234 nautical miles [433 km]), creating the interlinked communications system between Point Mugu, Santa Cruz Island, and San Nicolas Island.
- Periodic maintenance and inspection of the onshore and offshore cable alignments, including underwater surveys and lifting of portions of exposed or damaged cable, to ensure uninterrupted operation of FOCUS II communications system.

HDD operations would create an eight-inch bore hole extending from the shoreline to 2,000 ft offshore, and steel piping would be placed into the borehole. Once the HDD bore hole was completed, the new cable would be run from the bore hole exit point back to the new onshore landing site. The cable diameter decreases from 1.41 inches at the splice joint near the bore hole exit to less than 0.88 inches in deep water. Drilling mud, comprised of a mixture of water and bentonite clay, would be injected into the drill pipe, and would then return back through the HDD bore hole. The drilling mud would then be pumped into a recycling system to filter drill cuttings (i.e., small, broken pieces of material from the formation removed from the borehole) from the mixture before re-injecting the bentonite and water back into the HDD bore hole. Because the freshwater supply on Santa Cruz Island is limited, a temporary water intake structure would be used to generate enough seawater to support the drilling operations there. The temporary intake would be screened and employ a velocity cap that produces horizontal intake/discharge currents such that velocities across the intake screen will not exceed 0.5 ft per second.

Upon completion of drilling operations, there would be an unavoidable release of up to 442 gallons of drilling fluid due to pressure discharge and seepage through seabed fractures when the drill bit penetrates the exit point. In the unlikely event of a mechanical failure of the drill pipe at or near the lowest point in its trajectory and when the drilling was near completion (i.e., worst-case scenario), up to 7,443 gallons of drilling mud could be released into the surrounding formation. This volume would include approximately 27 ft^3 (less than 1 m^3) of cuttings. However, every reasonable effort, including implementation of a project-specific spill prevention plan, would be made to minimize the unavoidable discharge of drilling fluid.

In addition to the release of drilling mud at the exit point, a "frac-out" could result in drilling fluid migrating to the ocean floor through fissures in the geologic formation. However, loss of circulation due to frac-outs can be reduced or eliminated through implementation of proper HDD controls and procedures, such as HDD Installation Monitoring. By monitoring the mud system, HDD personnel can determine the correct properties and pressures needed for different formations to reduce or eliminate frac-outs. Prior to commencement of drilling operations, the construction contractor will also develop a bentonite spill prevention plan (or Frac-out Plan) to establish the monitoring and response criteria that will minimize the release of drilling materials during the HDD process.

Offshore cable installation on the seafloor would include a pre-lay grapnel run to clear debris on the seabed, and the laying of cables on the seafloor using a towed seaplow in between HDD exit sites. In all three locations, the HDD exit sites will be in soft sediments, at an approximate depth of 85 ft, and a minimum of 300 ft (91 m) distance from known kelp and seagrasses. The pre-lay grapnel run would consist of dragging grapnel hooks, starting at the HDD exit sites, along the entire length of the buried cable route to remove debris on the seabed (e.g., fishing equipment). After the route has been cleared, the fiber optic cables would be laid on primarily sandy bottom with the uncommon occurrence of rock outcroppings. Over sandy bottom, the seaplow will be used to bury the cable approximately 1 m below the sediment surface to an ocean depth of approximately 1,000 ft (300 m). Deeper than that, the cable will be laid on the seafloor where, based on evidence from previous fiber optic cable projects, it will be expected to self-bury over time. The length of time for cables to self-bury is highly variable and depends on the density of the substrate, water movement, water depth, cable weight, and other factors. For instance, a study performed 8 years after cable installation for the Acoustic Thermometry of Ocean Climate/Pioneer Seamount (ATOC) project demonstrated that the cable was nearly completely buried in shallow waters (91% burial +/- 16%) and partially buried in deeper soft sediments (61% burial +/- 19%). The deepest portions of ATOC are on hard substrate and not expected to self-bury (Kogan et al. 2006). A post-lay inspection will also be performed using a remotely operated vehicle to identify and bury any cable that was not buried with the seaplow (at depths shallower than 300 m).

Hydrographic surveys will be performed to map the ocean floor and identify a final cable path. The cable path will be selected to specifically avoid areas of rock, particularly high-relief rock (i.e., greater than 1 m), as well as steep gradients including pinnacles, sea mounts, or submarine canyons, all of which could create unnecessary cable strain or wear and tear. Despite these efforts, the cable may be placed over small, undetected, or otherwise unavoidable rocky outcroppings. Over time, the cable would likely become encrusted by fouling organisms, similar to those found on the adjacent rocky substrate.

Hydrographic surveys will achieve the following minimum spatial resolution:

- Water Depth: 0 to 40 m Spatial Resolution: 1 to 2 m (Typically set to 2 m)
- Water Depth: 40 to 200 m Spatial Resolution: 2 to 5 m (Typically set to 5 m)
- Water Depth: 200 to 500 m Spatial Resolution: 5 to 10 m (Typically set to 10 m)
- Water Depth: 500 to 1,500 m Spatial Resolution: 10 to 25 m (Typically set to 25 m)
- Water Depth: 1,500 to 3,000 m Spatial Resolution: 25 to 50 m (Typically set to 50 m)

Data collected during the hydrographic surveys will be made available to NOAA upon completion of processing and analysis.

After FOCUS II is installed, FOCUS I will continue to operate to provide a second level of redundancy until it has degraded beyond the level of service required. Although it is not specified in the EFH Assessment as there is no discussion regarding the process or potential impacts associated with cable removal, NMFS assumes FOCUS I would be abandoned in place at that time for the purposes of this analysis.

Action Area

The proposed project occurs within EFH for various federally managed fish species within the Coastal Pelagic Species, Pacific Coast Groundfish, and Highly Migratory Species Fishery Management Plans (FMPs). In addition, the project occurs within or in the vicinity of seagrass, kelp, and rocky reef habitat, and areas of interest, including specific areas in the Channel Islands National Marine Sanctuary and a Cowcod Conservation Area (i.e., Hidden Reef), which were designated as habitat areas of particular concern (HAPC) for various federally managed fish species within the Pacific Coast Groundfish FMP. HAPC are described in the regulations as subsets of EFH which are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Designated HAPC are not afforded any additional regulatory protection under MSA; however, federal projects with potential adverse impacts to HAPC will be more carefully scrutinized during the consultation process.

Effects of the Action

The adverse effects to EFH from cable installation and maintenance activities, including the pre-lay grapnel run, trench excavation, cable placement and burial may include: 1) direct removal/burial of organisms; 2) turbidity/siltation effects, including light attenuation from turbidity; 3) contaminant release and uptake, including nutrients, metals, and organics; 4) release of oxygen consuming substances; 5) entrainment; 6) noise disturbances; and 7) alteration to hydrodynamic regimes and physical habitat.

Installation and repair of fiber optic cables over hard-bottom substrate can directly damage benthic organisms. Additional damage can be caused to adjacent habitats if any horizontal movement occurs. Bathymetric surveys will be performed to identify and avoid rocky reefs (especially high-relief reefs), and other sensitive habitats, such as seagrass and kelp. Despite this avoidance measure, the potential to cross rocky outcroppings, especially in deeper water, cannot be totally avoided. Rocky habitats generally support more invertebrate species than sandy habitats (EA/OEA p. 3-37), and are preferred habitat by a number of Federally-managed species. Rockfish (*Sebastes spp.*) in particular, exhibit strong affinities for hard substrate and even specific locations (Love and Yoklavich 2006; PFMC 2016). Although the width of the impact corridor would be relatively narrow given the size of the fiber optic cable (i.e., 1.41 to .88 inches) and recent improvements in methods to secure them, the total impact area could be considerable given the length of the cable routes. To compensate for impacts to hard-bottom habitat from cable installation, previous, and currently proposed, projects (e.g., Tyco Networks, Inc. project off Hermosa Beach; Pacific Gas and Electric Company project off Point Buchon; MC Global BP4 Transpacific project) have provided, or intend to provide, mitigation fees toward

various hard-bottom habitat enhancement efforts. Consistent with those projects, NMFS believes compensatory mitigation options should be pursued for impacts from the Navy's installation and maintenance of cables over hard-bottom substrate.

Direct impacts to canopy kelp or seagrass habitat could result from the installation and maintenance of the cables. Based on the maximum extent of kelp canopy area according to California Department of Fish and Wildlife data, canopy kelp is present within the vicinity of the proposed project but is absent in depths greater than 85 ft in any of the exit point locations. Similarly, seagrass exists near the Santa Cruz Island HDD exit point with the closest bed located approximately 400 ft (330 m) inshore of that site. However, survey data and HDD will be used at all shoreline crossings to establish exit points in soft sediments and a minimum of 300 ft (91 m) distance from any known kelp or seagrass to avoid impacting these sensitive habitats.

The discharge of drilling fluids is possible during HDD activities, either via release at the exit point (up to 442 gallons) or by migration to the ocean floor through fissures in the geologic formation, also known as a "frac-out." However, as mentioned previously, the drilling fluid would be unlikely to migrate to the surface or be released offshore. Conservation measures, including a project-specific spill prevention plan, HDD Installation Monitoring, and a Frac-Out Plan would also be developed and implemented to help prevent and address an accidental discharge into the marine environment. In addition, bentonite clay used for directional drilling is a naturally occurring hydrated aluminosilicate composed of sodium, calcium, magnesium, and iron. Bentonite is derived from sediment deposits created by weathering of volcanic ash. The small amount of clay anticipated to exit the borehole is denser than the surrounding sea water and will settle rapidly to the bottom. Neff (1987) concluded that exposure to drilling fluids by water column organisms wouldn't be of sufficient duration or concentrations to result in any acute or sublethal effects. Moreover, chronic tests of copepods, amphipods, bivalves and cod fry exposed to "water-based muds" at 10-103 milligram per liter produced no observed effect (Kosheleva, et al. 1997). Therefore, even if drilling fluids were released into the marine environment, any impact would be minimal since the drilling fluid consists of a water-based bentonite clay mixture and cuttings from the seabed that are non-toxic to marine organisms and would not be expected to impair marine water quality. .

Water intake structures would be used temporarily in association with the HDD activities at Santa Cruz Island. However, as described previously, the temporary intake at Santa Cruz Island would be screened and have a low-flow rate (i.e., not to exceed 0.5 ft per second). These protective measures are consistent with the Conservation Recommendations identified in the Coastal Pelagic Species and Pacific Coast Groundfish FMPs for water intake structures to minimize entrainment or impingement effects.

EFH Conservation Recommendations

As described in the above effects analysis, NMFS has determined that the proposed action would adversely affect EFH for various federally managed fish species within the Pacific Coast Groundfish, Coastal Pelagic Species, and Highly Migratory Species FMPs. Therefore, pursuant to section 305(b)(4)(A) of the MSA, NMFS offers the following EFH Conservation Recommendation to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH.

1. Due to an anticipated reduction in quality of habitat associated with the placement of fiber optic cables over hard-bottom habitat, compensatory mitigation may be warranted. The Navy should coordinate with NMFS and other interested resource agencies to develop an appropriate compensatory mitigation plan. Data collected from the bathymetric surveys should be used to first calculate as accurate an estimate of the impacted hard substrate as possible. The Navy should then use this information on the area of hard substrate impacted to develop an appropriate compensatory mitigation plan to offset those impacts. Compensatory mitigation options that contribute to the restoration or enhancement of rocky reef habitat (e.g., marine debris removal, abalone recovery efforts) warrant special consideration. NMFS is amenable to various approaches, including a Navy-led action or in-lieu fee program, and is willing to discuss these options with the Navy in more detail.

Statutory Response Requirement

Please be advised that regulations at section 305(b)(4)(B) of the MSA and 50 CFR 600.920(k) of the MSA require your office to provide a written response to this letter within 30 days of its receipt and at least 10 days prior to final approval of the action. A preliminary response is acceptable if final action cannot be completed within 30 days. Your final response must include a description of measures to be required to avoid, mitigate, or offset the adverse impacts of the activity. If your response is inconsistent with our EFH Conservation Recommendation, you must provide an explanation of the reasons for not implementing that recommendation. The reasons must include the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

Supplemental Consultation

Pursuant to 50 CFR 600.920(l), the Navy must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendation.

Fish and Wildlife Coordination Act Comments

The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development [16 U.S.C. 661]. The FWCA establishes a consultation requirement for Federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage [16 U.S.C 662(a)]. Consistent with this consultation requirement, NMFS provides recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources. The FWCA allows the opportunity to offer recommendations for the conservation of species and habitats beyond those currently managed under the MSA.

As described in the EFH effects analysis, NMFS has determined that rocky reef habitat will be negatively impacted by proposed project activities. Given the importance of this habitat to a variety of fish and wildlife species, the Conservation Recommendation provided above to avoid

or minimize adverse effects to EFH is also considered necessary to address negative impacts to fish and wildlife resources managed under the FWCA.

Endangered Species Act Comments

As a federal agency and pursuant to section 7 of the ESA of 1973, as amended (16 U.S.C. § 1531 et. seq.), the Navy shall, in consultation with and with the assistance of NMFS, insure that any action it authorizes, funds, or carries out, does not jeopardize the continued existence of any species listed as threatened or endangered, or result in the destruction or adverse modification of designated critical habitat. NMFS recommends that the Navy consider the potential effect of this proposed action on ESA-listed species that may be present in the action area, and consider implementation of appropriate measures to minimize the risks of adverse effects as necessary. Upon request, NMFS Protected Resources staff in Long Beach, California is available to help in the determination of how any ESA-listed species may be directly or indirectly affected by the proposed project, and assist the Navy with ESA compliance. NMFS staff may also be able to assist in further development of protective measures that can help minimize the potential for adverse effects to ESA-listed species.

Marine Mammal Protection Act Comments

Marine mammals, including pinnipeds and cetaceans, may be found in or adjacent to the proposed project area. All marine mammals are protected under the MMPA (16 U.S.C. § 1361 et. seq.), and some are also protected under the ESA (see above). Under the MMPA, it is generally illegal to "take" a marine mammal without prior authorization from NMFS. "Take" is defined as harassing, hunting, capturing, or killing, or attempting to harass, hunt, capture, or kill any marine mammal. Except with respect to military readiness activities and certain scientific research conducted by, or on behalf of, the Federal Government, "harassment" is defined as any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal in the wild, or has the potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

Thank you for consulting with NMFS and consideration of our comments. If you have any questions pursuant to this letter, please contact Eric Chavez at (562) 980-4064 or Eric.Chavez@noaa.gov.

Sincerely,

William W. Stelle, Jr.
Regional Administrator

cc: Administrative File: 150316WCR2016PR_O15.03

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DEPARTMENT OF THE NAVY
NAVAL BASE VENTURA COUNTY
311 MAIN ROAD, SUITE 1
POINT MUGU, CA 93042-5033

IN REPLY REFER TO
5090
Ser N0000CV/949
September 7, 2017

Mr. William W. Stelle, Jr.
Regional Administrator
Protected Resources Division
National Marine Fisheries Service
501 W. Ocean Blvd., Suite 4200
Long Beach, CA 90802-4213

Dear Mr. Stelle:

SUBJECT: FINAL RESPONSE TO ESSENTIAL FISH HABITAT CONSULTATION (WCR-2016-4927) FOR FIBER OPTIC COMMUNICATIONS UNDERSEA SYSTEM REPLACEMENT

On behalf of the United States Navy, this letter is a final response to your letter dated July 11, 2016 (WCR-2016-4927) regarding our Essential Fish Habitat (EFH) consultation for the Fiber Optic Communications Undersea System (FOCUS) Replacement Project. The Navy appreciates your review of our consultation and draft Environmental Assessment/Overseas Environmental Assessment (EA/OEA). The Navy has reviewed your response and the proposed Conservation Recommendations and used them to guide actions following the "preliminary ltr 5090 Ser N0000CV/1016 of 27 Sep 16." This letter summarizes the proposed action, reviews how the Navy is following the aforementioned conservation recommendations and outlines the benthic habitat analysis and consequent cable routes.

Proposed Action Summary

The Navy is proposing to replace the existing FOCUS I between Naval Base Ventura County (NBVC) Point Mugu and NBVC San Nicolas Island (SNI) and the microwave communications system link between NBVC Point Mugu and Santa Cruz Island (SCI) with a single new system, FOCUS II. The FOCUS II will be comprised of four interlinked undersea fiber optic cables; two connecting NBVC Point Mugu and NBVC SNI, one connecting SNI and SCI, and one connecting SCI and Point Mugu. This configuration will provide redundant connections between the three sites in case any one of the links was disabled. As previously discussed in the EA, onshore actions will include installation of new seashore interface landings at each of the three sites, utilizing Horizontal Directional Drilling (HDD) technology. As described in our Proposed Off Shore Actions, the HDD bore holes will exit the seafloor, there will be installation of cable alignments at all three sites and periodic maintenance and inspection of both onshore and offshore cable alignments.

As described in the Draft EA/OEA and per National Marine Fisheries Service (NMFS) Conservation Recommendations, the following measures will be taken to mitigate the potential effects of the proposed actions:

a. For HDD operations, a temporary water intake structure will be used to support the drilling operations on SCI.

b. A project-specific spill prevention plan will be implemented during HDD operations on all sites to minimize the unavoidable discharge of drilling fluid.

c. HDD installation monitoring will be implemented to reduce or eliminate frac-outs.

d. To avoid marine mammal and listed bird breeding seasons, HDD and construction activities will only occur between September 15 and January 31 at Point Mugu and between September 15 and December 15 at SNI and SCI.

e. Offshore cable installation on the seafloor would include a pre-lay grapnel run to clear marine debris from the cable path.

f. The fiber optic cables would be laid on primarily sandy bottom with minimal and temporary disturbance and any exposed cable is expected to self-bury over time.

g. The cable will avoid near shore rocky reefs, canopy kelp and sea grass beds.

h. A post-lay inspection will be performed using a remotely operated vehicle to identify and bury any cable that was not buried with the seaplow (at depths shallower than 300 m).

i. The Navy will share all unclassified data collected, including any remote operated vehicle data of post-lay inspection and burial.

j. Data collected from the bathymetric surveys will be used to estimate the impacted hard bottom substrate and develop a plan to offset those impacts.

Benthic Habitat Mapping, Analysis and Plan

Per NMFS's recommendations, the Navy has completed the hydrographic surveys and benthic habitat analysis of the project area to determine how to best avoid possible EFH. The subsequent analysis and final routes now significantly avoid impacting potential hard bottom habitat.

The overall methodology for classifying the benthos uses slope position index and rugosity (surface area variations). The bathymetric data for this analysis were collected on the May 2016 Fugro hydrographic survey of the Channel Islands in support of the FOCUS II cable replacement project. The bathymetric data was post processed using hydrographic data cleaning system software. The completed analysis of cable routes A, B, C and D is over the full length of the cable route and classifies the data into the six benthic classification; "Valley/Crevice," "Lower Slope," "Flat/Plain," "Middle Slope," "Upper Slope," and "Peak / Ridge." In this analysis "hard bottom" is defined as "Valley/Crevice" and "Peak Ridges." Unburied cable has an impact of 1/2 the circumference of the cable. The three different cable diameters used throughout the route are 0.0224 meters (m), 0.00289-m and 0.00359-m.

The four values for each cable that summarize EFH impact include the total length of cable touching the hard bottom, the total surface area of cable touching hard bottom (this includes the impacts from burial of cable), percent of total route touching hard bottom and the percent of the total survey area that touches hard bottom. The numbers are as follows:

Cable A:

a. Total length of cable to touch hard bottom: 4457.1-m.

b. Total surface area of cable to touch hard bottom: 1466.99- m^2.

c. 3.86% of total cable route will touch hard bottom.

d. 0.000084% of the total survey area/GIS polygon will touch hard bottom.

Cable B:

a. Total length of cable to touch hard bottom: 6331.6-m.

b. Total surface area of cable to touch hard bottom: 1920.1-m2.

c. 5.48% of total cable route that touches hard bottom.

d. 4. 0.000111% of the total survey area/GIS polygon will touch hard bottom.

Cable C:

a. Total length of cable to touch hard bottom: 805.73-m.

b. Total surface area of cable to touch hard bottom: 45.21- m2.

c. 1.38% of total cable route that touches hard bottom.

d. 0.00000262% of the total survey area/GIS polygon will touch hard bottom.

Cable D:

a. Total length of cable touching hard bottom: 4,384.82-m.

b. Total surface area of cable touching hard bottom: 201.70- m2.

c. 3.02% of total cable route that touches hard bottom.

d. 0.000011% of the total survey area/GIS polygon will touch hard bottom.

The FOCUS cable project had potential to cross small rocky outcroppings considered EFH. The Navy therefore mapped benthic habitat in the area and used this analysis to adjust the cable routes on a micro level and avoid hard bottom to the maximum extent possible. The cable route also avoids the live hard bottom community locations identified previously by National Oceanic and Atmospheric Administration. As shown in enclosure (1) figure 3.6-3 of the Southern California Range Complex Environmental Impact Statement. These final cable routes do not change significantly but the benthic analysis allowed for slight adjustments in pivotal areas to avoid potential hard bottom habitat. The final cable routes overlaid on the survey data are provided in enclosure (2). The anticipated reduction in quality of habitat associated with the placement of the fiber optic cables is not significant.

A review of scientific literature on the effects of undersea cables on benthic habitat found that compared to other offshore activities such as bottom trawling, ship anchoring or large scale dredging, seabed disturbance resulting from subsea cable activities are considered temporary and have a relatively limited extent. The following represents some of the significant findings from the literature review: The 2014 Fiber Optic Cable Options Survey at Prisoners Harbor, SCI concluded that "to a depth of 85 feet (ft) where the cable will be installed by slant drilling we expect no disturbance to the sea bed. At depths beyond 85 ft, some temporary disturbance will occur by laying and burying the cable." According to the OSPAR 2009 report concerning similar habitat and activities, the disturbed seabed returns to its original state fairly quickly. The Deep-Water Benthic Habitat Characterization and Cable Assessment for the South Florida Ocean Measurement Facility (SFOMF) analyzed the relationship between geomorphology, cable disturbance and hard bottom habitat and could not prove cable impacts existed that were different than natural habitat differences. They also found that "organism density was not significantly affected by the presence of cable" (Messing et. al 2012).

The best available science does not prove significant impacts to benthic habitats from the proposed level of subsea cable activity. Literature reviewed by the Navy in support of this consultation letter is listed in enclosure (3). In addition, the FOCUS cable route was meticulously chosen to avoid as much potential hard bottom habitat as possible with the help of the best available technology and modeling techniques. It should be noted that the hydrographic survey model is conservative in its assessment of the possible presence of either rock substrate or coarse sediment on the ocean floor. For example, during the 2003 SNI FOCUS Cable repair effort, the Navy took grab samples of the ocean floor material to ground truth the sonar predictions and confirmed that the sonar images reflected coarse sediments and not rocky substrate as previously modeled. It is possible that the small amount of potential hard bottom may not actually be hard bottom.

The potential impact to EFH has been reduced because of this benthic habitat mapping and analysis effort. Due to the minimal impact to EFH, the sharing of related mapping and route clearance data, and the adherence to the aforementioned Conservation Recommendations, the conclusion of this analysis is there will be no additional mitigation needed.

5090
Ser N0000CV/949
September 7, 2017

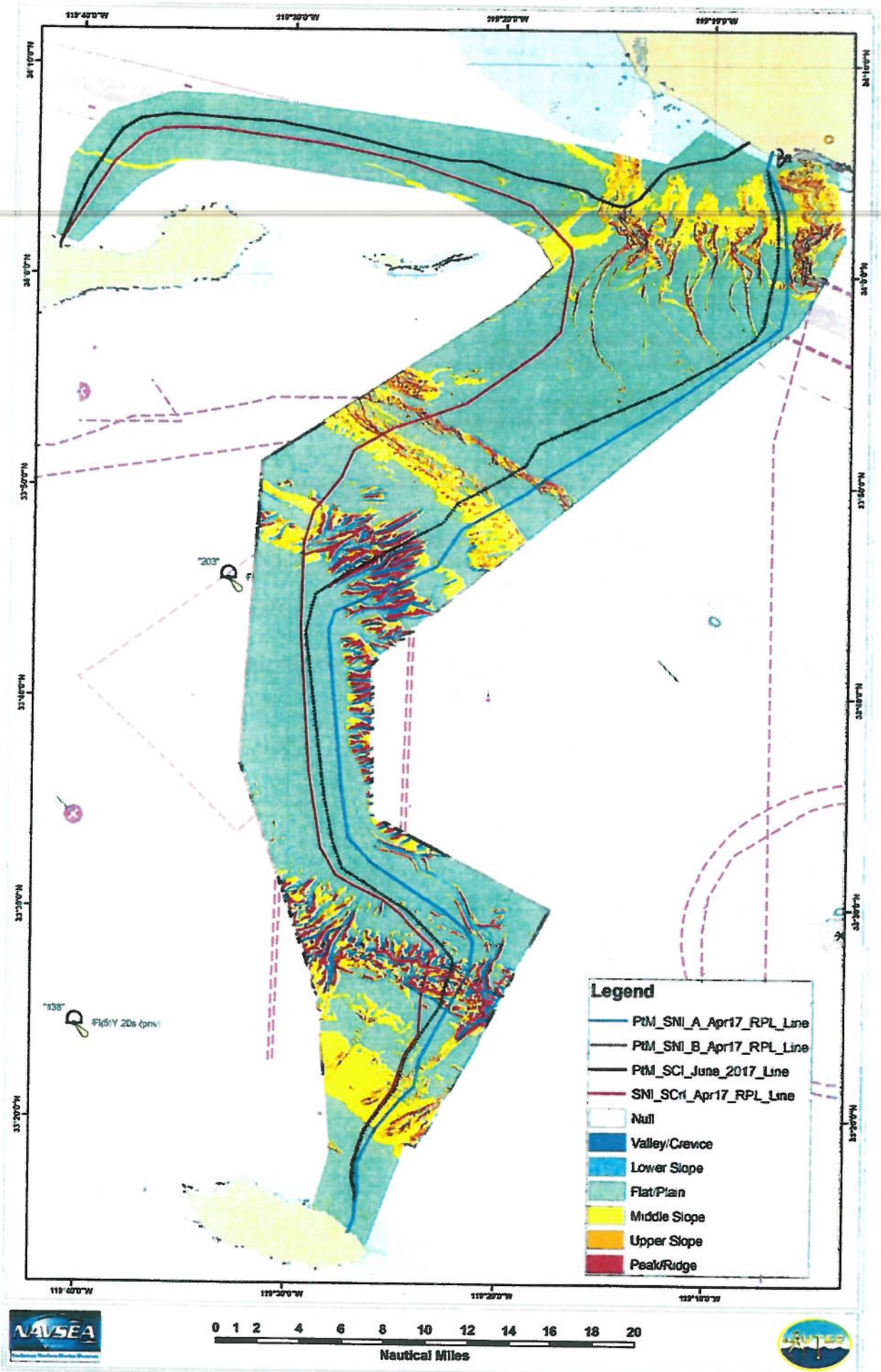
The Navy is requesting concurrence. Should you have any questions or need further information, please contact Ms. Claudia Makeyev at claudia.makeyev@navy.mil or (805) 989-3807.

Sincerely,

C. D. JANKE
Captain, U.S. Navy
Commanding Officer

Enclosures: 1. Figure 3.6-3 of the SOCAL Range Complex EIS
2. Final cable routes overlaid on the survey data
3. Literature Review

Figure 3.6-3: Live Hardbottom Community Locations


Legend
PtM_SNI_A_Apr17_RPL_Line
PtM_SNI_B_Apr17_RPL_Line
PtM_SCI_June_2017_Line
SNI_SCrl_Apr17_RPL_Line
Null
Valley/Crevice
Lower Slope
Flat/Plain
Middle Slope
Upper Slope
Peak/Ridge
0 1 2 4 6 8 10 12 14 16 18 20
Nautical Miles

Enclosure (2)

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DEPARTMENT OF THE NAVY
NAVAL BASE VENTURA COUNTY
311 MAIN ROAD, SUITE 1
POINT MUGU, CA 93042-5033

IN REPLY REFER TO
5090
Ser N0000CV/1016
27 SEP 16

Mr. William W. Stelle, Jr.
Regional Administrator
Protected Resources Division
National Marine Fisheries Service
501 W. Ocean Blvd., Suite 4200
Long Beach, CA 90802-4213

Dear Mr. Stelle:

SUBJECT: PRELIMINARY RESPONSE TO ESSENTIAL FISH HABITAT CONSULTATION (WCR-2016-4927) FOR FIBER OPTIC COMMUNICATIONS UNDERSEA SYSTEM REPLACEMENT

On behalf of the United States (U.S.) Navy, this letter is a preliminary response to your letter, dated July 11, 2016 (WCR-2016-4927) regarding our Essential Fish Habitat (EFH) consultation for the Fiber Optic Communications Undersea System (FOCUS) Replacement Project. The Navy appreciates your review of our consultation and draft Environmental Assessment/Overseas Environmental Assessment (EA/OEA). The Navy is still reviewing your response and the proposed Conservation Recommendations, but is providing this initial response to provide additional information.

The Navy has now completed benthic habitat mapping in the project area and is currently analyzing these new data. This mapping effort is intended to provide specific information on the amount of hard bottom habitat in the area and to assist the Navy in creating cable routes which avoid hard bottom to the maximum extent possible. Additionally, the Navy is considering scientific information already provided in order to clarify any potential inconsistencies in its interpretation. This review, along with the benthic habitat data analysis, should help ascertain the actual amount of hard-bottom habitat that will be crossed by the fiber optic cable along with potential impacts to that habitat. As noted in the draft EA/OEA, in water deeper than 1,500', the resolution of the data will be between 15 and 20 meters and small, unconnected, rock may not be visible. Our benthic habitat data analysis will take this limitation into account. We anticipate the data analysis to require a minimum of three to four months and will update you if this timeline changes.

With regards to your comments regarding the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA), the draft EA/OEA already considers the potential effects of the proposed project. In the draft EA/OEA, the Navy has determined that the project will have no effect on listed species, and as such, consultation under Section 7 of the ESA is not required. Additionally, the Navy has determined that the project will not result in take of marine mammals and MMPA permitting is not required.

With regards to potential impacts to EFH, in particular hard-bottom impacts, the Navy proposes to complete the benthic habitat data analysis and review of scientific literature on the effects of undersea cables on benthic habitat, prior to providing you with a more complete response to your letter dated July 11, 2016. The Navy anticipates this analysis and review to be completed by December 31, 2016. Should you have any questions or need further information, please contact Mr. John Ugoretz at john.ugoretz@navy.mil or (805) 989-4852.

Sincerely,

C. D. JANKE
Captain, U.S. Navy
Commanding Officer

Seeley, Kenneth R CIV WD, 52F00ME

From: Eric Chavez - NOAA Federal <eric.chavez@noaa.gov>
Sent: Tuesday, January 16, 2018 17:35
To: Makeyev, Claudia F CIV WD
Cc: Lousen, Chad A CIV NAVFAC, MUGU; Penny Ruvelas; Melissa Neuman - NOAA Federal
Subject: [Non-DoD Source] Re: EFH Consultation and recovery efforts in the rocky intertidal

Ms. Makeyev,

Thank you for providing this information. It's good to know that the Navy's existing, important abalone and rocky reef habitat work will continue to be funded. Moreover, we're pleased to learn that the subtidal surveys will be augmented to better understand the potential impacts of invasive algae on black abalone and the rocky reef ecosystem in general. Please keep us informed of the progress and results of this work.

Assuming the aforementioned efforts proceed as planned, NMFS considers the Conservation Recommendation provided for the Navy Fiber Optic Communications Undersea Systems (FOCUS) Essential Fish Habitat (EFH) Consultation to have been accepted and satisfactorily implemented by the Navy. We have no additional comments to provide and consider the Navy FOCUS EFH consultation to be completed. Thank you for consulting with NMFS.

Regards,

Eric

On Thu, Jan 11, 2018 at 4:17 PM, Makeyev, Claudia F CIV WD <claudia.makeyev@navy.mil <mailto:claudia.makeyev@navy.mil> > wrote:

Dear Mr. Chavez,

Thank you again for speaking with me about our Essential Fish Habitat consultation as well as our black abalone and critical habitat protection and recovery efforts. The Navy has historically had a significant commitment to recovery efforts. Per your request, below are brief bullet points summarizing these efforts:

- USGS Black Abalone surveys continuing a 37 year dataset designed specifically to survey black abalone at nine sites throughout SNI. This effort was originally established in conjunction with the introduction of the experimental otter population.

- USGS Rocky Intertidal surveys continuing a 37 year dataset documenting changes in the rocky intertidal ecosystem that was designed to complement the black abalone survey.

- CDFW Black Abalone surveys continuing a 25 year data set designed specifically to fall in line with the black abalone USGS surveys

- Multi-Agency Rocky Intertidal Network (MARINe) survey continues a 2 year dataset. MARINe is a partnership of agencies, universities and private groups committed to determining the health of the rocky intertidal habitat and providing this information to the public.

- USGS Subtidal surveys continuing a 37 year dataset of subtidal rocky bottom habitat and associated ecosystem changes.

- USGS, USFWS and Navy southern sea otter monitoring program continues a 27 year effort to support and monitor a translocated sea otter population and the associated rocky bottom habitat ecosystem.

- Annual Aerial Kelp Forest survey to determine growth and health of the kelp forest canopy.

- In addition, we are planning to add a component to the subtidal surveys to assess the full abundance and distribution of invasive algae and black abalone in the subtidal. An island-wide accounting will be crucial to understand the interplay between competing algal species, their response to sea urchin herbivory, and the potential impacts to this rocky bottom habitat ecosystem.

The Navy recognizes the importance of continuing these efforts as they provide invaluable insight into the ecosystem and support the stabilization of the largest known endangered black abalone population.

VR,

Claudia Makeyev

Environmental Protection Specialist
NAVAIR Ranges Sustainability Office
San Nicolas Island & Point Mugu
Bldg.53A, Code 52F00ME
575 I Avenue, Suite 1
Point Mugu, CA 93042

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Eric Chavez

Protected Resources Division

NOAA Fisheries West Coast Region

U.S. Department of Commerce

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<https://lh5.googleusercontent.com/VzADSJn_qVsJFg08tINaf-vcPeMxU74jIH6LEUL4HO7Qh3Y5B5ksbikr2PrKqZDR9MMm_-YePKUmrCAzsAp0txaCwlAcA3NvJbfhR1uyJAq7U3TdMExBsQaYvg>

Appendix C.2: Cultural Resources

United States Department of the Interior

NATIONAL PARK SERVICE
Channel Islands National Park
1901 Spinnaker Drive
Ventura, California 93001-4354

IN REPLY REFER TO:

I.A.2 (H4217) - CHIS

September 2, 2016

Mr. Kenneth Kahn, Chair
Santa Ynez Band of Chumash Indians
P.O. Box 365
Santa Ynez, California 93460

Regarding: Navy Fiber Optics Communications Underwater System (FOCUS) Replacement

Dear Chairman Kahn:

The purpose of this letter is to initiate consultation under 36 CFR Part 800 for the Navy FOCUS project. The United States (U.S.) Navy proposes to replace the existing Fiber Optic Communications Underwater System-I (FOCUS-I) between Naval Base Ventura County (NBVC) Point Mugu and NBVC San Nicolas Island (SNI) and the microwave communications system link between NBVC Point Mugu and Santa Cruz Island (SCrI) with a single new system. This letter follows our initial discussions with the Elders Council at their August 15, 2016 meeting. This new FOCUS, FOCUS-II, will connect NBVC Point Mugu, NBVC SNI, and SCrI via new undersea fiber optic cables. Additionally, a new fresh water supply line will be installed to support operations on SCrI. For purposes of consultation under Section 106 and its implementing regulations (36 CFR Part 800), the Navy is the lead federal agency. As part of this project, Channel Islands National Park will issue a right-of-way permit for the Navy's activities on Santa Cruz Island. Therefore we retain responsibility for Government-to-Government consultations with you for all issues and concerns related to this right-of-way. We have sent an identical letter to the Chair of the Elders Council.

We are working with the Navy to address the requirements of 36 CFR 800 for the Santa Cruz Island portion of the project. This will involve installation of a fiber-optics cable between Prisoners Harbor and the Navy Site, which is an inholding owned by The Nature Conservancy, but leased to the Navy. For part of this distance, a water line would also be installed. The installation would be buried for the majority of the alignment; however, a portion of the installation would be installed above-ground in a cable trough to avoid ground disturbance. The Navy has hosted 3 site visits to the Santa Cruz Island project area in 2014 and 2015, one of which was attended by Mr. Pat Tumamait. During those site visits, participants walked the proposed route, and identified and discussed resource issues in the field. This has helped the Navy and the National Park Service identify and evaluate potential effects to historic properties that may result from the project.

We have identified the Area of Potential Effects (APE) for the Santa Cruz Island right-of-way as the entirety of Santa Cruz Island. We have identified the historic properties within this APE as the Santa Cruz Island Archeological District, the Santa Cruz Island Historic District, and archeological site CA-SCrI-240/439. We have determined that issuing a right-of-way has the potential to cause

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adverse effects to archeological resources, specifically site CA-SCrI-240/439. Given this, the Navy has prepared a draft test plan to investigate archeological resources in the immediate project impact area in order to gather more site-specific information and determine what measures may be necessary to avoid, minimize or mitigate those effects. A copy of this test plan is included with this letter for your review and comment; a copy was also distributed to the Elders Council on August 15, 2016.

The Navy has also prepared a draft environmental assessment (EA) for the entirety of the project. We have enclosed a copy for your reference; a copy was also distributed to the Elders Council at their meeting on August 15, 2016. The Navy expects to release the project EA for full public review and comment in September, 2016. Regarding the project schedule, archeological testing would occur once tribal and SHPO consultation for this aspect of the project has been addressed. Construction work would not occur until 2018.

We respectfully request your comments on the enclosed archeological test plan. If you have comments regarding any other issues related to identification of, potential effects to, or treatment of historic properties related to the right-of-way permit, please let us know. If necessary, the Navy would be happy to host another site visit for tribal members.

If you have any questions or comments regarding the EA for the project, we ask that you direct those to John Ugoretz, Marine Resources Manager for the Navy. Mr. Ugoretz can be reached by telephone at (805) 989-4852, or by email at john.ugoretz@navy.mil. Please send any correspondence to Mr. Ugoretz at the NAVAIR Ranges Sustainability Office, Bldg 53A, 575 I Ave, Suite 1, Point Mugu, CA, 93042. If you request the Navy to address any comments prior to release of the EA to the public, please provide these to Mr. Ugoretz by September 28, 2016. Tribal comments may also be addressed during the public comment period.

Please contact Laura Kirn, Chief of Cultural Resources, at (805) 658-5752 if you have questions on the testing or other tribal issues related to the right-of-way permit. We look forward to your comments on the archeological test plan.

Sincerely,

Russell E. Galipeau, Jr.
Superintendent

Enclosures

1) Draft Archeological Test Plan
2) Draft Environmental Assessment

cc: Elders Council Chair, Santa Ynez Band of Chumash Indians, PO Box 365, Santa Ynez, CA 93460

DEPARTMENT OF THE NAVY
NAVAL BASE VENTURA COUNTY

5090
Ser N0000CV/1301
19 Dec 16

Ms. Juliane Polanco
State Historic Preservation Officer
Department of Parks and Recreation
1725 23rd Street, Suite 100
Sacramento CA 95816-7100

Dear Ms. Polanco:

SUBJECT: FIBER OPTIC CABLE UNDERSEA SYSTEM (FOCUS) REPLACEMENT, NAVAIR SEA RANGE, POINT MUGU CALIFORNIA

The United States Navy proposes to replace the existing Fiber Optic Communications Undersea System-I (FOCUS-I) between Naval Base Ventura County (NBVC) Point Mugu and NBVC San Nicolas Island (SNI), and the microwave communications system link between NBVC Point Mugu and Santa Cruz Island (SCrI) with a fiber optic system. This new FOCUS, FOCUS-II, will connect NBVC Point Mugu, NBVC SNI, and SCrI via new undersea fiber optic cables. Additionally, a new fresh water supply line will be installed to support operations on SCrI. This letter initiates Section 106 consultation in accordance with 36 CFR 800.3(a), regulations implementing the National Historic Preservation Act (NHPA) of 1966, as amended. Concurrent with this letter, the Channel Islands National Park Service (NPS), as the property owner for a portion of the project, is conducting ongoing consultation with the Santa Ynez Band of Chumash Indians of Santa Ynez California.

The Navy has prepared a draft Environmental Assessment/Overseas Environmental Assessment (EA/OEA) which details the project and its potential impacts, including effects to cultural resources (enclosed). In order to comply with NHPA and its implementing regulations (36 CFR 800) for this undertaking, the Navy is 1) describing the proposed undertaking, 2) defining the Area of Potential Effects (APE), 3) providing data regarding the identification of historic properties, 4) providing a draft archeological testing plan and 5) providing the Navy's finding of No Adverse Effect to Historic Properties.

The remainder of this letter is organized to present an overview of the undertaking and associated APE, review of survey efforts completed to date, as basis for determining whether historic properties might be affected, and discussion of the proposed project's potential to affect historic architectural and archaeological properties.

Description of the Undertaking

The following is a brief overview of the project description. For a complete description of the project, see the enclosed Draft EA/OEA. As documented in the EA/OEA, the U.S. Navy proposes to replace the existing undersea cable, FOCUS-I, and microwave link with a single new system. This new system, FOCUS-II, will connect NBVC Point Mugu, NBVC SNI, and SCrI via new undersea fiber optic cables. The Navy also proposes to replace the existing above-ground water line on SCrI with a new line, buried in the same trench as the new fiber optic cable.

The purpose of the Proposed Action is to provide continued reliable operation of the real-time intra-range and inter-range communications capability for the Sea Range with an effective increase in bandwidth required to meet customer requirements. This real-time capability includes all data communications between NBVC Point Mugu, NBVC SNI, and SCrI. The need for the proposed action is three-fold; 1) reliability of FOCUS-I is degrading; 2) there is a need for increased bandwidth in the SCrI microwave system; and 3) the existing water supply to the SCrI Navy site is aging and could fail.

The EA/OEA includes three alternatives, as well as a no-action alternative. The preferred alternative, and the one consulted on here, includes the use of two landing sites at NBVC Point Mugu: one near Building 811 and one at Charlie Pad. Landing sites for NBVC SNI and SCrI would be located near the Coast Guard Jetty and the Prisoners Harbor area, respectively. Each landing site would be used as a Horizontal Directional Drilling (HDD) pad and equipment staging area. FOCUS-II will be installed as a four-node ring connecting NBVC Point Mugu, NBVC SNI, and SCrI. This ring will be composed of two cables connecting Point Mugu to SNI utilizing mainland landing sites from the Point Mugu Charlie Pad site to the NBVC SNI Coast Guard Jetty site. The NBVC Point Mugu to SCrI cable will utilize mainland landing sites with the Point Mugu Building 811 site, connecting to the SCrI Prisoners Harbor landing site.

The NBVC SNI to SCrI cable will utilize the SNI Coast Guard Jetty and SCrI Prisoners Harbor landing sites. A new water line would be included with the onshore portion of the FOCUS-II cable at SCrI. The onshore cable and water line on SCrI would be installed in a combination of trenches and an above-ground channel system. The above-ground channel system would follow the base of the hill to the east of the existing well site access road in order to avoid known archeological resources.

Project APE

In accordance with 36 CFR 800.4(a)(1), the Navy has defined APE components at the respective terrestrial nodes affected by this undertaking, including at NBVC Point Mugu, NBVC SNI APE, and on SCrI. This APE also includes the submerged alignments between these nodes along which the fiber optic cables will be laid. The APE consists of the areas directly affected by the undertaking, plus 50-foot buffers, and including the entirety of any historic properties within or lapping the buffers.

The APE at NBVC Point Mugu consists of the Building 811 drilling site and Charlie Pad drilling sites, the equipment staging areas as provided in Figures 2-3 and 2-5 of the EA/OEA, and a 328-ft (100-m) radius around the Bravo Launching Control Building.

The NBVC SNI APE includes the drilling area and staging area near the Coast Guard Jetty plus the area within a 50-ft (15-m) radius around the combined area (Figure 2-7 of the EA/OEA).

Because the entirety of SCrI is designated as the National Register-eligible SCrI Archaeological District (see enclosed map), while the entirety of the island's National Park Service lands are also concurrently the National Register-eligible Santa Cruz Ranching District, the APE consists of the entire island. Within this, the Area of Direct Impact (ADI) is the area that could actually be affected by the FOCUS II installation. Work for this project will be limited to the Navy Road, an area to the west of the access road from the Navy Road to the existing well site at Prisoners Harbor, and staging areas on existing graded areas at Prisoners Harbor (Figures 2-12 and 2-14 of the EA/OEA). The ADI, for purposes of determining potential effects to known historic sites, was expanded to a 50 foot buffer around the planned construction path. The project calls for the cable to be buried up to 102 cm (40 in) deep (vertical ADI) within the existing road or in an elevated channel approximately 1.6 ft. (0.5 m) above the ground. The ADI for the SCrI sites includes the following areas (Figures 2-12 and 2-14):

- The HDD area at Prisoners Harbor;
- Equipment storage areas in the Prisoners Harbor area and at the well site;
- The section of Navy Road connecting the Prisoners Harbor HDD site to the Navy Site;
- The roadways connecting the well site to Navy Road.

The APE for the offshore alignments includes the HDD exit sites and the lengths of cable connecting the exit sites, plus the area within a 50-ft (15-m) radius around each of these project sites. It should be noted that the offshore APE in the vicinity of SCrI starts at a distance of 1 mi (1.6 km) from the high tide line, as the NPS boundaries extend to this distance.

Identification of Historic Properties

At NBVC Point Mugu, the Charlie Pad site is within 328 ft. (100 m) of the Bravo Launching Control Building, which is a contributing factor to the Baker Complex. The complex was constructed in 1948 and was determined to be eligible for listing on the NRHP under Criterion A for the direct association with testing of the earliest missile systems assigned to NBVC Point Mugu. The complex was also determined to be eligible for listing under Criterion C, as an unusual example of a test launch facility. No cultural resource surveys were conducted specifically for the proposed NBVC Point Mugu project sites because these project areas are in previously disturbed areas that have been deeply filled and paved.

No recorded archaeological historic properties or other cultural resources are located within the NBVC SNI APE. No cultural resource surveys were conducted specifically for the proposed NBVC SNI project site because the project area has been previously subject to archaeological

inventory and determined to be absent archaeological deposits, likely as a result of being a previously disturbed area. There are no facilities within the NBVC SNI APE.

There are five documented archaeological sites within the ADI on SCrI: CA-SCrI-96, CA-SCrI-240/439, CA-SCrI-464, CA-SCrI-465, and CA-SCrI-466. All are contributing sites within the larger Santa Cruz Island Archaeological District. Proposed construction trenching would generally be restricted to the disturbed road surface and shoulders. The exception will be in an area at the base of the slope to the east of the road from the well site back to the Navy Road where the cable and pipeline will be elevated across the recorded southeastern extent of CA-SCrI-240/439 where the cultural deposits are buried under sterile alluvium. Here the cable and pipeline will be carried an elevated cable channel suspended approximately 1.6 ft. (0.5 m) above the ground on post driven approximately every three (3) meters.

For sites CA-SCrI-96, CA-SCrI-464, CA-SCrI-465, and CA-SCrI-466, their archaeological deposits have been removed down to the bedrock within the roadbed the Navy Road and exist only lateral to the disturbed shoulder. To ensure avoidance of off-road archaeological deposits, stakes will be placed around the five documented site boundaries prior to construction. These stakes will mark the presence of a resource, and Native American and archaeological monitors should be present for all installation and maintenance work conducted within the boundaries of the five sites and within a 50-meter buffer for each site. The 50-meter buffers are required because the site boundaries are not well known in all directions. Previously undocumented, intact archeological resources were discovered by NPS in the vicinity of the proposed alignment on SCrI.

A testing plan (enclosed) for the trenching corridor between the shoreline of Prisoners Harbor and the Navy Road above CA-SCrI-240/439, and the alignment for the elevated channel route within and across the mapped area of CA-SCrI-240/439, will be executed in advance of final approval to proceed with construction to determine the presence or absence of any archeological deposits, the integrity of any deposits, and how these deposits may contribute to the further understanding of CA-SCrI-240/439. The Channel Islands National Park has been in discussions with the Santa Ynez Band of Chumash Indians Elders Council regarding CA-SCrI-240/439. They have indicated support for the testing plan and interest in collaborating on the protection of this site.

If testing results indicate the presence of intact, significant archeological deposits that will be directly affected by the project, the Navy will work with CASHPO, the NPS, and the Santa Ynez Band of Chumash to determine appropriate treatment.

There are three contributing elements of the Santa Cruz Ranching District within the ADI: A warehouse, a scale house, and Navy Road. The construction phase would create temporary effects to the cultural landscape of the Ranching District. Upon construction completion, all equipment will be removed and the existing visual environment will be restored. The proposed action includes the trenching and installation of a subsurface vault in the vicinity of the warehouse. The trenching will be filled and compacted to match the existing contours and visual integrity of the Ranching District. The vault will be installed in a manner that minimizes its final

profile, preserving the cultural landscape of the area. The scale house will not be affected by the proposed action.

The proposed action also includes installation of a permanent above-ground feature along the 1,150 ft. (350 m) elevated channel corridor. This may affect the integrity of the Ranching District in the localized area of the Prisoners Harbor Cluster by introducing a new element into the historic district. However, this installation will be partially screened by native vegetation and will have minor visual effect on the quality of the district's integrity of setting, and will not constitute an adverse effect to the historic district.

Offshore cable alignments were developed to avoid known historic shipwrecks and aircraft crash sites. Records do not indicate the presence of any underwater cultural resources within the immediate subsurface tidal zone off NBVC Point Mugu. Archaeological studies focusing on underwater resources near NBVC SNI have identified 45 shipwrecks and 21 downed aircraft in the vicinity of SNI and Begg Rock, dating from the mid-nineteenth century to the late-twentieth century. A total of five submerged vessels including cargo, military, and civilian wrecks exist off the coast of SCrI. No shipwrecks are recorded within 1.75 mi (2.7 km) of the proposed offshore cable alignment.

There is a possibility that submerged archaeological sites could exist just offshore of SNI and SCrI. These sites would have been occupied over 7,000 years ago when sea levels were lower than current levels. Although it is conceivable that underwater prehistoric archaeological resources may exist, especially given the antiquity of human occupation of the Channel Islands, no such resources are currently known to exist, apart from an isolated stone bowl found offshore SCrI.

Results of Identification and Evaluation

In accordance with 36 CFR 800.5(a)(1), the Navy has applied the Criteria for Adverse Effect to provisionally determine that implementation of the proposed project would, under 36 CFR 800.5(b), have "no adverse effect" on identified historic properties. The one historic property within the project APE at NBVC Point Mugu is greater than 300 feet from the project work area and is not subject to change by the project. There are no recorded properties or known archeological resources within the NBVC SNI APE. At SCrI, the installation of the buried and above-ground segments of the fiber optic cable and water line are designed to avoid or minimize effects to known historic properties. The proposed subsurface testing across and in the vicinity of archeological site CA-SCrI 240/439 would be conducted in keeping with the "Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines," and would incorporate a tribal cultural monitor per ongoing consultation with the Santa Ynez Band of Chumash Indians tribe.

The Navy respectfully requests your comments or concurrence on the adequacy of the enclosed Testing Plan for identifying and assessing potential project effects on any buried archaeological components that would be encountered along the trenching corridor in the vicinity of Prisoners Harbor. We are also requesting your conditional concurrence on our provisional

"no adverse effect" determination, pending reporting the results from implementing the Testing Plan. We request your concurrence within 60 days of receipt of this letter. Should you have any questions or need further information, please contact Mr. Joseph Montoya at (805) 989-3804 or via email at: joseph.l.montoya@navy.mil for questions regarding this document or Ms. Lisa Thomas at (805) 989-1938 or via email at: lisa.Thomas@navy.mil for questions regarding the proposed test plan.

Sincerely,

C. D. JANKE
Captain, U. S. Navy
Commanding Officer

Enclosures: 1. Draft Environmental Assessment/Overseas Environmental Assessment Fiber Optic Communications Undersea System (FOCUS) Replacement NAVAIR Sea Range, Point Mugu, California
2. Santa Cruz Island Archaeological District Map
3. FOCUS Cable Installation Archeological Testing Plan Santa Cruz Island, California

Copy to:
Commander Navy Region Southwest, Environmental Department
Cultural Resources Management Program
San Diego, CA 92147

Diane Silva, NARA Certified Command Records Manager
NAVFAC Southwest
1220 Pacific Highway, Code EV33
NBSD Bldg. 3519
San Diego, CA 92132

Mr. Russell E. Galipeau, Jr.
Superintendent
Channel Islands National Park
1901 Spinnaker Drive
Ventura CA 93001-4354

Santa Ynez Band of Mission Indians
Attn: Kenneth Kahn - Chairman
P.O. Box 517
Santa Ynez, CA 93460

STATE OF CALIFORNIA – THE NATURAL RESOURCES AGENCY EDMUND G. BROWN, JR., *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

February 14, 2017

Refer to: USN_2016_1223_001

Captain C.D. Janke
Department of the Navy
Naval Base Ventura County
311 Main Road, Suite 1
Point Mugu, CA 93042-5033

RE: Fiber Optic Cable Undersea System (FOCUS) Replacement, NAVAIR Sea Range, Point Mugu (your letter 5090 Ser N0000CV/1301 of 19 December 2016)

Dear Captain Janke:

The Department of the Navy (Navy) is initiating its consultation on the above cited undertaking, in accordance with Section 106 of the *National Historic Preservation Act* (16 U.S.C. §306108), as amended, and its implementing regulations found at 36 CFR Part 800. The Navy is proposing to replace the existing Fiber Optic Communications Undersea System (FOCUS-I) between Naval Base Ventura County (NBVC) Point Mugu and NBVC San Nicolas Island (SNI) and the existing microwave communications system link between NBVC Point Mugu and Santa Cruz Island (SCrI) with a new fiber optic system (FOCUS-II). FOCUS-II will connect NBVC Point Mugu, SNI, and SCrI via new undersea fiber optic cables. Additionally, a new fresh water supply line will be installed to support operations on SCrI.

Succinctly, the proposed undertaking will include the following components:

- Approximately 234 nautical miles of cable will be laid on the seafloor between horizontal directional drilling entrance/exit sites located at NBVC Point Mugu, SNI, and SCrI. Offshore cable alignments were developed to avoid known historic shipwrecks and aircraft crash sites;
- On SNI and SCrI, the fiber optic cable will be connected to communications buildings or existing manhole systems via conduits which may be buried in a trench, laid upon the ground surface, or supported in above-ground channels;
- Where needed, trenches would be dug along existing roads and within previously disturbed or developed areas, with widths ranging from 4 to 20 inches and depths down to 40 inches; and
- On SCrI, a new 3-inch polyvinyl chloride water line will be installed in trenches or above-ground channels between the well site and the Navy Site, which will replace a metal pipeline that was originally installed in 1951.

The area of potential effect (APE) will contain the components described above. Access to the APE will be by existing paved and dirt roads. The components of the proposed undertaking were discussed thoroughly in your submission.

As documentation for your finding of effect, you provided an *Environmental Assessment/Overseas Environmental Assessment* (EA) dated September 2016, which contained information on cultural resources potentially affected by the proposed undertaking, and a *FOCUS Cable Installation Archaeological Testing Plan, Santa Cruz Island, California*, dated August 2016 and prepared by Dr. Jennifer E. Perry, Amanda L. Martinez, Dr. Colleen M. Delaney, and Dr. Robert M. Yohe (Epsilon Systems Solutions, Inc.). No cultural resources were identified within the project sites at NBVC Point Mugu because that portion of the APE is located in previously disturbed areas that previously have been filled deeply and paved. No cultural resources were identified within the APE on SNI because that area has been previously subjected to archaeological inventory and determined to be absent archaeological deposits, as a result of it being a previously disturbed area.

On SCrI, five archaeological sites (CA-SCrI-96, CA-SCrI-240/439, CA-SCrI-464, CA-SCrI-465, and CA-SCrI-466) are located within the APE. All of those sites are contributing sites within the larger Santa Cruz Island Archaeological District. For four of the sites (does not include CA-SCrI-240/439), their archaeological deposits had been removed down to the bedrock within the roadbed of Navy Road when it was initially constructed and the remaining portions of those sites are located outside of the roadbed of that road. The cable will be installed in a trench in the roadbed of Navy Road and to ensure avoidance of off-road archaeological deposits, stakes will be placed around the boundaries of those sites including a 50-meter buffer zone for each site prior to construction. Both archaeological and Native American monitors will be present for all ground disturbing activities in the vicinity of those sites.

A portion of the cable and the new water line will be installed within and across the mapped area of CA-SCrI-240/439, either by trenching or an elevated channel located above ground. That site will be tested in accordance with the testing plan identified above to determine the presence or absence of any archaeological deposit, the integrity of any deposits, and how those deposits may contribute to the further understanding of that site. The Channel Island National Park (NPS) has consulted with the Santa Ynez Band of Chumash Elders Council, who supported the testing plan and was interested in collaborating on the protection of this site. If the testing results indicate the presence of intact, significant archaeological deposits that will be affected directly by the proposed undertaking, the Navy will work with CA SHPO, NPS, and the Santa Ynez Band of Chumash Indians to determine the appropriate treatment of those deposits. A Native American monitor will be present during implementation of the testing plan.

Based on the previous surveys, tribal consultation, and that both archaeological and Native American monitors will be present during ground disturbing activities, the Navy has determined that a finding of No Adverse Effect is appropriate for this proposed

undertaking. That determination is made pursuant to the condition that the Navy will continue this consultation with the Office of Historic Preservation it that is warranted.

After reviewing the information submitted with your letter, I offer the following comments:

- I have no objections to your identification and delineation of the APE, pursuant to 36 CFR Parts 800.4(a)(1) and 800.16(d);
- I do not object to the use of both archaeological and Native American monitors during ground disturbing activities associated with the proposed undertaking;
- After reviewing the enclosed testing plan, I found it to be adequate for identifying and assessing potential project effects on any buried archaeological components that may be encountered during the implementation of the proposed undertaking;
- I look forward to continuing this consultation with you if that is warranted, and
- I do not object to your finding of No Adverse Effect and believe that it is appropriate for the proposed undertaking, as described.

Be advised that under certain circumstances, such as an unanticipated discovery or a change in project description, you may have additional future responsibilities for this undertaking under 36 CFR Part 800. Should you encounter cultural artifacts during ground disturbing activities, please halt all work until a qualified archaeologist can be consulted on the nature and significance of such artifacts.

If you have any questions or concerns, please contact Tristan Tozer at (916) 445-7027 or via e-mail at Tristan.Tozer@parks.ca.gov.

Sincerely,

Julianne Polanco
State Historic Preservation Officer

United States Department of the Interior

NATIONAL PARK SERVICE
Pacific West Region
333 Bush Street, Suite 500
San Francisco, California 94104-2828

IN REPLY REFER TO
A9015 (PWR-CR)

AUG 0 2 2017

Lisa Thomas, Sea Range Support Branch
Naval Air Warfare Center Weapons Division
575 "I" Avenue, Bldg. 53
Point Mugu, NAWCWD, CA 93042-5049

Subject: ARPA Permit PWR-1979-17-CA-12 (CHIS)

Dear Ms. Thomas:

The National Park Service is pleased to approve the permit application for site recordation, testing, collecting and monitoring. The permitted work can be carried out within the boundaries of Channel Islands National Park on Santa Cruz Island as specified in the area of direct impact defined in the Archaeological Testing Plan (NAVAIR Contract Number: N68936-13-D-0015-000301).
We understand that Horizon Water and Environment is conducting the archaeology testing and documentation work for the Naval Air Warfare Center Weapons Division which is planning to install a Fiber Optic Communication Undersea System II Cable.

We understand that this project is being conducted adjacent to and within sites that have been listed on the national register as well as within the Santa Cruz Island National Historic District and that it is likely archaeological materials will be collected. We also understand that the analyzed material, associated field records, and report for this project will be provided to Laura Kirn (Laura_Kirn@nps.gov) and assumed into the park's collection and archives. This permit is valid for the areas identified within the permit application. Your permit is enclosed and in effect until January 1, 2018.

Please review the permit conditions. Initiation of fieldwork constitutes your program's acceptance of the conditions. Note that the permission of the National Park Service must be obtained prior to any public presentation or publication of archaeological site locations within park boundaries. After reviewing the permit, please return a signed copy to the attention of Archaeological Resources Protection Act (ARPA) Permit Coordinator, Kirstie Haertel, at the address noted on the permit. Contact Kirstie at (206) 220-4136 or Kirstie_Haertel@nps.gov if you have any questions.

Sincerely,

for Laura E. Joss
Regional Director, Pacific West Region

Enclosure (Permit for Archeological Investigations)

TAKE PRIDE IN AMERICA

Please use this number
when referring to this permit

DI Form 1991 (Rev Jan 2008)
for use with DI Form 1926
OMB No. 1024-0037

No. **PWR-1979-17-CA-12 (CHIS)**

United States Department of the Interior

PERMIT FOR ARCHEOLOGICAL INVESTIGATIONS

To conduct archeological work on Department of the Interior lands and Indian lands under the authority of:

- ☑ The Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa-mm) and its regulations (43 CFR 7).
- ☐ The Antiquities Act of 1906 (P.L. 59-209; 34 Stat. 225, 16 U.S.C. 431-433) and its regulations (43 CFR 3).
- ☐ Supplemental regulations (25 CFR 262) pertaining to Indian lands.
- ☐ Bureau-specific statutory and/or regulatory authority: _____

1. Permit issued to: Lisa Thomas, Sea Range Support Branch Naval Air Warfare Center Weapons Division	2. Under application dated: June 25, 2017
3. Address: 575 "I" Avenue, Bldg. 53 Point Mugu, NAWCWD CA 93042-5049	4. Telephone number(s): 805-989-1938 5. E-mail address(es): Lisa.Thomas@Navy.Mil
6. Name of Permit Administrator: Lisa Thomas Telephone number(s): 805-989-1938 Email address(es): Lisa.Thomas@Navy.Mil	7. Name of Principal Investigator(s): Lisa Thomas, USN Dr. Rene Vellanoweth, CSU-LA Telephone number(s): 805-989-1938 / 323-343-2439 Email address(es): Lisa.Thomas@Navy.Mil Rvellan@calstatela.edu
8. Name of Field Director(s) authorized to carry out field projects: Lisa Thomas Rene Vellanoweth, Ph.D.	Telephone number(s): 805-989-1938 / 323-343-2439 Email address(es): Lisa.Thomas@Navy.Mil Rvellan@calstatela.edu
9. Activity authorized: Site Recordation, Limited Testing / Collecting and Monitoring	
10. On lands described as follows: The project is within Channel Islands National Park boundaries on Santa Cruz Island. The Area of Direct Impact will run from Prisoners Harbor south and east to UTM 256623 E / 3764747 N. The area is spatially defined in the Archaeology Testing Plan and should be used for reference as it relates to this permit.	
11. During the duration of the project: From: August 1, 2017 To: January 1, 2018	
12. Name and address of the curatorial facility in which collections, records, data, photographs, and other documents resulting from work under this permit shall be deposited for permanent preservation on behalf of the United States Government: All materials and copy of the data generated from the project will be provided to Laura Kirn for accessioning into the Channel Islands Curation Facility and Archives.	
13. Permittee is required to observe the listed standard permit conditions and the special permit conditions attached to this permit.	
14. Signature and title of approving official: Acting Regional Director Regional Director, Pacific West Region, National Park Service	15. Date: 8/2/17

15. Standard Permit Conditions

a. This permit is subject to all applicable provisions of 43 CFR Part 3, 43 CFR 7, and 25 CFR 262, and applicable departmental and bureau policies and procedures, which are made a part hereof.

b. The permittee and this permit are subject to all other Federal, State, and local laws and regulations applicable to the public lands and resources.

c. This permit shall not be exclusive in character, and shall not affect the ability of the land managing bureau to use, lease or permit the use of lands subject to this permit for any purpose.

d. This permit may not be assigned.

e. This permit may be suspended or terminated for breach of any condition or for management purposes at the discretion of the approving official, upon written notice.

f. This permit is issued for the term specified in 11 above.

g. Permits issued for a duration of more than one year must be reviewed annually by the agency official and the permittee.

h. The permittee shall obtain all other required permit(s) to conduct the specified project.

i. Archeological project design, literature review, development of the regional historic context framework, site evaluation, and recommendations for subsequent investigations must be developed with direct involvement of an archeologist who meets the Secretary of the Interior's Standards for Archeology and Historic Preservation; fieldwork must be generally overseen by an individual who meets the Secretary of the Interior's Standards for Archeology and Historic Preservation.

j. Permittee shall immediately request that the approving official (14. above) make a modification to accommodate any change in an essential condition of the permit, including individuals named and the nature, location, purpose, and time of authorized work, and shall without delay notify the approving official of any other changes affecting the permit or regarding information submitted as part of the application for the permit. Failure to do so may result in permit suspension or revocation.

k. Permittee may request permit extension, in writing, at any time prior to expiration of the term of the permit, specifying a limited, definite amount of time required to complete permitted work.

l. Any correspondence about this permit or work conducted under its authority must cite the permit number. Any publication of results of work conducted under the authority of this permit must cite the approving bureau and the permit number.

m. Permittee shall submit a copy of any published journal article and any published or unpublished report, paper, and manuscript resulting from the permitted work (apart from those required in items q. and s., below), to the approving official and the appropriate official of the approved curatorial facility (item 12 above).

n. Prior to beginning any fieldwork under the authority of this permit, the permittee, following the affected bureau's policies and procedures, shall contact the field office manager responsible for administering the lands involved to obtain further instructions.

o. Permittee may request a review, in writing to the official concerned, of any disputed decision regarding inclusion of specific terms and conditions or the modification, suspension, or revocation of this permit, setting out reasons for believing that the decision should be reconsidered.

p. Permittee shall not be released from requirements of this permit until all outstanding obligations have been satisfied, whether or not the term of the permit has expired. Permittee may be subject to civil penalties for violation of any term or condition of this permit.

15. Standard Permit Conditions (continued)

q. Permittee shall submit a preliminary report to the approving official within a timeframe established by the approving official, which shall be no later than 6 weeks after the completion of any episode of fieldwork, setting out what was done, how it was done, by whom, specifically where, and with what results, including maps, GPS data, an approved site form for each newly recorded archeological site, and the permittee's professional recommendations, as results require. If other than 6 weeks, the timeframe shall be specified in Special Permit Condition p. Depending on the scope, duration, and nature of the work, the approving official may require progress reports, during or after the fieldwork period or both, and as specified in Special Permit Condition r.

r. Permittee shall submit a clean, edited draft final report to the agency official for review to insure conformance with standards, guidelines, regulations, and all stipulations of the permit. The schedule for submitting the draft shall be determined by the agency official.

s. Permittee shall submit a final report to the approving official not later than 180 days after completion of fieldwork. Where a fieldwork episode involved only minor work and/or minor findings, a final report may be submitted in place of the preliminary report. If the size or nature of fieldwork merits, the approving official may authorize a longer timeframe for the submission of the final report as specified in Special Permit Condition q.

t. Two copies of the final report, a completed NTIS Report Documentation Page (SF-298), available at http://www.ntis.gov/pdf/rdpform.pdf, and a completed NADB-Reports Citation Form, available at http://www.cr.nps.gov/aad/tools/nadbform_update.doc, will be submitted to the office issuing the permit.

u. The permittee agrees to keep the specific location of sensitive resources confidential. Sensitive resources include threatened species, endangered species, and rare species, archeological sites, caves, fossil sites, minerals, commercially valuable resources, and sacred ceremonial sites.

v. Permittee shall deposit all artifacts, samples and collections, as applicable, and original or clear copies of all records, data, photographs, and other documents, resulting from work conducted under this permit, with the curatorial facility named in item 12, above, not later than 90 days after the date the final report is submitted to the approving official. Not later than 180 days after the final report is submitted, permittee shall provide the approving official with a catalog and evaluation of all materials deposited with the curatorial facility, including the facility's accession and/or catalog numbers.

w. Permittee shall provide the approving official with a confirmation that museum collections described in v. above were deposited with the approved curatorial facility, signed by an authorized curatorial facility official, stating the date materials were deposited, and the type, number and condition of the collected museum objects deposited at the facility.

x. Permittee shall not publish, without the approving official's prior permission, any locational or other identifying archeological site information that could compromise the Government's protection and management of archeological sites.

y. For excavations, permittee shall consult the OSHA excavation standards which are contained in 29 CFR §1926.650, §1926.651 and §1926.652. For questions regarding these standards contact the local area OSHA office, OSHA at 1-800-321-OSHA, or the OSHA website at http://www.osha.gov.

z. Special permit conditions attached to this permit are made a part hereof.

16. Special Permit Conditions

☐ a. Permittee shall allow the approving official and bureau field officials, or their representatives, full access to the work area specified in this permit at any time the permittee is in the field, for purposes of examining the work area and any recovered materials and related records.

☑ b. Permittee shall cease work upon discovering any human remains and shall immediately notify the approving official or bureau field official. Work in the vicinity of the discovery may not resume until the authorized official has given permission.

☑ c. Permittee shall backfill all subsurface test exposures and excavation units as soon as possible after recording the results, and shall restore them as closely as reasonable to the original contour.

☑ d. Permittee shall not use mechanized equipment in designated, proposed, or potential wilderness areas unless authorized by the agency official or a designee in additional specific conditions associated with this permit.

☐ e. Permittee shall take precautions to protect livestock, wildlife, the public, or other users of the public lands from accidental injury in any excavation unit.

☐ f. Permittee shall not conduct any flint knapping or lithic replication experiments at any archeological site, aboriginal quarry source, or non-site location that might be mistaken for an archeological site as a result of such experiments.

☐ g. Permittee shall perform the fieldwork authorized in this permit in a way that does not impede or interfere with other legitimate uses of the public lands, except when the authorized officer specifically provides otherwise.

☑ h. Permittee shall restrict vehicular activity to existing roads and trails unless the authorized officer provides otherwise.

☑ i. Permittee shall keep disturbance to the minimum area consistent with the nature and purpose of the fieldwork.

☐ j. Permittee shall not cut or otherwise damage living trees unless the authorized officer gives permission.

☐ k. Permittee shall take precautions at all times to prevent wildfire. Permittee shall be held responsible for suppression costs for any fires on public lands caused by the permittee's negligence. Permittee may not burn debris without the authorized officer's specific permission.

☐ l. Permittee shall conduct all operations in such a manner as to prevent or minimize scarring and erosion of the land, pollution of the water resources, and damage to the watershed.

☐ m. Permittee shall not disturb resource management facilities within the permit area, such as fences, reservoirs, and other improvements, without the authorized officer's approval. Where disturbance is necessary, permittee shall return the facility to its prior condition, as determined by the authorized officer.

☑ n. Permittee shall remove temporary stakes and/or flagging, which the permittee has installed, upon completion of fieldwork.

☑ o. Permittee shall clean all camp and work areas before leaving the permit area. Permittee shall take precautions to prevent littering or pollution on public lands, waterways, and adjoining properties. Refuse shall be carried out and deposited in approved disposal areas.

☐ p. Permittee shall submit the preliminary report within _____ days/weeks of completion of any episode of fieldwork..

☐ q. Permittee shall submit the final report within _____ days/weeks/months after completion of fieldwork..

☐ r. Permittee shall submit progress reports every _____ months over the duration of the project.

☑ s. Additional special permit conditions are attached.

Special Permit Conditions Continuation Sheet

t. One paper copy and one electronic copy (PDF) each, of the draft and final survey report shall be mailed or delivered separately to:

Laura Kirn, Chief of Cultural Resources

Channel Islands National Park
1901 Spinnaker Drive
Ventura, CA 93001

And

Kirstie L. Haertel, ARPA Permit Coordinator
Cultural Resources Program
National Park Service, Pacific West Region
909 1st Avenue; Suite 5
Seattle, WA 98104

u. An electronic copy of any resultant cultural resources GPS and GIS files will be provided to the Park's Cultural Resources Program Manager when the final report is delivered.

v. The ARPA permit number shall appear on the cover and title page of the final report.

w. Standard Permit Condition t. is waived.

x. The preliminary report described in Standard Permit Condition q. is not required provided that a draft report is submitted within six weeks of completion of fieldwork.

y. The survey and resultant draft and final reports must meet or exceed the Secretary of the Interior's Standards and Guidelines for Identification [as amended and annotated] which can be retrieved from http://www.nps.gov/history/local-law/arch_stnds_2.htm

By signing below, I, the Principal Investigator, acknowledge that I have read and understand the Permit for Archeological Investigations and agree to its terms and conditions as evidenced by my signature below and initiation of work or other activities under the authority of this permit.

Signature and title:	Date:

Paperwork Reduction Act and Estimated Burden Statement: This information is being collected pursuant to 16 U.S.C. 470cc and 470mm, to provide the necessary facts to enable the Federal land manager (1) to evaluate the applicant's professional qualifications and organizational capability to conduct the proposed archeological work; (2) to determine whether the proposed work would be in the public interest; (3) to verify the adequacy of arrangements for permanent curatorial preservation, as United States property, of specimens and records resulting from the proposed work; (4) to ensure that the proposed activities would not be inconsistent with any management plan applicable to the public lands involved; (5) to provide the necessary information needed to complete the Secretary's Report to Congress on Federal Archeology Programs; and (6) to allow the National Park Service to evaluate Federal archeological protection programs and assess compliance with the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470). Submission of the information is required before the applicant may enjoy the benefit of using publicly owned archeological resources. To conduct such activities without a permit is punishable by felony-level criminal penalties, civil penalties, and forfeiture of property. A federal agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number. Public reporting for this collection of information is estimated to average three hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Departmental Consulting Archeologist; NPS; 1849 C Street, NW (2275); Washington, DC 20240-0001.

Appendix C.3: NMSA Consultation

Seeley, Kenneth R CIV WD, 52F00ME

From:	Sean Hastings - NOAA Federal <sean.hastings@noaa.gov>
Sent:	Friday, March 30, 2018 15:26
To:	Delisle, Sarah K CIV NAVAIR, 52F00ME; Seeley, Kenneth R CIV WD, 52F00ME
Cc:	Makeyev, Claudia F CIV WD; Chris Mobley - NOAA Federal; Lauren Bregman - NOAA Federal; Vicki Wedell
Subject:	[Non-DoD Source] Re: CINMS Response

Hello Sarah and Ken -

Thank you for providing responses to the Channel Islands National Marine Sanctuary comments on the Department of the Navy's Environmental Assessment (EA)/Overseas Environmental Assessment for a Fiber Optic communications Undersea System Replacement at the NAVAIR Sea Range, Point Mugu, California. We appreciate the Navy's commitment to address the consultation requirements of the National Marine Sanctuaries Act as authorized under Section 304(d) of 16 U.S.C. 1434(d).

We request further clarification on your responses below.

Section 2.1.2.5 Offshore Maintenance

- An underwater fiber optic cable monitoring system will be implemented that will allow the Navy to remotely continuously monitor the status of the FOCUS cable. This is a change from the draft EA and it reflects the newest and best available technology to minimize disturbance. Given the functionality of this new technology, maintenance by divers will only be required in the event that an issue is detected by the monitoring system. Maintenance is therefore not anticipated at regular intervals and the EA/OEA will be updated to reflect this.

Sanctuary Comment
Our comment on maintenance and primary concern with respect to the cable post installation is the possible physical impacts to sanctuary habitats and resources where the cable is uncovered or becomes uncovered and moves on the seabed and in the water column. Can the referenced monitoring system detect if the cable becomes uncovered and if there is movement of the cable? If not, please detail how the Navy can address this concern.

Section 2.1.3 Conservation Measures

- To avoid marine mammal and listed bird breeding seasons and the congregations of endangered blue and fin whales and the threatened humpback known to occur in the Sanctuary through late October, HDD and construction activities at Santa Cruz Island will only occur between the end of October and December 15. The EA/OEA will be updated to include this adjustment to the conservation measures.

Sanctuary Comment

Thank you for shifting the construction time period to later in the year to avoid endangered whales. Note these species can be present later in the year as well, for example, blue and fin whales were present in the region through December 2017. To address the possible presence of endangered whales and to mitigate cable installation impacts we recommend the Navy use qualified marine mammal observers and well established best management practices, such as installation shut down protocols to minimize disturbance to whales. We recognize in the Draft EA Conservation Measures section

2.1.3 the reference to providing a qualified biologist to monitor construction areas with listed species, but is not clear if this measure applies to the offshore marine environment.

Section 2.1.4.2 Alternatives Analyzed in this EEA/OEA

- The proposed route crosses into the Channel Islands National Marine Sanctuary. The current route avoids the Footprint Marine Reserve, Anacapa Marine Conservation Area and Anacapa Marine Reserve but needs to run within the Sanctuary boundary east and north of Anacapa Island and Santa Cruz Island to avoid existing oil and gas production platforms and associated cables and pipelines to the North. This route will avoid the maximum amount of rocky, high relief habitat to satisfy the National Marine Fisheries Service's (NMFS) request to avoid impacting Essential Fish Habitat.

Sanctuary Comment

To avoid injury to sanctuary resources routing the cable outside the sanctuary for as long as feasible is the most reasonable and prudent alternative. Given there are no oil and gas production platforms east of Anacapa Island it is not clear why the cable "needs to run within the Sanctuary boundary" in this area.

We appreciate the Navy's recognition to avoid high relief habitat to avoid impacts to Essential Fish Habitat. The sanctuary has recently acquired high resolution bathymetric and associated habitat data in the region of the proposed cable route. We are reviewing this data and in communication with the National Marine Fisheries Service to determine the least impactful route with respect to high relief and sensitive habitats. We will share our findings as soon as possible to continue the discussion regarding routing.

Thank you again for the ongoing communications and exchange of information. We look forward to your additional information and will continue to work with the Navy to reach a mutually acceptable resolution to the sanctuary consultation process.

VR,

Sean Hastings

On Fri, Mar 16, 2018 at 3:51 PM, Makeyev, Claudia F CIV WD <claudia.makeyev@navy.mil <mailto:claudia.makeyev@navy.mil> > wrote:

Hello Sean,

Sarah Delisle received Chris Mobley's voicemail this morning regarding the CINMS consultation and we appreciate your attention on the FOCUS EA.

The project is at a critical point and really do need a response by March 30th. If you need to discuss anything beforehand, please do not hesitate to reach out by email or phone.

As of March 26th, I will be on leave but Sarah and/or Ken will answer any questions after that.

VR,

Claudia Makeyev

Environmental Protection Specialist
NAVAIR Ranges Sustainability Office
San Nicolas Island & Point Mugu
Bldg.53A, Code 52F00ME
575 I Avenue, Suite 1
Point Mugu, CA 93042

(805) 989-3807 <tel:%28805%29%20989-3807>
(805) 312-0338 <tel:%28805%29%20312-0338>
Island office (805) 989-2210 <tel:%28805%29%20989-2210>

Seeley, Kenneth R CIV WD, 52F00ME

From: Sean Hastings - NOAA Federal <sean.hastings@noaa.gov>
Sent: Sunday, April 01, 2018 19:27
To: Delisle, Sarah K CIV NAVAIR, 52F00ME; Seeley, Kenneth R CIV WD, 52F00ME
Cc: Makeyev, Claudia F CIV WD; Chris Mobley - NOAA Federal; Lauren Bregman - NOAA Federal; Vicki Wedell; Ryan Freedman - NOAA Affiliate
Subject: [Non-DoD Source] Re: CINMS Response

Hello -

I forgot to ask - can you provide a GIS shapefile of the proposed route?

It will help us with our comparison to the bathy and habitat data. I have cc'd Ryan Freedman with our Research Dept., please cc' him with the GIS file.

Thank you -

Sean

Seeley, Kenneth R CIV WD, 52F00ME

From: Seeley, Kenneth R CIV WD, 52F00ME
Sent: Monday, April 23, 2018 9:28
To: Sean Hastings - NOAA Federal
Cc: Delisle, Sarah K CIV NAVAIR, 52F00ME; Makeyev, Claudia F CIV WD; Chris Mobley - NOAA Federal; Lauren Bregman - NOAA Federal; Vicki Wedell; Ryan Freedman - NOAA Affiliate; Bouvier, Corey A CIV NAVAIR, K00000D; Lousen, Chad A CIV NAVFAC, MUGU
Subject: RE: [Non-DoD Source] Re: CINMS Response

Sean,

Thank you for your response. Just to be clear, did the 45-day clock begin on April 5, when we submitted our response to your questions?

v/r,

Ken Seeley

-----Original Message-----
From: Sean Hastings - NOAA Federal [mailto:sean.hastings@noaa.gov]
Sent: Friday, April 20, 2018 3:38 PM
To: Seeley, Kenneth R CIV WD, 52F00ME
Cc: Delisle, Sarah K CIV NAVAIR, 52F00ME; Makeyev, Claudia F CIV WD; Chris Mobley - NOAA Federal; Lauren Bregman - NOAA Federal; Vicki Wedell; Ryan Freedman - NOAA Affiliate; Bouvier, Corey A CIV NAVAIR, K00000D; Lousen, Chad A CIV NAVFAC, MUGU
Subject: Re: [Non-DoD Source] Re: CINMS Response

Hello Ken -

Thank you for the additional clarification regarding post installation cable monitoring, the Navy's commitment to use trained marine mammal observers during cable installation offshore, and for providing the shape files for the Navy's proposed cable routes. We are still in the process of reviewing the shape files with the bathymetric data we have recently acquired.

Once we have determined we have sufficient information, we will submit, within 45 days, our findings and recommend any reasonable and prudent alternatives, in accordance with the NMSA.

Further details on where we are in the consultation process can be found at this link <https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/management/pdfs/304d.pdf> - see especially pp. 9-10. Following resolution on the cable route we will invite you to submit a permit application <https://sanctuaries.noaa.gov/management/permits/welcome.html> .

Thank you,

Sean

On Thu, Apr 5, 2018 at 12:37 PM, Seeley, Kenneth R CIV WD, 52F00ME <kenneth.seeley@navy.mil> wrote:

Sean,

Thank you for your comments and questions. We are happy to clarify our plan and provide you with the additional information you requested.

Due to the number of files and file sizes, we will send the requested shape files in a separate email.

With respect to your first comment regarding the monitoring of the fiber optic cable, we asked our technical experts here to provide a more detailed description of the technology involved and they provided us with the information below.

The cable monitoring system has an AIS (Automatic Identification System) that can keep track of the cable's position. The system is even more accurate when detecting any change in the cable when an overlay of the submarine cable route is included in the system.

The active cable monitoring system currently under consideration is the EXFO FG-750 Fiber Guardian Series system. The system is basically a multiport OTDR (Optical Time-Domain Reflectometer), meaning it injects a series of optical pulses into the fiber under test and extracts, from the same end of the fiber, light that is scattered (Rayleigh backscatter) or reflected back from points along the fiber. In other words we send a test light signal down the cable and see what comes back. Currently there are plans to have the monitoring software running here at Pt. Mugu where we can receive any alerts and respond to them in real-time.

Please let me know if that information is adequate or if you have any additional specific questions that you would like to have addressed and we will do our best to get answers.

With respect to your second comment regarding conservation measures, our analysis indicates that the proposed action would not affect marine mammals. However, we can commit to having appropriately trained observers on the work boats and if anything is observed during installation of the cable we will follow appropriate operating procedures in response.

With respect to your third comment regarding modifications to the proposed cable route, as you are aware, the Navy has made every reasonable effort to incorporate avoidance, conservation, and mitigation measures to minimize adverse impacts to coastal resources, including cable alignments that avoid offshore hard-bottom habitat and environmentally and culturally sensitive nearshore habitats. As a result, we believe we have kept any potential impacts to Sanctuary resources to a bare minimum, with any remaining impacts being temporary in nature and limited in their geographic scope. However, if your analysis, based on your new data, demonstrates that we are incorrect in our conclusion, we would appreciate any reasonable and appropriate recommendations, prior to the issuance of your permit. However, we would need to work with our technical experts to determine the technical feasibility of any cable route changes. Further, in order to keep the process moving forward, we would want to try drafting our Final EA and a draft FONSI to indicate that we are continuing consultation with CINMS on modifications to the cable route that would help to further reduce already non-significant (in a NEPA context) impacts to Sanctuary resources. Hopefully that approach would meet with your approval.

Again, thank you for your comments and quick turn-around on our documents. If you require additional clarifying information please let me know in the next few days. We look forward to a continued dialogue on the issuance of a permit for the project and will consider this portion of our consultation concluded unless we hear otherwise by April 20 2018.

Respectfully,

Ken Seeley

Kenneth R. Seeley, Ph.D.
Marine Resources
NAVAIR Sustainability Office
Point Mugu Sea Range
(comm): 805-989-0927
(DSN): 312-351-0927

Seeley, Kenneth R CIV WD, 52F00ME

From: Sean Hastings - NOAA Federal <sean.hastings@noaa.gov>
Sent: Tuesday, April 24, 2018 13:47
To: Seeley, Kenneth R CIV WD, 52F00ME; Makeyev, Claudia F CIV WD; Delisle, Sarah K CIV NAVAIR, 52F00ME
Cc: Vicki Wedell; Chris Mobley - NOAA Federal; Lauren Bregman - NOAA Federal; Jonelle Dilley - NOAA Federal; Bouvier, Corey A CIV NAVAIR, K00000D; Lousen, Chad A CIV NAVFAC, MUGU; Ryan Freedman - NOAA Affiliate
Subject: Re: [Non-DoD Source] Re: CINMS Response

Hi Ken,

Thanks very much for your question, and your continued willingness to provide information to the Sanctuary about the proposed cable. We understand that you have determined that the proposed cable route through the Sanctuary will have only temporary impacts to the Sanctuary, but we also need to have some documentation and analysis that analyzes the feasibility of a route outside of the Sanctuary in order for us to satisfy our statutory requirements. Once we have this information, we will notify you that our 45-day clock for the NMSA 304(d) consultation will commence, and we will also be able to begin processing your permit application. Some additional information is provided below on our statutory processes. We have also generated some additional route and habitat information to assist you.

As you know, the Sanctuary has two separate statutory requirements that must be satisfied for the proposed cable: (1) a 304(d) interagency consultation, and (2) a permit for prohibited activities. Under 304(d), if the Sanctuary finds that the proposed route will injure Sanctuary resources, such as benthic habitat resources, the Sanctuary "shall (within 45 days of receipt of complete information on the proposed agency action) recommend reasonable and prudent alternatives, which may include conduct of the action elsewhere." (Section 304(d)(2).) If Navy rejects the Sanctuary's recommended alternative, and the route injures sanctuary resources, even temporarily, Navy "shall promptly prevent and mitigate further damage and restore or replace the sanctuary resource." (Section 304(d)(4).)

Furthermore, pursuant to our permitting criteria under 15 C.F.R. § 922.74(b)(8), the Sanctuary must find that it is "necessary to conduct the proposed activity within the Sanctuary." One way to meet this criteria would be for Navy to analyze the feasibility to route the cable outside of the Sanctuary.

To that end, we have identified an alternative route for the proposed action that avoids to the maximum extent practicable the Sanctuary boundary and other federally-designated sensitive habitats. In addition to protecting the Sanctuary resources, this alternative route avoids the federal water portions of the Anacapa Island and Scorpion Marine Reserves designated under the NMSA, and the Habitat Areas of Particular Concern designated under the Magnuson-Stevens Fisheries Conservation and Management Act. I have attached to this e-mail a map and a map package for the route.

We look forward to hearing back from you about this route. We understand you may be on a tight deadline with your NEPA document. Although you have requested to use the Environmental Assessment as your Sanctuary Resource Statement (SRS), you may submit this additional information about a route outside of the Sanctuary to us as a supplement to your SRS. We are standing by to continue consultation and process your permit application once submitted.

Thank you,

Sean

On Mon, Apr 23, 2018 at 9:28 AM, Seeley, Kenneth R CIV WD, 52F00ME <kenneth.seeley@navy.mil <mailto:kenneth.seeley@navy.mil> > wrote:

Sean,

Thank you for your response. Just to be clear, did the 45-day clock begin on April 5, when we submitted our response to your questions?

v/r,

Ken Seeley

CINMS_CableRouteProposal.pdf <https://drive.google.com/a/noaa.gov/file/d/1MIb3oiXvGPVerlFybRylcWHkEUjyigKL/view?usp=drive_web>

CINMS_CableRouteProposal.mpk <https://drive.google.com/a/noaa.gov/file/d/17EiUH1QdS7T_DqOT_F-SoCoiSbhGWTr4/view?usp=drive_web>

Sean Hastings
Resource Protection Coordinator
Channel Islands National Marine Sanctuary

sean.hastings@noaa.gov <mailto:sean.hastings@noaa.gov>
(805) 893-6424 wk
(805) 705-1790 cell

University of California Santa Barbara
Ocean Science Education Building 514, MC 6155
Santa Barbara, CA 93106-6155

The mission of NOAA's national marine sanctuaries is to conserve, protect and enhance the biodiversity, ecological integrity and cultural legacy of these special underwater places.

---------- Forwarded message ---------
From: Chris Mobley - NOAA Federal <chris.mobley@noaa.gov <mailto:chris.mobley@noaa.gov> >
Date: Wed, May 2, 2018 at 1:12 PM
Subject: FOCUS cable consultation with Channel Islands NMS
To: kenneth.seeley@navy.mil <mailto:kenneth.seeley@navy.mil> , sarah.delisle@navy.mil <mailto:sarah.delisle@navy.mil> , claudia.makeyev@navy.mil <mailto:claudia.makeyev@navy.mil> , corey.bouvier@navy.mil <mailto:corey.bouvier@navy.mil> , chad.lousen@navy.mil <mailto:chad.lousen@navy.mil>
Cc: "sean.hastings" <Sean.Hastings@noaa.gov <mailto:Sean.Hastings@noaa.gov> >, Lauren Bregman - NOAA Federal <lauren.bregman@noaa.gov <mailto:lauren.bregman@noaa.gov> >, Ryan Freedman - NOAA Affiliate <ryan.m.freedman@noaa.gov <mailto:ryan.m.freedman@noaa.gov> >

Dear Mr. Seeley and Navy Colleagues,

Thank you for submitting the Department of the Navy's Draft Environmental Assessment (Draft EA)/Overseas Environmental Assessment for a Fiber Optic Communications Undersea System Replacement at the NAVAIR Sea Range, Point Mugu, California, initiating consultation under Section 304(d) of the National Marine Sanctuaries Act. We understand you wish the Channel Islands National Marine Sanctuary to consider this document in lieu of a specific Sanctuary Resource Statement (SRS).

As per our communication dated April 24, 2018, the Channel Islands National Marine Sanctuary has requested analysis of a route that avoids to the maximum extent practicable the Sanctuary boundary and other federally-designated sensitive habitats. Once we have this information, we will notify you of the status of the consultation, including applicable timelines, and we will also be able to begin processing your permit application.

We understand you are preparing to finalize your EA in order select an alternative for the entire project, for which the portion subject to Section 304(d) consultation is only a piece. We understand that the specific route in the vicinity of the Sanctuary may be open to modification. Although you have requested to use the EA as your SRS, please submit this additional information about the alternative route as a supplement to your SRS.

In accordance with our statutory and regulatory requirements, the Channel Islands National Marine Sanctuary looks forward to continuing our consultation process with you, and reviewing your permit application.

--

Sincerely,

Chris Mobley
Superintendent

Channel Islands National Marine Sanctuary
University of California Santa Barbara, MC 6155

Ocean Science Education Building
Santa Barbara, CA 93106-6155

Phone: 805-893-6416
Fax: (805) 568-1582
channelislands.noaa.gov <http://channelislands.noaa.gov>
Follow us on Facebook <https://www.facebook.com/pages/NOAA-Channel-Islands-National-Marine-Sanctuary/375160569258277>
Follow us on Twitter <https://twitter.com/NOAA_CINMS>

--

Sean Hastings
Resource Protection Coordinator
Channel Islands National Marine Sanctuary

sean.hastings@noaa.gov <mailto:sean.hastings@noaa.gov>
(805) 893-6424 wk
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Santa Barbara, CA 93106-6155

The mission of NOAA's national marine sanctuaries is to conserve, protect and enhance the biodiversity, ecological integrity and cultural legacy of these special underwater places.

Seeley, Kenneth R CIV WD, 52F00ME

From:	Seeley, Kenneth R CIV WD, 52F00ME
Sent:	Monday, July 23, 2018 11:35
To:	'Chris Mobley - NOAA Federal'
Cc:	sean.hastings; Lauren Bregman - NOAA Federal; Ryan Freedman - NOAA Affiliate; Delisle, Sarah K CIV NAVAIR, 52F00ME; Bouvier, Corey A CIV NAVAIR, K00000D; Lousen, Chad A CIV NAVFAC, MUGU; Racette, Russell A CIV NUWC NWPT; French, Alison N CIV NUWC NWPT
Subject:	RE: [Non-DoD Source] FOCUS cable consultation with Channel Islands NMS
Attachments:	SCrI Cables View.pdf; SCrI Cables View w_Habitat Classification.pdf

Mr. Mobley,

Thank you for your patience while the Navy evaluated CINMS' alternate route for the proposed FOCUS II Cable, which you provided to the Navy via e-mail on 24 April 2018. The Navy has determined that we can partially accept your proposed alternative (see attached figures).

The Navy's conclusions regarding your proposed alternative are as follows:

1. It would be technically impractical for the San Nicolas Island (SNI) to Santa Cruz Island (SCrI) segment to cross the canyon moving East and then cross back again to the West. This would add considerable technical complexity due to the steeper angles involved in the cable installation and could reduce the life-cycle of the cable survivability. The originally proposed Point Mugu (PtM) to SCrI canyon crossing was carefully selected for technical feasibility and cable survivability. Therefore, we cannot accept your proposed alternative for this cable segment.

2. Your proposed alternative route included moving the cable closer to existing offshore oil platforms, in order to minimize the amount of cable that would run within the sanctuary. The original Navy routes specifically avoided the platforms, due to the proximity of the oil and gas operations, because of the potential for both natural and man-made objects on the seafloor. An additional survey would be required, but even with high resolution mapping capabilities, these objects on the seafloor could go undetected due to size, increasing the risks associated with the cable installation. Therefore, we cannot accept this portion of your alternative route.

3. Your proposed alternate route avoids the Marine Protected Area Federal extensions, whereas our original proposal did not. While this will add cable cost and will require additional survey, we can accept this portion of your proposed alternative route.

We hope that this partial acceptance of your proposed alternative route helps to provide the additional information required to meet your statutory and regulatory process requirements and we look forward to resolving any remaining areas of disagreement. Please confirm whether this correspondence, confirming the Navy's acceptance in part and rejection in part of the alternate route proposed by CINMS, will serve to trigger the 45-day consultation period.

Per our earlier discussion and as mentioned in your 2 May 2018 e-mail to me, the Navy intends to finalize our Environmental Assessment for the entire FOCUS II cable project in the very near future. We fully anticipate that our 304(d) consultation on the SCrI portion of the project will continue after this EA has been completed.

We look forward to hearing from you in the very near future.

Respectfully,

Ken Seeley

Kenneth R. Seeley, Ph.D.
Marine Resources
NAVAIR Sustainability Office
Point Mugu Sea Range
(comm): 805-989-0927
(DSN): 312-351-0927

-----Original Message-----
From: Chris Mobley - NOAA Federal <chris.mobley@noaa.gov>
Sent: Wednesday, May 02, 2018 1:12 PM
To: Seeley, Kenneth R CIV WD, 52F00ME <kenneth.seeley@navy.mil>; Delisle, Sarah K CIV NAVAIR, 52F00ME <sarah.delisle@navy.mil>; Makeyev, Claudia F CIV WD <claudia.makeyev@navy.mil>; Bouvier, Corey A CIV NAVAIR, K00000D <corey.bouvier@navy.mil>; Lousen, Chad A CIV NAVFAC, MUGU <chad.lousen@navy.mil>
Cc: sean.hastings <Sean.Hastings@noaa.gov>; Lauren Bregman - NOAA Federal <lauren.bregman@noaa.gov>; Ryan Freedman - NOAA Affiliate <ryan.m.freedman@noaa.gov>
Subject: [Non-DoD Source] FOCUS cable consultation with Channel Islands NMS

Dear Mr. Seeley and Navy Colleagues,

Thank you for submitting the Department of the Navy's Draft Environmental Assessment (Draft EA)/Overseas Environmental Assessment for a Fiber Optic Communications Undersea System Replacement at the NAVAIR Sea Range, Point Mugu, California, initiating consultation under Section 304(d) of the National Marine Sanctuaries Act. We understand you wish the Channel Islands National Marine Sanctuary to consider this document in lieu of a specific Sanctuary Resource Statement (SRS).

As per our communication dated April 24, 2018, the Channel Islands National Marine Sanctuary has requested analysis of a route that avoids to the maximum extent practicable the Sanctuary boundary and other federally-designated sensitive habitats. Once we have this information, we will notify you of the status of the consultation, including applicable timelines, and we will also be able to begin processing your permit application.

We understand you are preparing to finalize your EA in order select an alternative for the entire project, for which the portion subject to Section 304(d) consultation is only a piece. We understand that the specific route in the vicinity of the Sanctuary may be open to modification. Although you have requested to use the EA as your SRS, please submit this additional information about the alternative route as a supplement to your SRS.

In accordance with our statutory and regulatory requirements, the Channel Islands National Marine Sanctuary looks forward to continuing our consultation process with you, and reviewing your permit application.

--

Sincerely,

Chris Mobley
Superintendent

Channel Islands National Marine Sanctuary University of California Santa Barbara, MC 6155

Ocean Science Education Building
Santa Barbara, CA 93106-6155

Phone: 805-893-6416
Fax: (805) 568-1582
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<https://www.facebook.com/pages/NOAA-Channel-Islands-National-Marine-Sanctuary/375160569258277>
Follow us on Twitter <https://twitter.com/NOAA_CINMS>

Appendix C.4: CZMA Consistency Determination

DEPARTMENT OF THE NAVY
NAVAL BASE VENTURA COUNTY
311 MAIN ROAD SUITE 1
POINT MUGU, CA 93042-5033

IN REPLY REFER TO
5090
Ser N0000CV/1138

25 OCT 16

Mr. Mark Delaplaine
Federal Consistency Supervisor
California Coastal Commission
45 Fremont Street, Suites 1900 & 2000
San Francisco, CA 94105-2219

Dear Mr. Delaplaine:

SUBJECT: COASTAL CONSISTENCY DETERMINATION FOR FIBER OPTIC COMMUNICATIONS UNDERSEA SYSTEM REPLACEMENT ON POINT MUGU SEA RANGE, NAVAL BASE VENTURA COUNTY

The U.S. Navy is submitting this Coastal Consistency Determination for the proposed Fiber Optic Communications Undersea System Replacement on the Point Mugu Sea Range located at Naval Base Ventura County, Point Mugu, CA.

This submittal is in compliance with Section 930.36 of the National Oceanic and Atmospheric Administration Federal Consistency Regulations (15 CFR 930). The U.S. Navy has determined that the proposed action would have no effect to coastal resources for the reasons identified in enclosure (1).

The U.S. Navy requests your concurrence on this proposed project. When completed, email a letter of concurrence to Ms. Deb McKay, Region National Environmental Policy Act Coordinator, at deborah.mckay@navy.mil. If you have any questions or need further information, please contact Ms. Deb McKay at (619) 532-2284.

Sincerely,

C. D. JANKE
Captain, U.S. Navy
Commanding Officer

Enclosure: 1. Coastal Consistency Determination

COASTAL CONSISTENCY DETERMINATION
FOR
FIBER OPTIC COMMUNICATIONS UNDERSEA SYSTEM (FOCUS) REPLACEMENT
ON POINT MUGU SEA RANGE,
NAVAL BASE VENTURA COUNTY POINT MUGU

In accordance with the Federal Coastal Zone Management Act (CZMA) of 1972 as amended, Section 307c(1), the United States Department of the Navy (Navy) has determined that the proposed action, Fiber Optic Communications Undersea System (FOCUS) Replacement on Point Mugu Sea Range, Naval Base Ventura County (NBVC) Point Mugu, California is consistent with the California Coastal Act of 1976 (Cal. Pub. Resources Code §§ 30200 to 30265.5) and would not adversely affect coastal resources. Therefore, the Navy is requesting your concurrence with this Coastal Consistency Determination (CCD) in compliance with the Ocean and Coastal Resource Management regulations (15 CFR 930.39).

The Navy has prepared a draft Environmental Assessment/Oversees Environmental Assessment (EA/OEA) for the proposed project. Public review of the draft EA/OEA is occurring from 30 September to 31 October 2016. It is available on the Navy Region Southwest website and in local libraries. The EA/OEA provides comprehensive descriptions for four action alternatives and one no action alternative as well as describing the resources that could be affected by the action, providing an analysis of the potential environmental consequences, and proposing minimization measures applicable to the proposed action to mitigate any adverse effects. This consistency determination presents and analyzes the preferred alternative identified in the EA/OEA. If one of the other alternatives were ultimately selected, the Navy would make a determination at that time whether there were additional effects not previously analyzed in this determination and consult with the Commission.

PROJECT LOCATION

The proposed action would take place at three sites: Naval Base Ventura County (NBVC) Point Mugu, NBVC San Nicolas Island (SNI), and Santa Cruz Island (SCrI), and the water space and submerged lands connecting the three sites within the Point Mugu Sea Range. NBVC Point Mugu is located between the City of Oxnard to the north and Point Mugu State Park to the east in Ventura County. NBVC Point Mugu operates an airfield with two runways, ordnance assembling and storing facilities, military family housing and is adjacent to the Point Mugu Sea Range. The Point Mugu Sea Range is located in Ventura and Santa Barbara counties along the Pacific Coast of Southern California and is a 36,000-square-mile sea test range extending more than 180 nautical miles (NM) seaward from shore and operated by Naval Air Warfare Center Weapons Division (NAWCWD). SNI is a 22.7-square mile U.S. Navy-owned island, 57 NM southwest of NBVC Point Mugu. SCrI is located approximately 25 NM west of NBVC Point Mugu and has an area of 96.5 square miles. The eastern 26 percent of the island is owned by the

U.S. National Park Service (NPS) as part of the Channel Islands National Park (CINP), and the western side is owned by the Nature Conservancy (TNC). A small inholding, within NPS land, is retained by TNC and leased to the Navy (hereinafter referred to as the Navy Site) for a radar facility which supports Sea Range operations.

BACKGROUND, PURPOSE AND NEED FOR PROJECT

The U.S. Navy proposes to replace an existing Fiber Optic Communications Undersea System (herein referred to as FOCUS-I) on the Point Mugu Sea Range between NBVC Point Mugu and NBVC SNI and a microwave communications system link between NBVC Point Mugu and SCrI with a new system to support Sea Range operations. This new system, FOCUS-II, would connect NBVC Point Mugu, NBVC SNI, and SCrI via new undersea fiber optic cables on the Point Mugu Sea Range. Additionally, a new water line would be installed on SCrI between Prisoners Harbor and the Navy Site to improve reliability of water conveyance and to reduce water loss from the existing system. Figure 1 provides a regional overview of the project area and the existing FOCUS-I cable alignment while Figure 2 depicts a map of the Point Mugu Sea Range. FOCUS-I is comprised of two 80-mile (mi) undersea 12-strand fiber optic cables, labeled as FOCUS A and FOCUS B. These cables were installed in 1993 and 1994 and are spliced to 48-fiber cables between the sea-to-shore interface (SSI) manholes and the Communication Buildings at NBVC Point Mugu and SNI. FOCUS-I was repaired near the SNI shore in 2006, involving the installation of a new landing site and onshore buried cable. These repairs were described in the Final Environmental Assessment for FOCUS Cable Repair at San Nicolas Island dated 2003. FOCUS-I cables have a design-life of 20 years and have already experienced signal degradation and are expected to further degrade which could lead to catastrophic failure of FOCUS-I and prevent completion of mission-essential research, development, testing and evaluation and training on the Sea Range. The 2006 repairs extended life of a very small portion of the system in the vicinity of the island but the remainder of the system is beyond its design life.

Current communications between NBVC Point Mugu and SCrI are conducted via an aging microwave system. Bandwidth requirements for SCrI have been increasing for telemetry, time-space-position information (TSPI), and video. Upgrading the current microwave system is not feasible as the original equipment manufacturer does not provide support for the system and third party vendors cannot guarantee availability of necessary parts. This system carries all data between NBVC Point Mugu and SCrI. Both the FOCUS-I and SCrI microwave systems are used to transmit and receive data signals between the three locations to track, control and communicate with air and ship traffic on the Sea Range. Loss of data signals could lead to mishaps resulting in death or injury to personnel or loss of equipment. Communications facilitated by the existing systems are critical to the safe operation of the Sea Range.

The existing water line on SCrI provides drinking water to the Navy Site by connecting to a well near Prisoners Harbor via a metal pipeline laid overland. It was originally installed in 1951. This water line leaks in many locations, leading to significant water losses. Failure of the water line would require water to be driven from the well at Prisoners Harbor to the Navy Site and could result in the inability to adequately supply water for personnel and equipment stationed at the Navy Site. This would lead to an inability to provide continuous support of the systems at SCrI.

PROJECT DESCRIPTION

The proposed FOCUS-II system would be comprised of four interlinked fiber optic cables connecting NBVC Point Mugu, SNI, and SCrI. See Figure 3 for map of the proposed cable routes. The link between Point Mugu and SNI involves two cables with slightly different alignments and there would be two onshore landings at Point Mugu. FOCUS-I would be operated and maintained until FOCUS-II is completely installed and its operational status is verified. Following FOCUS-II installation, FOCUS-I would continue to operate and would provide a second level of redundancy until it has degraded beyond the level of service required. Removal of non-functioning equipment and evaluation of how to best remove this equipment would be conducted, if required, in the future and is not part of the proposed action.

The installation of FOCUS-II preferred alternative would involve the following actions summarized below and can be found in detail in Section 2.1 of the EA/OEA.

Onshore Activities:

- Installation of new onshore interface landings at each of the three locations: two sites on Point Mugu: one near Building (Bldg) 811 and the other near Charlie Pad; one site on SNI near Coast Guard Jetty; and one site on SCrI near Prisoners Harbor. All onshore landings will use horizontal directional drilling (HDD) technology to transition under sensitive near shore coastal habitat. (See Figures 4, 5, and 6 for landing site locations)
- Use of existing underground infrastructure and installation of new buried cable at Point Mugu, connecting the nearshore HDD site to the building termination site (PM Bldg 531). (See Figure 7 for cable alignment on Point Mugu.)
- Installation of approximately 500 feet (ft) of new buried cable at SNI connecting the nearshore HDD site to an existing concrete bunker. From the bunker, existing underground infrastructure will be used to connect to the building termination site (SNI Bldg 127). (See Figure 8 for cable alignment on SNI.)
- Installation of approximately 7.49 miles (mi) of new cable (7.28 mi of cable would be buried and 1,150 ft placed in elevated cable channel) at SCrI connecting the nearshore HDD site to the building termination site (SCrI Bldg 4, also known as the Navy Site). (See Figures 9 and 10 for cable alignment on SCrI and Figure 11 for cable channel.)
- Installation of approximately 7.3 mi of new water line at SCrI in the same trenches or cable trays as the cables.

- Installation of between 20 and 80 buried concrete vaults (5 ft x5 ft x 4 ft) along the SCrI alignment.
- Periodic maintenance and inspection of the onshore cable alignments to ensure uninterrupted operation of FOCUS-II communications system.

Horizontal Directional Drilling (HDD) Operations

Each HDD site would temporarily host a drill rig, a portable crane, one 1,000-gallon (gal) reservoir for mixing and storing drilling fluid, a mud pump unit, a mud filtering system, a catch basin for drilling mud, a hydraulic power unit, a drill rig control station, a pipe rack for cable conduits, and a tool van. The drill site would require level ground thus some grading would be required prior to commencement of drilling. In addition, an in-ground buried anchoring system would require excavation of an area (35 ft x 1.5 ft x 3.3 ft deep) to ensure stability of the equipment and a small pump pit (6.6 ft x 6.6 ft x 3.3 ft deep) to allow for the recovery of drilling fluid coming from borehole back to surface. Drilling equipment and facilities would be removed upon completion of HDD and all HDD pads would be returned to their original condition.

The HDD process would involve drilling and horizontal placement of piping into the ground, ultimately creating an 8-inch (in) HDD bore hole. Drilling mud would be injected under pressure into the interior of the drill pipe. Drilling mud consists of a mixture of water and bentonite clay (a substance derived from naturally occurring clay). The drilling fluid would transfer energy to the rotating drill head which would make contact with the soil. Drilling fluid (mud and drilling cuttings) would return back through the HDD bore hole, which would be 1-in larger than the diameter of the pipe. Erosion control for the temporary HDD bore site would be installed after all equipment is in place and before drilling starts. Onshore HDD activity would occur for approximately four weeks. The sump pit would be backfilled with the original soil following completion of the drilling process.

For planning purposes, it is estimated that approximately 25,000 gal of fresh water would be required for each day of drilling, with a minimum daily requirement of 10,000 gal and a maximum of 50,000 gal. There are adequate fresh water resources at Point Mugu but on SNI water would need to be transported in volumes sufficient to accommodate drilling operations and be stored in water bladders approximately 1,500 ft from HDD site. The water supply on SCrI does not have the production or storage capacities to accommodate the drilling operations, and it would be very difficult to bring in fresh water by barge in the quantities needed, as existing offloading and storage facilities and infrastructure do not exist. Considering this, the drilling fluid used on SCrI would be generated using seawater. This seawater would be pumped through a 5-inch fire hose running from approximately 50 ft (15 m) offshore to a mixing unit used to mix the drilling fluid. Consistent with National Marine Fisheries Service (NMFS) recommendations to limit impacts to EFH, the fire hose end would be equipped with a screen grate to prevent

uptake of marine organisms. A velocity cap that reduces horizontal intake currents will be employed and intake velocities across the intake screen will not exceed 0.5 foot per second.

The seashore interface HDD would be connected to communications buildings or existing manhole systems via conduits (i.e., casing for fiber optic cable protection). Where needed trenches would be dug along existing roads and within previously disturbed or developed areas and conduits would be laid in the trenches and buried. Once the conduit installation is complete, the fiber optic cable would be pulled through the conduit. Cable installation involves equipment trucks stationed at the terminal location, manholes and vaults placed at intervals of 100 ft to 2,500 ft to enable cable pulling, strain relief, backflow preventers, and air vacuum release station. For a portion of the alignment on SCrI, conduit would be placed inside protective above-ground (elevated) channels supported by posts. Trenching will take approximately three months and cable pulling would take approximately two days at each landing site.

Water Line Installation

A 3-in polyvinyl chloride (PVC) water line would be installed in trenches or above-ground channels between the well site and the Navy site on SCrI. A trench and elevated channel originating at the well site would run down the road 930 ft connecting to the same 7-mi trench carrying the fiber optic cable along the Navy Road. The trenches would be installed with widths ranging from 4 to 20-in and depths up to 40-in.

Offshore Activities:

- HDD bore holes exiting the seafloor at depths of approximately 85 ft. in each of the three drill locations. (Approximate distance from HDD site to exit site at Point Mugu would be 4,990 ft; at SNI would be 2,960 ft; at SCrI would be 1,249 ft)
- Installation of four new underwater cable alignments (approximately 234 nautical miles of which 175.5 nm would be plowed into the seafloor), creating the interlinked communications system between Point Mugu, SNI and SCrI.
- Periodic maintenance and inspection of the offshore cable alignments (including underwater surveys and lifting of portions of exposed or damaged cable) to ensure uninterrupted operation of FOCUS-II communications system.

Installation of cabling offshore would commence following HDD operations and involve an installation vessel and an ocean construction dive team laying out fiber optic cables on the seafloor between the HDD exit sites. The vessel would be positioned at the bore tube exit point and a messenger line would be inserted into the bore tube to pull trunk cables (the segment from in-water splice joint to dry termination onshore). At each HDD exit site, two trunk cables would exit the directional drilled pipe in a maximum depth of about 85 ft. If the exit site is short of this depth, the cable will be protected with 9.76-in outer diameter split pipe between the bore exit and the splice joint to a water depth of 85 ft. The splice is a titanium cylinder approximately 6.6-in

diameter and 9-in long. The vessel would then navigate a defined route slowly (typically at 0.5 to 3 knots) while laying out the cable. Deployment of the cables would use conventional cable laying machinery to provide a gradual, controlled rate of descent to minimize risk of damage to the cables as it lands on the seafloor.

Offshore Cable Installation on the Seafloor

Cable routes were determined based on data collected during a high resolution multi-beam hydrographic survey of the FOCUS-II area conducted for each of the proposed routes. Cable routes were selected to avoid steep bathymetry since these features could create unnecessary cable strain or wear and tear. The spreading out or turning of cables is planned to occur at a constant depth to avoid placing any cables at angles to the downward slope. The installation of cables parallel to the steep slope of canyons will also be avoided. In the event that small, undetected or otherwise unavoidable outcroppings are encountered, the impact of the cable on those habitats is not anticipated to alter the substrate to the extent that habitat will be permanently lost. Over time, the cable would become encrusted by fouling organisms and act as habitat itself. Where cable crossings are necessary, the new cables would lie perpendicular across existing cables where possible.

Fiber optic cables would be laid on the seafloor between the HDD exit sites. The HDD exit sites would each be in soft sediments and a minimum of 100 yards from known kelp and sea grasses. Offshore cable alignments would traverse primarily sandy bottom, with the uncommon occurrence of rock outcroppings along each of the routes. As a means of clearing seabed debris, pre-lay grapnel run (PLGR) operations would be performed prior to the start of cable burial operations. To accomplish this, a grapnel, typically of the "flatfish" type, will be dragged along the cable routes before cable installation at a speed of approximately 1 mile per hour to clear debris such as discarded fishing gear. Any debris recovered during PLGR operations will be disposed of in compliance with local laws and regulations. The cable would then be plowed into the sandy seafloor using a towed seaplow, buried three ft deep, out to a water depth of 3,280 ft. Beyond this water depth, the cable would lie directly on the seafloor. It is estimated that 234 NM of cable would be need to complete the system. Of this, approximately 175.5 NM of the cable would be trenched into the seafloor using the seaplow. The design of the internode cable (sections between splices and cable landings) would be similar to standard submarine telecommunication cables. The cable would be over-armored for protection from the splice at the exit site out to a maximum water depth of 4,920 ft. Over-armor is a sheath of one or more additional layers of steel wires wrapped around the glass fiber optic cable.

It is not anticipated that the cable will cross any rocky habitat in water depths less than 100 ft. In the atypical instance where rocky bottom areas are encountered shallower than 98.4 ft water depth, the cable segments would be anchored to the seafloor to stabilize it. General stabilization methods involve a diver using a handheld hydraulic drill to drill a 1-in hole to a depth of 20-in.

Loose material is cleared from the hole using compressed air or water jet. A 0.75-in threaded rod is then placed into the hole and secured using a two-part acrylic epoxy. The epoxy is a rapidly hardening resin/grit compound that is much denser than water and immediately sticks to the substrate upon application by a diver. The material does not disperse into the surrounding water and is non-toxic. Approximately 7 cubic inches of epoxy would be used per hole. Afterwards, steel clamps would be secured to the threaded rods to reduce movement of the pipes and cables.

Post-lay inspection and burial will take place during or very soon after the main lay operation and is performed to attempt retro-burial of any cable that could not be buried with the seaplow, or to inspect select cable sections. Post-lay inspection and burial is typically performed with a remotely operated vehicle (ROV).

Following completion of the FOCUS-II installation, periodic maintenance activities would occur on the new and existing offshore cable segments to ensure uninterrupted operation of the system. This maintenance would be conducted by divers, most likely annually, and would consist of visual inspections with occasional repairs, as needed. Typical activities would occur in proximity of the HDD exit sites and would be similar to those currently conducted for the existing FOCUS-I cables. In some instances, the periodic maintenance would include pulling the cable to a surface vessel, repairing and/or splicing the cable, and returning the cable to the seafloor. Following repair, the cable may be buried using divers or a ROV. It is estimated that every other year divers must inspect and re-stabilize any dislodged split pipe. This would occur from the drill exit to a water depth of 85 ft. A small diver support boat might have to anchor in the area, and the cable may be buried using divers or a ROV.

EFFECTS ANALYSIS

The proposed project is similar to previous Navy consistency determinations for undersea cable laying such as: CD-045-89, Construction of Fiber Optics Communication Undersea System (FOCUS); ND-107-92, Test of Fiber Reinforced Plastic Cable at San Nicolas Island; ND-092-94, Install A Shore Cable on Santa Cruz Island; CD-20-95 Placement of a Cable at San Clemente Island; CD-050-03, Partial Replacement of Undersea Fiber Optics Cable (aka FOCUS Cable Repair) at SNI, and CD-015-05, Repair and Replacement of Cables and Projectors for the Anti-Submarine Warfare Range at SCI (SOAR Range); and ND-049-11, DSG-Alpha at San Clemente Island.

CD-045-89 and CD-050-03 are directly related to the existing FOCUS cable installation while the others are examples of similar Navy undersea cable installations or tests within the same relative geographic area (the Channel Islands within the Southern California bight). In most determinations, the Commission found that Navy activities had either no effect on resources or uses of coastal waters or that the activities were consistent with the enforceable policies of the Coastal Act.

The one notable exception to full concurrence was with CD-050-03 where the Commission "was concerned over the long-term disposition of the [FOCUS] cable in the event it was no longer needed". The Commission conditioned their concurrence with a requirement to remove the existing cable being replaced. The Navy did not agree to this condition and has not removed the cable. The Commission added a clarification to the condition that "for the proposed new FOCUS cables the Navy can (1) at a future date submit materials to the Commission which document that leaving the new cables in place on the ocean floor will be less harmful to the marine environment than removing them; and (2) based on that documentation, request that the Commission eliminate the condition to remove the new FOCUS cable segments when no longer used by the Navy." In the Commission's report for CD-043-06, a cable project near San Clemente Island, there was a review of the history of FOCUS cable and the Navy's interactions. It stated, "The Navy did agree that for the new cable, it would return to the Commission at such time that the cable is not being used, with additional analysis to determine whether the new (but at that future date, non-operational) cables should be abandoned in place or removed."

Although, the current proposed project, which is the subject of this consistency determination, intends to keep the existing FOCUS cable in operation, for redundancy purposes, and thus does not fall within the agreement prescribed above, the Navy has provided the Commission's federal consistency staff two Navy-funded studies that analyzed effects of undersea cables on the marine environment off the coast of California. The first study was the "ATOC Cable Removal Environmental Study and Biological Resource Characterization Final Report" (NAVFAC 2014). The study was prepared for the Acoustic Thermometry of Ocean Climate (ATOC) cable, a submarine cable, also known as the Pioneer Seamount cable, which was installed in October 1995 and placed in Half Moon Bay, within the Monterey Bay National Marine Sanctuary. The report concluded that "biological impacts of the presence and removal of the inshore portion of the ATOC cable were minor." It also concluded that "species richness between cable and reference sites was indistinguishable" and that the cable served to support similar adjacent biological communities.

The other study was a "Biological Characterization Survey of the Sound Surveillance System (SOSUS)" (NAVFAC 2011), an undersea cable at Point Sur in the near-shore environment. Although the cable was installed in the 1950s or 60s as part of the Navy's early warning detection system, by the 1990s the segment near Point Sur had been transitioned to operation by the Naval Post Graduate School and was being used for scientific ocean acoustic observing purposes only. This study concluded that the cable "has little or no effect on the seafloor or associated biological communities." In addition, "experienced marine biologists performing the subtidal sampling efforts found it difficult to distinguish between the cable and the surrounding substrate and recorded no abnormalities in the associated biological community structure or diversity along the SOSUS cable. Based on this investigation and observations of the

surrounding environment it is the opinion of the participating scientists that the SOSUS cable will continue to slowly degrade and assimilate as hard substrate into the benthic environment, posing little threat to the benthic marine community or higher trophic levels dependent on it." The conclusions of these two studies support the Navy's assertion (and preference) that the cables should be abandoned in place rather than be removed from the seafloor when we eventually cease to use them as redundant communication pathways.

Another study prepared by the Navy resulted in similar conclusions that removal of seafloor cables would have adverse impacts. An Environmental Assessment was prepared in 2004 to evaluate the Disposition of Underwater Tracking Range St. Croix, U.S. Virgin Islands. Specifically, "removal of cables (at a depth shoreward of the shelf break) would have temporary, minor, short-term impacts to water quality (from increased turbidity). Removal of the cables would have adverse impacts to the coastal zone and the marine environment." The U.S. Virgin Islands' Division of Coastal Zone Management and Division of Fish and Wildlife both supported the Navy's conclusion that abandoning the cables in place would have the least environmental impacts.

As defined in Section 304 of the CZMA, the term "coastal zone" does not include "lands the use of which is by law subject solely to the discretion of or which is held in trust by the Federal Government." NBVC Point Mugu and SNI are owned and operated by the Navy and, therefore, are excluded from the coastal zone. As mentioned above, a portion of SCrI is owned by NPS, another federal agency, while the remaining portion of SCrI is owned by TNC. The SCrI portions of land discussed in this determination and owned by TNC are under lease to and control by the Navy. It should be noted that the NPS park boundary for CINP extends 1 NM from the shore of each island to include the submerged lands and waters surrounding the islands. The Navy recognizes that a portion of the project occurs within the coastal zone, namely the offshore cable routes out to 3 NM, and have the potential to affect uses and resources of the coastal zone.

The Navy analyzed the effects of the proposed action by looking at reasonably foreseeable direct and indirect effects on any coastal use or resource, and by reviewing relevant management program enforceable policies (15 CFR 930.33[a][1]) and the Coastal Resources Planning and Management Policies (CRPMP). Sections of the California Coastal Act relevant to this proposed action, as determined by the Navy, include: Article 2 – Public Access (Section 30210); Article 3 - Recreation (Section 30220); Article 4 – Marine Environment (Section 30230 and 30235); Article 5 – Land Resources (Sections 30240 and 30244); and Article 6 – Development (Section 30251, 30253, and 30255). Sections and Articles of the California Coastal Act not addressed below are not relevant to the proposed action.

Article 2 - Public Access (Coastal Resources Planning and Management Policies [CRPMP] Section 30210 *et seq.*), and Article 3 - Recreation (CRPMP Sections 30220 *et seq.*)
Article 2, Section 30210 – Public Access; Recreational Opportunities; Posting. In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Section 30220 - Recreation; Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

The proposed project involves the installation and operation of fiber optic cables to interconnect two islands located off the coast of California with a site on the mainland coast of California for purposes of providing reliable data and communication transmissions to support Point Mugu Sea Range operations. During normal operation of FOCUS-II cables, there would be no effects to public access or recreation. In fact, reliable communications for Sea Range operations provides improved safety for the public and recreational activities within those waters. During installation of the project, there may be temporary effects to public access and/or recreation depending upon the location and timing of installation activities as described below.

Two of the three proposed HDD landing sites would occur within the boundaries of NBVC, either at Point Mugu or SNI, where access is controlled and restricted to military personnel, Department of Defense (DoD) employees and retirees, authorized contractors and official visitors. For safety purposes, a restricted area has been established for the waters surrounding SNI out to three nautical miles from the shoreline which also inhibits public access and recreation. This restricted area is divided into three sections whose boundaries were amended in May 2014 and are periodically closed during operations. Boats must remain at least 300 yards from the shoreline of SNI at all times and no boats are allowed to anchor within 300 yards or land on SNI except in an emergency. There are no opportunities for public access or recreation located near these HDD sites, lay-down areas or the associated trenching routes connecting the HDD site to the communications buildings. Construction associated with drilling operations is expected to take approximately 30 days which may cause a temporary increase in traffic along Beach Road on Point Mugu due to transport of equipment and heavy machinery however this would not create conflicts with other users. Traffic would need to reduce speed near the Charlie site due to reduction in lanes to support construction activity. On SNI, there would be similar, temporary traffic increases on Beach Road between Coast Guard jetty and barge landing pier.

The third proposed HDD landing site occurs on SCrI in a location owned by the NPS as part of CINP. The HDD site would be located adjacent to Prisoners Harbor pier, a public access point of entry for CINP on SCrI. The cabling and waterline route would primarily occur alongside Navy

Road which connects Prisoners Harbor to the Navy Site (deviations of the route away from Navy Road are illustrated in Figure 10). Navy Road, a paved road, is also a public access trail within CINP and comprises 10.6 of the 20.2 miles of roads on SCrI. CINP is a public recreation resource located on five of the Channel Islands and includes all submerged lands, waters, rocks and islets surrounding those islands out to a distance of one nautical mile. Common activities on CINP include marine mammal and bird watching, photography, hiking and camping in designated locations. According to the CINP 2015 General Management Plan, population of Prisoners Harbor is planned for no more than 100 visitors per day. There is currently no visitor contact station in the Prisoners Harbor area though the General Management Plan does anticipate one in the future.

Construction activities associated with the HDD site and cable/waterline route would temporarily affect the visitor experience to CINP at SCrI, but would not have an adverse effect to public access and recreation. Public access and recreational uses of the Prisoners Harbor Pier would be temporarily disrupted, but not eliminated, during the drilling operations for approximately 30 days. Road traffic would not be disrupted by drilling operations at this site and recreational visitors would still be allowed access to the Prisoners Harbor Pier, but the area west of the pier would be not be available for recreational use. Public access to SCrI would still be available via the pier at Scorpion Anchorage for recreational users as are all the other beaches on the SCrI. In discussions with NPS, the Navy understands there are plans to replace the Scorpion pier. Schedules for construction have not been set for either project. The Navy will work with NPS to ensure disruptions to visitor access are minimized. The Navy will coordinate with NPS and the public concessionaire to schedule such operations outside normal public access schedules and at no time will the pier be closed to public access while other NPS piers are closed. During trenching operations, temporary daily closure of portions of Navy Road to non-authorized vehicles may be required for the three months duration, with the trenches excavated and covered in segments to maximize road availability. Vehicles will be allowed to pass through the construction areas when active work is not underway. There are secondary routes allowing access to all SCrI sites whenever vehicle passing the trenching operations is not possible. The installation of the elevated channel system to the well site may divert travel to other routes. These closures would be temporary in nature and would not lead to permanent land use changes, and alternative public access or recreation areas would be available in the immediate vicinity.

The offshore cable routes between all three drill exit sites occur in the Pacific Ocean within the boundaries of the Point Mugu Sea Range which is used primarily by the Navy for testing of military weapon systems and also accessible by the public for commercial and recreational activities. A portion of the offshore cable route transits the Channel Islands National Marine Sanctuary (CINMS), a program administered by the National Oceanographic and Atmospheric Administration. Recreational activities that occur within the offshore routes include sport fishing, sailing, boating, whale-watching, and diving. Commercial uses include fishing, tourism, and

marine transportation. These areas also are used by the public for scientific research and education.

Types of commercial fishing gear used in the vicinity of the landing sites or offshore route include drift gillnets, longline gear, troll gear, trawls, seining and traps or pots. Commercial and recreational fishing is limited in the vicinity of the HDD landing sites. Short-term and temporary impacts on commercial or recreational fisheries could occur from preclusion of fishing during cable installation, operation, repair, and removal activities from the proposed project. The presence of the cable installation vessel and equipment could preclude fishing within a limited area (~1 mi) for a temporary period (a few hours to several days based on location). However, advance notice would be given via a Notice to Mariners (NOTMARs). There is potential for commercial fisheries that use equipment that contacts the bottom, such as otter trawls, to snag unburied portions of the cable causing damage to or loss of fishing gear or damage to the cable. Since the cable is expected to be buried three feet below the surface in soft-bottom areas to a water depth of 3,280 ft, the likelihood of snagging cables is remote and not expected.

Construction activities may temporarily affect recreational activities in the immediate vicinity of the drill exit sites, the cable laying vessel, and any dive operations associated with cable installation. The proposed cable laying activity is generally compatible with concurrent recreational activities and any restriction of recreational use of the waters would be temporary. For example, recreational use of the waters off the Prisoners Harbor site would be restricted, but not eliminated, during drilling and cable installation operations. However, this would be temporary in nature. All other waters around the eastern end of the island, including Scorpion Anchorage and Smugglers Cove, would remain open to recreational use (See Figure 12). As stated above, the Navy will implement procedures to efficiently inform the public about the construction activities and any temporary restrictions. A Notice to Mariners (NOTMARs) would be issued to allow mariners and commercial and recreational services (e.g., dive charters) to select alternate locations for their activities and the restrictions would only extend through the duration of the construction activity. Although the Navy would temporarily limit access to an area, the availability of the littoral ocean area is greater than the aggregate demand for this resource.

The proposed activities are consistent to the maximum extent practicable with Sections 30210 and 30220 because the public would continue to have substantial access to existing recreational areas or recreational opportunities in the coastal zone, to the extent consistent with public safety needs. Public beaches and beach access routes are not affected and any effects to recreation would be limited to a very small area and temporary in duration.

Therefore, based on the above analysis, the proposed action is consistent with Sections 30210 and 30220.

Article 4 - Marine Environment (CRPMP Sections 30230 *et seq.*)

Section 30230 – Marine Resources; Maintenance. Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Elements of the proposed activities that could affect marine resources in the coastal zone include: the HDD landing and exit site construction; cable-laying and burial; and maintenance and repairs of cables. The proposed project area spans portions of several marine areas afforded special consideration. For example, there are three areas designated as Areas of Special Biological Significance (ASBS) in the project area. The entire project area is also considered essential fish habitat (EFH), namely, within the EFH boundaries for the Pacific Coast Groundfish (PCG), Coastal Pelagic Species (CPS), and Highly Migratory Species (HMS). A portion of the project will transit Scorpion State Marine Reserve and a portion of the cable route traverses the Cowcod Conservation Area, though not those designated as areas of interest. Still another portion of the cable route crosses the Channel Islands National Marine Sanctuary (CINMS). A complete description of all biological, including marine, resources found at NBVC Point Mugu, SNI and SCrI are included in the project's EA/OEA in Section 3.2. For simplicity, the following will present only the potential impacts to affected coastal resources resulting from the project.

The three ASBSs in the project area are: Latigo Point to Mugu Lagoon, SNI and Begg Rock, and Santa Cruz Island. The proposed project activities would not result in long-term changes to water chemistry (e.g., the pH, temperature, and dissolved oxygen levels), turbidity, or the amount of light in the water column within the project areas, including the ASBSs. Upon completion of drilling operations, an unavoidable release of drilling fluid would occur by seepage through fractures in the seabed and by pressure discharge when the drill bit penetrates the exit point. The drill pipe has an internal diameter of five inches, so the volume of material that could be released offshore due to hydrostatic pressure is up to 442 gal per HDD site. In the unlikely event that the drill pipe fractures (a mechanical failure) at or near the lowest point in its trajectory and the drilling was near completion, the volume of mud contained in the HDD bore hole could migrate into the surrounding formation. This volume of material represents a worst-case release of up to 7,443 gal per HDD site into the surrounding geology. However, the drilling fluid would remain contained within the subsurface formation and would be unlikely to migrate to the surface or be released offshore. This volume would include approximately 27 cubic feet of cuttings. Since the drilling fluid consists of water-based bentonite clay mixture and cuttings from the seabed, it would be non-toxic to nearshore marine organisms or marine water quality. In addition, every reasonable effort would be made to minimize the unavoidable discharge of drilling fluid. The

drilling fluid would be switched to fresh or salt water at the bore exit to mitigate a bentonite discharge. This switch would be approximately 151 ft before the bore exit. The driller and surveyor will know when the drill head assembly exits the seafloor by a dramatic change of the drill trajectory inclination angle. If the drilling fluid had not been switched to water, it would be done so immediately. All procedures in the project-specific spill prevention plan would be followed. Prior to HDD activities, the Navy will coordinate with the California State Water Resources Control Board to determine whether the Navy will need to apply for an exception of the California Ocean Plan prohibition against direct discharges of waste to an ASBS.

As mentioned above, the entire offshore project area falls within the EFH boundaries for the Pacific Coast Groundfish (PCG), Coastal Pelagic Species (CPS), and Highly Migratory Species (HMS) and a portion of the Cowcod Conservation Area. There are no estuaries in the proposed project area and canopy kelp is absent in depths greater than 85 ft in any of the exit locations. Seagrass is present nearby the SCrI HDD exit point, though the closest bed is approximately 400 ft inshore of the HDD exit point. Rocky substrate will be avoided though the potential exists to cross limited rocky outcroppings in deeper water. The cable route north of SCrI will likely cross the offshore portion of two areas specified in the federal waters of the CINMS. Environmentally sound engineering practices would be used during cable installation and operating activities to minimize the influence of the cable on EFH. Therefore, it is unlikely that cable-laying activities would have any long term impacts on PCG, CPS, and HMS, their spawning, feeding, or fishing activities for these species. If any disruption did occur, it would be temporary and reversible. An EFH consultation describing potential impacts to PCG, CPS, and HMS EFH has been prepared by the Navy and submitted to NMFS.

Drilling activities would occur during the non-breeding season for all pinnipeds potentially present in the project areas so noise from HDD operation would not impact these communities in the vicinity of the project sites. Conservation measures such as those found in Figure 13 would require that all HDD and onshore construction activities on SNI occur between September 15 and December 15, outside sensitive bird breeding and nesting periods as well as marine mammal breeding season. Given the distance between the SNI sea otter populations and the project sites, the proposed action would have no effect on sea otters on SNI. No population of special status marine species would be adversely affected due to the general avoidance of these resources by the sea route and/or low abundance of these organisms in the general vicinity. There would be no significant disruption in the migration route of fish or wildlife because the cable installation phase would last only minutes to hours (sea route) to a few days (landing sites) in any one location and would be similar to disruptions caused by normal ship traffic (e.g., noise) through the area. Similarly the long-term presence of the cable on the bottom would not significantly impede migration since it would be buried along most (~93 percent) of the route and represent a very low profile in hard-bottom areas as a result of careful installation and post-lay inspection/adjustment of the cable in these areas.

While both black and white abalone are found in the waters surrounding SCrI, none have been found at any of the HDD drill sites and due to the previous mapping effort all deeper rocky habitat will be avoided during cable laying activity.

The proposed cable installation has low potential for collision with or entanglement of marine mammals and sea turtles from project vessels or cables. The larger project vessels would move very slowly during cable installment activities (0 to 2 knots), and would not pose a collision threat to marine species that may be present. Entanglement of marine species is not likely because the rigidity of the cable is designed to lie extended on or be buried underneath the sea floor. Anchor and cable lines would be taut, posing no risk of entanglement or interaction with marine species that may be swimming in the area. Once installed on the seabed, the new cables would be equivalent to other hard structures on the seabed, again posing no risk of adverse effect on marine species. There are no documented incidents of sea turtle entanglement in a submarine cable during the past 50 years (Norman and Lopez 2002). The project vessels would abide by all appropriate Navy regulations regarding marine species sighting and reporting.

Installation of FOCUS cables would disturb bottom sediments and benthic organisms. This disturbance would occur over very small areas, and would be temporary. These installed materials would eventually become encrusted by marine organisms, and buried in sediment. The Navy has no plans to remove these inert materials at the conclusion of their useful life.

Section 30231- Biological Productivity; water quality. The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

All equipment to be used for installation of the cables would be properly maintained and monitored for leakage of fuel, oil, or other hazardous materials. Vessels and equipment used for cable deployment and installation would comply with regulatory requirements and best management practices (BMPs) for minimizing the inadvertent discharge of potential marine contaminants. Cable materials (e.g., glass, plastic, nylon, over-armor) would not leach contaminants into the water or sediments. Based on observations of existing cable arrays, the cable materials would become encrusted with benthic organisms.

Any potential fuel or oil spill at the construction sites would be cleaned up in accordance with standard procedures for similar activities at Navy sites and all procedures would be included in a project-specific spill prevention plan. Excess drilling fluid (drilling mud and cuttings) not recycled into the HDD borehole would be temporarily stored in catch basins and disposed at offsite locations. The drilling fluid is non-toxic and would not affect water quality if it were to spill out. The NBVC Point Mugu project areas are also located within the 100-year floodplain of Calleguas Creek; therefore there is the potential for impacts to the floodplain. Those impacts would be reduced as would any effects to the marine waters through implementation of standard construction BMPs; low impact development design measures; National Pollutant Discharge Elimination System (NPDES) permits; construction Storm Water Pollution Prevention Plan; Erosion Control Plans; and the use of catch devices and sheeting designed to minimize water quality degradation. The project would not affect the current on-site or off-site drainage or any existing drainage structures nor require modification of existing drainage structures.

In addition to release at the exit point, drill fluid may occasionally migrate to the ocean floor surface through fissures in the geologic formation. This phenomenon is called "frac-out." By monitoring the mud system, HDD personnel can determine the correct properties and pressures needed for different formations. Loss of circulation due to frac-outs can be reduced or eliminated through implementation of proper HDD controls and procedures. The drilling fluid will be switched to fresh or salt water at the bore exit to mitigate a discharge. This switch would be approximately 151 ft before the bore exit. The driller and surveyor will know when the drill head assembly exits the seafloor by a dramatic change of the drill trajectory inclination angle. If the drilling fluid had not been switched to water, it would be done so immediately. Prior to commencement of drilling operations, the construction contractor will develop a bentonite spill prevention plan (or frac-out plan) to establish the monitoring and response criteria that will minimize the release of drilling materials during the HDD process.

A two part acrylic epoxy grout would be used for the cable anchor holes, if required, (1 inch in diameter and 20 in deep) in the seabed. The volume of grout required would be approximately 7 cubic inches per hole. It is estimated that approximately 200 to 500 holes could be required for stabilization purposes, resulting in a total of between 0.8 and 2.0 cubic feet of grout. This mixture would be placed in each hole; however if some were to leak out, it is a fast-curing substance that solidifies within seconds after leaving the caulking gun and would not react with ocean water or marine organisms.

Section 30233(a) states in part: The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

(4) Incidental public service purposes, including but not limited to, burying

cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.

There would be a temporary increase in turbidity in the water columns near the exit points. The turbidity would be expected to settle and dissipate in a short amount of time. Only minimal sediment disturbance would occur along the sandy-bottom areas of the offshore cable alignment while the cable is lowered from the marine vessel and during plowing operations, and the disturbed sediments would quickly settle back to the bottom. No permanent source of turbidity would be associated with the proposed project.

HDD technology would be used to install fiber optic cable beneath the sandy beach and out to approximately 85 ft water depth. This technology would avoid (go under) all sensitive nearshore habitats (such as eelgrass beds) and not significantly impact biological resources in these areas. Drilling fluid releases during HDD activities at the landing and exit sites are unlikely and, if they do occur, would not cause significant impacts to nearshore marine organisms. This is because of the naturally high dispersion these fluids would be experienced in this dynamic environment, thereby precluding significant effects from temporary increases in turbidity and lack of significant toxicity of this material. BMPs such as HDD Installation Monitoring would help prevent an accidental discharge into the marine environment. Some impacts (e.g., burial, crushing, and/or displacement) would occur to invertebrates in both hard-bottom and soft-bottom areas as a result of cable-laying activities. Seafloor mapping has confirmed that hard-bottom habitats will be avoided to the maximum extent possible. The predominant (i.e., non-sensitive) species in these limited hard-bottom habitats are mostly very low profile (i.e., one inch or less) and/or sturdy species such as cup corals and encrusting or turf forms, while species on the soft-bottom habitat are relatively mobile, such as seastars, sea cucumbers, and fishes. Cable laying on these species would have only a temporary and localized scale of disturbance (likely a few inches) and would be inconsequential given the common occurrence of these species throughout these habitats. Soft bottom habitats are not considered sensitive habitats, and generally support lower biological diversity than hard substrate habitats. Soft bottom organisms are also generally opportunistic and would be expected to rapidly re-colonize the disturbed areas. Temporary displacement of some fishes from the immediate vicinity (e.g., tens of feet) of the cable route would occur during short-term passage of cable installation equipment. The fish are anticipated to return almost immediately to normal behaviors following the passage of equipment. Suspended solids are expected in a plume resulting from cable burial by the seaplow; potential impacts to soft-bottom species from turbidity would be localized and short term with temporary (e.g., hours) and localized (occurring over a very discrete area). Once the cable is buried by the plow, or settles onto the bottom in deep water, the soft sediment would rapidly return to a normal state.

Effects to wetlands existing at NBVC Point Mugu and SCrI would be avoided and/or minimized by implementing several conservation measures listed in Figure 12, such as not allowing work to begin in areas adjacent to wetlands until the wetlands have been flagged and all personnel working in the site have had NBVC biologists review appropriate BMPs for the site.

Because of the dispersed, low-intensity use of the coastal zone for cable installation and operation activities and the wide dispersal of marine resources and the temporary nature of the installation process, biological productivity of coastal waters will be maintained. Marine resources will be maintained and populations of fish and other marine organisms will be sustained.

Therefore, based on the above analysis, the proposed action is consistent with Sections 30230, 30231, and 30233.

Article 5 - Land Resources (CRPMP Sections 30240 *et seq.*)

Section 30240 - Environmentally Sensitive Habitat Areas; Adjacent Developments. (a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

NBVC Point Mugu, SNI and SCrI are host to a variety of plant and animal species as well as several sensitive and/or protected species. The Navy manages and protects its natural resources with Integrated Natural Resource Management Plans. CINP has a similar program for natural resource management for those resources under its control. A complete description of all biological resources found at NBVC Point Mugu, SNI and SCrI are included in the EA/OEA, Section 3.2. For simplicity, the following will present only the potential impacts to affected coastal resources resulting from the project.

Construction activities associated with the proposed action would be implemented near concentrations of sensitive wildlife species. In order to protect these species, wildlife conservation measures, as listed in Figure 13, would be required during construction activities depending on the type of activity, location of the activity, and the time of year. Personnel would be required to stay off sites when construction activities are not being conducted. Western snowy plovers, Ridgway's rails, least terns, and saltmarsh bird's beak are present at Point Mugu on the beaches and marsh adjacent to the Building 811 and Charlie Pad project sites. However, the terns will be avoided by implementing the seasonal restrictions listed in Figure 13. Western snowy plovers and island foxes are located on the beach adjacent to the drilling site on SNI. At the SCrI project sites, the SCrI fox is present, and bald eagles are, at times, found in the Prisoners Harbor area. Marine mammals (northern elephant seals, harbor seals, and California sea lions) are present on the beaches and/or in the nearshore waters adjacent to the SNI drilling site. A harbor seal haulout is located within the estuary at Point Mugu, west of the mouth of Mugu Lagoon.

At NBVC Point Mugu, the HDD drill sites at Bldg 811 and Charlie pad would be located within previously disturbed areas devoid of vegetation. Implementation of BMPs such as restricting project vehicles and equipment to previously disturbed areas & graded surfaces and treating areas for invasive weeds and flagging all wetlands would ensure no impacts to wetlands. Although there are populations of salt marsh bird's beak, a listed plant species, adjacent to the HDD sites, a qualified biologist will survey the area to confirm absence at the time of construction operations, thus no effects on salt marsh bird's beak is anticipated. Of the other special status bird species, Ridgway's rail, California least tern, and western snowy plover, by implementing seasonal conservation measures, proposed construction activities would have no effect on these species.

At SNI, the HDD drill site at Coast Guard jetty, staging area and trenching corridor would be located within previously disturbed areas with sparse vegetation and no sensitive plant species. To reduce the potential introduction of ecologically harmful non-native flora or fauna, all barge and aircraft shipments to SNI will be conducted in accordance with NBVC Instruction 5090.14, Biological Resources Security Requirements for Air and Barge Transport of All Cargo to San Nicolas Island. Of the special status species located on SNI, seasonal avoidance will ensure no effects to western snowy plover. Although there are high density populations of island night lizards (a recently de-listed species) in the vicinity of the water bladder staging area, the area would be surveyed within seven days prior to use of the water bladders and any ground disturbance to minimize effects to the night lizards. Likewise, implementation of conservation measures such as daily trash and rubbish removal; securely sealing all trash receptacles; covering pits deep enough to trap foxes and capping all pipe ends from 2 to 6 inches in diameter would provide protection for the inquisitive San Nicolas Island foxes.

At SCrI, the HDD drill site at Prisoners Harbor, staging areas, and trenching corridor would be located in previously disturbed areas devoid of vegetation, including no presence of island bedstraw and rush rose. Soils excavation during trenching operations would be kept within the Navy Road footprint, minimizing impacts to Prisoners Harbor wetlands. All barge and aircraft shipments to SCrI will be conducted in accordance with CINP Biosecurity Protocols. Noise from construction activities may generate avoidance reactions by bald eagles at SCrI and although the immediate project area is located within normal bald eagle foraging areas, it is within areas of existing human activity and would be short-term in addition to the fact that an equally valuable foraging area is located farther north along the Canada del Puerto. Construction noise and increased human activity may temporarily displace SCrI foxes but this is similar to existing conditions and similar conservation measures used for the SNI foxes would be implemented on SCrI to minimize effects.

Section 30244 – Archeological or paleontological resources: Where development would adversely impact archeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

The Navy has a Programmatic Agreement (PA) in place with the State Historic Preservation Office (SHPO) for NBVC Point Mugu that allows the Commanding Officer to make reviews of potential effects to historic properties on NBVC Point Mugu to satisfy Section 106 of the National Historic Preservation Act. However, there is no such PA in place for SNI and CINP. NPS does not have one in place for SCrI. Therefore the Navy will follow the standard Section 106 consultation process with SHPO for activities on those two islands. All three locations have a diverse history of human occupation that is provided in more detail in the EA/OEA; for brevity, below is a summary of potential effects to historic and archeological resources.

At NBVC Point Mugu, a review of the Integrated Cultural Resources Management Plan indicates that there are no resources within the area of potential effect for the HDD drill sites at Charlie Pad and Bldg 811 and the trenching corridor. There is however a National Register of Historic Place (NRHP) eligible property, the Bravo Launching Control Building, within 328 ft of the area of potential effect. The HDD drilling operations and other construction activities would not affect the physical integrity or visual appearance of the Bravo Launching Control Building. Therefore, the project would result in no adverse effect to historic properties.

On SNI, because the project site is within a previously disturbed area and there are no NRHP listed or eligible properties within the area of potential effect and there are no known archeological sites within the area of potential effect. Therefore, the project would result in no historic properties affected.

On SCrI, the entire project site exists within the Santa Cruz Ranching District, a cultural landscape eligible for listing in the National Register of Historic Places (NRHP). The Prisoners Harbor HDD site and parts of the road are part of the Prisoners Harbor Cluster while Navy Road, as an integral part of historic ranching operations and as a contributor to the Cold War operations on the island, are contributing elements of district. In addition, the area of potential effect for SCrI crosses five documented archeological sites whose eligibility for NRHP has not been determined but is assumed eligible. There is a presumption that a finding of no adverse effects to four of the five archeological sites (CA-SCrI-96, 464, 465, and 466) will be recommended due to the fact that all archeological deposits have been physically removed during the 60 years that the road has been used and maintained. To ensure avoidance of off-road archeological sites, stakes will be placed around the five documented site boundaries prior to construction at SCrI. These stakes will mark the presence of a resource and Native American and archeological monitors would be present for all installation and maintenance work conducted within the boundaries of the five sites and within a 50-meter buffer for each site. The 50-meter buffer is necessary because the precise site boundaries are not known confidently in all directions. The fifth archeological site (CA-SCrI-240/439) has the potential for intact deposits and thus the reason for the elevated cable tray for approximately 1,150 ft of the conduit and waterline alignment. The Navy has prepared a subsurface testing plan to determine the character of effects from the entire

alignment. The Navy, with approval and oversight by NPS, will consult with SHPO on the effects determination. If the testing results indicate the presence of intact, significant archeological deposits that will be directly impacted by the project the Navy will work with SHPO and NPS to avoid or minimize the potential for adverse effects. If adverse effects are unavoidable, the Navy will develop a memorandum of agreement to comply with 36 CFR 800.

As for the offshore portion of the project, there is lack of evidence that sensitive resources exist at the HDD exit sites and the cable alignments were developed to avoid known shipwrecks and plane crashes so there are no known historic resources located within the area of potential effect.

As with any Navy project, if potential subsurface archeological deposits are detected during construction, all work in the discovery area would cease until an archeologist could provide input regarding the significance of the resource. The NBVC Cultural Resources Manager would evaluate the resource against eligibility criteria for inclusion in the NRHP and if it is found eligible, a treatment plan detailing either preservation in-place or mitigation of impacts through data recovery would be developed and implemented in consultation with SHPO.

Therefore, the proposed project is consistent with Sections 30240 and 30244 of the Coastal Act.

Article 6 - Development (CRPMP Section 30250 *et seq.*)

Section 30251 – Scenic and visual qualities: The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.

Scenic and Visual Quality. Views of the project sites vary depending upon the location. For example, on NBVC Point Mugu, the HDD site at Bldg 811 is not visible from established nearby communities, such as Port Hueneme, Oxnard, and Camarillo and not visible to boaters near the shore due to the shoreline protection structure located between the site and the water. Likewise, the Charlie Pad site is not visible from the same nearby communities. However, it would be visible to offshore boaters. On SNI, the HDD site near the Coast Guard jetty would not generally be visible to the public due to the restricted access on and around the island. On SCrI, the HDD site would be visible by recreational visitors to CINP and to NPS and TNC employees. A portion of the cabling corridor will be comprised of an elevated (i.e., approximately 1.6 ft above-ground) channel (or tray) system connecting the well site to Navy Road, a majority of which would be behind low brush and large trees. The elevated cable channel will be neutral in color to blend in

with the existing vegetation as much as possible. Therefore, due to its location away from the roadside, its height, form and color, the elevated cable channel would be seen but would not attract attention from the existing landscape. Meanwhile, the trenched alignment along the shoulder of Navy Road up to the Navy Site would not be visible by NPS and TNC employees and the occasional recreational hiker.

Since the proposed project is to install fiber optic underground and along the seafloor, visual resource impacts are considered minimal and temporary, predominately occurring only during construction. The equipment used at each HDD site would include a drilling rig, a mud pump unit, a mud filtering system, a catch basin for drilling mud, a hydraulic power unit, a drill rig control station, a pipe rack for cable conduits, an excavator and a tool van. During construction the equipment's height may be a visual contrast to surrounding views and there is a very slight potential for glare to be produced off the equipment but the effects are expected to be minor due to temporary nature of construction (approximately 30 days at each site) and the low number of on-installation viewers near most of project sites (i.e., Point Mugu and SNI). Following construction activities, project sites would be returned to their original state. On SCrI, although there may be more public viewers near the HDD site, its effect to visual resources would still be temporary as the site would return to original condition once construction activities ended. However, as discussed above, a permanent visual change would occur with installation of the new elevated cable channel system.

Section 30253 – Minimization of adverse impacts: New development shall: (1) minimize risks to life and property in areas of high geologic, flood, and fire hazard. (2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs. (3) Be consistent with requirements imposed by an air pollution control district or the State Air Resources Control Board as to each particular development.

Minimization of Adverse Impacts. The proposed project involves installing fiber optic cabling underground so a majority of the construction consists of some ground disturbing activity which has the potential to affect soils and the surrounding geology. However, the project is designed to use existing infrastructure as much as possible and would implement erosion control measures to minimize effects. In addition, drilling operations would be temporary, lasting approximately 30 days at each site. At all the HDD sites, anchor holes and catch basins would be backfilled with original soils and standard erosion control measures would be implemented. At SCrI, trenching along Navy Road would include areas of steep slope which would require additional erosion control measures and BMPs, including the requirement that backfill trenches be compacted to conditions as close to original state as possible. In addition, all manholes and vaults along the trenching route will be installed using BMPs such as silt screens and barriers to minimize

erosion. Given this, the project would not contribute significantly to erosion, geologic instability and nor require substantial alterations of natural landforms along the coast.

For the offshore cable alignments, the subsurface geology at the HDD exit sites is unknown but is likely sedimentary bedrock similar to the nearshore portion of the existing FOCUS onshore landing sites. While the cable alignment along the seafloor consists primarily of sandy bottom, there may be an occasional rock outcropping along the route. The construction crew would closely monitor the pressure during drilling, especially at the exit point to ensure that drilling ceases as quickly as possible after the exit point has been penetrated to minimize affects to marine sediments by the discharges occurring during or upon completion of drilling activities.

Sea Level Rise. While effects of coastal flooding and storm surge can be significant, sea level rise has an even greater potential to impact facilities on NBVC Point Mugu, SNI and SCrI by exacerbating flooding. For example, sea level rise may expose some of the trench-buried fiber optic cables. However, the cable would be armored and would not be affected by exposure to the elements. Exposure of the fiber optic cables would not affect existing infrastructure and utilities at the project sites and no other methods to accommodate for predicted sea level rise exist for underground/seafloor fiber optic cabling.

Air Quality. Project emissions generated by installation operations for site preparations, drilling, and trenching activities as well as motor vehicle use at all sites and emissions associated with supply barge transport and loading and unloading of barges at the two islands were calculated. Actual calculations are presented in Tables 3.1-4, 5, 6 of the EA/OEA. The estimated emissions occurring at NBVC Point Mugu would be below de minimis threshold levels in conformity with the South Central Coast Air Basin State Implementation Plan and would not trigger a conformity determination under the Clean Air Act as amended. In addition, since SNI and SCrI are located in areas categorized as attainment/unclassified by the Environmental Protection Agency, they are not subject to the General Conformity Rule. Air quality conservation measures such as those listed in Figure 13 would be implemented as needed. These measures would include watering ground disturbance areas to minimize fugitive dusts, as well as turning off internal combustion engines not in use.

Section 30255 – Priority of coastal-dependent developments: Coastal-dependent developments shall have priority over other developments on or near the shoreline. Except as provided elsewhere in this division, coastal-dependent developments shall not be sited in a wetland. When appropriate, coastal-related developments should be accommodated within reasonable proximity to the coastal-dependent uses they support.

Coastal-dependent development. The Navy's mission "is to maintain, train and equip combat-ready naval forces capable of winning wars, deterring aggression and maintaining freedom of the

seas." Having installations on the coast, near the seas where their primary mission takes them, is vitally important to the Navy and thus can be considered a coastal-dependent use with priority in development. The Point Mugu Sea Range is the world's largest instrumented over-water range encompassing up to 36,000 square miles and providing extensive test and training capabilities for the U.S. Navy and allied forces. The Point Mugu Sea Range is capable of complex, multi-participant, multi-target operations in dense electronic-combat environments with multi-service, multi-national forces. The FOCUS-II project would enable improved command and control communications for all aspects of operations and testing on the Point Mugu Sea Range and is needed to keep pace with the increased data and band-width requirements. Connecting the mainland at NBVC Point Mugu with the two islands where critical elements of the Point Mugu Sea Range operations exist via interconnected cables is a coastal-dependent development for the Navy and is necessary to provide improved secure communications in real-time.

Therefore, based on the above analysis, the proposed action is consistent with Sections 30251, 30253, 30255.

CONCLUSION

In accordance with the Federal Coastal Zone Management Act of 1972, as amended, Section 307 (c)(1), this Coastal Consistency Determination demonstrates that the proposed action would be undertaken in a manner that is consistent with the enforceable policies of California's approved Coastal Management Plan. If you need additional information, or if you have any questions, please do not hesitate to contact Deb McKay at (619) 532-2284 or email at deborah.mckay@navy.mil.

Figure 1 – Existing FOCUS Cable Alignment

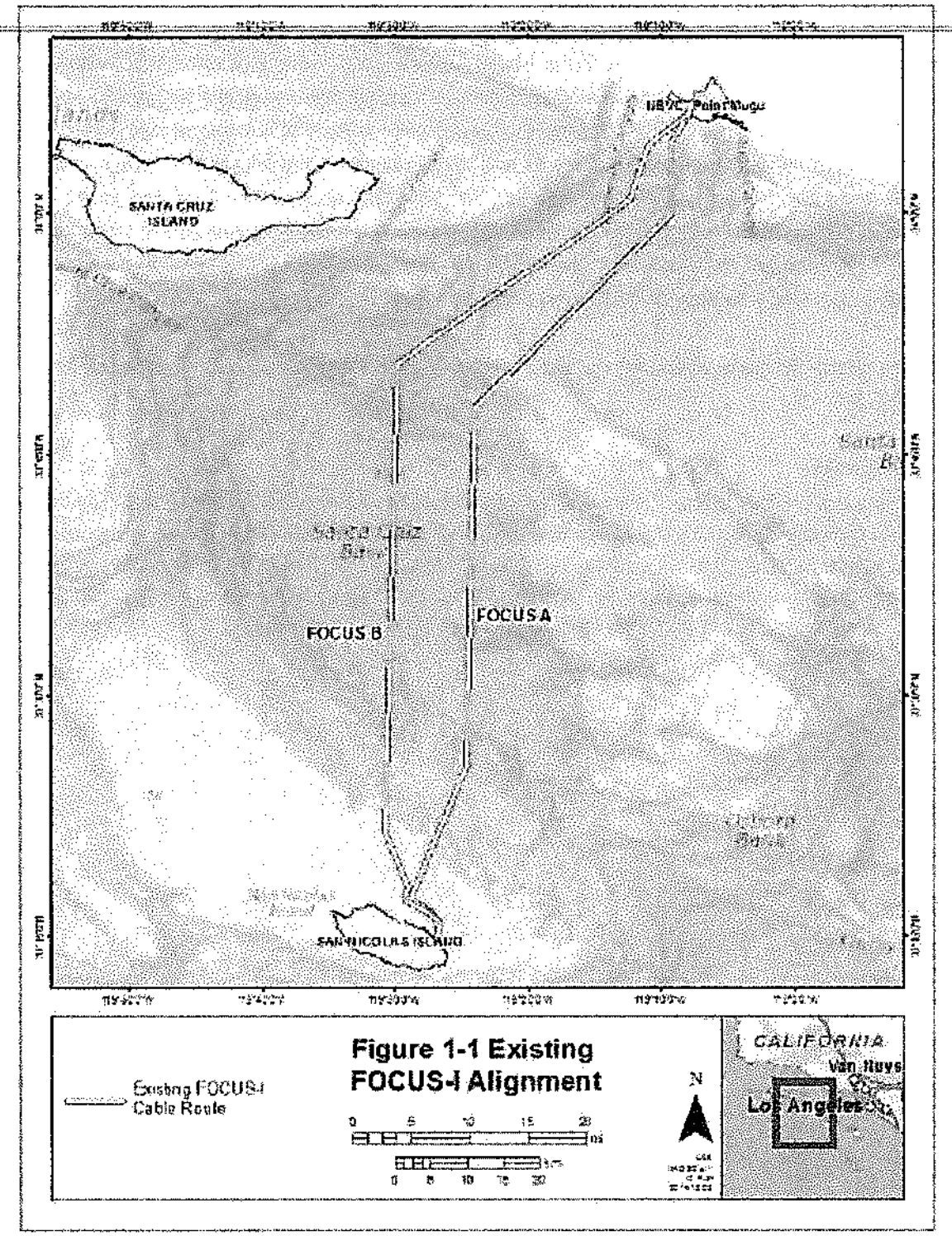

Figure 2 – Point Mugu Sea Range

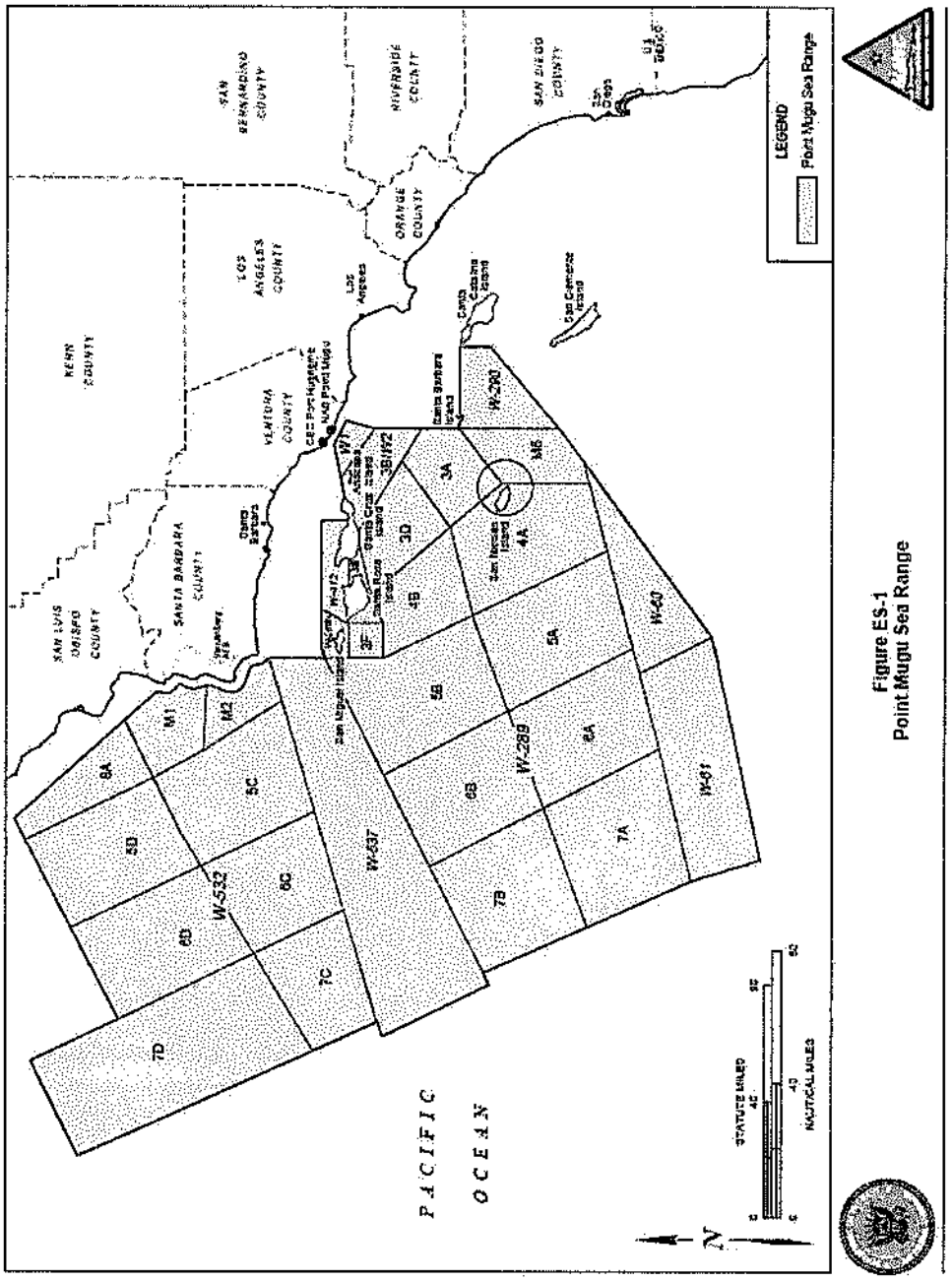

Figure ES-1
Point Mugu Sea Range

ES-2

Figure 3 – FOCUS-II Cable Alignment

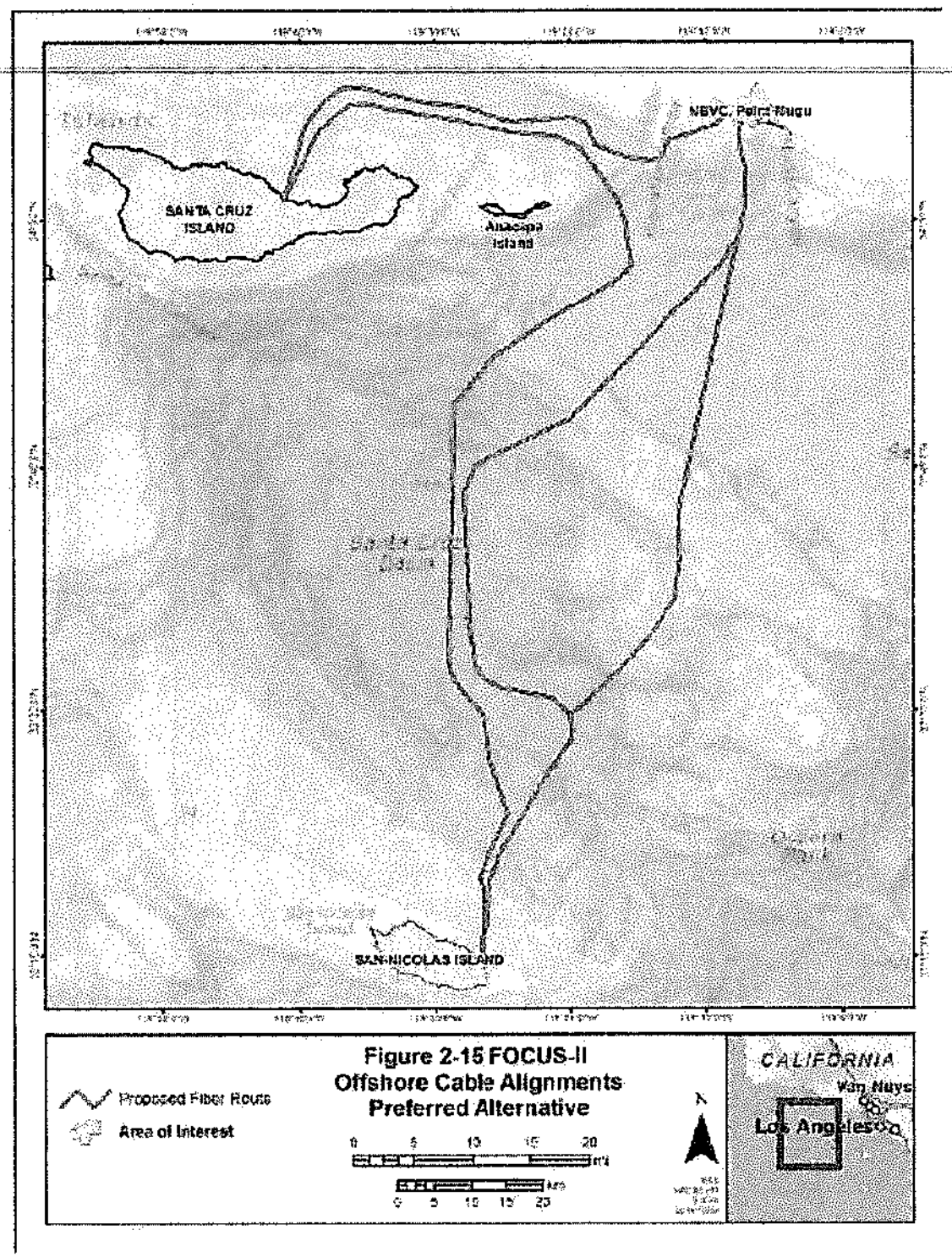

Figure 4 –NBVC Point Mugu Landing Sites

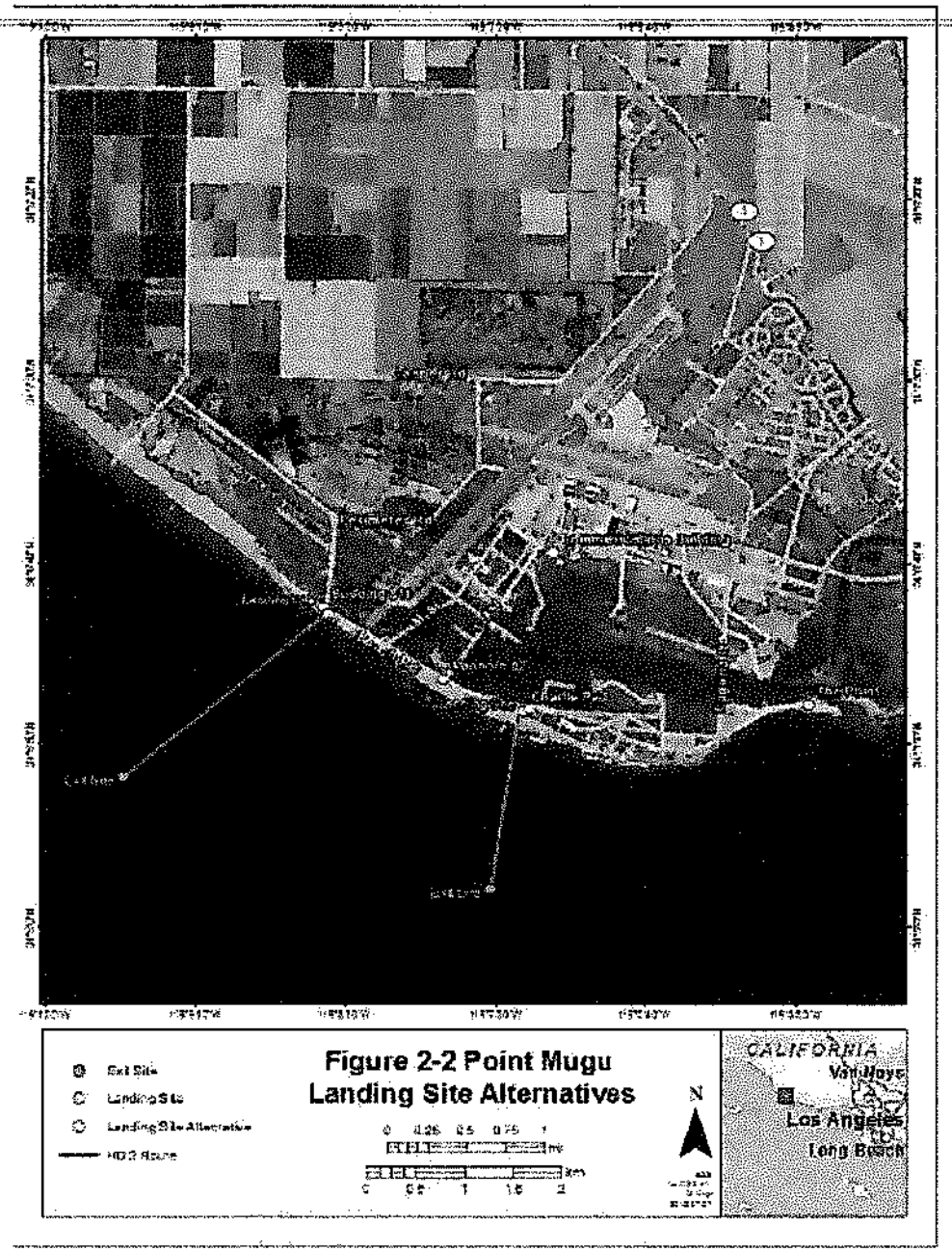

Figure 5 – San Nicolas Island Landing Sites

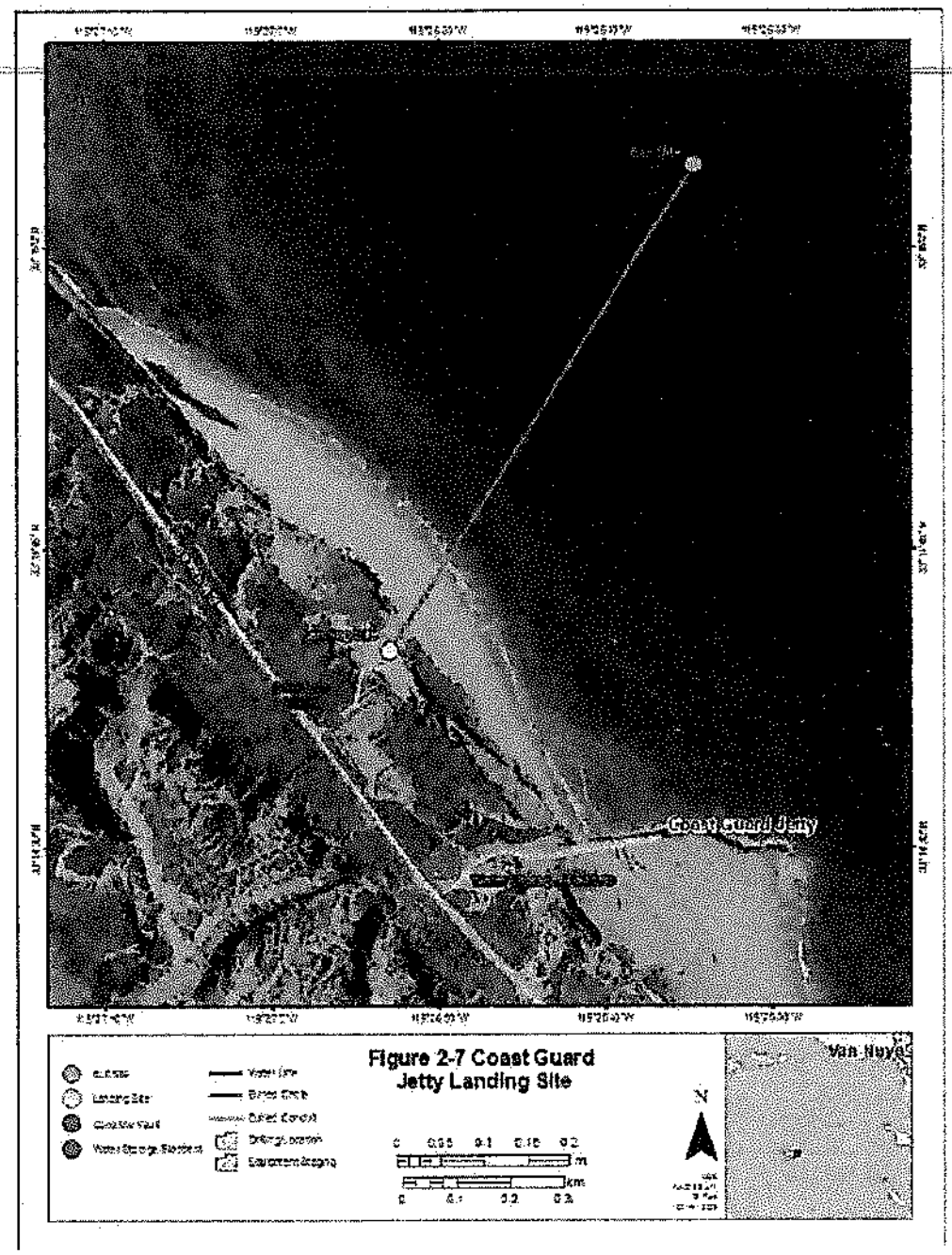

Figure 6 – Santa Cruz Island Landing Sites

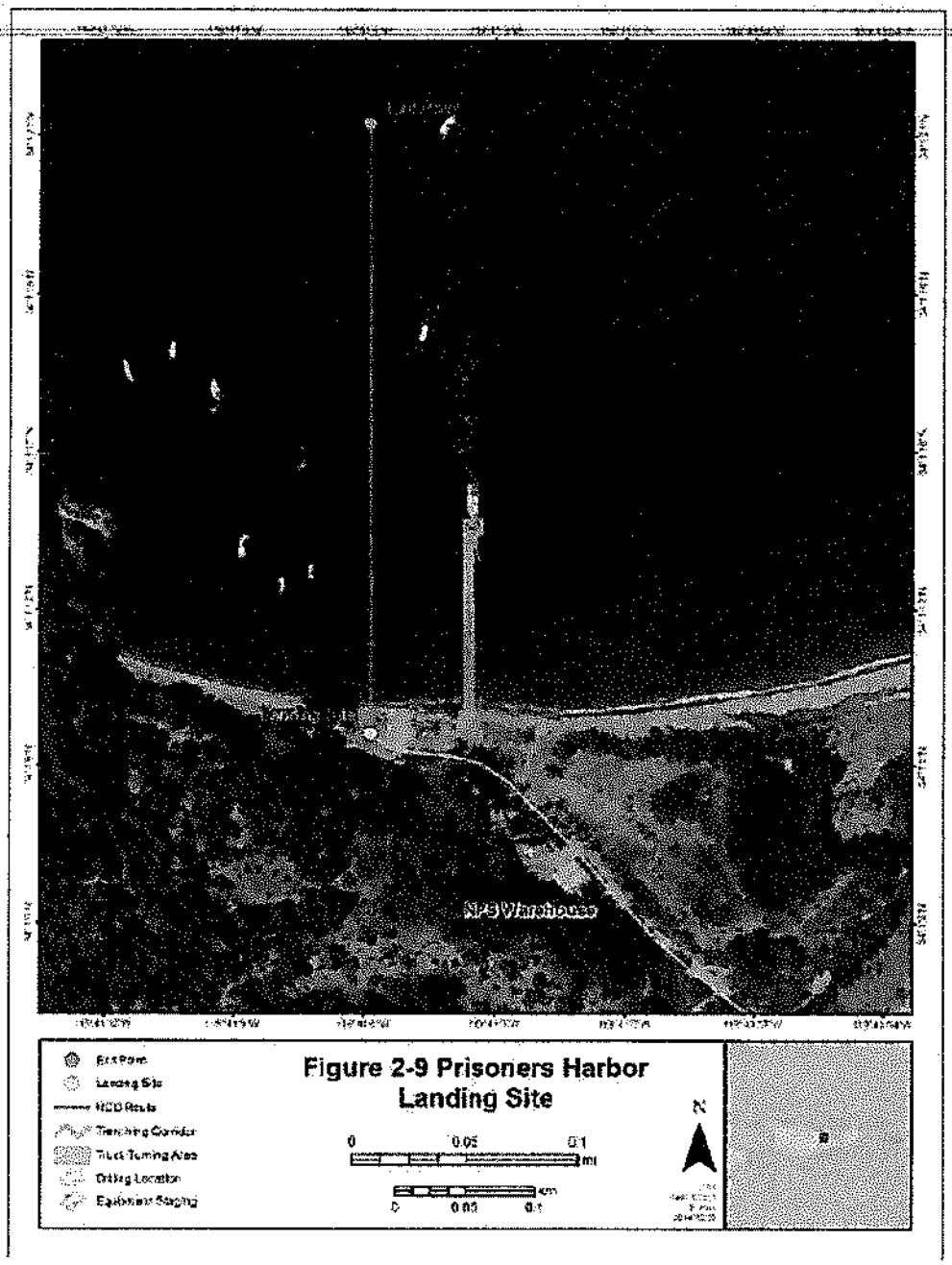

Figure 7 – NBVC Point Mugu Cable Alignment

Figure 8 – San Nicolas Island Cable Alignment

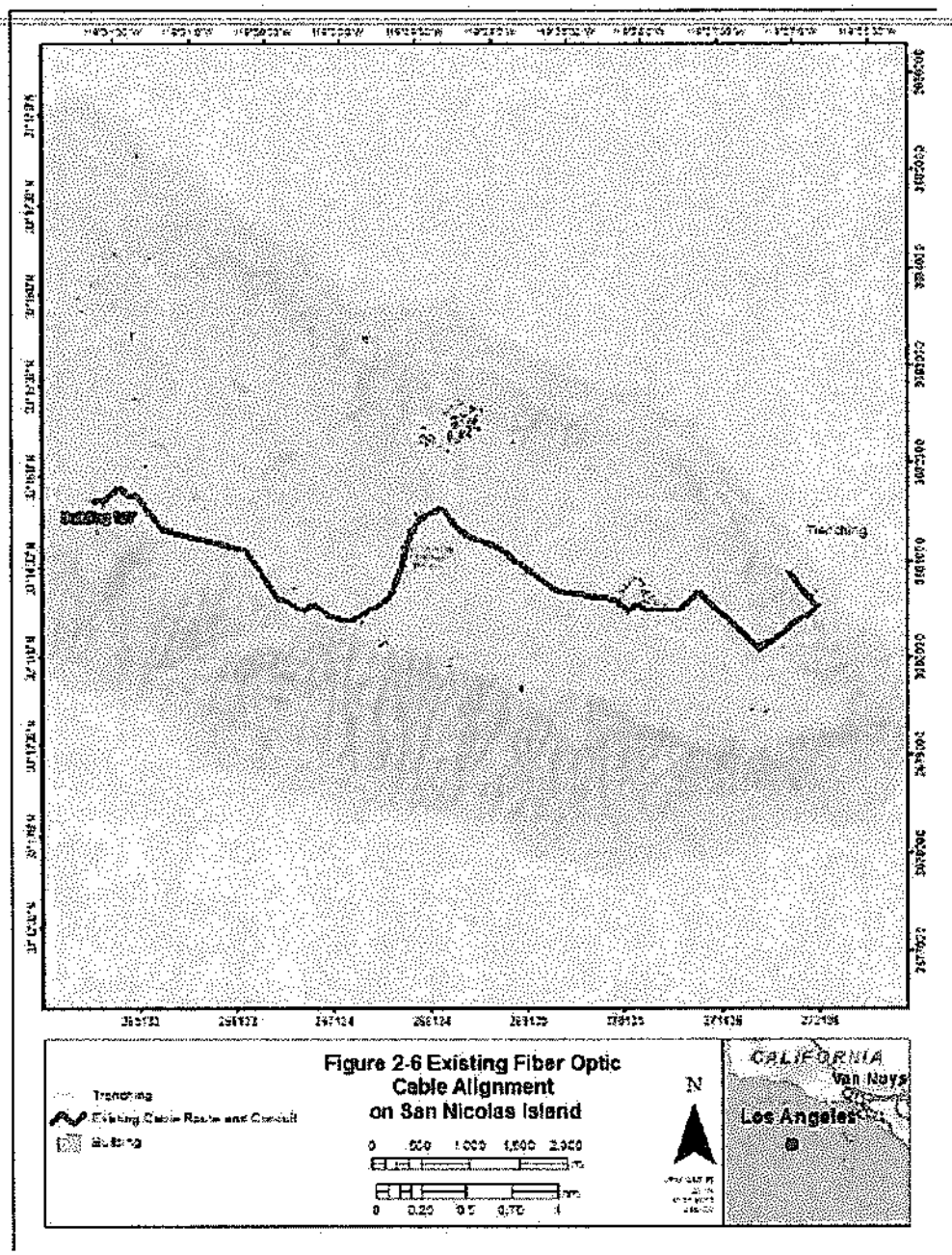

Figure 9 – Santa Cruz Island Cable Alignment

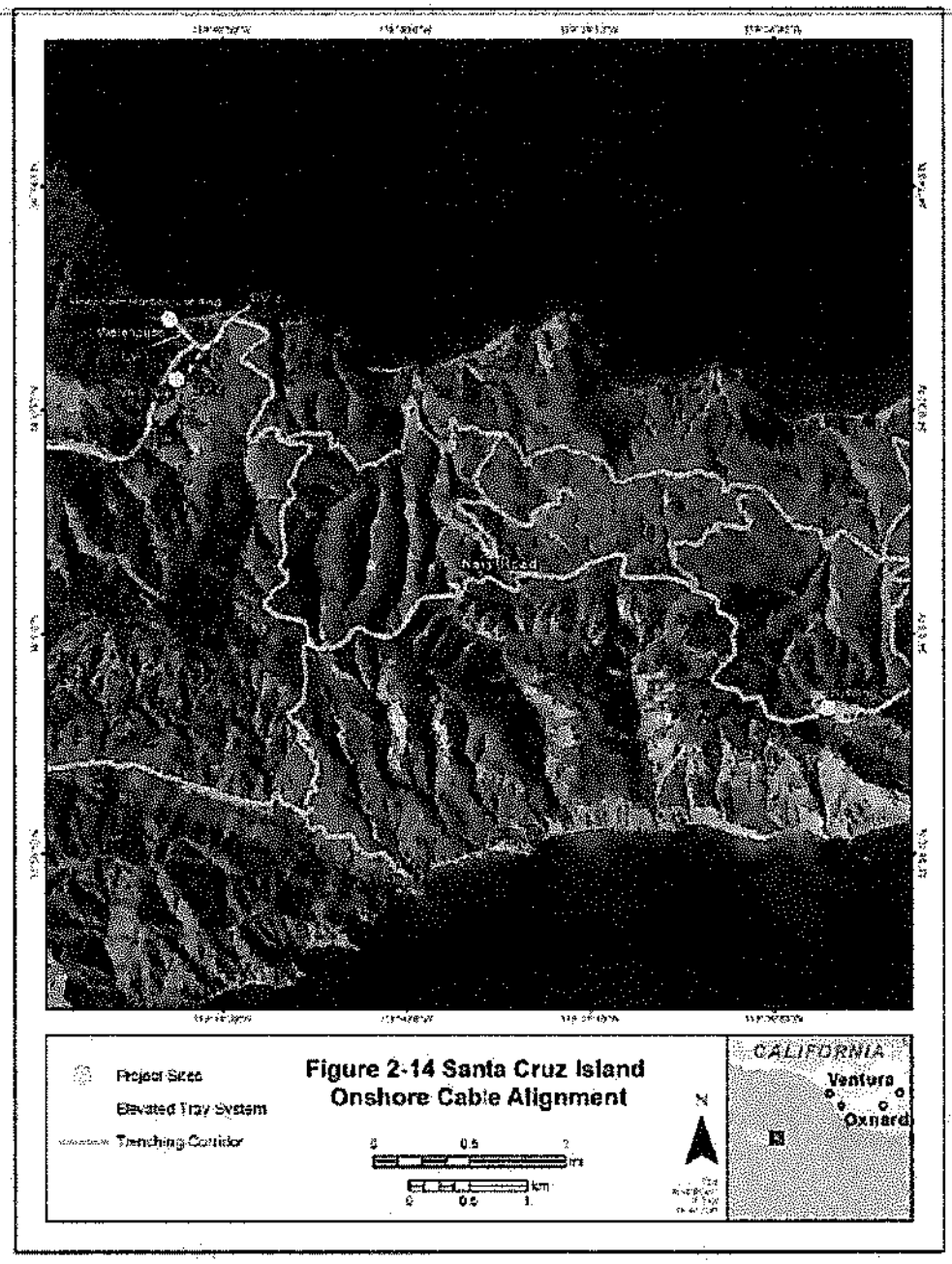

Figure 10 – Santa Cruz Island Cable Elevated Tray Alignment

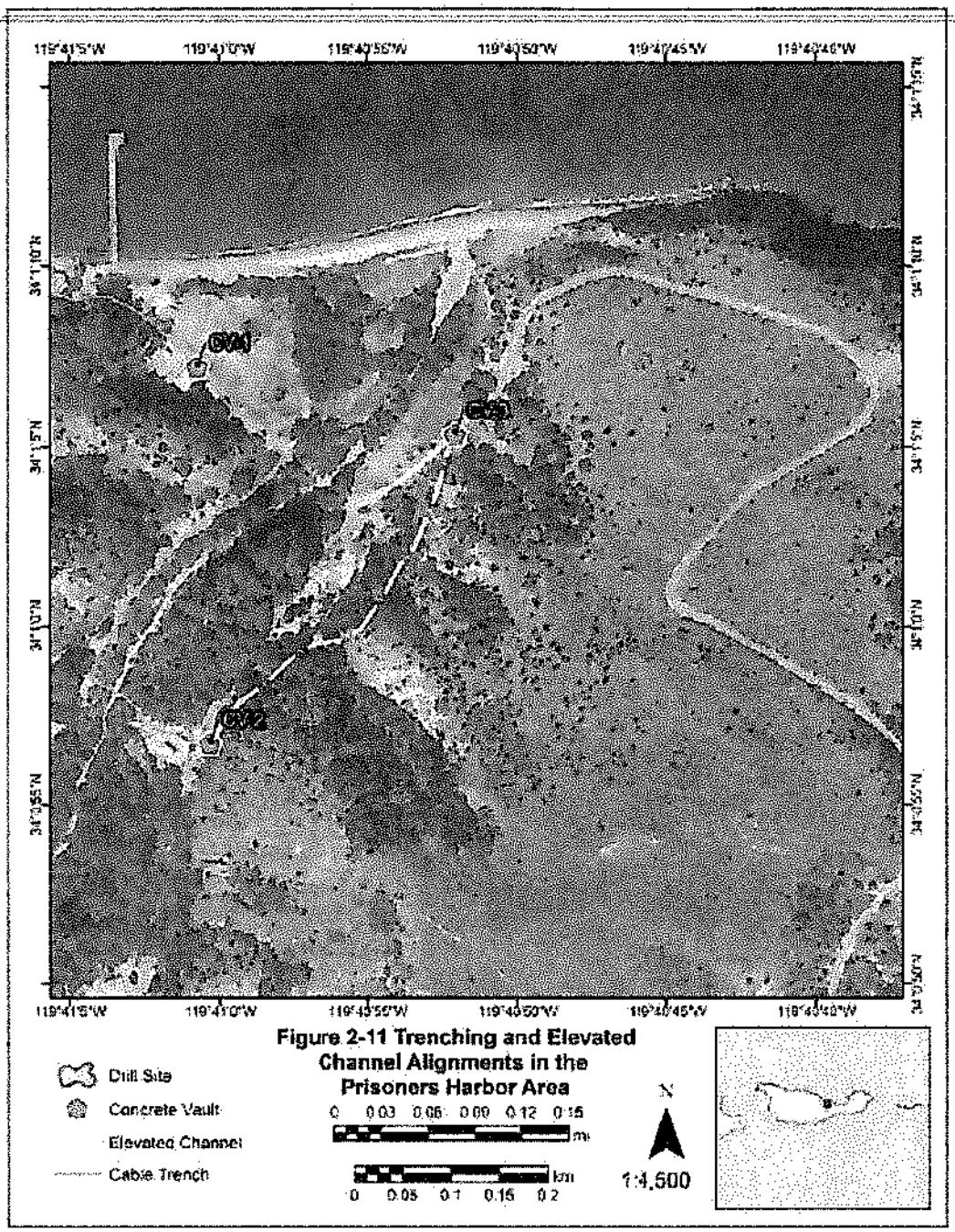

Figure 11 – Sample Elevated Cable Channel

Figure 12 – Santa Cruz Island Recreational Areas

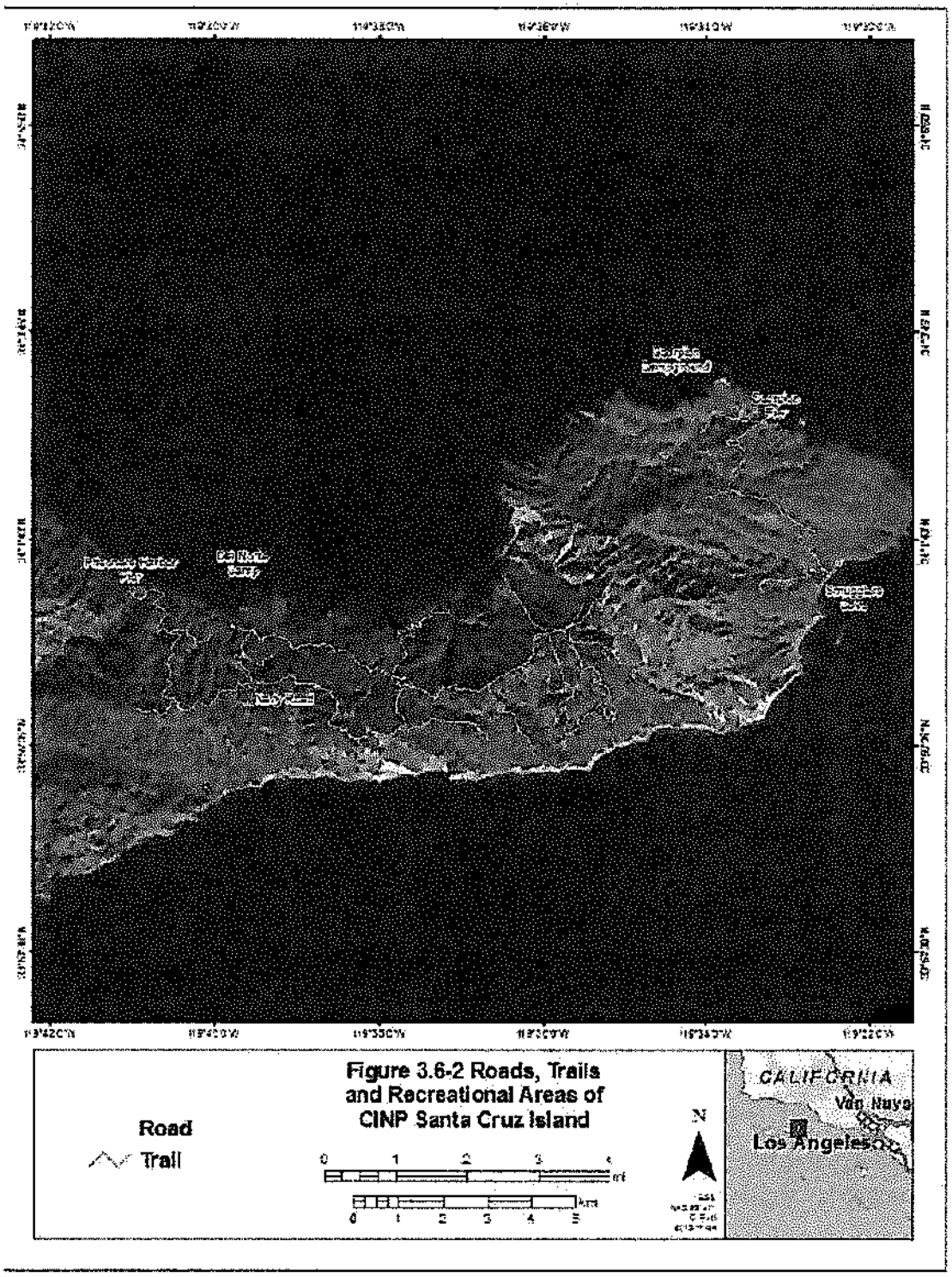

Figure 13 – Conservation Measures

The following conservation measures are proposed to protect air quality and sensitive terrestrial and marine species, including federally-listed terrestrial species:

1) Dependent upon the dryness of soil and wind conditions, ground disturbance areas may be watered to minimize fugitive dust generation.

2) Internal combustion engines will be turned off when not in use to minimize emissions of criteria air pollutants.

3) To avoid marine mammal and listed bird breeding seasons, HDD and construction activities will only occur between September 15 and January 31 at Point Mugu and between September 15 and December 15 at SNI.

4) Project vehicles and equipment will be restricted to existing concrete pads, leveled surfaces, HDD areas, and paved or dirt access roads.

5) NBVC Environmental Division will be made aware of any aircraft or barge shipments of equipment to SNI or SCrI to allow for needed biosecurity inspections, as specified in NBVC Instruction 5090.14.

6) All heavy equipment, vehicles, and waste containers will be power-washed prior to delivery to SNI or SCrI. Waste containers and dumpsters will be treated with disinfectant before leaving the mainland.

7) All materials being shipped to SNI and SCrI will be closely inspected and monitored to ensure that no soil, other seed-carrying matrix, insects, or other animals are delivered to the islands.

8) Pre-construction surveys and treatments for invasive weeds will be conducted at the Point Mugu, SNI, and SCrI project sites.

9) Once onshore FOCUS-II installation activities are completed, invasive weed surveys and treatments will be conducted at Point Mugu, SNI, and SCrI. These surveys and treatments will be applied after three weeks following the first rain event of the post-construction rainy season.

10) Shipments to SCrI will adhere to protocols described in the Channel Islands National Park (CINP) Biosecurity Protocols (CINP 2014).

11) All personnel working on SNI or SCrI and people involved in delivery of project cargo will review biosecurity instructions and will adhere to all biosecurity measures.

12) Vessels delivering equipment and personnel to SNI and SCrI shall have armed bait boxes that are checked monthly. Also, sticky traps should be deployed on every boat and changed monthly.

13) Vessel decks will be washed clean between cargo runs. No soil or other debris should remain on a vessel.

14) If night-time operations are necessary, outdoor lighting will include shielding designs to ensure light entering adjacent nesting habitat is minimized.

15) Trash collection containers will be closed and tightly sealed to reduce attracting island fox and other wildlife.

16) Prior to commencing work on SCrI, a waste management and disposal plan will be developed by the construction contractor and submitted to the Navy and CINP for review.

17) Construction personnel will receive training regarding wildlife conservation measures to be applied at the project sites, including the importance of not feeding wildlife such as the island fox.

18) Open pits deep enough to trap island fox will be covered whenever construction operations are not underway.

19) Pipe ends between 2 and 6 in (5 and 15 cm) in diameter will be capped to ensure that island fox cannot be unintentionally trapped.

20) A Spill Prevention, Control, and Countermeasure Plan, developed by the construction contractor, will be in place to minimize the potential for an oil or hazardous substance spill, to prevent any spill from leaving the confines of the area and impacting listed species habitat, and to ensure that the cause of any spill is corrected.

21) Unless operationally necessary, personnel will not occupy the Charlie Pad, Coast Guard Jetty, or Prisoners Harbor construction areas between dusk and dawn and the area will remain dark (no artificial lighting) to reduce the potential for adverse impacts to listed species in adjacent natural habitat.

22) Erosion control best management practices (BMPs) (e.g., silt screens or other barriers) will be placed along Navy Road to protect sensitive biological resources including the island bedstraw (Galium buxifolium), the island manzanita (Artostaphylos insularis), and the Channel Island sweat bee (Lasioglossum channelense).

23) Prior to construction on SCrI, a survey will be conducted along Navy Road for the island bedstraw (Galium buxifolium) to ensure there is no take.

24) A qualified biologist will be required to monitor construction areas that have listed species with potential to be adversely affected in the immediate vicinity to ensure no impacts occur.

STATE OF CALIFORNIA – NATURAL RESOURCES AGENCY

EDMUND G. BROWN, JR., GOVERNOR

CALIFORNIA COASTAL COMMISSION
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March 9, 2017

Captain C.D. Janke
Commanding Officer
Naval Base Ventura County
311 Main Road, Suite 1
Point Mugu, CA 93042-5033

Subject: Consistency Determination CD-0006-16 (FOCUS-II)

Dear Captain Janke:

On March 9, 2017, the California Coastal Commission unanimously concurred with the above-referenced consistency determination. The Commission found that the project was consistent with the California Coastal Management Program. Please contact me at (415) 904-5288 should you have any questions regarding this matter.

Sincerely,

Larry Simon

Larry Simon
Federal Consistency Coordinator

cc: Deb McKay, Navy Region SW NEPA Coordinator
CCC – South Central Coast District

STATE OF CALIFORNIA—NATURAL RESOURCES AGENCY EDMUND G. BROWN, JR., GOVERNOR

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Th 14a

Filed:	10/31/16
60th Day:	12/30/16
75th Day:	1/14/17
Extended to	3/14/17
Staff:	L. Simon-SF
Staff Report:	2/22/17
Hearing Date:	3/9/17

ADOPTED STAFF REPORT: CONSENT CALENDAR

Consistency Determination No.:	**CD-0006-16**
Federal Agency:	**Department of the Navy**
Location:	Point Mugu Sea Range, San Nicolas Island, Santa Cruz Island, and Naval Base Ventura County/Point Mugu, in Ventura and Santa Barbara Counties (**Exhibits 1 and 2**)
Project Description:	Replacement of existing Fiber Optic Communications Undersea System (FOCUS) cables with four new interlinked fiber optic cables on the ocean floor in state and federal waters; new onshore landings at Point Mugu, San Nicolas Island, and Santa Cruz Island using horizontal directional drilling; new onshore cables on San Nicolas Island and Santa Cruz Island; and a new water line on Santa Cruz Island.
Commission Action:	Concurrence

SUMMARY OF COMMISSION ACTION

The Department of the Navy ("Navy") has submitted a consistency determination for the replacement of the existing Fiber Optic Communications Undersea System ("FOCUS") with four

new interlinked fiber optic cables located at Naval Base Ventura County/Point Mugu, San Nicolas Island, Santa Cruz Island, and the submerged lands within the Point Mugu Sea Range. The existing FOCUS-I system was installed in 1993 and 1994, includes two cables connecting Point Mugu and San Nicolas Island, supports testing and training activities on the Sea Range, has exceeded its 20-year design life, and is starting to experience signal degradation.

The proposed FOCUS-II system includes installation of two fiber optic cables between Point Mugu and San Nicolas Island, one cable between Point Mugu and Santa Cruz Island, and one cable between San Nicolas Island and Santa Cruz Island. Approximately 175.5 miles of cable will be buried in the sandy seafloor out to a water depth of 3,280 feet; the remaining 58.5 miles of cable will lie on the seafloor in deep water. The project includes the use of underground horizontal directional drilling (HDD) technology to bring the cables ashore and avoid environmentally sensitive nearshore habitat. Once ashore the new cables will be trenched through currently developed areas and connected to existing communications buildings. The current planned start date for FOCUS-II construction is calendar year 2018 or later.

The project is an allowable use under Coastal Act Section 30233(a)(4), similar to determinations the Commission has made with respect to other Navy fiber optic cable projects in ocean waters off southern California. There are no feasible less environmentally damaging alternatives, and the project incorporates avoidance, conservation, and mitigation measures to minimize adverse impacts to coastal resources, including cable alignments that avoid offshore hard-bottom habitat and environmentally and culturally sensitive nearshore and terrestrial habitats. The Commission found that the project is consistent with the dredge and fill policy of the Coastal Act (Section 30233(a)).

Construction and installation of the offshore components of the FOCUS-II project would lead to only temporary and minor adverse effects on marine resources and water quality, primarily due to the short-term nature of project installation, a construction schedule during the time of year that minimizes potential impacts on marine wildlife, and cable alignments that avoid rare and valuable hard-bottom habitat. The use of HDD technology to install cables avoids environmentally sensitive shoreline and nearshore habitats, and incorporates water quality protection and monitoring measures. The Commission found that the project is consistent with the marine resources and water quality policies of the Coastal Act (Sections 30230, 30231 and 30232). The project includes an extensive list of conservation measures, construction best management practices, and a construction schedule that the Navy will implement to protect environmentally sensitive terrestrial habitat areas and listed species. The HDD sites, staging areas, and trenching corridors connecting landing sites to existing communications buildings at Point Mugu, San Nicolas Island, and Santa Cruz Island would be situated within previously disturbed and/or currently developed areas. The Commission found that the project is consistent with the environmentally sensitive habitat policy of the Coastal Act (Section 30240).

The project includes provisions for monitoring of ground-disturbing activities in those areas where cultural resources are known to exist, and procedures to follow in the event that previously unknown resources are discovered. The State Historic Preservation Officer's February 14, 2017, letter to the Navy concurred with the Navy's definition of the area of potential effects, identification of historic properties, adequacy of the testing plan for the CA-SCRI-240/439 site,

and the finding of no adverse effect. The Commission staff and representatives from the Navy spoke with John Tommy Rosas (Tongva Ancestral Territorial Tribal Nation) regarding the tribal consultation process for the FOCUS-II project and the need for protection of cultural resources in the project area. The Commission found that the project is consistent with the cultural resource policy of the Coastal Act (Section 30244). In addition, the Commission found that the project is consistent with the commercial and recreational fishing, public access and recreation, and hazard minimization policies of the Coastal Act (Sections 30234.5, 30210, 30212, 30220, and 30253(2)).

The Commission **concurred** with the Navy's consistency determination CD-0006-16.

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Exhibit 16 – Protected Offshore Areas
Exhibit 17 – FOCUS-II Conservation Measures
Exhibit 18 – California Department of Fish and Wildlife Fishery Catch Blocks
Exhibit 19 – February 3, 2017, letter from Patricia Martz, Ph.D.
Exhibit 20 – February 3, 2017, email from Mr. Jack Hunter
Exhibit 21 – February 1, 2, 9, 21, 22, 23, 24, 27, 2017, emails from Mr. John Tommy Rosas
Exhibit 22 – February 14, 2017, letter from California State Historic Preservation Officer
Exhibit 23 – List of Documents, Reports, and Letters submitted (in electronic format) by Mr. John Tommy Rosas
Exhibit 24 – February 28, 2017, email from Laura Kirn, National Park Service

I. FEDERAL AGENCY'S CONSISTENCY DETERMINATION

The Navy has determined the project consistent with the California Coastal Management Program.

II. MOTION AND RESOLUTION

Motion:

I move that the Commission ***concur*** *with consistency determination CD-0006-16.*

Staff recommends a **YES** vote on the motion. Passage of this motion will result in a concurrence in the determination of consistency and adoption of the following resolution and findings. An affirmative vote of a majority of the Commissioners present is required to pass the motion.

Resolution:

The Commission hereby ***concurs*** *with consistency determination CD-0006-16 by the Navy on the grounds that the project is fully consistent, and thus consistent to the maximum extent practicable, with the enforceable policies of the California Coastal Management Program.*

III. FINDINGS AND DECLARATIONS

A. PROJECT DESCRIPTION

Location

The Navy's proposed Fiber Optic Communications Undersea System ("FOCUS-II") would be located at Naval Base Ventura County ("NBVC") Point Mugu, NBVC San Nicolas Island, Santa Cruz Island, and the submerged lands within the Point Mugu Sea Range ("Sea Range")(**Exhibits 1 and 2**). NBVC is located on the shoreline between the City of Oxnard and Point Mugu State Park. The Sea Range is a 36,000 square-mile test range extending more than 200 miles seaward from the shoreline off San Luis Obispo, Santa Barbara, Ventura, and Los Angeles counties. The Sea Range is the world's largest instrumented over-water range and provides extensive test and training capabilities for the U.S. Navy and allied forces. San Nicolas Island, located 65 miles south of NBVC Point Mugu, is owned by the Navy. Santa Cruz Island, located 30 miles west of NBVC Point Mugu is owned in part by the National Park Service ("NPS") and The Nature Conservancy ("TNC"). A small inholding, within the NPS portion of the island and retained by TNC, is leased to the Navy for a microwave radar facility which supports Sea Range operations.

Much of the proposed project would take place on Navy property (Point Mugu and San Nicolas Island), on National Park Service property (Santa Cruz Island), or on land under exclusive use to the Navy (the Navy Site leased from The Nature Conservancy on Santa Cruz Island). These sites are federal property and excluded from the coastal zone, as are the open ocean portions of cable segments located beyond the coastal zone (i.e., outside the 3 nautical mile limit of state waters).

The Navy has analyzed all project components, whether within or excluded from the coastal zone, for potential spillover impacts on coastal resources.

Background, Purpose, and Need

The existing FOCUS-I system was installed in 1993 and 1994 and includes two 80-mile-long fiber optic cables connecting NBVC Point Mugu and San Nicolas Island, and a microwave communications systems link between Point Mugu and Santa Cruz Island (**Exhibit 3**). The Commission concurred with installation of the FOCUS-I system in November 1989 (CD-045-89). The undersea cables and the microwave system are used to transmit and receive data signals between the three locations to track, control, and communicate with air and sea traffic on the Sea Range, and to support testing and training activities on the Range (operated by the Naval Air Warfare Center Weapons Division at Point Mugu). The Navy states that the FOCUS-I cables have a design life of 20 years. In July 2003 the Commission concurred with CD-050-03 for repairs to sections of the FOCUS-I cables at the San Nicolas Island landing site, and this work was completed in 2006. The Navy reports that the FOCUS-I cables are now experiencing signal degradation and are expected to further degrade in the coming years. Cable failure would prevent completion of mission-essential research, development, testing, evaluation, and training on the Sea Range.[1]

The aging microwave system that connects Point Mugu and Santa Cruz Island cannot be upgraded to handle telemetry, time-space-position information, and video, due to the lack of system support by the original equipment manufacturer and the lack of necessary parts needed to upgrade the system. As a result, the Navy proposes to install fiber optic cables connecting Point Mugu with San Nicolas Island and Santa Cruz Island, and connecting Santa Cruz and San Nicolas Islands.

The existing 7-mile-long water line on Santa Cruz Island that connects a well near Prisoners Harbor and the Navy microwave facility in the interior of the island was originally installed in 1951 and is leaking water at many locations. Failure of the water line would require water to be trucked from the well to the microwave facility. The Navy is concerned that inadequate water for personnel and equipment at the site would lead to an inability to continuously support Sea Range operations.

Project Description

The proposed FOCUS-II system is comprised of four interlinked fiber optic cables connecting NBVC Point Mugu, San Nicolas Island, and Santa Cruz Island. FOCUS-I will operate and be maintained until FOCUS-II is installed and its operational status verified. Following FOCUS-II installation, FOCUS-I would continue to operate and would provide a second level of redundancy until the cables degrade beyond the level of service required. The Navy states that "Removal of non-functioning equipment and evaluation of how best to remove this equipment would be conducted, if required, in the future and is not part of the proposed action."

[1] In addition to the installation and repair of the FOCUS-I cables, the Commission has concurred with other Navy undersea cable projects (both installation and repair projects) off shore of San Nicolas, Santa Cruz, and San Clemente Islands which support Navy operations and training activities on the Point Mugu Sea Range and the Southern California Offshore Range (ND-107-92, ND-092-94, CD-020-95, CD-015-05, and ND-049-11).

The proposed installation of FOCUS-II includes the following actions:

Onshore Activities

- Installation of new onshore cable landings at three locations: two sites at Point Mugu near Building 811 and near Charlie Pad (**Exhibit 4**), one site on San Nicolas Island near the Coast Guard jetty (**Exhibit 5**), and one site on Santa Cruz Island near Prisoners Harbor (**Exhibit 6**). Onshore landings will use horizontal directional drilling (HDD) technology to transition under sensitive nearshore coastal habitat.

- Use of existing underground infrastructure and installation of new buried cable at Point Mugu, connecting the onshore landing sites to the existing Building 531 cable termination site.

- Installation of approximately 500 feet of new buried cable on San Nicolas Island connecting the onshore HDD landing site to an existing concrete bunker. From the bunker, existing underground infrastructure will be used to connect to the existing Building 127 cable termination site (**Exhibit 7**).

- Installation of approximately 7.49 miles of new cable (7.28 miles buried and 0.21 miles placed in an elevated cable tray) within the Navy Road footprint on Santa Cruz Island connecting the onshore HDD landing site to the Building 4 cable termination site (currently the existing Navy microwave facility; **Exhibits 8 and 9**). Trenching is expected to take approximately three months.

- Installation of approximately 7.3 miles of new 3-inch diameter PVC water line between the well site and the Navy microwave facility on Santa Cruz Island, using the same trench and cable trays used for the fiber optic cables.

- Installation of between 20 and 80 buried concrete vaults along the Santa Cruz Island cable alignment.

- Cable pulling to connect the HDD landings and the communications buildings is expected to take approximately two days at each of the four landing sites.

- Periodic inspection and maintenance of the onshore cable alignments to ensure uninterrupted operation of the FOCUS-II communications system.

Horizontal Directional Drilling (HDD) Operations

- The project includes four HDD sites: two at Point Mugu at Building 811 and Charlie Pad, one on San Nicolas Island near the Coast Guard jetty, and one on Santa Cruz Island near Prisoners Harbor. HDD bore holes will exit the seafloor at depths of approximately 85 feet. Approximate distances from the onshore HDD sites to the exit sites offshore from Point Mugu, San Nicolas Island, and Santa Cruz Island are 4,990 feet, 2,960 feet, and 1,249 feet, respectively.

- The HDD process involves drilling and horizontal placement of piping into the ground to create an 8-inch diameter HDD bore hole. Drilling mud consists of water and bentonite clay, which powers the rotating drill head through the soil beneath the ocean floor. Drilling mud and cuttings return through a section of the bore hole back to a catch basin at the onshore HDD site. The drilling fluid will be switched to fresh or salt water approximately 150 feet from the bore exit point to minimize the potential for an escape of bentonite drilling fluid into the ocean.

- There are adequate freshwater supplies for HDD operations at Point Mugu. Freshwater will be transported to and stored in existing or additional bladders near the HDD site on San Nicolas Island. Seawater will be used in HDD operations on Santa Cruz Island due to water supply and storage constraints and the lack of infrastructure needed to import and store fresh water. Seawater will be pumped from a location 50 feet offshore through a screened 5-inch-diameter hose, equipped with a velocity cap such that intake velocities will not exceed 0.5 feet per second.

- Upon completion of HDD operations, all drilling fluids and solids will be transported to an approved treatment, storage, and disposal site, in coordination with the Regional Water Quality Control Board.

- Drilling equipment and facilities would be removed upon completion of HDD and all HDD pads would be returned to their original condition.

- Onshore HDD activity would occur for approximately four weeks at each of the four HDD sites.

Offshore Activities

- Installation of cabling offshore would commence following HDD operations and involves an installation vessel and an ocean construction dive team laying out fiber optic cables on the seafloor between the HDD exit sites.

- The Navy estimates that 234 nautical miles (NM) of cable would be installed to complete the FOCUS-II project, and that approximately 175.5 NM of the cable system (75%) would be trenched into and buried within the seafloor.

- For each of the four FOCUS cables, a trunk cable will extend from the onshore termination points, through the HDD bore tubes, and out to the offshore exit points, where the trunk cable will be connected to the main seafloor cable.

- The installation vessel will slowly navigate a defined route while laying out each cable, using conventional cable laying machinery to provide a gradual, controlled rate of descent to minimize risk of damage to the cable as it lands on the seafloor.

- The four cable routes were determined based on data collected during a high-resolution multi-beam hydrographic survey of the FOCUS-II area conducted for each of the proposed routes.

- The HDD exit sites are located in soft sediments and a minimum of 100 yards from known kelp and seagrass areas, and the cable route will primarily traverse sandy seafloor areas.

- Prior to the start of offshore cable burial, pre-lay grapnel operations would occur in order to clear the seabed of debris (e.g., discarded fishing gear) along the cable route. Any debris recovered would be collected on board the vessel and later disposed at an appropriate upland location.

- The cable would then be plowed into the sandy seafloor using a towed seaplow buried three feet deep out to a water depth location of 3,280 feet. Beyond this water depth the cable would lie directly on the seafloor, to a maximum depth of 4,920 feet. The Navy estimates that approximately 175.5 miles of cable would be buried and 58.5 miles of cable would lie on the seafloor.

- Each of the four cable routes have been designed to avoid hard-bottom habitat from the HDD exit sites out to the edge of the continental shelf.

- Post-lay inspection and burial will occur during or very soon after the cable lay operation and is performed to attempt retro-burial of any cable that could not be buried with the seaplow and/or to inspect select cable sections. Post-lay inspection and burial is typically performed with a remotely operated vehicle (ROV). The final cable routes will be denoted on NOAA's nautical chart of the area.

- Periodic maintenance activities of the new and existing FOCUS cables would occur to ensure uninterrupted operation of the system. Maintenance, including visual inspections and repairs, would likely occur annually. Typical activities would occur near the HDD exit sites, but occasionally may involve pulling the cable to a surface vessel for repairs and then returning the cable to the seafloor for burial using divers or a ROV.

- The Navy estimates that offshore cable installation is expected to take approximately 1-2 weeks for each of the four cables.

The Navy reports that the current planned start date for FOCUS-II construction is calendar year 2018 or later.

B. Prior Fiber Optic Cable Projects Approved by Coastal Commission

The Commission has concurred with numerous consistency and negative determinations for undersea cable projects proposed by the Navy offshore of southern California:

- CD-045-89, Construction of the Fiber Optics Communication Undersea System (FOCUS) between Naval Base Ventura County/Point Mugu and San Nicolas Island.

- ND-107-92, Test of Fiber Reinforced Plastic Cable at San Nicolas Island.

CD-0006-16 (Department of the Navy)

- ND-092-94, Shore Cable Installation on Santa Cruz Island.
- CD-020-95, Cable Placement at San Clemente Island.
- CD-050-03, Partial Replacement of FOCUS Cable at San Nicolas Island.
- CD-015-05, Repair and Replacement of Cables and Projectors for the Anti-Submarine Warfare Range at San Clemente Island.
- ND-049-11, Cable and Hydrophone Installation offshore of San Clemente Island.

The Commission has concurred with other federal consistency determinations, negative determinations, and consistency certifications for submarine fiber optic cable-related projects in other areas of the state by the Navy, Coast Guard, Federal Aviation Administration, MCI WorldCom, AT&T, Global West, and Tyco Networks (US) (some of the private company projects listed in this paragraph were combined with CDPs for the state water cables listed below).

The Commission has also approved numerous coastal development permits for fiber optic cable projects in state offshore waters:

- 4-91-61, Installation of cable and conduits offshore of Montana de Oro State Park.
- 4-91-61-A1, Installation of two additional cables offshore of Montana de Oro State Park.
- E-99-011, Installation of two fiber optic cables and five conduits offshore of Montana de Oro State Park.
- E-98-029, Installation of two fiber optic cables offshore of Montana de Oro State Park.
- E-98-27, Installation of three fiber optic cables and three conduits at Grove Beach.
- E-00-004, Installation of one fiber optic cable and five conduits at Manchester State Beach and one cable off of Montana de Oro State Park.
- E-00-008, Installation of a fiber optic cable along the California coastline and landing onshore at Morro Bay, Santa Barbara, Manhattan Beach, and Mission Beach.
- E-01-029, Installation of two fiber optic cables landing in Hermosa Beach.
- E-05-007, Installation of a research fiber optic cable from Moss Landing to Smooth Ridge in Monterey Bay.
- E-08-021, Installation of two fiber optic cables offshore of Montana de Oro State Park.
- 9-16-0160, Installation of one fiber optic cable offshore of Hermosa Beach.

C. Other Agency Approvals and Consultations

U.S. Army Corps of Engineers

The Navy will submit permit applications to the Corps in compliance with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbor Act, under Nationwide Permit 12 (Utility Line Activities).

Channel Islands National Park

The Navy will submit a Transportation and Utility Systems and Facilities on Federal Lands application to the National Park Service for work on Santa Cruz Island in Channel Islands National Park.

National Oceanic and Atmospheric Administration

The Navy has initiated consultation with NOAA regarding that part of the project located within the Channel Islands National Marine Sanctuary.

National Marine Fisheries Service

The Navy has initiated consultation with NMFS as required by the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act, the Marine Mammal Protection Act, the Endangered Species Act, and the Fish and Wildlife Conservation Act.

Native American Tribal Consultation

The Navy, in cooperation with the National Park Service, is undertaking consultation with Native American tribal representatives regarding protection of cultural resources within the project area.

Regional Water Quality Control Boards – Los Angeles Region and Central Coast Region

The Navy will submit applications with the Los Angeles and Central Coast Regional Water Quality Control Boards for Clean Water Act Section 401 Certifications for discharges into state waters in the project area.

State Water Resources Control Board

The Navy will submit a Stormwater Pollution Prevention Plan to the SWRCB.

California State Historic Preservation Office

The Navy has initiated National Historic Preservation Act Section 106 consultation with SHPO.

D. Dredging and Placement of Fill in Coastal Waters

Section 30233(a) of the Coastal Act states:

> *The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division where there is no feasible less environmentally damaging alternative,*

and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

(2) Maintaining existing, or restoring previously dredged depths on existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

(3) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

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

(5) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

(6) Restoration purposes.

(7) Nature study, aquaculture, or similar resource dependent activities.

The proposed FOCUS-II cable project involves filling within coastal waters and therefore triggers the three-part test of Section 30233(a): (1) the project must be one of the seven enumerated allowable uses; (2) the project must be the least environmentally damaging feasible alternative; and (3) the project must include feasible mitigation measures to minimize adverse environmental impacts. With regard to the first test, the proposed cable replacement project is an incidental public service and allowable use under Section 30233(a)(4), similar to determinations the Commission has made with respect to other Navy fiber optic cable projects in ocean waters off southern California.

The second test required by Section 30233(a) centers on project alternatives. As previously described in **Section III.A** of this report, the Navy determined that the aging and degrading FOCUS-I system must be replaced with the proposed FOCUS-II system. Therefore, the alternative analysis prepared by the Navy in the project *Draft Environmental Assessment* (DEA) centers on alternative HDD landing sites and onshore and offshore cable alignments.

The DEA states that potential horizontal directional drilling (HDD) site alternatives were developed based on the following operational requirements and environmental factors:

- Drilling sites should be placed as close as possible to the shoreline to minimize the length of drilling required;

- Elevation of the drill entry should be as low as possible to minimize the angle of drilling;
- Depth of drill exit points should be maximized to as close to 85 ft (26 m) water depth as possible so that cable segment exposure to nearshore currents and wave actions is minimized and divers using conventional air diving methods can install and maintain cable;
- There should be a relatively level cleared area for the HDD pad, particularly for the bentonite recycling system;
- The drilling site should, to the extent possible, be located in a previously disturbed area to minimize environmental disruption;
- The drilling site, to the extent possible, should be situated on level compacted soil; and
- NBVC Point Mugu landing sites should be at least 1 mile (1.6 km) apart to avoid both cables being damaged by a single event (e.g., anchor drag of bottom fishing activities).

The proposed HDD landing sites at Point Mugu (Building 811 and Charlie Pad), San Nicolas Island (Coast Guard Jetty), and Santa Cruz Island (Prisoners Harbor) were selected due to their locations in existing developed areas adjacent to existing infrastructure (e.g., existing cable landing sites, manholes, conduits, communications buildings), that meet the aforementioned HDD operational requirements, and that minimize environmental impacts. The Commission has approved numerous projects that employed HDD technology to bring submarine fiber optic cables onshore, and has generally found it to be the environmentally superior method for landing cables onshore, as underground HDD cables eliminate the need for construction activity on beaches, in surf zones, and through environmentally sensitive nearshore habitats. The Commission finds that there are no feasible less environmentally damaging alternatives to the proposed cable landing sites and to the use of HDD technology for landing the cables at Point Mugu, San Nicolas Island, and Santa Cruz Island.

The DEA states that development of alternative onshore cable alignments considered the following factors:

- The onshore cable alignment should use existing infrastructure to the maximum extent possible to minimize costs and potential environmental impacts;
- Trenching alignments should be designed in a manner that avoids impacts to natural and cultural resources to the maximum extent possible; and
- Where necessary, above-ground cable alignments will be designed to minimize impacts to cultural and visual resources and provide continued access to land areas to the extent possible.

The two onshore cable alignments selected for Point Mugu extend from the HDD sites, are routed through adjacent and existing underground conduits, and terminate at the Range Communications Building. All installation work would occur in existing developed areas. The selected onshore cable route on San Nicolas Island entails approximately 500 feet of trenching between the HDD site and an existing concrete vault currently housing the FOCUS-I cable. At this vault the two new cables would be spliced into an existing underground cable which terminates at Building 127 in the interior of the island. On Santa Cruz Island, the onshore cable route alternatives require more new construction compared to Point Mugu and San Nicolas Island. The selected alternative includes a combination of new trenching along existing roads and a 0.21-mile-long stretch of conduit elevated 1.6 feet above ground, connecting the HDD site, the existing water well, and Building 4 at the Navy Site in the interior of the island. The Commission finds that the onshore cable routes selected by the Navy minimize adverse effects on environmentally sensitive habitat and recreational and cultural resources (described below in **Sections III.F, H, and I**). The Commission finds that there are no feasible less environmentally damaging alternatives to the proposed onshore cable alignments at Point Mugu, San Nicolas Island, and Santa Cruz Island.

The DEA states that the following factors were considered in developing offshore cable alignment alternatives:

- Offshore cable alignments should to the extent possible avoid rocky bottom areas that provide habitat to sensitive fish and invertebrates and increase potential wear and tear on the cables;
- Offshore cable alignments should avoid known underwater cultural resources;
- Offshore cable alignments should avoid areas with steep offshore slope or large rocky outcroppings that increase stress on the fiber optic cable;
- Offshore cable alignments should be parallel to the prevailing wave and current direction wherever possible to reduce the stress from strong ocean currents and wave action; and,
- Offshore FOCUS-II cable alignments should avoid crossing FOCUS-I cables in the nearshore environment and existing oil and gas pipelines on the ocean floor.

Selection of the four proposed offshore cable routes was based on the results of data collected by the Navy during a high resolution multi-beam hydrographic survey of the FOCUS-II project area (**Exhibit 10**). The Navy states that:

> *Cable routes were selected to avoid steep bathymetry since these features could create unnecessary cable strain or wear and tear. The spreading out or turning of cables is planned to occur at a constant depth to avoid placing any cables at angles to the downward slope. The installation of cables parallel to the steep slope of canyons will also be avoided.*

The four offshore cable routes selected by the Navy meet the above factors and avoid all areas of hard-bottom habitat between the HDD exit sites and the edge of the continental shelf (**Exhibits 11-13**). In addition, the selected routes avoid pipelines and cables connecting oil and gas production platforms to the mainland (**Exhibit 14**). As discussed further in **Section III.E** of this report, the selected cable route alignments minimize adverse effects on marine resources. Therefore, the Commission finds that there are no feasible less environmentally damaging alternatives to the proposed offshore cable routes connecting Point Mugu, San Nicolas Island, and Santa Cruz Island and meets the alternatives test of Coastal Act Section 30233(a).

The final requirement of Section 30233(a) is that dredging and filling of coastal waters may be permitted if feasible mitigation measures are provided to minimize any adverse effects on coastal resources. **Sections III.E through J** of this report include analysis of the avoidance, conservation, and mitigation measures that the Navy has incorporated into the FOCUS-II project to minimize adverse environmental impacts. With these measures the Commission finds that the mitigation test of Coastal Act Section 30233(a) has been met.

E. Marine Resources and Water Quality

Section 30230 of the Coastal Act states:

> *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long term commercial, recreational, scientific, and educational purposes.*

Section 30231 of the Coastal Act states:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Section 30232 of the Coastal Act states:

> *Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.*

Marine Resources. The offshore waters in the project area are considered essential fish habitat (EFH) for Pacific Coast Groundfish (PCG), Coastal Pelagic Species (CPS), and Highly Migratory Species (HMS). There are three areas designated by the state as Areas of Special Biological Significance (ASBS) in the project area: Latino Point to Mugu Lagoon, waters surrounding San Nicolas Island and waters surrounding Santa Cruz Island (**Exhibit 15**). The Channel Islands National Marine Sanctuary encompasses, in part, the waters within six nautical miles of Santa Cruz Island, and the Scorpion State and Federal Marine Reserve is located off the northeast shore of Santa Cruz Island (**Exhibit 16**).

The *Draft Environmental Assessment* (DEA) for the proposed project describes the marine habitats and resources adjacent to the offshore HDD exit sites at Point Mugu, San Nicolas Island and Santa Cruz Island, and in the offshore waters transited by the four FOCUS-II cables. The nearshore continental shelf seaward of the two HDD exit points at Point Mugu supports numerous species of marine invertebrates and fisheries. Nearshore marine habitats at San Nicolas Island and Santa Cruz Island include offshore rocks, rocky reefs, kelp forests, eelgrass beds, and sandy bottom habitat, and support a wide diversity of invertebrates and fisheries.

The DEA states that the majority of the cable sea route is located in deepwater, soft bottom areas:

> *In general, these offshore areas are characterized by a diversity of habitats, primarily muddy (silt-clay) to sandy shelf and muddy slope environments, but also include areas of deep basins, submarine canyons, shelf-slope break, and near-island habitats. A few areas near the northern Channel Islands have more extensive hard-bottom features, but these areas would be avoided by the cable route.*
>
> *Little to no offshore algae or vegetation is present along the cable route. HDD technology will be used at the landing sites to drill offshore below and past the kelp beds and vegetated areas.*
>
> *Most of the biological resources that occur commonly along the sea route are found throughout much of southern California, especially at depths below about 650 ft (200 m), where many species tend to be relatively cosmopolitan in distribution along the California coast (SAIC 2000).*

The DEA also describes the marine mammals and special species that are present within the project area adjacent to Point Mugu, San Nicolas Island, and Santa Cruz Island:

> *Sandy beaches within Point Mugu, including near the landing sites, are used as an occasional haul out area for individual pinnipeds, including juvenile elephant seals and California sea lions (Navy 2013).*
>
> *Three species of pinnipeds are regularly observed in the vicinity of or nearshore at SNI: California sea lion, northern elephant seal, and Pacific harbor seal (Figure 3.2-8). SNI and the surrounding waters provide important foraging, breeding, and haul out areas for these pinnipeds.*

> *The CINMS [including Santa Cruz Island] provides vital habitat for pinnipeds, offering important feeding areas, breeding sites, and haulouts . . . the most common pinniped in the region is the California sea lion. No pinniped haulout areas are located at or near the proposed landing site.*

Marine mammals and special species are also present in the offshore waters transited by the four proposed cables:

> *Marine mammals reported within the Santa Barbara Channel are represented by more than 40 species, all of which are protected by the MMPA [Marine Mammal Protection Act]; these include 34 species of cetaceans (whales, dolphins, and porpoises) and six species of pinnipeds (seals and sea lions) . . . the southern sea otter is also found in the waters surrounding SNI. Six species of cetaceans are federally listed as endangered, while two species of pinnipeds and the southern sea otter are listed as threatened under the federal ESA [Endangered Species Act].*

The DEA reports that while a total of eight species of baleen whales occur in the Southern California Bight, including the proposed offshore cable routes, only four species are commonly sighted: California gray whale, humpback whale, blue whale, and fin whale. In addition, several dolphin and porpoise species are commonly observed in offshore waters along the cable routes. Four pinniped species are year-round residents in the offshore waters of the project area: northern fur seals, harbor seals, northern elephant seals, and California sea lions, the latter being the most abundant.

Project Impacts. The Navy's consistency determination first examines the potential adverse effects on marine habitat and fisheries in the project area from construction of the HDD cable tube exit sites and offshore cable laying and burial (Project-related impacts to recreational and commercial fishing are found in **Section III.G** of this report):

> *There are no estuaries in the proposed project area and canopy kelp is absent in depths greater than 85 ft in any of the exit locations. Seagrass is present nearby the SCrI HDD exit point, though the closest bed is approximately 400 ft inshore of the HDD exit point. Rocky substrate will be avoided though the potential exists to cross limited rocky outcroppings in deeper water. The cable route north of SCrI will likely cross the offshore portion of two areas specified in the federal waters of the CINMS* [Channel Islands National Marine Sanctuary]. *Environmentally sound engineering practices would be used during cable installation and operating activities to minimize the influence of the cable on EFH. Therefore, it is unlikely that cable-laying activities would have any long term impacts on PCG, CPS, and HMS, their spawning, feeding, or fishing activities for these species. If any disruption did occur, it would be temporary and reversible. An EFH consultation describing potential impacts to PCG, CPS, and HMS has been prepared by the Navy and submitted to NMFS.*

The consistency determination next examines potential impacts on marine mammals in the project area:

> *Drilling activities would occur during the non-breeding season for all pinnipeds potentially present in the project areas so noise from HDD operation would not impact these communities in the vicinity of the project sites. Conservation measures such as those found in Figure 13 would require that all HDD and onshore construction activities on SNI* [and Santa Cruz Island] *occur between September 15 and December 15, outside sensitive bird breeding and nesting periods as well as marine mammal breeding season. Given the distance between the SNI sea otter populations and the project sites, the proposed action would have no effect on sea otters on SNI. No population of special status marine species would be adversely affected due to the general avoidance of these resources by the sea route and/or low abundance of these organisms in the general vicinity.*
>
> . . .
>
> *The proposed cable installation has low potential for collision with or entanglement of marine mammals and sea turtles from project vessels or cables. The larger project vessels would move very slowly during cable installment activities (0 to 2 knots), and would not pose a collision threat to marine species that may be present. Entanglement of marine species is not likely because the rigidity of the cable is designed to lie extended on or be buried underneath the sea floor. Anchor and cable lines would be taut, posing no risk of entanglement or interaction with marine species that may be swimming in the area. Once installed on the seabed, the new cables would be equivalent to other hard structures on the seabed, again posing no risk of adverse effect on marine species. There are no documented incidents of sea turtle entanglement in a submarine cable during the past 50 years (Norman and Lopez 2002). The project vessels would abide by all appropriate Navy regulations regarding marine species sighting and reporting.*

The Navy provided the following list of existing measures and protocols that will be implemented during offshore cable laying operations in order to minimize and avoid adverse effects on marine mammals:

- *Ship Safety Manual & Ship Standard Operating Manual*
- *U.S. Navy Afloat Environmental Compliance Manual (ex. OPNAV M-5090)*
- *Vessel Safety SOP (ex. Section C.1.1, CD-008-13, HSTT)*
- *Notice to Mariners (ex. Section 3.12, of the HSTT EIS/OEIS)*
- *Protective Measures Assessment Protocol (ex. Section C.2.2., CD-008-13, HSTT)*
- *Lookout Procedures (ex. Section C.3.1, CD-008-13, HSTT)*
- *Marine Species Awareness Training (ex. Section 3.1.1.1.1, CD-008-13, HSTT)*
- *Stranding Response Plan for SOCAL Range Complex*
- *Stranding Protocol, OPNAVINST 3100.6H*
- *US Navy/NMFS Marine Mammal Stranding MOU dtd 2011*

The Navy states that HDD technology would be used to install fiber optic cable beneath the sandy beach and out to approximately 85 ft water depth. This technology would avoid (by drilling the cables underneath) all sensitive nearshore habitats (**Exhibits 4-6**). Some temporary impacts (e.g., burial, crushing, and/or displacement) would occur to invertebrates in soft-bottom areas as a result of cable-laying activities; however seafloor mapping has confirmed that hard-bottom habitats will be avoided by all four cables from the HDD exit points out to the edge of the continental shelf. The Navy confirmed this after analyzing the bathymetric data collected in the May 2016 hydrographic survey of the offshore cable routes in the FOCUS-II project area (**Exhibits 11-13**). Cable laying in deepwater areas beyond the edge of the continental shelf could potentially cross areas of hard-bottom habitat. However, any potential impact to coastal resources would be de minimus due to: (1) the distance between hard-bottom habitat in these deepwater areas and state waters within the coastal zone, and (2) the difficulty in quantifying potential impacts arising from a cable crossing hard-bottom habitat in these deepwater areas. The Commission has not previously required mitigation for such cable impacts occurring beyond the edge of the shelf (as documented most recently in CC-0001-16/CDP 9-16-0160 (MC Global BP4, Inc.)

The consistency determination notes that:

> *Soft bottom habitats are not considered sensitive habitats, and generally support lower biological diversity than hard substrate habitats. Soft bottom organisms are also generally opportunistic and would be expected to rapidly re-colonize the disturbed areas. Temporary displacement of some fishes from the immediate vicinity (e.g., tens of feet) of the cable route would occur during short-term passage of cable installation equipment. The fish are anticipated to return almost immediately to normal behaviors following the passage of equipment. Suspended solids are expected in a plume resulting from cable burial by the seaplow; potential impacts to soft-bottom species from turbidity would be localized and short term with temporary (e.g., hours) and localized (occurring over a very discrete area). Once the cable is buried by the plow, or settles onto the bottom in deep water, the soft sediment would rapidly return to a normal state.*

The Navy states that any marine debris (e.g., discarded nets or other fishing gear) encountered during the pre-lay grapnel run prior to cable burial will be removed from the ocean floor and disposed at an appropriate upland location. Project Conservation Measure No. 3 states that, "To avoid marine mammal and listed bird breeding seasons, HDD and construction activities will only occur between September 15 and January 31 at Point Mugu, and between September 15 and December 15 at San Nicolas Island and Santa Cruz Island." This schedule also protects spring and summer grunion runs at Point Mugu near the HDD landing sites. In addition, the Navy reports that it will implement:

> *. . . significant BMPs for vessel safety, lookout and watch stander standards, and extensive marine mammal observer and marine species awareness training and reporting requirements. All personnel conducting cable-laying operations, to include vessel handling operations and lookouts, will be either DON personnel or contracted with the Navy and appropriate training completed.*

The Navy also reports that any additional marine resource protection measures arising from Navy consultations with NOAA/Channel Islands National Marine Sanctuary and the National Marine Fisheries Service will be incorporated into the project.

Disposition of Abandoned/Unused Cables. In previous Commission concurrences with submarine cable installation projects, the Commission has raised the issue of the final disposition of abandoned or unused fiber optic cables on the seafloor. In CD-050-03 (Navy) for replacement of two short, nearshore sections of FOCUS-I cables immediately offshore of San Nicolas Island, the Commission conditioned its concurrence to require removal of the degraded cable segments. (The CD for the original installation of the FOCUS-I cables (CD-045-89) did not analyze the issue of cable removal after the cables were no longer in use.) The Navy did not agree to this condition and the cable segments remain on the seafloor. After additional discussion with the Navy, the Commission agreed that for the replacement cable segments, the Navy could: (1) submit materials to the Commission which document that leaving the replacement cable segments on the seafloor when they are no longer in service would be less harmful to the marine environment than removing them; and (2) request at that time that the Commission eliminate the condition seeking removal of the replacement cable segments when they are no longer used by the Navy.

At the present time: (1) the FOCUS-I replacement cable segments are still in use (as is the entire FOCUS-I system); (2) the Navy has submitted materials to the Commission in support of its determination that leaving the replacement cable segments in place is the environmentally preferred option; and (3) the Navy and the Commission have agreed to essentially delay final resolution of this issue until the Navy no longer uses the cables. For the FOCUS-II cable project, the Navy re-states that while it does not make any commitment over removal of these cables when they are no longer in service, the Navy will re-engage with the Commission at such time that the cables are taken out of service to discuss cable disposition. The Navy intends to continue using the FOCUS-I cables as a back-up system after the FOCUS-II cables are placed into service. Therefore, discussions with the Navy on the disposition of FOCUS-I and FOCUS-II cables will occur at future dates, and disposition is not an element of the subject consistency determination. The Commission believes this approach is warranted in this situation and at this time under several procedures available under the federal consistency regulations: (1) through procedures encouraging and allowing "phased review" for federal agency decisions made in phases (15 CFR § 930.36(d)); and/or (2) through continuing review under the federal consistency "reopener" provision (15 CFR § 930.45).

Water Quality. The DEA includes a description of water quality in the ocean waters of the project area and is summarized briefly here. Water quality in the nearshore area of Point Mugu is affected by the presence of particulates and contaminants in the outflow from Mugu Lagoon and by discharges from offshore oil and gas development. The water quality of ocean water in the vicinity of San Nicolas Island is relatively pristine. Water quality offshore of Santa Cruz Island is generally good due to its isolated location, but oil and tar deposition from natural seeps and ship traffic is chronic. In the offshore waters of the Sea Range, the distance from both the mainland and oil and gas development, combined with the large diluting volume of the ocean and the shelves and basins near the mainland where many pollutants settle, ensures high water quality.

HDD activities, accidental discharge from project vessels, upland construction runoff, and turbidity increases from cable laying hold the potential to adversely affect ocean water quality in the project area. The consistency determination addresses these potential effects and the measures incorporated into the project to minimize and avoid adverse effects on water quality.

Regarding proposed HDD activities:

> *The three ASBSs* [Areas of Special Biological Significance] *in the project area are: Latigo Point to Mugu Lagoon, SNI and Begg Rock, and Santa Cruz Island. The proposed project activities would not result in long-term changes to water chemistry (e.g., the pH, temperature, and dissolved oxygen levels), turbidity, or the amount of light in the water column within the project areas, including the ASBSs. Upon completion of drilling operations, an unavoidable release of drilling fluid would occur by seepage through fractures in the seabed and by pressure discharge when the drill bit penetrates the exit point. The drill pipe has an internal diameter of five inches, so the volume of material that could be released offshore due to hydrostatic pressure is up to 442 gal per HDD site. In the unlikely event that the drill pipe fractures (a mechanical failure) at or near the lowest point in its trajectory and the drilling was near completion, the volume of mud contained in the HDD bore hole could migrate into the surrounding formation. This volume of material represents a worst-case release of up to 7,443 gal per HDD site into the surrounding geology. However, the drilling fluid would remain contained within the subsurface formation and would be unlikely to migrate to the surface or be released offshore. This volume would include approximately 27 cubic feet of cuttings. Since the drilling fluid consists of water-based bentonite clay mixture and cuttings from the seabed, it would be non-toxic to nearshore marine organisms or marine water quality. In addition, every reasonable effort would be made to minimize the unavoidable discharge of drilling fluid. The drilling fluid would be switched to fresh or salt water at the bore exit to mitigate a bentonite discharge. This switch would be approximately 151 ft before the bore exit. The driller and surveyor will know when the drill head assembly exits the seafloor by a dramatic change of the drill trajectory inclination angle. If the drilling fluid had not been switched to water, it would be done so immediately. All procedures in the project-specific spill prevention plan would be followed. Prior to HDD activities, the Navy will coordinate with the California State Water Resources Control Board to determine whether the Navy will need to apply for an exception of the California Ocean Plan prohibition against direct discharges of waste to an ASBS.*

The consistency determination next examines potential impacts from vessel discharges:

> *All equipment to be used for installation of the cables would be properly maintained and monitored for leakage of fuel, oil, or other hazardous materials. Vessels and equipment used for cable deployment and installation would comply with regulatory requirements and best management practices (BMPs) for minimizing the inadvertent discharge of potential marine contaminants. Cable materials (e.g., glass, plastic, nylon, over-armor) would not leach contaminants into the water or sediments. Based*

on observations of existing cable arrays, the cable materials would become encrusted with benthic organisms.

Potential impacts to water quality from upland construction activities are next examined:

Any potential fuel or oil spill at the construction sites would be cleaned up in accordance with standard procedures for similar activities at Navy sites and all procedures would be included in a project-specific spill prevention plan. Excess drilling fluid (drilling mud and cuttings) not recycled into the HDD borehole would be temporarily stored in catch basins and disposed at offsite locations. The drilling fluid is non-toxic and would not affect water quality if it were to spill out. The NBVC Point Mugu project areas are also located within the 100-year floodplain of Calleguas Creek; therefore there is the potential for impacts to the floodplain. Those impacts would be reduced as would any effects to the marine waters through implementation of standard construction BMPs; low impact development design measures; National Pollutant Discharge Elimination System (NPDES) permits; construction Storm Water Pollution Prevention Plan; Erosion Control Plans; and the use of catch devices and sheeting designed to minimize water quality degradation. The project would not affect the current on-site or off-site drainage or any existing drainage structures nor require modification of existing drainage structures.

Construction at the HDD exit points and cable laying may affect ocean turbidity levels:

There would be a temporary increase in turbidity in the water columns near the exit points. The turbidity would be expected to settle and dissipate in a short amount of time. Only minimal sediment disturbance would occur along the sandy-bottom areas of the offshore cable alignment while the cable is lowered from the marine vessel and during plowing operations, and the disturbed sediments would quickly settle back to the bottom. No permanent source of turbidity would be associated with the proposed project.

The Navy has incorporated numerous conservation measures into the FOCUS-II project, many of which are designed to prevent adverse impacts to water quality during construction and installation of the project (**Exhibit 17**). In addition, the Navy will implement a Spill Prevention, Control, and Countermeasure Plan, HDD Frac-Out Contingency Plan, Environmental Compliance Afloat Plan, Stormwater Pollution Prevention Plan, and the Navy's standard construction best management practices. The latter will include HDD installation monitoring to ensure that drilling of the four HDD trunk cable tubes does not lead to adverse effects on water quality and marine resources. The Navy has committed to inform the Commission of any accidental releases of drilling fluids during HDD installation work.

In conclusion, the Commission finds that construction and installation of the terrestrial and offshore components of the FOCUS-II project would lead to only temporary and minor adverse effects on marine resources and water quality, primarily due to the short-term nature of project installation, a construction schedule during the time of year that minimizes potential impacts on

terrestrial and marine wildlife, the location of upland development in existing developed areas, cable alignments that avoid rare and valuable hard-bottom habitat, and the use of HDD technology to avoid installing cables in environmentally sensitive shoreline and nearshore habitats. With the above-described marine resource and water quality protection measures incorporated into the FOCUS-II project, the Commission finds that the project will be implemented in a manner that protects marine resources and habitats, and sustains the biological productivity and quality of coastal waters. The Commission finds that the proposed project is consistent with the marine resources and water quality policies of the Coastal Act (Sections 30230, 30231 and 30232).

F. ENVIRONMENTALLY SENSITIVE HABITAT

Section 30240 of the Coastal Act states:

> *(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.*
> *(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.*

The Navy states that it manages and protects the natural resources at Point Mugu and San Nicolas Island with *Integrated Natural Resource Management Plans*, and that Channel Islands National Park similarly manages the natural resources under its control on Santa Cruz Island through its *General Management Plan*. The consistency determination describes the sensitive wildlife species and the environmentally sensitive habitat areas at these locations and the potential impacts from the FOCUS-II project:

> *Construction activities associated with the proposed action would be implemented near concentrations of sensitive wildlife species. In order to protect these species, wildlife conservation measures, as listed in Figure 13, would be required during construction activities depending on the type of activity, location of the activity, and the time of year. Personnel would be required to stay off sites when construction activities are not being conducted. Western snowy plovers, Ridgway's rails, least terns, and saltmarsh bird's beak are present at Point Mugu on the beaches and marsh adjacent to the Building 811 and Charlie Pad project sites. However, the terns will be avoided by implementing the seasonal restrictions listed in Figure 13. Western snowy plovers and island foxes are located on the beach adjacent to the drilling site on SNI* [San Nicolas Island]. *At the SCrI* [Santa Cruz Island] *project sites, the SCrI fox is present, and bald eagles are, at times, found in the Prisoners Harbor area. Marine mammals (northern elephant seals, harbor seals, and California sea lions) are present on the beaches and/or in the nearshore waters adjacent to the SNI drilling site. A harbor seal haulout is located within the estuary at Point Mugu, west of the mouth of Mugu Lagoon.*

Regarding resources at Point Mugu:

> *At NBVC Point Mugu, the HDD drill sites at Bldg 811 and Charlie Pad would be located within previously disturbed areas devoid of vegetation. Implementation of BMPs such as restricting project vehicles and equipment to previously disturbed areas & graded surfaces and treating areas for invasive weeds and flagging all wetlands would ensure no impacts to wetlands. Although there are populations of salt marsh bird's beak, a listed plant species, adjacent to the HDD sites, a qualified biologist will survey the area to confirm absence at the time of construction operations, thus no effects on salt marsh bird's beak is anticipated. Of the other special status bird species, Ridgway's rail, California least tern, and western snowy plover, by implementing seasonal conservation measures, proposed construction activities would have no effect on these species.*

Regarding resources at San Nicolas Island:

> *At SNI, the HDD drill site at Coast Guard jetty, staging area and trenching corridor would be located within previously disturbed areas with sparse vegetation and no sensitive plant species. To reduce the potential introduction of ecologically harmful non-native flora or fauna, all barge and aircraft shipments to SNI will be conducted in accordance with NBVC Instruction 5090.14, Biological Resources Security Requirements for Air and Barge Transport of All Cargo to San Nicolas Island. Of the special status species located on SNI, seasonal avoidance will ensure no effects to western snowy plover. Although there are high density populations of island night lizards (a recently de-listed species) in the vicinity of the water bladder staging area, the area would be surveyed within seven days prior to use of the water bladders and any ground disturbance to minimize effects to the night lizards. Likewise, implementation of conservation measures such as daily trash and rubbish removal; securely sealing all trash receptacles; covering pits deep enough to trap foxes and capping all pipe ends from 2 to 6 inches in diameter would provide protection for the inquisitive San Nicolas Island foxes.*

Regarding resources at Santa Cruz Island:

> *At SCrI, the HDD drill site at Prisoners Harbor, staging areas, and trenching corridor would be located in previously disturbed areas devoid of vegetation, including no presence of island bedstraw and rush rose. Soils excavation during trenching operations would be kept within the Navy Road footprint, minimizing impacts to Prisoners Harbor wetlands. All barge and aircraft shipments to SCrI will be conducted in accordance with CINP Biosecurity Protocols. Noise from construction activities may generate avoidance reactions by bald eagles at SCrI and although the immediate project area is located within normal bald eagle foraging areas, it is within areas of existing human activity and would be short-term in addition to the fact that an equally valuable foraging area is located farther north along the Canada del Puerto. Construction noise and increased human activity may temporarily displace SCrI foxes but this is similar to existing conditions and similar*

> *conservation measures used for the SNI foxes would be implemented on SCrI to minimize effects.*

The consistency determination also includes an extensive list of conservation measures that the Navy will implement to protect environmentally sensitive habitat areas and listed species during construction of the FOCUS-II project terrestrial components (**Exhibit 17**). Additional measures arising from the NEPA process or consultation with the National Park Service and other federal agencies will be incorporated into the project. The HDD sites, staging areas, and trenching corridors connecting landing sites to existing communications buildings at Point Mugu, San Nicolas Island, and Santa Cruz Island would be situated within previously disturbed and/or currently developed areas. The above-ground elevated channel carrying the fiber optic cable and water line on Santa Cruz Island would follow a path along previously disturbed oak woodland and grassland. The Commission agrees that the design of project components, the conservation measures incorporated into the project, construction best management practices, and the temporary nature of construction activities will ensure that the project will not adversely affect sensitive habitat and species at Point Mugu, San Nicolas Island, and Santa Cruz Island. Therefore, the Commission finds that the proposed project is consistent with the environmentally sensitive habitat policy of the Coastal Act (Section 30240).

G. COMMERCIAL AND RECREATIONAL FISHING

Section 30234.5 of the Coastal Act states:

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

The *Draft Environmental Analysis* (DEA) describes the commercial and recreational fishery activities that occur in the project area offshore of Point Mugu, San Nicolas Island, and Santa Cruz Island, and in the larger offshore area encompassing the alignments of the four submarine cables:

> *The Point Mugu [cable] landing sites are located within the California Recreational Fishing Survey (CRFS) Channel Sampling District (RecFin, 2016) . . . recreational fishing by the general public does not occur in the project area due to access restrictions.*
>
> *The San Nicolas Island landing site is located within CDFW commercial catch block 813 (Figure 3.2-7)*[**Exhibit 18**][2] *. . . Red sea urchin had the highest overall catch of over 500,000 lb (227,000 kg), followed by warty sea cucumber, California spiny lobster, spot prawn, and white seabass . . . California spiny lobster, spot prawn, warty sea cucumber, red sea urchin, and white seabass had the highest total commercial value . . . The SNI landing site is located within the CRFS South Sampling District . . . Chub (Pacific) mackerel were caught in the highest number by*

[2] Note that the FOCUS-II cable alignments shown on this SDFW catch block map do not reflect the final cable alignments proposed by the Navy in its consistency determination as shown in **Exhibit 1** of this staff report.

recreational anglers, followed by Pacific sardine, kelp bass, California lizardfish, and barred surfperch.

The Prisoners Harbor [Santa Cruz Island] landing site is located within CDFW commercial catch block 686 (Figure 3.2-7)[**Exhibit 18**] *. . . Market squid had the highest overall catch of over 19 million pounds, followed by Pacific sardine, red sea urchin, Pacific mackerel, and Pacific bonito . . . Market squid, California spiny lobster, red sea urchin, spot prawn, and California halibut had the highest total commercial value . . . Recreational catches for SCrI are included in the same CRFS sampling district as Point Mugu . . . barred surfperch were caught in the highest number by recreational fishermen, followed by Pacific sardine, chub (Pacific) mackerel, jacksmelt, and walleye surfperch.*

The Offshore Route is located within CDFW commercial catch blocks 683-685, 706, 707, 726, 747, 748, 767, and 813 (Figure 3.2-7)[**Exhibit 18**] *. . . Market squid had the highest overall catch of over 125 million pounds, followed by Pacific sardine, northern anchovy, Pacific mackerel, and red sea urchin . . . Market squid, California spiny lobster, spot prawn, California halibut, and white seabass had the highest total commercial value. The offshore route overlaps both the South and the Channel CRFS Sampling Districts (RecFin, 2016). In the South District . . . California scorpionfish were caught in the highest number by recreational fishermen, followed by Pacific sanddab, barred sandbass, vermilion rockfish, and bocacciio . . . In the Channel District . . . vermilion rockfish were caught in the highest number by recreational fishermen, followed by bocaccio, Pacific sanddab, greenspotted rockfish, and rockfish genus (unspecified).*

The consistency determination notes the presence of commercial and recreational fisheries in the project area and examines the potential project-related impacts on commercial and recreational fishing from installation and operation of the FOCUS-II cable system:

Types of commercial fishing gear used in the vicinity of the landing sites or offshore route include drift gillnets, longline gear, troll gear, trawls, seining and traps or pots. Commercial and recreational fishing is limited in the vicinity of the HDD landing sites. Short-term and temporary impacts on commercial or recreational fisheries could occur from preclusion of fishing during cable installation, operation, repair, and removal activities from the proposed project. The presence of the cable installation vessel and equipment could preclude fishing within a limited area (~1 mi) for a temporary period (a few hours to several days based on location). However, advance notice would be given via a Notice to Mariners (NOTMARs). There is potential for commercial fisheries that use equipment that contacts the bottom, such as otter trawls, to snag unburied portions of the cable causing damage to or loss of fishing gear or damage to the cable. Since the cable is expected to be buried three feet below the surface in soft-bottom areas to a water depth of 3,280 ft, the likelihood of snagging cables is remote and not expected.

Installation of the four FOCUS-II cables in offshore waters is expected to take between four and eight weeks. The Commission agrees with the Navy that while cable installation will preclude commercial and recreational fishing in the immediate vicinity of the cable vessel, this restriction does not represent a significant adverse effect due to the limited geographic area and duration of the installation activity as the cable vessel transits along the cable alignment. Military security designations in the waters immediately offshore of Point Mugu and San Nicolas Island currently restrict commercial and recreational fishing and this condition would not change with the installation of the FOCUS-II cables. The offshore cables will be buried to a depth of three feet in the ocean floor out to a water depth of 3,280 feet, will avoid hard-bottom habitat out to the edge of the continental shelf, and the cable alignments will be denoted on NOAA's nautical chart for the area. These measures will further ensure that the FOCUS-II cables would not adversely affect commercial and recreational fishing in the project area. The Navy also reports that to the best of its knowledge the existing FOCUS-I cables between Point Mugu and San Nicolas Island have not caused adverse effects to commercial and recreational fishing along and adjacent to the cable alignments. With the above measures, the Commission finds that the installation and location of the proposed FOCUS-II cables will not adversely affect commercial or recreational fishing in the offshore waters of the project area, and that the project is consistent with Section 30234.5 of the Coastal Act.

H. Public Access and Recreation

Section 30210 of the Coastal Act states:

> *In carrying out the requirements of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.*

Section 30212 of the Coastal Act states in part:

> *(a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where: (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources . . . .*

Section 30220 of the Coastal Act states:

> *Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.*

The Navy states in its consistency determination that:

> *During normal operation of FOCUS-II cables, there would be no effects to public access or recreation. In fact, reliable communications for Sea Range operations provides improved safety for the public and recreational activities within those*

> *waters. During installation of the project, there may be temporary effects to public access and/or recreation depending upon the location and timing of installation activities as described below.*

The Commission agrees that presence and operation of the four FOCUS-II submarine cables would not affect public access and recreation.

Two of the three proposed HDD cable landing sites would occur within the boundaries of NBVC, at Point Mugu and San Nicolas Island, where access is controlled and restricted to military and Department of Defense personnel, authorized contractors, and official visitors. The Navy states that:

> *For safety purposes, a restricted area has been established for the waters surrounding SNI out to three nautical miles from the shoreline which also inhibits public access and recreation. This restricted area is divided into three sections whose boundaries were amended in May 2014 and are periodically closed during operations. Boats must remain at least 300 yards from the shoreline of SNI at all times and no boats are allowed to anchor within 300 yards or land on SNI except in an emergency. There are no opportunities for public access or recreation located near these HDD sites, lay-down areas or the associated trenching routes connecting the HDD site to the communications buildings* [at Point Mugu and San Nicolas Island].

The Commission agrees that the installation of FOCUS-II components (e.g., cable landings at HDD sites, conduit connections) at Point Mugu and on San Nicolas Island will not affect public access and recreation due to their locations on military reservations and restricted waters closed to public access and use.

The third HDD cable landing site occurs on Santa Cruz Island (SCrI) in a location owned by the National Park Service as an element of Channel Islands National Park (CINP). The consistency determination states that:

> *The HDD site would be located adjacent to Prisoners Harbor pier, a public access point of entry for CINP on SCrI. The cabling and waterline route would primarily occur alongside Navy Road which connects Prisoners Harbor to the Navy Site (deviations of the route away from Navy Road are illustrated in Figure 10). Navy Road, a paved road, is also a public access trail within CINP and comprises 10.6 of the 20.2 miles of roads on SCrI. CINP is a public recreation resource located on five of the Channel Islands and includes all submerged lands, waters, rocks and islets surrounding those islands out to a distance of one nautical mile. Common activities on CINP include marine mammal and bird watching, photography, hiking and camping in designated locations. According to the CINP 2015 General Management Plan, population of Prisoners Harbor is planned for no more than 100 visitors per day. There is currently no visitor contact station in the Prisoners Harbor area though the General Management Plan does anticipate one in the future.*

Construction activities associated with the HDD site and cable/waterline route would temporarily affect the visitor experience to CINP at SCrI, but would not have an adverse effect to public access and recreation. Public access and recreational uses of the Prisoners Harbor Pier would be temporarily disrupted, but not eliminated, during the drilling operations for approximately 30 days. Road traffic would not be disrupted by drilling operations at this site and recreational visitors would still be allowed access to the Prisoners Harbor Pier, but the area west of the pier would be not be available for recreational use. Public access to SCrI would still be available via the pier at Scorpion Anchorage for recreational users as are all the other beaches on the SCrI. In discussions with NPS, the Navy understands there are plans to replace the Scorpion pier. Schedules for construction have not been set for either project. The Navy will work with NPS to ensure disruptions to visitor access are minimized. The Navy will coordinate with NPS and the public concessionaire to schedule such operations outside normal public access schedules and at no time will the pier be closed to public access while other NPS piers are closed. During trenching operations, temporary daily closure of portions of Navy Road to non-authorized vehicles may be required for the three months duration, with the trenches excavated and covered in segments to maximize road availability. Vehicles will be allowed to pass through the construction areas when active work is not underway. There are secondary routes allowing access to all SCrI sites whenever vehicle passing the trenching operations is not possible. The installation of the elevated channel system to the well site may divert travel to other routes. These closures would be temporary in nature and would not lead to permanent land use changes, and alternative public access or recreation areas would be available in the immediate vicinity.

As described previously in the project description (**Section III.A**), HDD work at the Santa Cruz Island landing site is expected to take approximately four weeks, and installation of the fiber optic cable and water line (in the same trench to be excavated within Navy Road) is expected to take three months. Under its Conservation Measure #3, the Navy has stated that HDD and construction activities will only occur between September 15 and December 15 on Santa Cruz Island. Conservation Measure #25 states that the Navy "will coordinate with the National Park Service to develop a plan to help avoid limitations on public pedestrian access to the Navy Road during installation of the buried cable." The Navy has committed to inform the Commission of decisions made regarding public access protection measures along Navy Road during the construction period. Given that project construction on Santa Cruz Island would not occur during the peak summer recreation season and with the conservation measures to be implemented, the Commission agrees that the installation of FOCUS-II cable landing at the HDD site, and the installation of the cable and water line within the Navy Road corridor on Santa Cruz Island, will result in only temporary and minimal impacts to public access and recreation on the island.

The project also has the potential to affect public access and recreation in ocean waters offshore of Point Mugu, San Nicolas Island, and Santa Cruz Island during cable laying operations and cable connection work at the HDD exit points. The consistency determination states that:

> *The offshore cable routes between all three drill exit sites occur in the Pacific Ocean within the boundaries of the Point Mugu Sea Range which is used primarily by the Navy for testing of military weapon systems and also accessible by the public for commercial and recreational activities. A portion of the offshore cable route transits the Channel Islands National Marine Sanctuary (CINMS), a program administered by the National Oceanographic and Atmospheric Administration. Recreational activities that occur within the offshore routes include sport fishing, sailing, boating, whale-watching, and diving. Commercial uses include fishing, tourism, and marine transportation. These areas also are used by the public for scientific research and education.*
>
> . . .
>
> *Construction activities may temporarily affect recreational activities in the immediate vicinity of the drill exit sites, the cable laying vessel, and any dive operations associated with cable installation. The proposed cable laying activity is generally compatible with concurrent recreational activities and any restriction of recreational use of the waters would be temporary. For example, recreational use of the waters off the Prisoners Harbor site would be restricted, but not eliminated, during drilling and cable installation operations. However, this would be temporary in nature. All other waters around the eastern end of the island* [Santa Cruz Island], *including Scorpion Anchorage and Smugglers Cove, would remain open to recreational use (See Figure 12). As stated above, the Navy will implement procedures to efficiently inform the public about the construction activities and any temporary restrictions. A Notice to Mariners (NOTMARs) would be issued to allow mariners and commercial and recreational services (e.g., dive charters) to select alternate locations for their activities and the restrictions would only extend through the duration of the construction activity. Although the Navy would temporarily limit access to an area, the availability of the littoral ocean area is greater than the aggregate demand for this resource.*

Cable laying operations are expected to last approximately 1-2 weeks for each of the four cables, for a total offshore construction period of one month. This activity may result in short-term disruption to recreational boaters in the immediate vicinity of cable laying operations. However, exclusion zones around the cable installation vessel would be temporary and in constant motion as cables are placed into the ocean. The public would continue to have substantial access to existing offshore recreational areas and project-related impacts would be temporary and minor in nature.

The Commission notes that the Navy has long conducted training and testing operations in the Point Mugu Sea Range without apparent significant conflicts with public recreational uses of these waters. Previous cable laying and repair activities have also taken place without adversely affecting public recreation in the Sea Range. The short duration of proposed FOCUS-II cable installation work in ocean waters and on Santa Cruz Island will ensure that any project-related impacts to public access and recreation will be minimal and temporary. The Commission

therefore concludes that the proposed project is consistent with the public access and recreation policies of the Coastal Act (Sections 30210, 30211, 30212, and 30220).

I. CULTURAL RESOURCES

Section 30244 of the Coastal Act states:

> *Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.*

Cultural resources are places or objects that possess cultural, archaeological, or paleontological significance and include sites, structures, or objects significantly associated with, or representative of, earlier people, cultures, and human activities. Project-related activities have the potential to disturb or damage Native American artifacts and shipwrecks of potential cultural resources value. The Navy states in its consistency determination that the FOCUS-II project area has a diverse history of human occupation and that HDD work and cable installation could potentially affect cultural resources. The consistency determination first includes analysis of potential impacts at Point Mugu and San Nicolas Island (SNI):

> *At NBVC Point Mugu, a review of the Integrated Cultural Resources Management Plan indicates that there are no resources within the area of potential effect* [APE] *for the HDD drill sites at Charlie Pad and Bldg 811 and the trenching corridor.*
>
> *On SNI, because the project site is within a previously disturbed area and there are no NRHP* [National Register of Historic Places] *listed or eligible properties within the area of potential effect and there are no known archeological sites within the area of potential effect. Therefore, the project would result in no historic properties affected.*

The consistency determination next examined potential impacts on Santa Cruz Island:

> *On SCrI, the entire project site exists within the Santa Cruz Ranching District, a cultural landscape eligible for listing in the National Register of Historic Places (NRHP). The Prisoners Harbor HDD site and parts of the road are part of the Prisoners Harbor Cluster while Navy Road, as an integral part of historic ranching operations and as a contributor to the Cold War operations on the island, are contributing elements of district. In addition, the area of potential effect for SCrI crosses five documented archeological sites whose eligibility for NRHP has not been determined but is assumed eligible. There is a presumption that a finding of no adverse effects to four of the five archeological sites (CA-SCrI-96, 464, 465, and 466) will be recommended due to the fact that all archeological deposits have been physically removed during the 60 years that the road has been used and maintained. To ensure avoidance of off-road archeological sites, stakes will be placed around the five documented site boundaries prior to construction at SCrI. These stakes will mark the presence of a resource and Native American and archeological monitors*

> *would be present for all installation and maintenance work conducted within the boundaries of the five sites and within a 50-meter buffer for each site. The 50-meter buffer is necessary because the precise site boundaries are not known confidently in all directions.*

Regarding the fifth archaeological site, the consistency determination states that:

> *. . . site (CA-SCrI-240/439) has the potential for intact deposits and thus the reason for the elevated cable tray for approximately 1,150 ft of the conduit and waterline alignment. The Navy has prepared a subsurface testing plan to determine the character of effects from the entire alignment. The Navy, with approval and oversight by NPS, will consult with SHPO* [State Historic Preservation Office] *on the effects determination. If the testing results indicate the presence of intact, significant archeological deposits that will be directly impacted by the project the Navy will work with SHPO and NPS to avoid or minimize the potential for adverse effects. If adverse effects are unavoidable, the Navy will develop a memorandum of agreement to comply with 36 CFR 800.*

The Navy also documented in the project DEA the consultation it is undertaking with the National Park Service, SHPO, the Santa Ynez Band of Chumash Indians, and other individuals and groups that are associated with cultural resource sites on Santa Cruz Island in the area of potential effects from the FOCUS-II project. The archaeological testing program on the island will be authorized by the NPS and monitored by a tribal cultural monitor approved by the Santa Ynez Band of Chumash Indians.

Regarding the potential for cultural resources in the offshore waters portion of the project area, the Navy states in the consistency determination that:

> *No offshore cultural resource surveys were conducted specifically for the HDD exit sites or cable alignments due to the depth of the exit sites and cable alignments (79 ft [24m] or greater) and lack of evidence that sensitive resources exist at the locations. The cable alignments were developed in a manner that avoids known locations of shipwrecks and plane crashes; therefore, no known historic properties are located within the offshore APE.*

The cultural resources analysis concludes as follows:

> *As with any Navy project, if potential subsurface archeological deposits are detected during construction, all work in the discovery area would cease until an archeologist could provide input regarding the significance of the resource. The NBVC Cultural Resources Manager would evaluate the resource against eligibility criteria for inclusion in the NRHP and if it is found eligible, a treatment plan detailing either preservation in-place or mitigation of impacts through data recovery would be developed and implemented in consultation with SHPO.*

The noticing list for the Commission's February 8, 2017, public hearing for the proposed project (subsequently postponed) and for the March 9, 2017, public hearing included 26 Native American representatives, nations, councils, bands, clans, and associations in the region stretching from San Luis Obispo County to Orange County. The Commission received comments from three individuals (**Exhibits 19-21**) and the issues raised in those communications are summarized as follows.

- To protect an identified archaeological site adjacent to the project area on San Nicolas Island, Dr. Patricia Martz requested monitoring of the proposed cable trenching work, delineation of the drill and staging areas, briefing of construction personnel on the location of the archaeological site, post-project monitoring of the site to ensure that future erosion does not affect the site, and additional surveys of the offshore project area to identify possible prehistoric sites (**Exhibit 19**).

- Mr. Jack Hunter stated that offshore areas (continental shelves and island platforms) may contain evidence of prehistoric human occupation at lowered sea levels. Underwater geophysical surveys and video taken during cable laying would provide views of possible artifacts of human origin. Mr. Hunter stated that this data should be reviewed in its entirety by a qualified archaeologist for indications of human presence or absence within the project area of potential effect. Mr. Hunter also expressed concern that anchoring of the cable-laying vessel would increase the area of potential effect beyond that documented in the project description (**Exhibit 20**).

- Mr. John Tommy Rosas (Tongva Ancestral Territorial Tribal Nation (TATTN)) stated his objection to the project due to a defective Commission staff report and information, inadequate foundation documents, inconsistency with Section 106 of the National Historic Preservation Act, and failure by the Commission staff to perform tribal consultation with Mr. Rosas. He further stated that the Navy did not consult with TATTN, the Navy project is illegal, and the project is in violation of the United Nations Educational, Scientific and Cultural Organization (UNESCO) Convention on the Protection of Underwater Cultural Heritage and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)(**Exhibit 21**).

In addition, on February 18, 2017, the Navy provided the Commission a copy of the February 14, 2017, letter from the State Historic Preservation Officer to the Navy concurring with the Navy's definition of the area of potential effects, identification of historic properties, adequacy of the testing plan for the CA-SCRI-240/439 archaeological site, and the finding of no adverse effect (**Exhibit 22**).

In a February 16, 2017, email to Commission staff, the Navy responded to Dr. Martz's comments regarding proposed cable trenching on San Nicolas Island and potential impacts to an identified archaeological site:

> *Dr. Martz correctly describes much of the context on San Nicolas Island (SNI) where the on-shore junction for the FOCUS II cable will be developed. The whole of the area that will be subject to trenching and the setup for the horizontal*

directional drilling (HDD) that remotely installs the cable piping beneath the beach and into the sub-tidal zone is within the old borrow pit and along the old access road that descends into the pit.

However, the new ground disturbance she assumes for trenching to run the cable from the head of the old access road across the un-borrowed terrace to conduit in the existing developed road will not occur. The new FOCUS cable will connect to the existing FOCUS I cable junction box at the head of the old access road which has an existing buried conduit across the subject terrace. The original trenching for installation of the existing FOCUS I conduit was observed for subsurface deposits without result. All new subsurface disturbance will occur within the prior borrow pit disturbance, which was taken well down into the underlying native geology or within the old access road which modified an existing erosional channel which dissected the terrace down to the beach. The adjacent, already graded laydown areas on the terrace above the borrow pit will not be further developed below the current disturbed surface.

The alignment for the cable within the borrow pit and access road runs parallel and 60m/200' northwest of the boundary for CA-SNI-328 and 90m/300' southeast of the boundary for CA-SNI-001. These separations provide ample buffer for avoiding inadvertent encroachment on these archaeological site areas by the construction activities.

Adequate conservation measures to address Dr. Martz' concerns are already in place. Standard protocols applied to construction projects on SNI already include having staging areas discretely defined to ensure construction does not encroach onto adjacent protected resources, including archaeological sites. Erosion is a focus of ongoing monitoring of sites on the island, with CA-SNI-328 already affected, and partially borrowed, by the earlier activities that created the borrow pit. Likewise, project personnel are also indoctrinated on the avoidance of archaeological sites in the immediate vicinity to preclude inadvertent effects.

In a February 16, 2017, email to Commission staff, the Navy responded to Mr. Hunter's comments regarding proposed cable installation in offshore waters and potential impacts to prehistoric sites or resources:

Dr. Martz's and Mr. Hunter's observations here reflect a common understanding among coastal and maritime archaeologists that much of the earliest periods of prehistoric coastal occupation would have been on terrains exposed by lowered sea level during the last glacial maximum at the end of the Pleistocene, but since inundated by the rise of sea level into the Holocene. Although there is potential for occupation of these now-submerged landscapes, the practical expectation of the evidence for such occupations having survived the subsequent transgression of the sea level across these surfaces and, if some have survived, the ability to directly observe such evidence on the ocean bottom is highly unlikely.

The gradual transgression of sea level across these now submerged land surfaces was an erosional process. Mr. Hunter's own reference to these as "wave cut" is accurate as the process that created these surfaces through successive fluctuations in sea level during earlier cycles of glacial maximums to glacial minimums across the Pleistocene. The edge of this terrace cutting process is the wave energy zone between the twice-daily tidal fluctuations at an existing sea level. The rate of sea level rise would have been slow enough over the period of transgression to be expected to have removed, or redistributed any cultural deposit within these inundated surfaces.

Exceptions to this practical reality could occur where bays, lagoons, or canyon mouths accumulate terrestrial sediments in the changing depositional environment. Sedimentary processes in stream canyons could bury a near-coastal prehistorically occupied surface with low-energy, over-bank sediments deeply enough prior to inundation to prevent or buffer eroding down to the buried deposits. Coastal strands also create a low-energy sedimentary environment in the lagoons they enclose where the inland side of a lagoon would submerge and bury cultural deposits along the shore prior to the strand migrating across the buried surface as it moves with sea level rise. But where this process may have occurred, by its very nature it has buried such prehistoric evidence under significant sediment depth below the proposed fiber burial.

The Navy also noted in its February 16, 2017, email that the FOCUS-II installation sites represent open coastlines with different possibilities for having possessed one or another of the aforementioned erosional or depositional environments:

Compared to the mainland context at Point Mugu, and even that for Prisoner's Harbor on SCRI, drainages running off SNI are limited in their catchments and their expected or observed stream flow. These conditions would not be expected to develop incised drainages with stream terraces within them that might have invited occupation. The bathymetry off northern SNI doesn't show evidence of a submerged canyon.

By contrast, Prisoner's Harbor on SCRI is where the mouth of Cañada del Puerto drains a large portion of the island's Central Valley, and the Point Mugu location is at the mouth of Calleguas Creek, which drains a large catchment in interior Ventura County. Both also have strands and lagoons at their ocean shorelines, although Mugu Lagoon dwarfs the much smaller lagoon that existed at Prisoner's Harbor before being filled by the island's ranching enterprise in the 1880s.

These two contexts are also differentiated by the sediments involved. The gradient of Cañada del Puerto is relatively steep as it drains the island interior, resulting in mostly gravelly and cobbly sediments being deposited. Calleguas Creek's drainage has a very shallow gradient across the eastern margin of the Oxnard Plain to sea level, so the sediment in the lagoon is sandy muds and the enclosing strand is well sorted sand. In both contexts, sedimentation within an associated stream canyon

> *that crossed the now submerged terrace would have been substantial. The bathymetry off Prisoner's Harbor and Mugu Lagoon also doesn't reveal evidence for a submerged canyon above a 120m/400' contour, suggesting that, if these existed, the sedimentation associated with sea level transgression will have completely filled these topographic features.*

The Navy also noted in its February 16, 2017, email that an offshore geophysical survey of the project area has mapped seafloor features and guided the proposed location of the FOCUS-II cable routes, that the cable-laying vessel will remain underway while laying cable with the exception of anchor points at the terminus of each segment where it connects to the shoreline, and that the area of potential effect is correctly depicted in the project documents. The Navy further noted that:

> *As stated in the consistency determination, a post-lay inspection and re-burial of any cable that could not be buried with the seaplow may occur and is typically performed by a remotely operated vehicle (ROV). Video recording of the inspection is not currently planned and any video that could be recorded may not be of a quality conducive to the purposes of determining presence/absence of artifacts nor be releasable to outside agencies or individuals out of national security concerns.*

Regarding Native American tribal consultation undertaken for the project and additional questions regarding that process from Commission staff, the Navy responded on February 15, 2017, as follows:

> *The Navy initiated Section 106 consultation with SHPO* [State Historic Preservation Officer] *on 19 Dec 2016 with a letter sent to Ms. Juliane Polanco from the Commanding Officer, Naval Base Ventura County. The letter requested a 60-day concurrence. On 15 Feb 2017, the Navy received a letter of concurrence from SHPO on the Navy's definition of an area of potential effects (APE), identification of historic properties, the adequacy of the testing plan for the archeological site CA-SCRI-240/439 and no objection to the Navy's finding of no adverse effect. Following implementation of the testing plan, consultation will continue for concurrence on the Navy/CINP's* [Channel Islands National Park] *determination of effect and, if adverse, for execution of an MOA to resolve that adverse effect.*
>
> *Due to the location of the FOCUS-II project on NPS* [National Park Service] *owned portions of Santa Cruz Island, the Navy has been coordinating with NPS. There is potential for effects to both historic and archeological resources as a result of this project and those effects occur on NPS land. As the federal landowner, NPS agreed to let the Navy take the lead on Section 106 consultation with SHPO but reserved its right to conduct tribal consultation. As such, NPS identified the Santa Ynez Band of Chumash Indians as the federally recognized tribe with closest cultural affiliation to SCRI. NPS sent official letters initiating consultation with the Santa Ynez Band and the Band's Elder Council on 02 September 2016, requesting their comments no later than 28 September 2016. The Navy attended two meetings with*

NPS, tribal representatives and the Elder Council to provide details of the project and answer questions. The Navy provided a tour of project site on SCRI for a tribal representative and provided the Elder Council with the opportunity to review and comment on its Environmental Assessment prior to its public release. Neither the Navy, nor, to the best of its knowledge, NPS, has received any comments on the EA or the project from the tribe, other than the agreement to have a tribal representative monitor any ground disturbing activity within the known archeological sites and during execution of the testing plan.

On February 18, 2017, the Navy responded to the issues raised by Mr. Rosas regarding tribal consultation and the National Historic Preservation Act (NHPA) Section 106 process for the project. The following are excerpts from the Navy's response which pertain directly to the proposed project.

Mr. Rosas stated that Tongva Ancestral Territorial Tribal Nation (TATTN) members are the true descendants for the project area and not the Chumash and Pechanga Tribes. The Navy replied that:

The TATTN claim aboriginal Gabrielino/Tongva ancestry. The ethnographic and ethnohistoric evidence is well established that the Gabrielino/Tongva were the indigenous occupants of the Los Angeles Basin and environs, including the four Southern Channel Islands. However, neither the TATTN nor any other Gabrielino/Tongva claimant groups in Southern California have received federal recognition, and so lack a statutory basis as an Indian tribe under NHPA, or a "culturally-affiliated Indian tribe" under the federal NAGPRA [Native American Graves Protection and Repatriation Act] *process.*

Mr. Rosas' references here to the Chumash and Pechanga (Luiseno) Band, and to "other tribes", are in context to the recent consultation by the Navy on the SNI NAGPRA Inventory. The Navy, with guidance from the Department of the Interior's National NAGPRA Program, determined that the federally-recognized Santa Ynez Band of Chumash Indians (SYBCI) and the six federally-recognized Luiseno bands (including the Pechanga Band of Luiseno Indians) represent the closest federally recognized culturally-affiliated Indian tribes to the NAGPRA Inventory materials from SNI. Because it is not federally recognized, the Navy was not able to determine the TATTN culturally affiliated for this NAGPRA consultation, and so, by statute, the TATTN cannot participate in the consultation.

Nor can the Navy identify the TATTN as an "Indian tribe" for the purposes of its compliance with Section 106 of the National Historic Preservation Act, where the same federally recognized standard also applies.

The issues of differentiated ethnographic geographic relationships and NAGPRA-related cultural affiliation for the FOCUS project area are also relevant here beyond SNI. Among Point Mugu, Santa Cruz Island and SNI, only the latter is within the commonly accepted prehistoric/ethnohistoric territory for the

> *Gabrielino/Tongva. Point Mugu and Santa Cruz Island (SCRI) fall well within the traditional territory of the Chumash, which are represented by the federally-recognized SYBCI.*

> *It is important here to note that in his email communications to the CCC, Mr. Rosas describes TATTN as a "tribal sovereign nation" under the United Nations "Declaration on the Rights of Indigenous Peoples", and a California Native American Tribe under the SB18, AB52 and other amendments to the California Environmental Quality Act. For federal lands and federal actions, "tribal sovereignty" in the United States is a status conveyed through federal recognition and not through state law.*

While SB 18 and AB 52 apply to state planning laws and state environmental impact analyses, and may not, in and of themselves, be directly applicable to federal agency activities submitted under the Coastal Zone Management Act, the Commission finds that, in performing its review under the enforceable policies of the Coastal Act (i.e., state law), which include protecting cultural resources under Section 30244, the Commission is clearly not limited to analysis based solely on consultation with federally recognized Tribes. The Commission further notes that federal guidance suggest that federal agencies should consider consultation or other forms of communication with non-federally recognized Tribes. For example, the December 2012 Section 106 Handbook published by the Advisory Council on Historic Preservation suggests (p. 11):

> *While non-federally recognized tribes do not have a statutory right to be consulting parties in the Section 106 process, the agency may invite them to consult as an "additional consulting party" as provided under the ACHP's regulations at 36 CFR Section 800.2(c)(5), if they have a "demonstrated interest." ... The ultimate decision on whether to consult with non-federally recognized tribes, however, rests with the federal agency. The decision should be given careful consideration and made in consultation with the SHPO .... In addition, the federal agency may elicit input on the question from any federally recognized Indian tribes that are consulting parties. If the agency decides that it is inappropriate to invite non-federally recognized to consult as "additional consulting parties," those tribes can still provide their views to the agency as members of the public under 36 CRF Section 800.2(d).*

Mr. Rosas requested that TATTN be involved in monitoring of project impacts to cultural resources, and that TATTN be included in the Section 106 Memorandum of Agreement. The Navy replied that:

> *Within the project scope and identified potential affects to historic properties, the only venue where archaeological and Native American monitoring will be required is on SCRI. In the Prisoner's Harbor area on SCRI, the trenched alignment for the on-shore fiber optic cable crosses a large, National Register-eligible, prehistoric/ ethnohistoric archaeological site, the ethnographic Chumash village of Xaxas, recorded as CA-SCRI-240/439. The on-shore FOCUS cable alignment as well as CA-SCRI-240/439, lie on Channel Island National Park (CINP) lands. CINP has*

reserved the authority to consult with the SYBCI under Section 106, and if required, under NAGPRA.

No archaeological sites will be affected by the FOCUS project at Point Mugu or on SNI. However, a qualified Navy archaeologist will monitor ground disturbing activities, where required.

A MOA under Section 106 is only executed when required to resolve an adverse effect. Because the overall goal for this project is a finding for "no adverse effect", predicated on the avoidance of adverse effect for the one archaeological site being affected, CA-SCRI-240/439, no MOA is currently being developed or otherwise in consultation. Execution of a MOA, if required, would be consulted among Navy, CINP, the SYBCI, and CASHPO (and if they decided to participate, the Advisory Council on Historic Preservation, or ACHP). The TATTN cannot be a party to such an MOA for reason of not being federally recognized.

Mr. Rosas also claimed that the Navy has not performed its obligations under Section 106 of the NHPA, to which the Navy replied that:

NBVC, with the CINP as a cooperating federal agency, initiated Section 106 consultation with the CASHPO and SYBCI in on 19 December 2016. On 15 Feb 2017, the Navy received a letter of concurrence from CASHPO on the Navy's definition of an area of potential effects (APE), identification of historic properties, adequacy of the testing plan for CA-SCRI-240/439 and no objection to the Navy's finding of no adverse effect. Following implementation of the testing plan, consultation will continue for concurrence on the Navy/CINP's determination of effect and, if adverse, for execution of an MOA to resolve that adverse effect.

In the absence of any potential for the project, as designed, to affect National Register-eligible archaeological properties on SNI, non-federally-recognized Native American entities were not included among the consulting parties.

Commission staff has spoken on the telephone with Mr. Rosas on several occasions to discuss the issue of tribal consultation for the FOCUS-II project. Mr. Rosas submitted by email numerous documents, letters, and reports in electronic format regarding cultural resources and history in the project area, federal tribal recognition, and the National Historic Preservation Act Section 106 process. These materials are listed in **Exhibit 23** and by reference are included in the administrative record for CD-0006-16. As a result of the initial telephone conversation between Commission staff and Mr. Rosas, the Commission staff recommended to the Navy that it postpone the scheduled February 8, 2017, public hearing for CD-0006-16 to allow for additional analysis of potential cultural resource impacts from the FOCUS-II project. The Navy agreed to a postponement to the March Commission meeting. In addition, and notwithstanding the issue of federal tribal recognition, Navy representatives, at the urging of Commission staff, spoke by telephone with Mr. Rosas on Feb 21, 2017, to discuss the tribal consultation process for the FOCUS-II project and to obtain Mr. Rosas' insights on that process. The Navy and Mr. Rosas separately reported to the Commission staff that the telephone call was a productive exchange of

views regarding the tribal consultation process. The Navy also agreed to inform Mr. Rosas of future land and sea projects in the Point Mugu Sea Range that hold the potential to affect cultural resources.

In conclusion, the Commission agrees with the Navy that the proposed upland and in-water construction activities associated with the FOCUS-II project are unlikely to adversely affect archaeological and cultural resources. The project includes an elevated cable tray for approximately 1,150-foot-long segment of the conduit and waterline alignment to avoid trenching through a known archaeological site. The project includes provisions for monitoring of ground-disturbing activities in those areas where cultural resources are known to exist, and procedures to follow in the event that previously unknown resources are discovered. The State Historic Preservation Officer concurred with the Navy's definition of the area of potential effects, identification of historic properties, adequacy of the testing plan for the CA-SCRI-240/439 archaeological site on Santa Cruz Island, and the finding of no adverse effect. Therefore, the Commission finds that the project is consistent with the cultural resource policy of the Coastal Act (Section 30244).

J. HAZARDS

Section 30253(2) of the Coastal Act states:

> *New development shall:*
>
> *(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.*

The project *Draft Environmental Analysis* (DEA) describes the geologic conditions at the project sites at Point Mugu, San Nicolas Island (SNI), Santa Cruz Island (SCrI), and the seafloor where the FOCUS-II cables will transit, which are predominated by a range of sandy beaches and nearshore areas, marine terraces, and offshore marine canyons.

The DEA examined the development that is proposed at Point Mugu, San Nicolas Island, and Santa Cruz Island and concluded that the short-term nature of ground disturbing activities, along with the erosion control measures that would be implemented, would not lead to significant impacts to geological resources and soils. The DEA also concluded that impacts on geological resources along the offshore cable alignments would not be significant.

The consistency determination also described the measures to be implemented to minimize any project-related adverse impacts to geologic stability and soils in onshore and offshore project areas:

> *The proposed project involves installing fiber optic cabling underground so a majority of the construction consists of some ground disturbing activity which*

has the potential to affect soils and the surrounding geology. However, the project is designed to use existing infrastructure as much as possible and would implement erosion control measures to minimize effects. In addition, drilling operations would be temporary, lasting approximately 30 days at each site. At all the HDD sites, anchor holes and catch basins would be backfilled with original soils and standard erosion control measures would be implemented. At SCrI, trenching along Navy Road would include areas of steep slope which would require additional erosion control measures and BMPs, including the requirement that backfill trenches be compacted to conditions as close to original state as possible. In addition, all manholes and vaults along the trenching route will be installed using BMPs such as silt screens and barriers to minimize erosion. Given this, the project would not contribute significantly to erosion, geologic instability and or require substantial alterations of natural landforms along the coast.

For the offshore cable alignments, the subsurface geology at the HDD exit sites is unknown but is likely sedimentary bedrock similar to the nearshore portion of the existing FOCUS onshore landing sites. While the cable alignment along the seafloor consists primarily of sandy bottom, there may be an occasional rock outcropping along the route. The construction crew would closely monitor the pressure during drilling, especially at the exit point to ensure that drilling ceases as quickly as possible after the exit point has been penetrated to minimize affects to marine sediments by the discharges occurring during or upon completion of drilling activities.

While effects of coastal flooding and storm surge can be significant, sea level rise has an even greater potential to impact facilities on NBVC Point Mugu, SNI and SCrI by exacerbating flooding. For example, sea level rise may expose some of the trench-buried fiber optic cables. However, the cable would be armored and would not be affected by exposure to the elements. Exposure of the fiber optic cables would not affect existing infrastructure and utilities at the project sites and no other methods to accommodate for predicted sea level rise exist for underground/seafloor fiber optic cabling.

The Commission agrees with the Navy that project construction activities are of the type and duration such that adverse effects on geologic stability at HDD sites and along cable alignments are unlikely to occur. Cable alignments have been selected to avoid hazardous topography and bathymetry to the greatest extent feasible. In addition, design and implementation of best management practices will minimize the potential for project-related adverse effects on terrestrial and offshore landscape features during and after construction. Therefore, the Commission finds that the proposed project is consistent with the hazard minimization policy of the Coastal Act (Section 30253(2)).

APPENDIX A

Substantive File Documents

1. CD-0006-16 (Navy, FOCUS-II, Point Mugu Sea Range).
2. Draft Environmental Assessment - FOCUS Replacement. Point Mugu Sea Range, Department of the Navy, September 2016.
3. Benthic Classification of the Seafloor in Support of the FOCUS II Program. Naval Undersea Warfare Center Detachment, Atlantic Undersea Test and Evaluation Center, 2016.
4. CD-049-89 (Navy, FOCUS-I, Point Mugu Sea Range).
5. CD-050-03 (Navy, FOCUS-I Repairs, San Nicolas Island).
6. ND-107-92 (Navy, San Clemente Island Offshore Cable Testing).
7. ND-092-94 (Navy, Santa Cruz Island Offshore Cable Installation).
8. CD-020-95 (Navy, San Clemente Island Offshore Cable Placement).
9. CD-015-05 (Navy, San Clemente Island Offshore Cable Repair and Replacement).
10. ND-049-11 (Navy, San Clemente Island Offshore Cable and Hydrophone Installation).
11. CC-0001-16 and CDP 9-16-0160 (MC Global BP4, Inc., Fiber optic cable line installation between Hermosa Beach and Asia).
12. Consultation with Indian Tribes in the Section 106 Review Process: A Handbook. Advisory Council on Historic Preservation, December 2012.

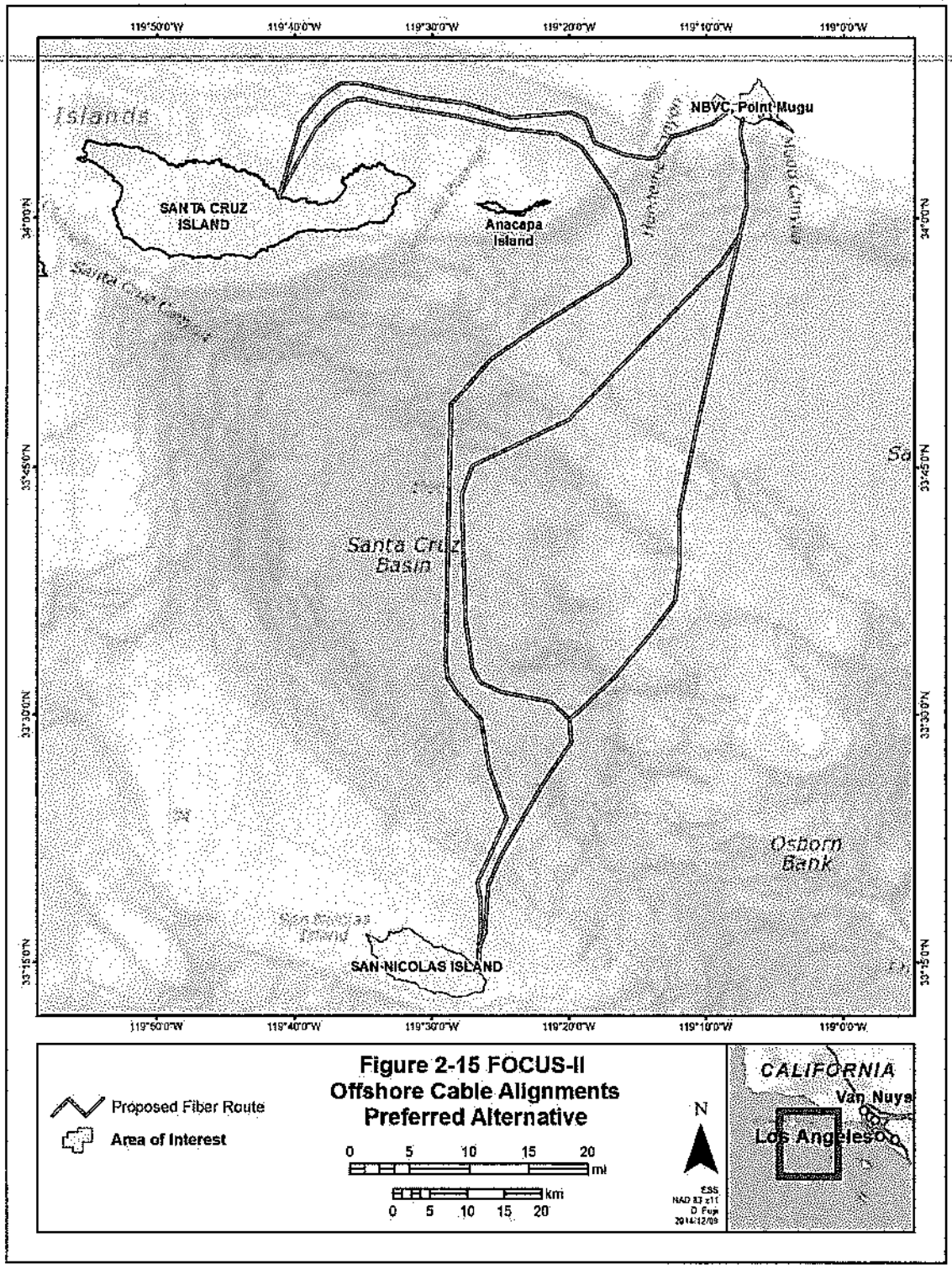
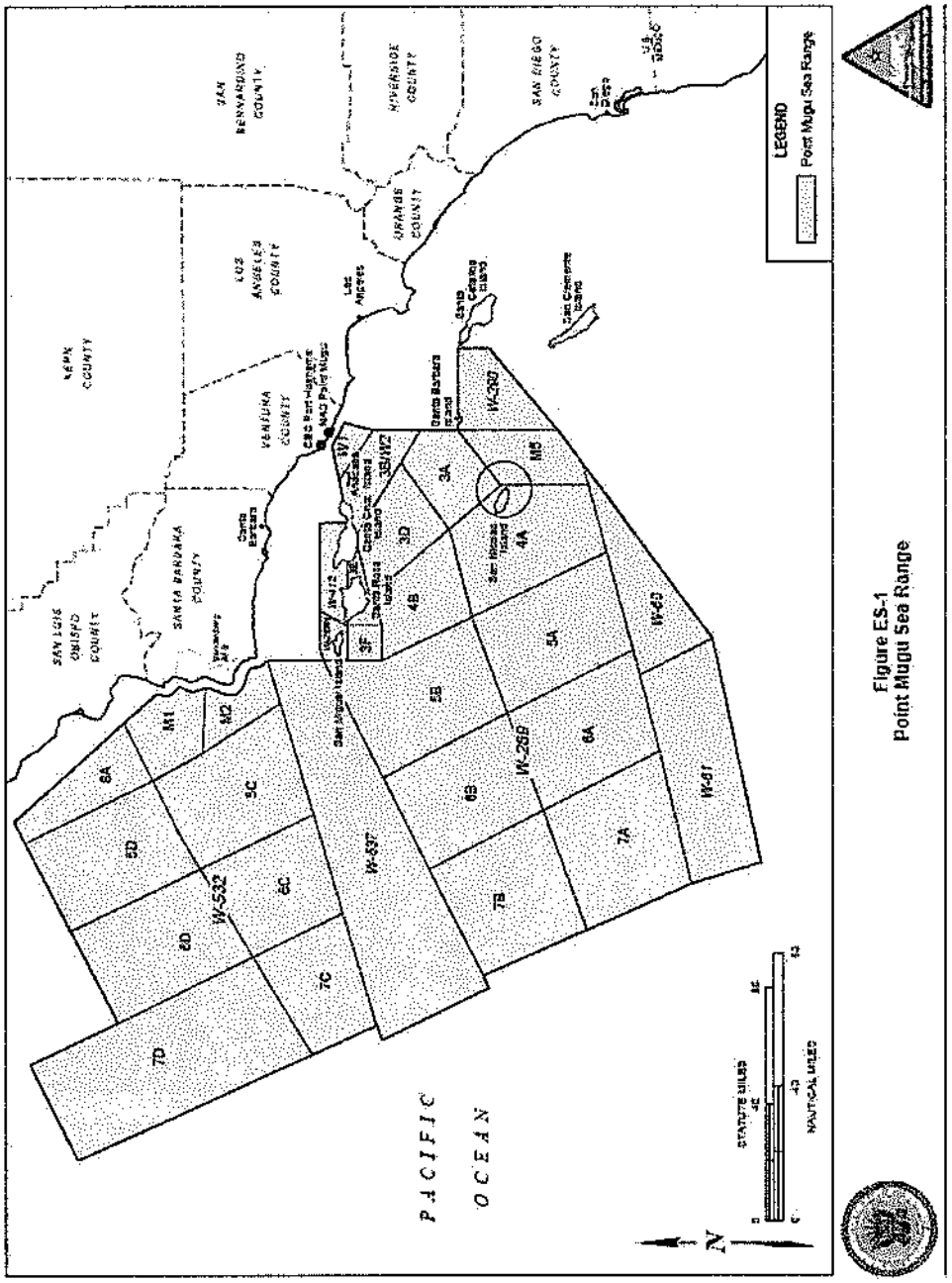


Figure 2-15 FOCUS-II Offshore Cable Alignments Preferred Alternative

Exhibit 1
CD-0006-16

Exhibit 2
CD-0006-16

Figure 2 – Point Mugu Sea Range



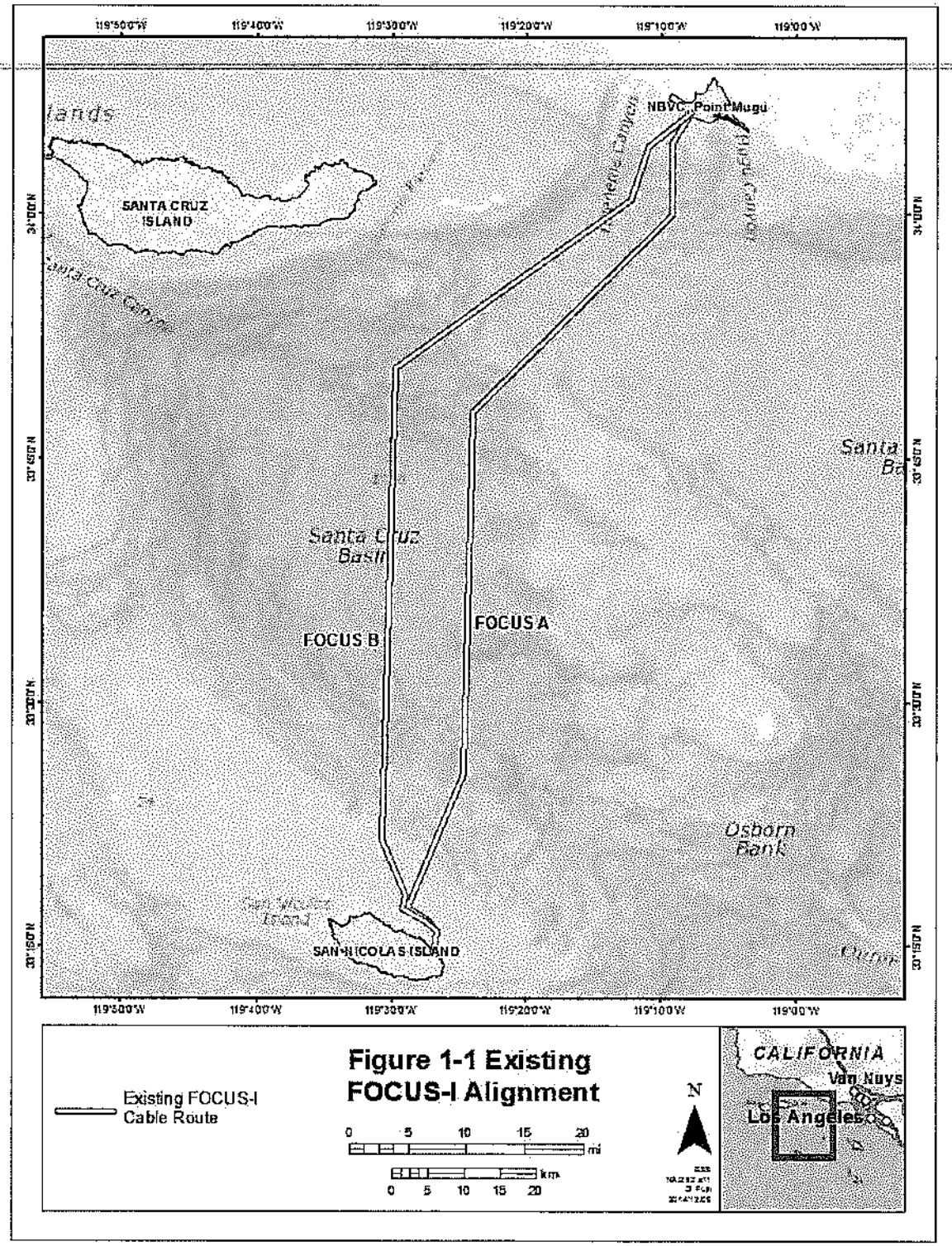


Exhibit 3
CD-0006-16

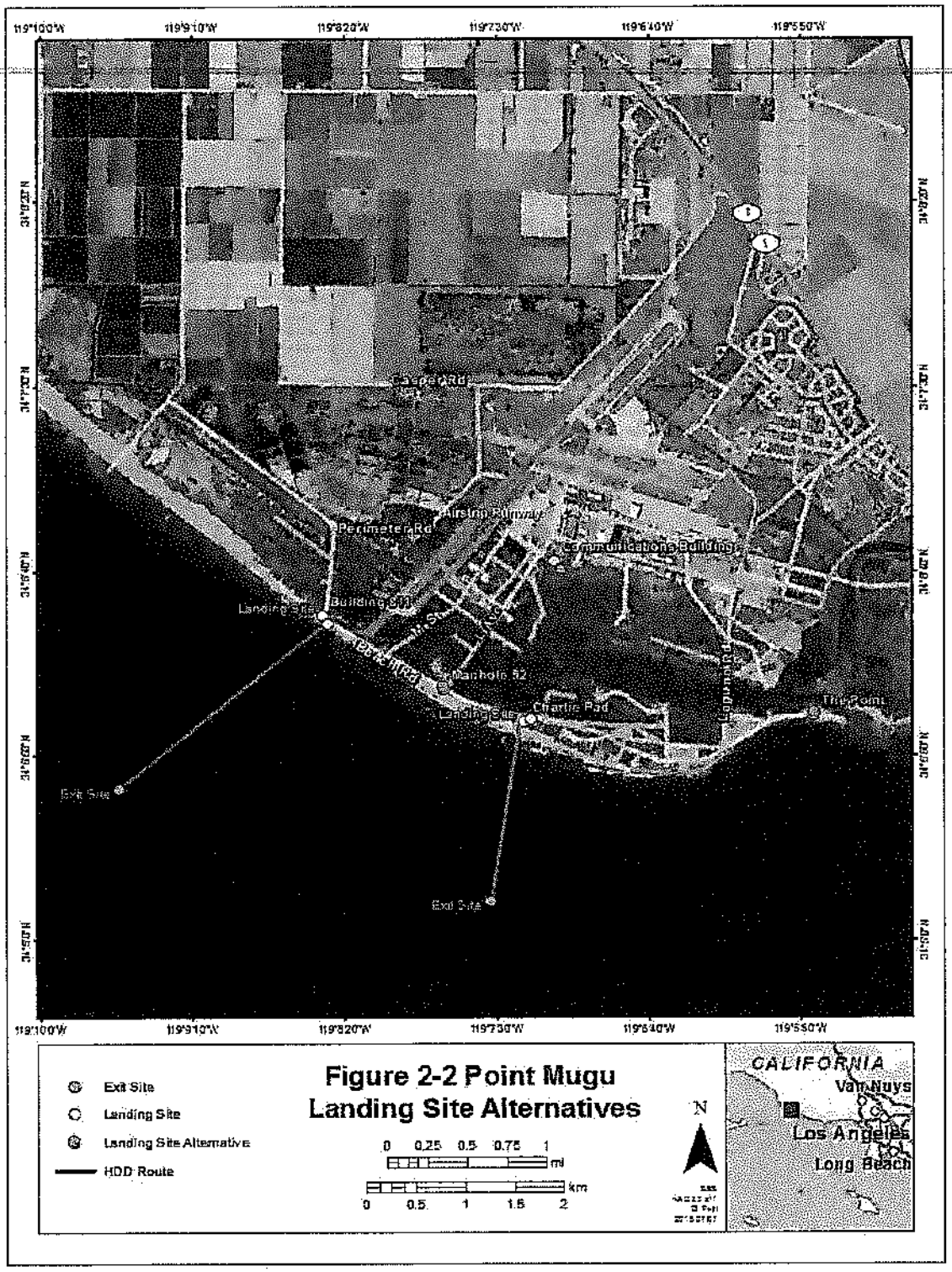


Exhibit 4
CD-0006-16

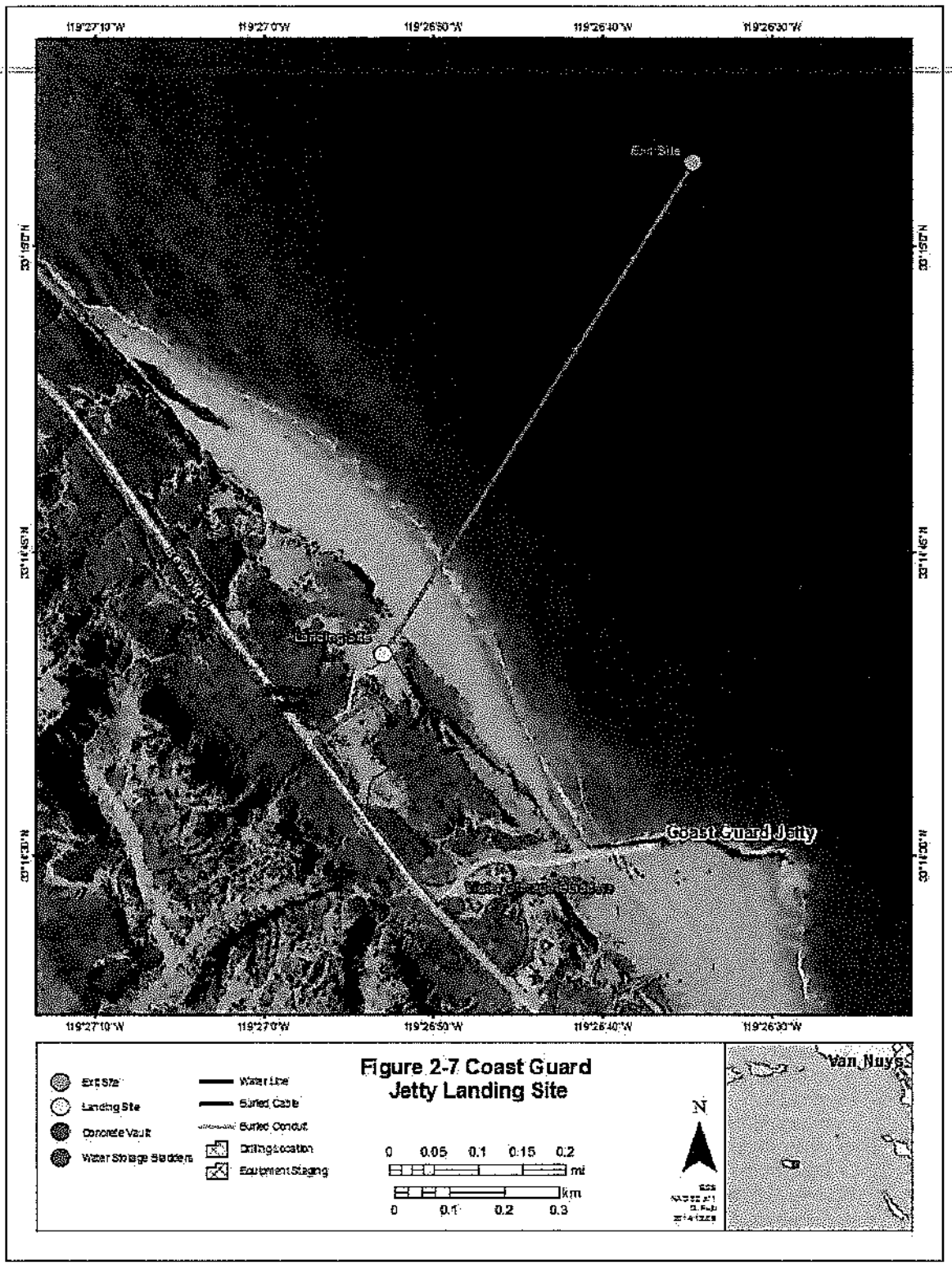


Figure 2-7 Coast Guard Jetty Landing Site

San Nicolas Island

Exhibit 5
CD-0006-16

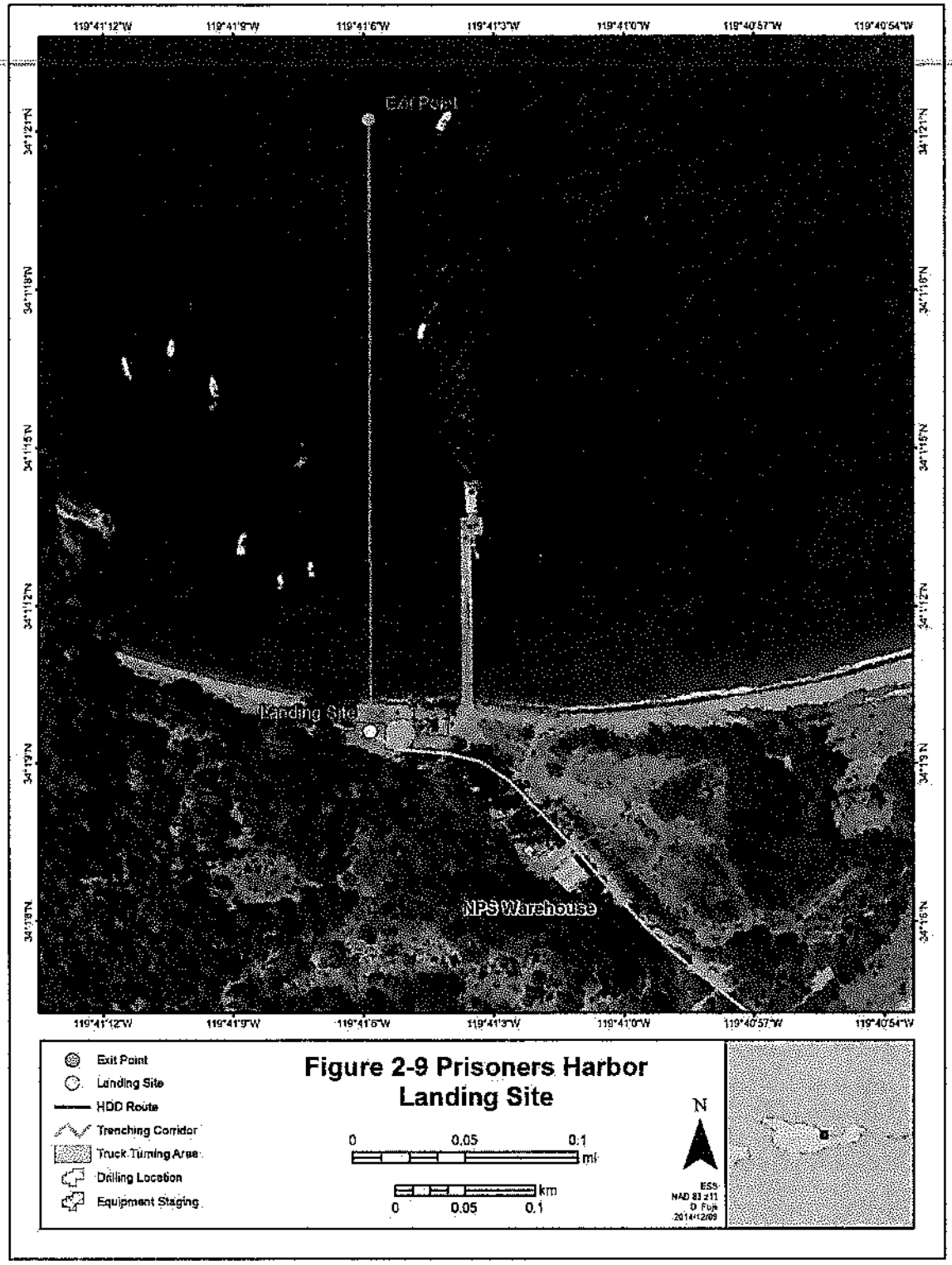


Figure 2-9 Prisoners Harbor Landing Site

Santa Cruz Island

Exhibit 6
CD-0006-16

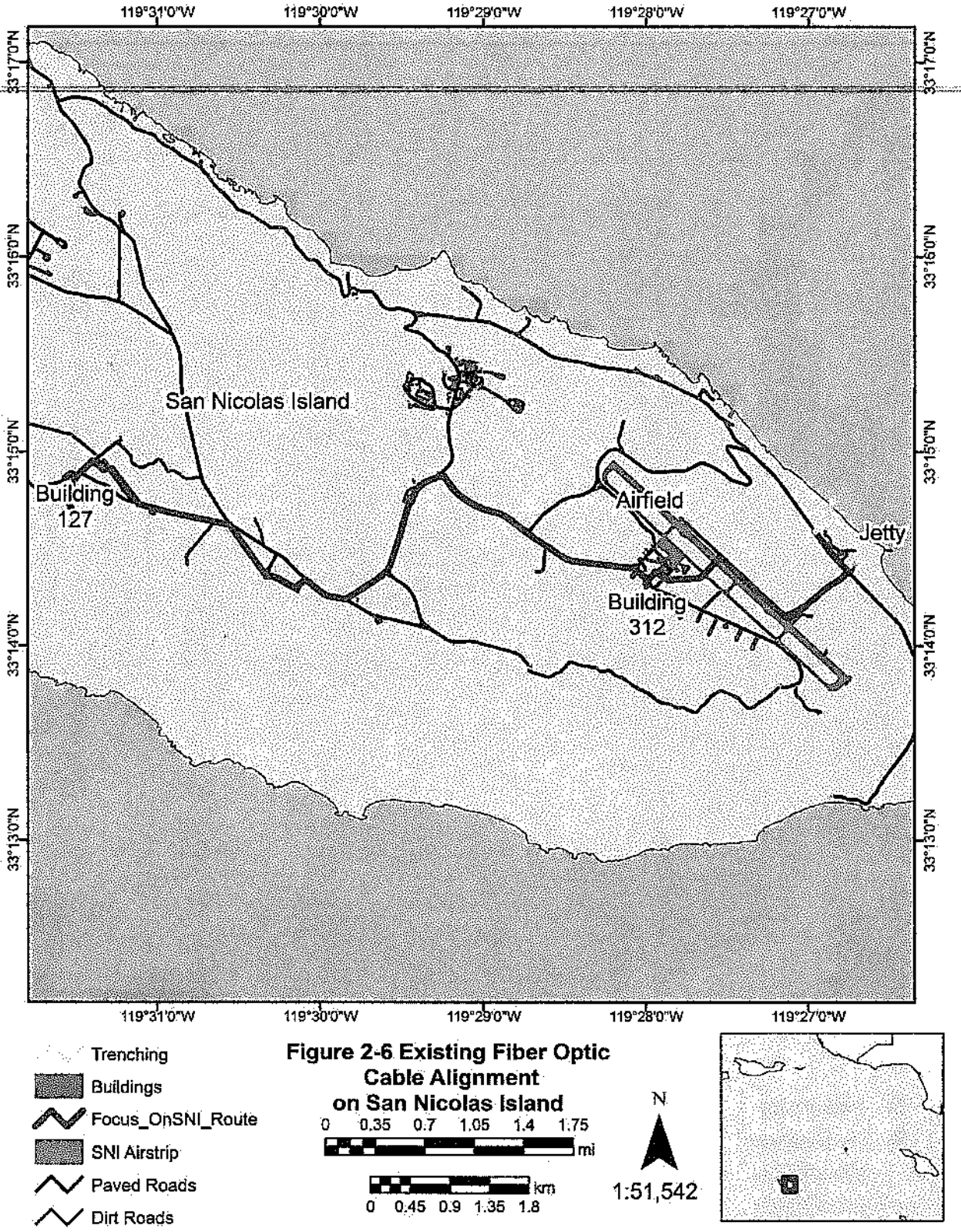


Figure 2-6 Existing Fiber Optic Cable Alignment on San Nicolas Island

Exhibit 7
CD-0006-16

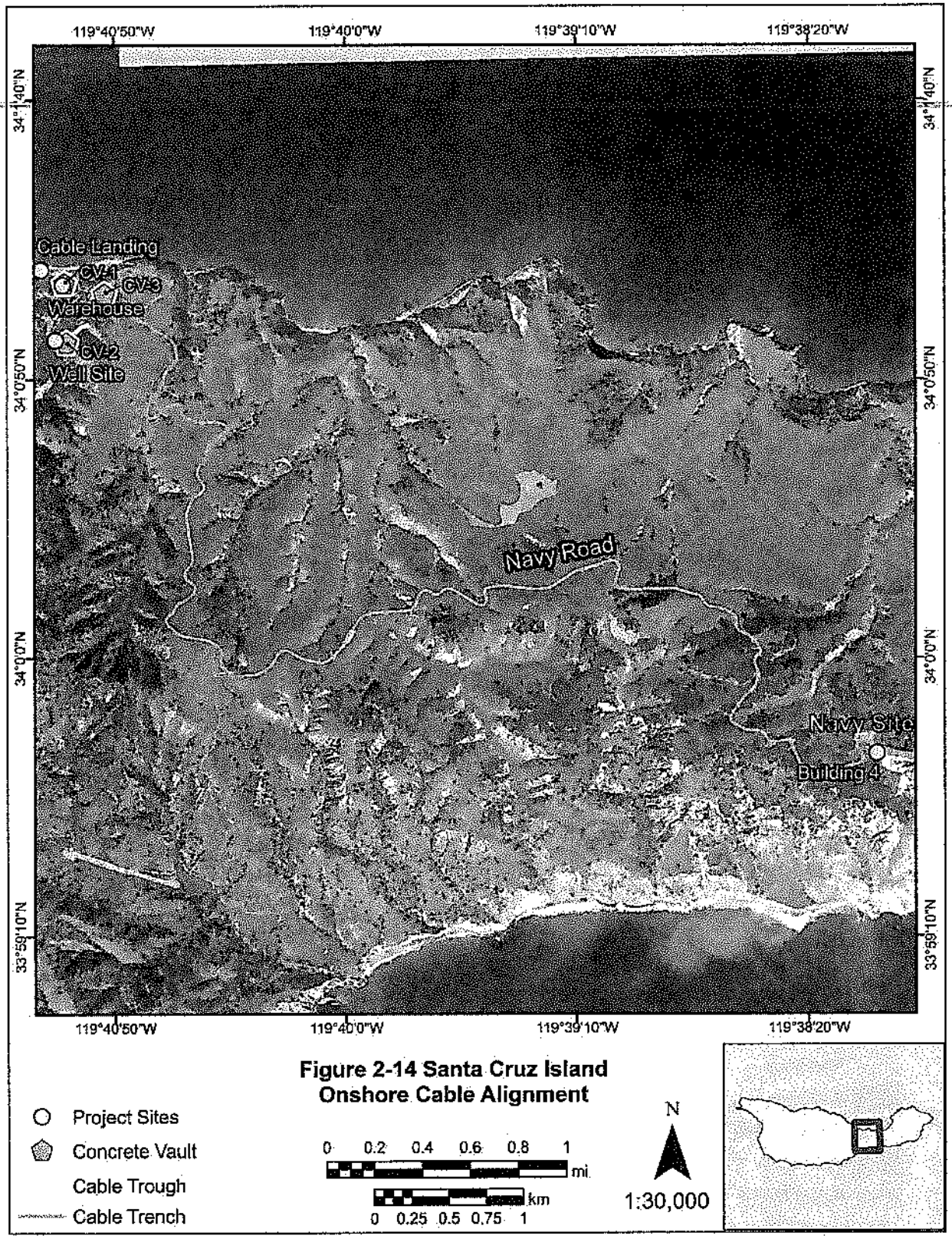


Figure 2-14 Santa Cruz Island Onshore Cable Alignment

Exhibit 8
CD-0006-16

Figure 2-12. Example of Typical Elevated Channel System

Between CV-3 and the Navy Site, the FOCUS-II cable and 3-in (8-cm) water line would be installed in a trench with widths ranging from 12 to 20 in (30 to 51 cm) and depth up to 40 in (102 cm). This trench would extend approximately 6.9 mi (11.1 km) to the Navy Site, running through the middle of Navy Road. Manholes and vaults will be placed at intervals of between 100 ft (30.5 m) and 2,500 ft (762 m) to provide for cable pulling stations, strain relief, backflow preventers, and air vacuum release stations. The total number of manholes and vaults will be between 20 and 80, depending on the engineering needs yet to be determined. Trenching will take approximately three months. Trenching equipment and other materials would be staged at turnout locations and parking areas along Navy Road. Portions of the road would be closed to vehicle traffic during trenching operations, with the trenches excavated and covered in segments to maximize road availability. Vehicles will be allowed to pass through the construction areas when active work is not underway. Figure 2-13 provides an overview of the typical SCrI trench cross section. Figure 2-14 provides an overview of the entire SCrI onshore alignment.

To accommodate the mobilization to the Prisoners Harbor, a barge with 4,000 ft^2 (372 m^2) deck space (triple stack capability) will be used to deliver the equipment and supplies needed to initiate the drilling and trenching operations. Subsequent shipments to and from SCrI will be conducted via barge shipments and a landing craft utility (LCU) vehicle operated by the NPS. This vessel has a capacity of approximately one semi-truck load with dimensions of 14 ft x 40 ft (4.3 m x 12.2 m). Upon completion of drilling and trenching operations, construction equipment and materials will be taken off SCrI via the LCU and barge shipments for the large equipment such as a crane and a semi-truck.

Exhibit 9
CD-0006-16

FOCUS II Survey Area

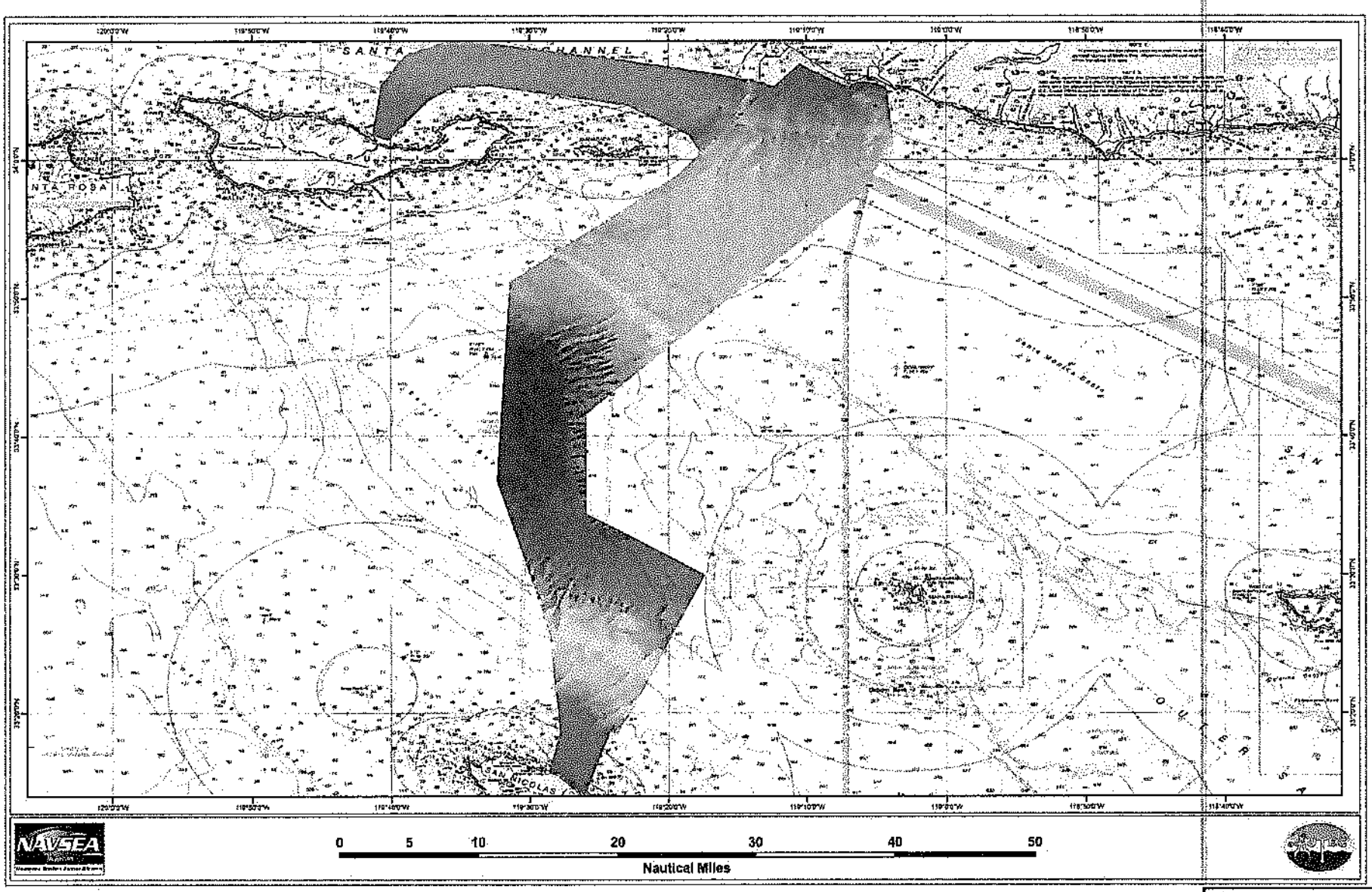


Exhibit 10
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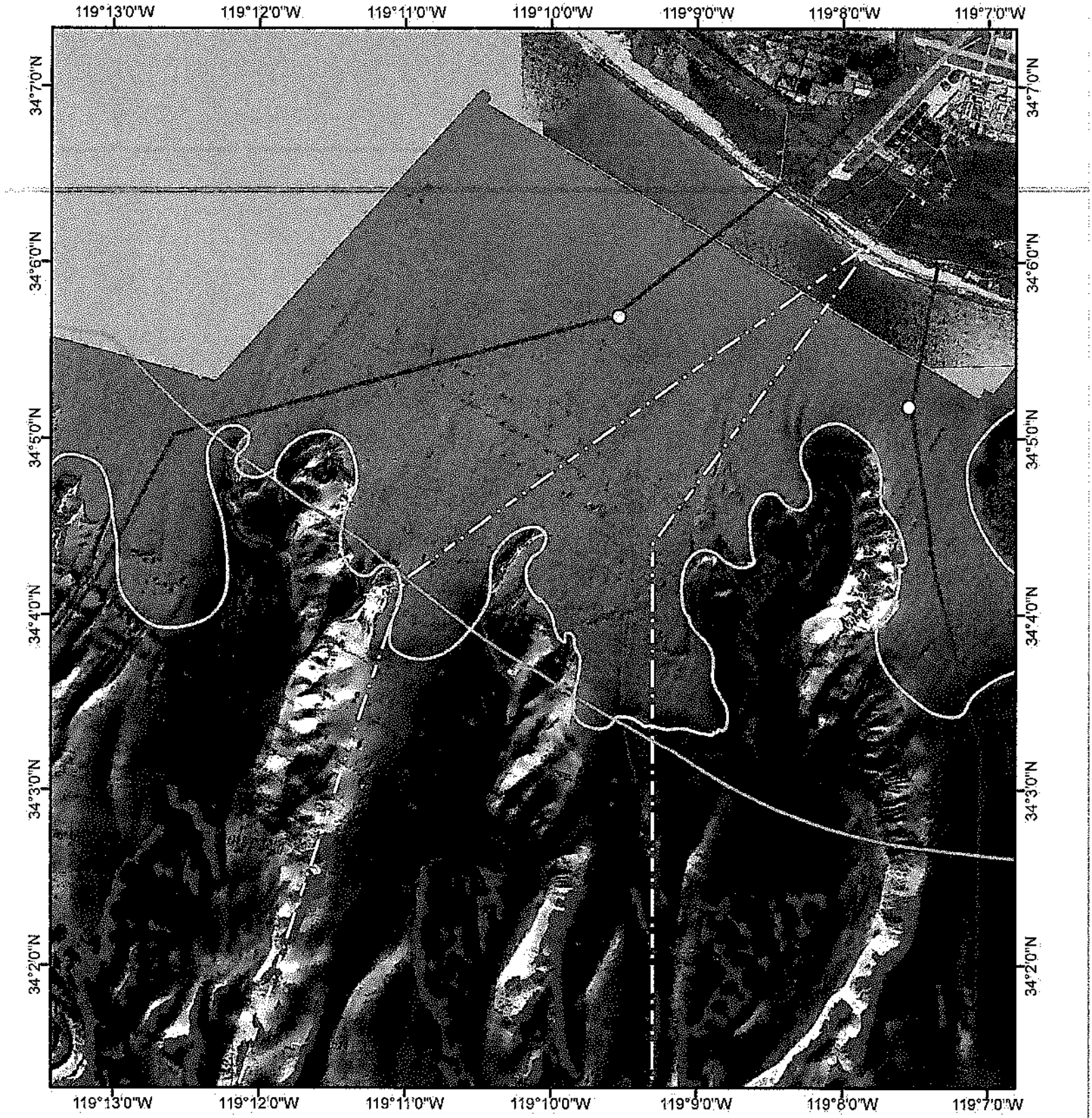

State Waters Boundary
Continental Shelf Edge
FOCUS I - Existing Cables
FOCUS II - Proposed
HDD Exit Point
Potentially Hard Substrate

FOCUS II Project
Point Mugu
Benthic Habitat Mapping

0 0.4 0.8 1.2 1.6 2 mi
0 0.5 1 1.5 2 km

N

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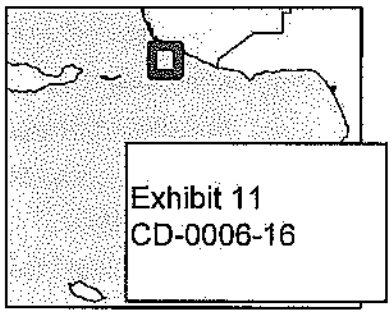
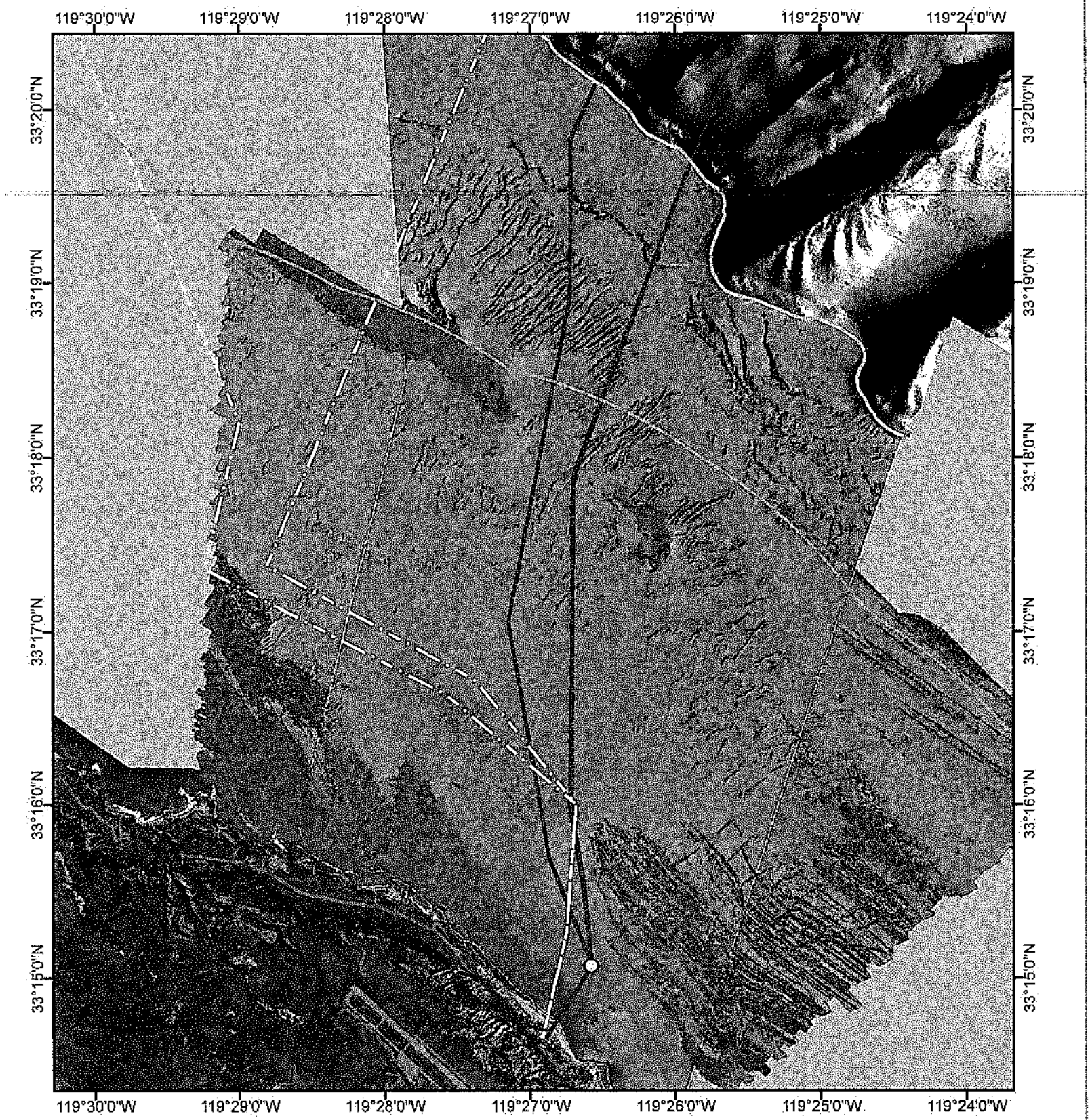




State Waters Boundary
Continental Shelf Edge
FOCUS I - Existing Cables
FOCUS II - Proposed
HDD Exit Point
Potentially Hard Substrate

FOCUS II Project
San Nicolas Island
Benthic Habitat Mapping

0 0.4 0.8 1.2 1.6 2 mi

0 0.5 1 1.5 2 km

N

1:62,500

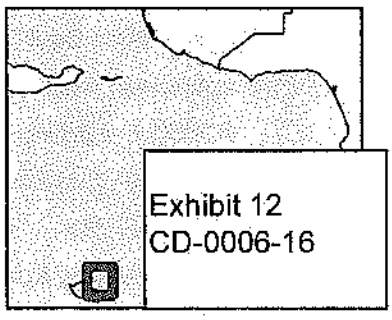
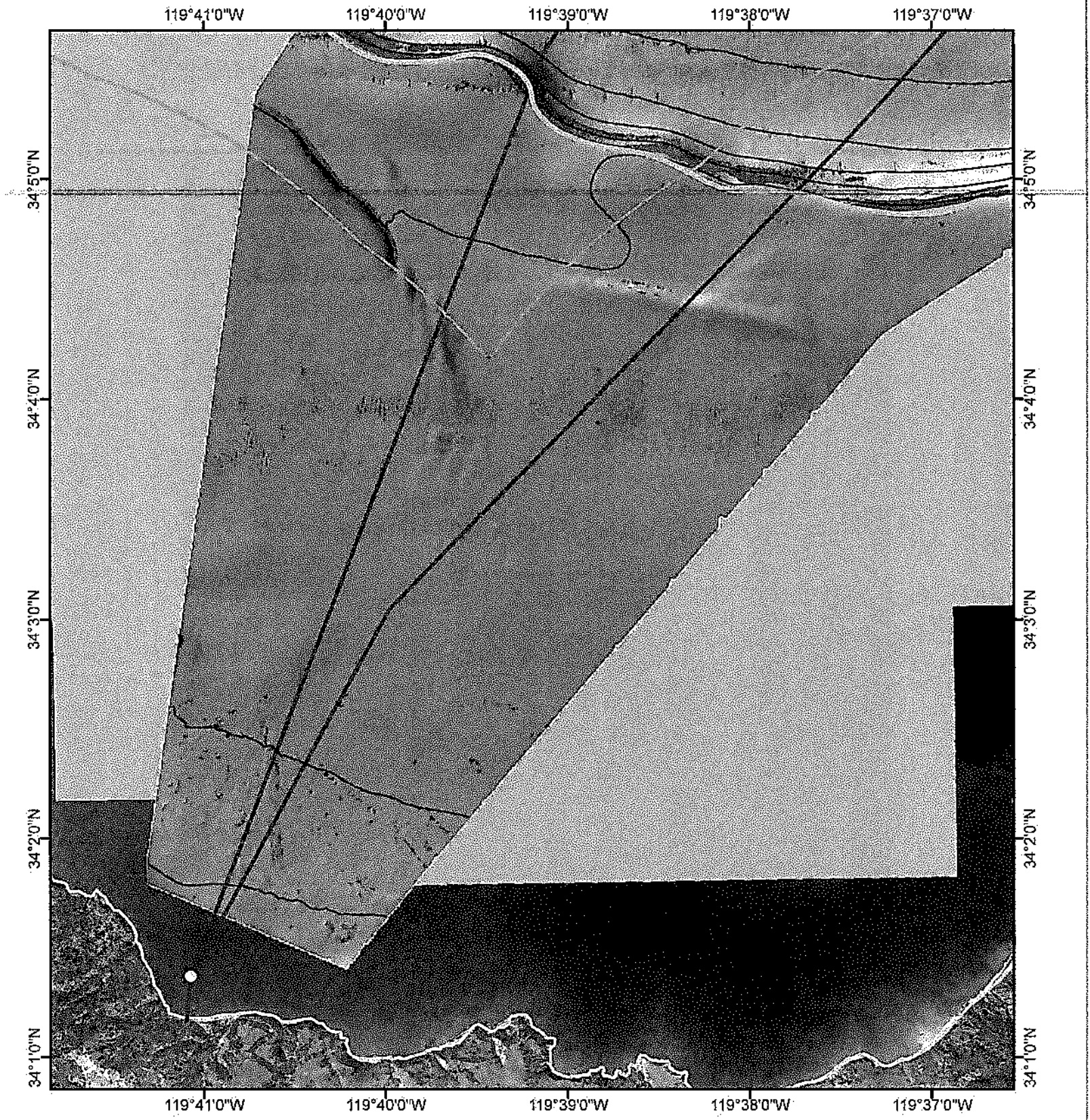


Exhibit 12
CD-0006-16



State Waters Boundary
Continental Shelf Edge
FOCUS I - Existing Cables
FOCUS II Proposed
HDD Exit Point
Potentially Hard Substrate

FOCUS II Project
Santa Cruz Island
Benthic Habitat Mapping

0 0.3 0.6 0.9 1.2 1.5 mi
0 0.5 1 1.5 2 km

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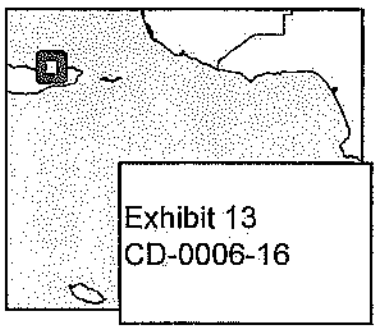

Exhibit 13
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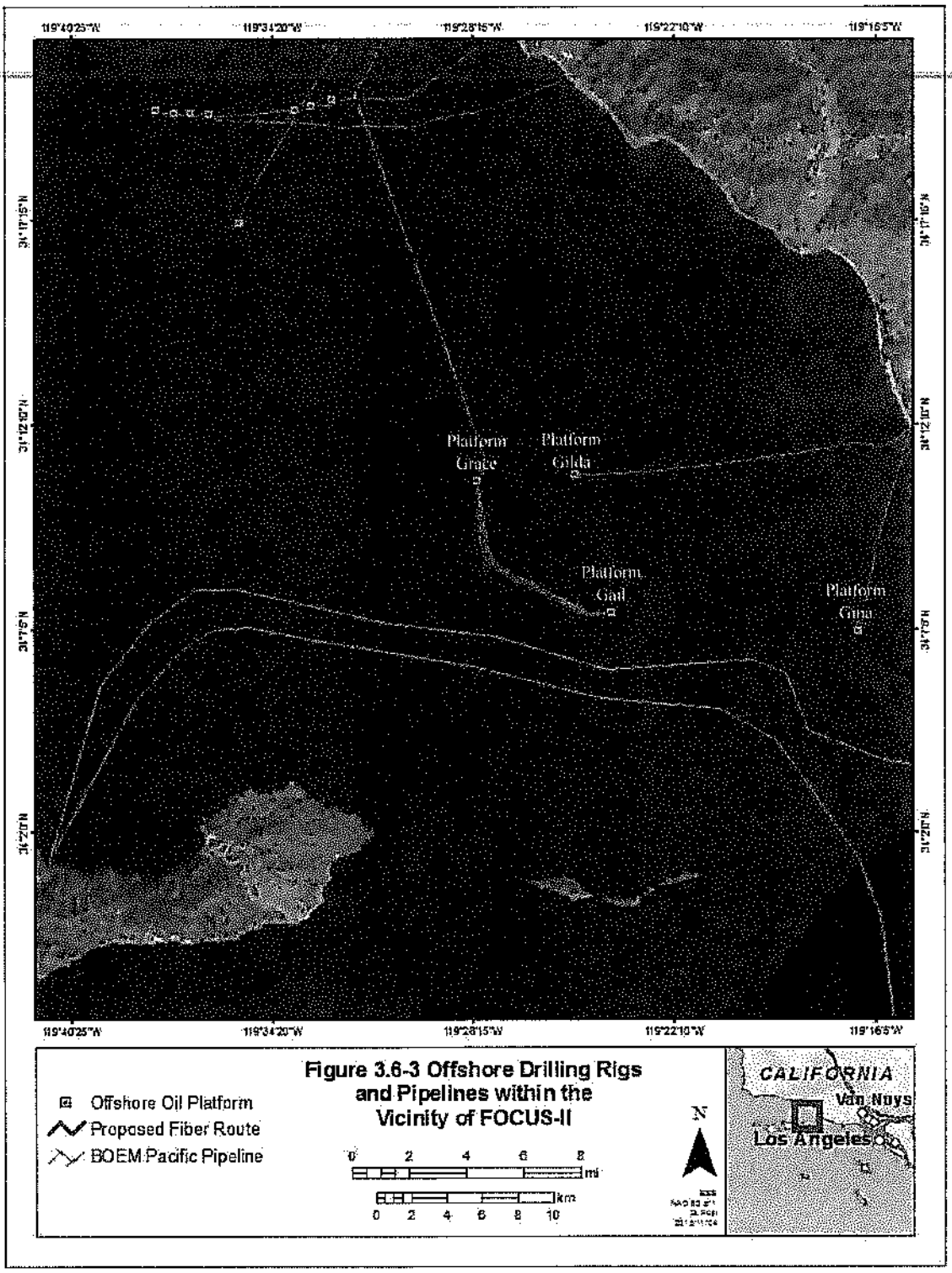
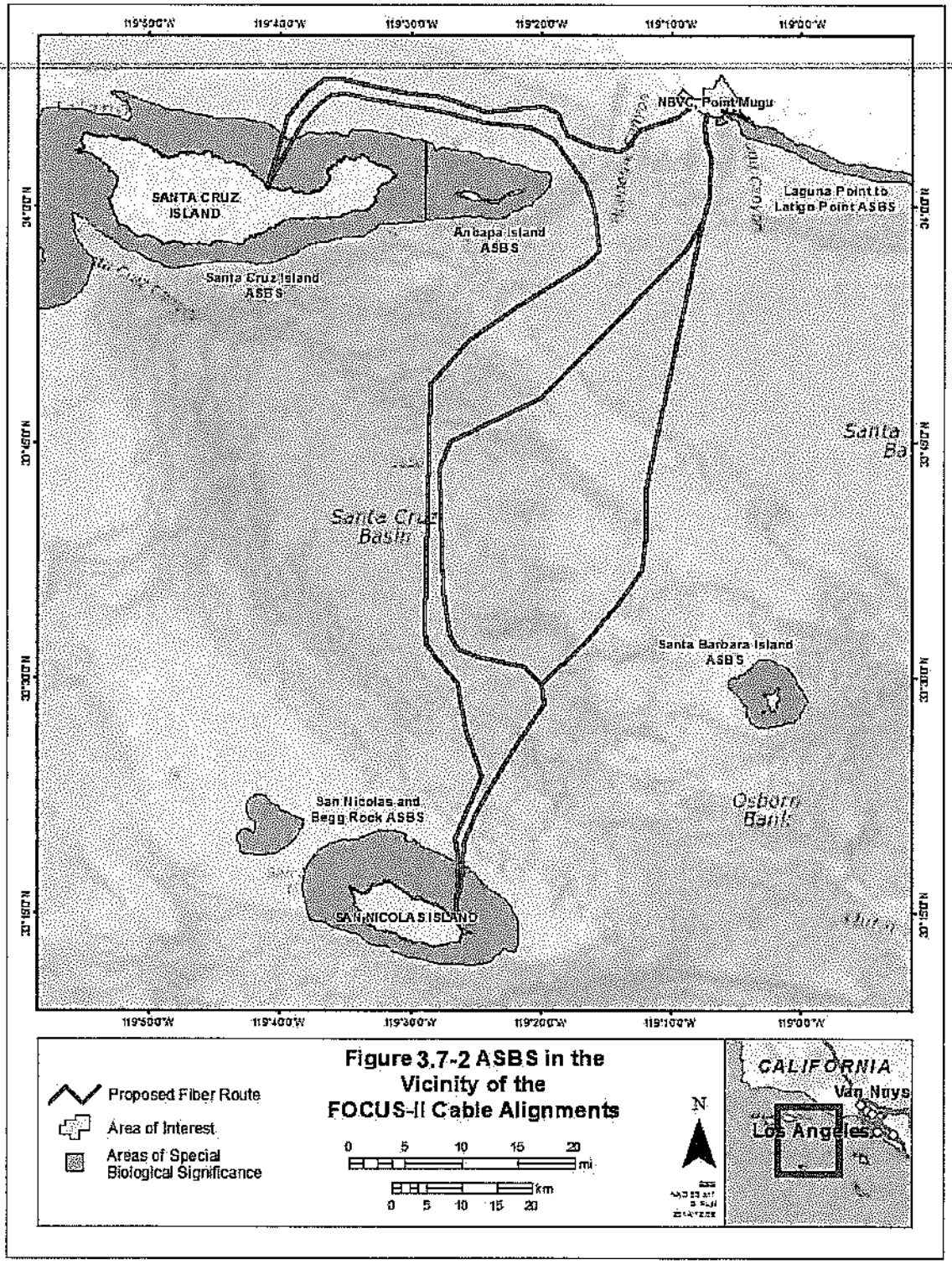


Figure 3.6-3 Offshore Drilling Rigs and Pipelines within the Vicinity of FOCUS-II

Exhibit 14
CD-0006-16



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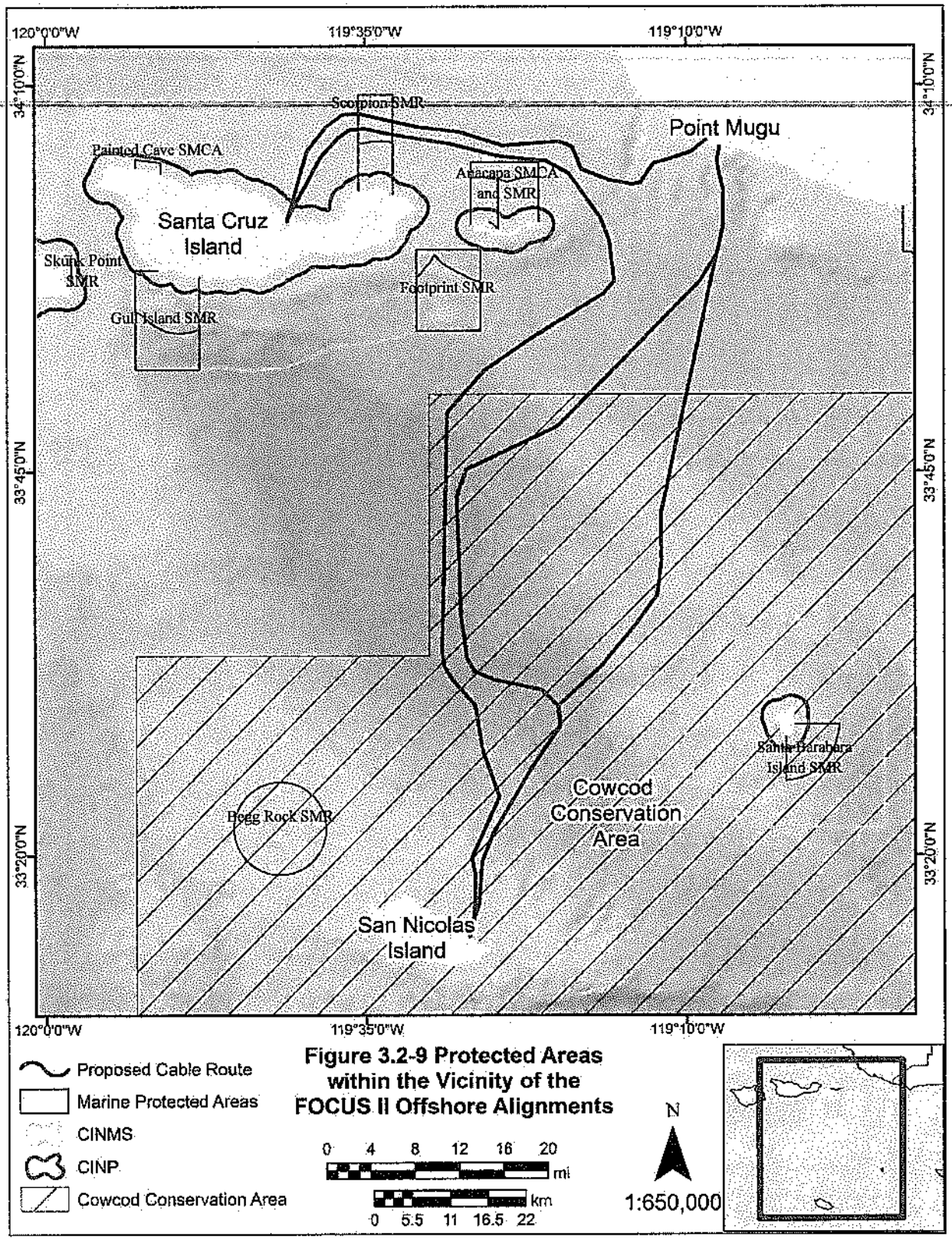

Figure 3.2-9 Protected Areas within the Vicinity of the FOCUS II Offshore Alignments

Exhibit 16
CD-0006-16

Figure 13 – Conservation Measures

The following conservation measures are proposed to protect air quality and sensitive terrestrial and marine species, including federally-listed terrestrial species:

1) Dependent upon the dryness of soil and wind conditions, ground disturbance areas may be watered to minimize fugitive dust generation.

2) Internal combustion engines will be turned off when not in use to minimize emissions of criteria air pollutants.

3) To avoid marine mammal and listed bird breeding seasons, HDD and construction activities will only occur between September 15 and January 31 at Point Mugu and between September 15 and 3 December 15 at SNI and SCrI.

4) Project vehicles and equipment will be restricted to existing concrete pads, leveled surfaces, HDD areas, and paved or dirt access roads.

5) NBVC Environmental Division will be made aware of any aircraft or barge shipments of equipment to SNI or SCrI to allow for needed biosecurity inspections, as specified in NBVC Instruction 5090.14.

6) All heavy equipment, vehicles, and waste containers will be power-washed prior to delivery to SNI or SCrI. Waste containers and dumpsters will be treated with disinfectant before leaving the mainland.

7) All materials being shipped to SNI and SCrI will be closely inspected and monitored to ensure that no soil, other seed-carrying matrix, insects, or other animals are delivered to the islands.

8) Pre-construction surveys and treatments for invasive weeds will be conducted at the Point Mugu, SNI, and SCrI project sites.

9) Once onshore FOCUS-II installation activities are completed, invasive weed surveys and treatments will be conducted at Point Mugu, SNI, and SCrI. These surveys and treatments will be applied after three weeks following the first rain event of the post-construction rainy season.

10) Shipments to SCrI will adhere to protocols described in the Channel Islands National Park (CINP) Biosecurity Protocols (CINP 2014a).

11) All personnel working on SNI or SCrI and people involved in delivery of project cargo will review biosecurity instructions and will adhere to all biosecurity measures.

12) Vessels delivering equipment and personnel to SNI and SCrI shall have armed bait boxes that are checked monthly. Also, sticky traps should be deployed on every boat and changed monthly.

13) Vessel decks will be washed clean between cargo runs. No soil or other debris should remain on a vessel.

14) If night-time operations are necessary, outdoor lighting will include shielding designs to ensure light entering adjacent nesting habitat is minimized.

15) Trash collection containers will be closed and tightly sealed to reduce attracting island fox and other wildlife.

16) Prior to commencing work on SCrI, a waste management and disposal plan will be developed by the construction contractor and submitted to the Navy and NPS for review.

17) Construction personnel will receive training regarding wildlife conservation measures to be applied at the project sites, including the importance of not feeding wildlife such as the island fox.

18) Open pits deep enough to trap island fox will be covered whenever construction operations are not underway.

19) Pipe ends between 2 and 6 in (5 and 15 cm) in diameter will be capped to ensure that island fox cannot be unintentionally trapped.

20) A Spill Prevention, Control, and Countermeasure Plan, developed by the construction contractor, will be in place to minimize the potential for an oil or hazardous substance spill, to prevent any spill from leaving the confines of the area and impacting listed species habitat, and to ensure that the cause of any spill is corrected.

21) Unless operationally necessary, personnel will not occupy the Charlie Pad, Coast Guard Jetty, or Prisoners Harbor construction areas between dusk and dawn and the area will remain dark (no artificial lighting) to reduce the potential for adverse impacts to listed species in adjacent natural habitat.

22) Erosion control best management practices (BMPs) (e.g., silt screens or other barriers) will be placed along Navy Road and offroad work areas on SCrI to protect sensitive biological resources including the island bedstraw (*Galium buxifolium*), the island manzanita (*Artostaphylos insularis*), and the Channel Island sweat bee (*Lasioglossum channelense*).

23) Prior to construction on SCrI, biologists will survey along Navy Road and offroad work areas for the island bedstraw, the island manzanita, and the Channel Island sweat bee and mark any known populations to ensure there is no take.

24) A qualified biologist will be required to monitor construction areas that have listed species with potential to be adversely affected in the immediate vicinity to ensure no impacts occur. If listed species are encountered, work will cease until it is ensured that no effect will result.

25) The Navy will coordinate with NPS to develop a plan to help avoid limitations on public pedestrian access to the Navy road during installation of the buried cable.

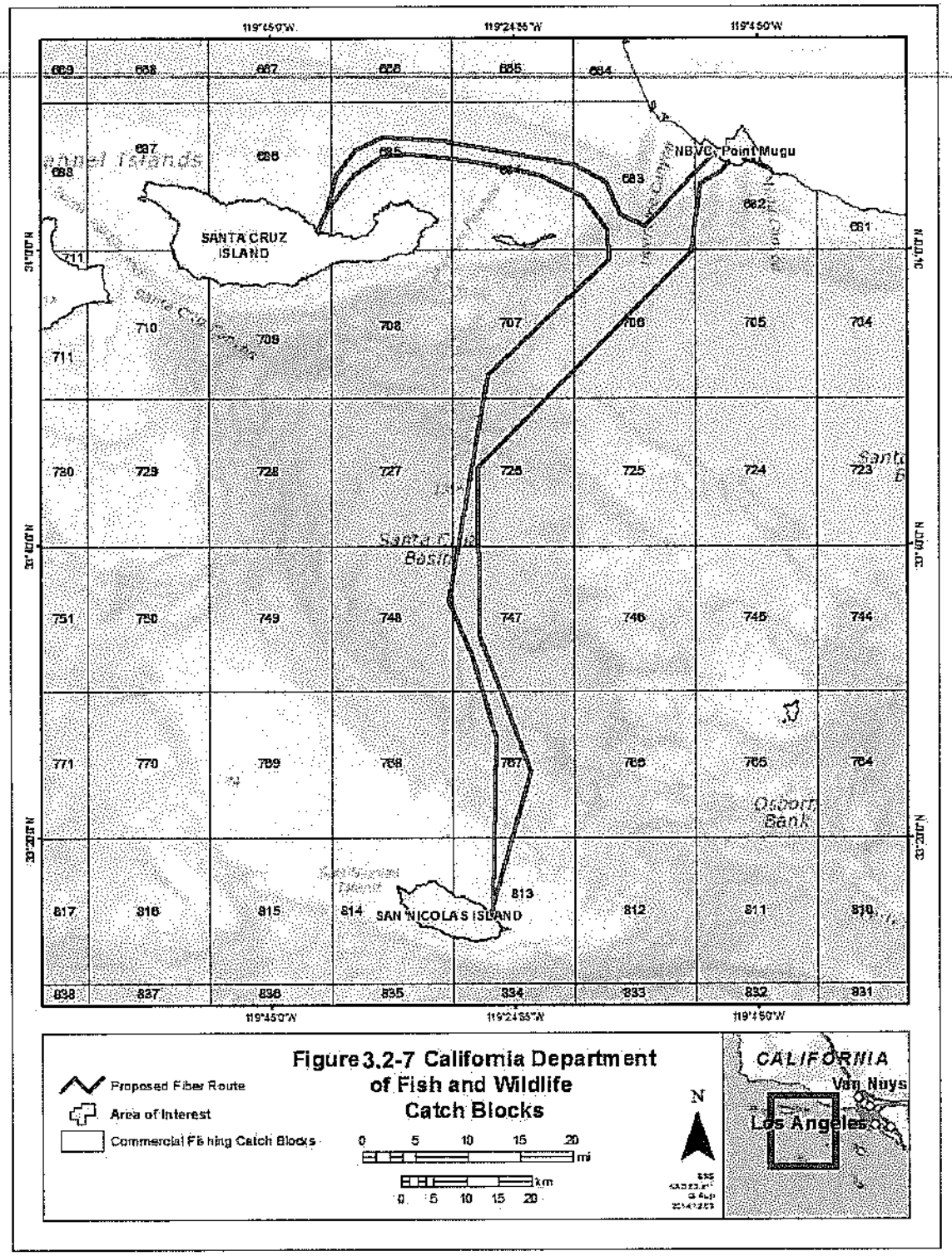

Figure 3.2-7 California Department of Fish and Wildlife Catch Blocks

Exhibit 18
CD-0006-16

CCRPA California Cultural Resource Preservation Alliance, Inc.

P.O. Box 54132
Irvine, CA 92619-4132

An alliance of American Indian and scientific communities working for the preservation of archaeological sites and other cultural resources.

February 3, 2017

Honorable Commissioners
California Coastal Commission

Item No. W13a
Department of the Navy Fiber Optic
Communications Undersea System

Mr. Larry Simon
Federal Consistency Coordinator
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

Dear Mr. Simon:

As a professional archaeologist who has conducted archaeological research on San Nicolas Island for 19 years, I writing to express some concerns regarding the potential for impacts to buried archaeological sites on San Nicolas Island. For example, the drill site is in the old borrow pit just to the west of the archaeological site, CA-SNI-328. The old borrow pit is disturbed, as is the old access road to the borrow pit, but when the trench crosses the terrace to the road, which has been scraped (but the subsurface has not been disturbed), there is the potential for impacts to a buried archaeological site.

Although the project area has been previously disturbed, monitoring the trenching would seem to be appropriate. This area has been identified as having the potential for buried archaeological sites. Also, given the lack of historical documentation, we don't know what all was actually done in that area. Certainly, once the trench comes up to the level of the road, and crosses the old work area, the potential increases as buried sites have been observed on that terrace.

The Navy has proposed many conservation measures to ensure that no bird, lizard, or other animal is potentially disturbed, but there is no mention of any measures to ensure that archaeological sites are not inadvertently disturbed. I am sure the drilling site will be at the bottom of the borrow pit at the beach level, but the way they have drawn it, it runs upslope very close to SNI-238. Therefore, I am requesting that you include measures to have the drill site and the staging area delineated to ensure that construction does not encroach onto SNI-328, as well as monitoring to ensure future erosion does not impact the site. Also, personnel should be briefed that archaeological sites SNI-328 and SNI-1 are in the immediate vicinity and personnel should stay away from those areas so as to avoid inadvertent impacts.

Regarding the offshore portion of the project, it is clear from the remote sensing that was conducted, that the cable will avoid any ships or plane wrecks, however, the previous work was done near the island (200-300 feet). Additional surveys are needed further out as the area was identified as having moderate potential for the presence of prehistoric sites (AMEC 2002).

Please give these concerns serious consideration. It seems appropriate that monitoring during trenching on the island, provisions to ensure that construction personnel do not inadvertently damage nearby archaeological sites, and additional underwater surveys should be included as conditions for the approval of this application.

Sincerely,

Patricia Martz

Patricia Martz, Ph.D.
Professor Emerita
California State University, Los Angeles
President
California Cultural Resources Preservation Alliance, Inc.

Simon, Larry@Coastal

From: jack hunter <jackhunter1000@gmail.com>
Sent: Friday, February 03, 2017 2:09 PM
To: Simon, Larry@Coastal; pmartz@calstatela.edu
Subject: Archaeological concerns, Navy Fiber Optic Cable Project, Agenda Item 13

Larry Simon

CALIFORNIA COASTAL COMMISSION February 3, 2017

45 Fremont St. Suite 2000

San Francisco, Ca 94105-2219

Santa Barbara, Ventura & Los Angeles Counties

Re: Agenda Item W13a: FEDERAL CONSISTENCY **Hearing Date 2/8/17**

CD-0006-16 (Department of the Navy) Consistency determination by the Dept of the Navy to install Fiber Optic Communication Undersea System replacement project at Naval Base Ventura County/Point Mugu, San Nicolas Island, Santa Cruz Island, and the water space and submerged lands within the Point Mugu Sea Range. (LS-SF)

The proposed FOCUS-II system includes installation of two fiber optic cables between Point Mugu and San Nicolas Island, one cable between Point Mugu and Santa Cruz Island, and one cable between San Nicolas Island and Santa Cruz Island. Approximately 175.5 miles of cable will be buried in the sandy seafloor out to a water depth of 3,280 feet; the remaining 58.5 miles of cable will lie on the seafloor in deep water.

Archaeological Concern:

The potential exists for continental shelves (Point Mugu) and island platforms (San Nicolas and Santa Cruz Islands) to contain evidence of prehistoric human occupation at lowered sea levels. These wave cut, now submerged coastal shelves, were exposed and subaerial to an average depth of 400 ft. (120m) at the maximum of the Wisconsin glacial period 18,000-20,000 years ago. Such coastal locations were rich in resources and a powerful draw to early inhabitants.

The project APE will require an offshore geophysical survey to map seafloor features important to route design. Anchor splay of the cable-laying vessel could be 3-5 times water depth along the route. This will widen the APE accordingly. The trenching machine laying cable will have a videocamera to provide guidance and confirm cable burial depth in the seafloor across the shelf. Data from the geophysical instruments will detect shipwrecks and prehistoric features of interest. Underwater video will provide a close-up of sediments being disrupted as well as views of possible artifacts of human origin.

It is important to cultural resource management that the geophysical and videographic data be reviewed in its entirety by a qualified archaeologist for indications of human presence/absence within the full project APE.

Sincerely,

Jack Hunter

Maritime Archaeologist

805-704-1356

cc: Patricia Martz PhD

Exhibit 20
CD-0006-16
Page 2 of 2

Simon, Larry@Coastal

From:	Ainsworth, John@Coastal
Sent:	Wednesday, February 01, 2017 1:57 PM
To:	Dettmer, Alison@Coastal; Delaplaine, Mark@Coastal; Simon, Larry@Coastal; Dobson, Amber@Coastal
Cc:	Henry, Teresa@Coastal
Subject:	FW: CCC FEB HEARING TATTN OBJECTIONS TO DEFECTIVE STAFF REPORTS AND INSUFFICIENT INFORMATION

See below e-mail. Jack

From: Johntommy Rosas [mailto:tattnlaw@gmail.com]
Sent: Wednesday, February 01, 2017 1:26 PM
To: Henry, Teresa@Coastal; Ainsworth, John@Coastal
Subject: CCC FEB HEARING TATTN OBJECTIONS TO DEFECTIVE STAFF REPORTS AND INSUFFICIENT INFORMATION

TATTN OBJECTIONS on these 2 agenda items -
both are based on defective information and inadequate foundation documents - I will send in my testimony before the hearing -
I am also requesting who are the staff persons on these 2 items-
I am also objecting to the failure by CCC staff to perform the tribal consultation with me on these 2 items.
thanks jt

FEDERAL CONSISTENCY

1. CD-0006-16 (Department of the Navy)
Consistency determination by the Dept of the Navy to install Fiber Optic Communication Undersea System replacement project at Naval Base Ventura County/Point Mugu, San Nicolas Island, Santa Cruz Island, and the water space and submerged lands within the Point Mugu Sea Range. (LS-SF)

REVISED FINDINGS:
See Agenda Categories.

1. Application No. 5-15-2097 (Newport Banning Ranch, LLC, Newport Beach)
Consideration of findings in support of Commission's action in September 2016 to deny permit to abandon oil operations, clean and remediate soil, and subdivide 401 acre site into residential, commercial, mixed use, open space, park, and public street lots. Grade 2.8 million cu.yds. of soil and construct residential and commercial development including approx. 12-acres of roads, 37-acres of residential with 895 residential units, 45,100 sq.ft. of commercial use, 75-room resort and 20-bed hostel, 5-acres of park, and construct public trails within 324-acre Natural Open Space Preserve, and Oil operations would remain on 15-acres, at 5100 block of West Coast Hwy, Newport Beach, Orange County. (AD-LB)

JOHN TOMMY ROSAS
TRIBAL ADMINISTRATOR
TRIBAL LITIGATOR
TONGVA ANCESTRAL TERRITORIAL TRIBAL NATION
A TRIBAL SOVEREIGN NATION UNDER UNDRIP WITH DNA AUTHENCATION ON CHANNEL ISLANDS AND COASTAL VILLAGES - AND AS A CALIFORNIA NATIVE AMERICAN TRIBE / SB18-AB 52-AJR 42
25 U.S. Code § 1679 - Public Law 85-671
August 18, 1958 | [H. R. 2824] 72 Stat. 619

Simon, Larry@Coastal

From:	Johntommy Rosas <tattnlaw@gmail.com>
Sent:	Thursday, February 02, 2017 4:18 PM
To:	Simon, Larry@Coastal
Cc:	McKay, Deborah E CIV CNRSW, N40 (deborah.mckay@navy.mil); Ainsworth, John@Coastal; Delaplaine, Mark@Coastal; Dettmer, Alison@Coastal
Subject:	Re: CD-0006-16 (Department of the Navy)

https://www.history.navy.mil/research/underwater-archaeology/policy-and-resource-management/permits.html

On Thu, Feb 2, 2017 at 2:48 PM, Johntommy Rosas <tattnlaw@gmail.com> wrote:
please add to my objections as this process on this project by u s navy is already illegal -in violation to UNDRIP and UNESCO
UNESCO Convention
All traces of human existence underwater which are one hundred years old or more are protected by the UNESCO Convention on the Protection of the Underwater Cultural Heritage. This convention aims at preventing the destruction or loss of historic and cultural information and looting. It helps states parties to protect their underwater cultural heritage with an international legal framework.[17] On the basis of the recommendations defined in the above-mentioned UNESCO Convention various European projects have been funded such as the CoMAS project-for in situ conservation planning of underwater archaeological artifacts.
http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/2001-convention/
http://portal.unesco.org/en/ev.php-URL_ID=13520&URL_DO=DO_TOPIC&URL_SECTION=201.html
Article 1 – Definitions

For the purposes of this Convention:

1. (a) "Underwater cultural heritage" means all traces of human existence having a cultural, historical or archaeological character which have been partially or totally under water, periodically or continuously, for at least 100 years such as:

(i) sites, structures, buildings, artifacts and human remains, together with their archaeological and natural context;

(ii) vessels, aircraft, other vehicles or any part thereof, their cargo or other contents, together with their archaeological and natural
context; and

(iii) objects of prehistoric character.

(b) Pipelines and cables placed on the seabed shall not be considered as underwater cultural heritage.

Simon, Larry@Coastal

From: Johntommy Rosas <tattnlaw@gmail.com>
Sent: Thursday, February 09, 2017 2:30 PM
To: Simon, Larry@Coastal
Subject: Re: CD-0006-16 (Navy, FOCUS-II)

thanks
I will email my letter and continued objections
to all the cc commissioners directly -
and so therefor I dont accept nor will I comply with your illegal "deadline "
it should be received in this office by February 15.

On Thu, Feb 9, 2017 at 1:25 PM, Simon, Larry@Coastal <Larry.Simon@coastal.ca.gov> wrote:

Mr. Rosas:

As you know, Commission action on CD-006-16 was postponed to the Commission's March 8-10 meeting in Ventura. Will you be submitting a comment letter on this project or will your Feb. 1 and Feb. 2 emails serve as your comments on the project? If you would like a comment letter to be attached to the staff report for the March Commission meeting, it should be received in this office by February 15. I know that you spoke with Mark Delaplaine about this project on February 2; please let us know if you would like to discuss further. I look forward to hearing from you, either in writing or on the phone, to better understand your concerns about the Navy's proposed project. Regards,

Larry Simon

Federal Consistency Coordinator

Energy, Ocean Resources and

Federal Consistency Division

California Coastal Commission

45 Fremont Street, Suite 2000

San Francisco, CA 94105-2219

(415) 904-5288

larry.simon@coastal.ca.gov

www.coastal.ca.gov

Simon, Larry@Coastal

From:	Johntommy Rosas <tattnlaw@gmail.com>
Sent:	Tuesday, February 21, 2017 1:23 PM
To:	Simon, Larry@Coastal; McKay, Deborah E CIV CNRSW, N40 (deborah.mckay@navy.mil); Ainsworth, John@Coastal; JOHNTOMMY ROSAS
Subject:	CCC CONDITIONS REQUIRES SEC 106 NHPA WITH TATTN ON NBR CCC STAFF REPORT
Attachments:	TATTN LTR CCC FEB 2017 NBR 01 HILD2.pdf

Please word search this doc for "NHPA" and you will see / read the CCC conditions to initiate sec 106 NHPA -
CCC has to be consistent and compliant under CZMA /NOAA - NAVY SNI OPTICS PROJECT STAFF REPORT DOES NOT CONTAINANY SEC 106 NHPA CONDITIONS OR COMPLIANCE as was stated in CCC STAFF REPORT ON NBR.
the NBR staff report has numerous citations on tribal consultation -all that should be applied and contained in the CCC staff report for NAVY SNI OPTICS PROJECT -so far the NAVY has illegally excluded TATTN - so we lodge those new objections for the record - INCLUDING statutory discrimination against TATTN/JTR because the NAVY has chosen to exclusively work with santa ynez indians over 100 miles away from project -with zero factual connections with coast or island on TONGVA documented territory
and we also expect more CCC consultation on this proposed project -which should be included in the revised staff report for compliance - TATTN requests a 30 day extension to have all the process completed and compliant -
thanks jt

--

JOHN TOMMY ROSAS
TRIBAL ADMINISTRATOR
TRIBAL LITIGATOR
TONGVA ANCESTRAL TERRITORIAL TRIBAL NATION
A TRIBAL SOVEREIGN NATION UNDER UNDRIP WITH DNA AUTHENCATION ON CHANNEL ISLANDS AND COASTAL VILLAGES - AND AS A CALIFORNIA NATIVE AMERICAN TRIBE / SB18-AB 52-AJR 42
25 U.S. Code § 1679 - Public Law 85-671
August 18, 1958 | [H. R. 2824] 72 Stat. 619
Tribal sovereignty in the United States is the inherent authority of indigenous tribes to govern themselves within and outside the borders and waters of the United States of America .
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tongvanation.org

Exhibit 21
CD-0006-16
Page 4 of 14

Simon, Larry@Coastal

From:	Johntommy Rosas <tattnlaw@gmail.com>
Sent:	Wednesday, February 22, 2017 10:29 AM
To:	Simon, Larry@Coastal; McKay, Deborah E CIV CNRSW, N40 (deborah.mckay@navy.mil); Ainsworth, John@Coastal
Cc:	JOHNTOMMY ROSAS
Subject:	TATTN -SNI NAVY PROJECT OBJECTIONS AND ERRONEOUS CCC STAFF REPORT INFO-

the ccc staff report has this
"On SNI, because the project site is within a previously disturbed area and there are no NRHP [National Register of Historic Places] listed or eligible properties within the area of potential effect and there are no known archeological sites within the area of potential effect. Therefore, the project would result in no historic properties affected."

https://documents.coastal.ca.gov/reports/2017/2/w13a-2-2017.pdf

////Evaluations of eligibility for listing on the National Register of Historic Places were based on whether the sites contain intact midden or other cultural materials that can be used to address the questions identified in the research design developed for the island (Martz 1994a). The questions address the following research domains: Paleoenvironmental influences, settlement systems, subsistence strategies, island cultural chronology, social organization, regional interaction and trade, cultural affiliation, technology, and depositional processes. A total of 196 sites appear to be eligible, 188 were determined to be ineligible, and subsurface testing is recommended for 151 sites to clarify whether they are eligible.////
http://iws.org/CISProceedings/6th_CIS_Proceedings/Martz.pdf

--

JOHN TOMMY ROSAS
TRIBAL ADMINISTRATOR
TRIBAL LITIGATOR
TONGVA ANCESTRAL TERRITORIAL TRIBAL NATION
A TRIBAL SOVEREIGN NATION UNDER UNDRIP WITH DNA AUTHENCATION ON CHANNEL ISLANDS AND COASTAL VILLAGES - AND AS A CALIFORNIA NATIVE AMERICAN TRIBE / SB18-AB 52-AJR 42
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Tribal sovereignty in the United States is the inherent authority of indigenous tribes to govern themselves within and outside the borders and waters of the United States of America.
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Simon, Larry@Coastal

From:	Johntommy Rosas <tattnlaw@gmail.com>
Sent:	Wednesday, February 22, 2017 1:45 PM
To:	Tozer, Tristan@Parks; rnelson@achp.gov; Simon, Larry@Coastal; McKay, Deborah E CIV CNRSW, N40 (deborah.mckay@navy.mil)
Cc:	JOHNTOMMY ROSAS
Subject:	RE SNI /NAVY/ CCC PROJECT - DEFECTIVE SHPO DETERMINATION LETTER -TATTN OBJECTIONS
Attachments:	USN_2016_1223_001 - Fiber optic cable undersea system (FOCUS) replacement NAVAIR Sea Range Point Mugu - signed.pdf; TATTN COMMENTED DOC USN_2016_1223_001 - Fiber optic cable undersea system - signed.pdf

The SHPO is defective and make erroneous claims about our sites there on SNI - It is our TONGVA documented territory andI have the same A2 DNA as documented there - TATTN requests SHPO withdraw their letter [attached] and consult with us as required - ACHP was not consulted with either -
thanks jt

--

JOHN TOMMY ROSAS
TRIBAL ADMINISTRATOR
TRIBAL LITIGATOR
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Simon, Larry@Coastal

From: Johntommy Rosas <tattnlaw@gmail.com>
Sent: Thursday, February 23, 2017 11:11 AM
To: Simon, Larry@Coastal; McKay, Deborah E CIV CNRSW, N40 (deborah.mckay@navy.mil); Ainsworth, John@Coastal; JOHNTOMMY ROSAS
Subject: Re: FW: FOCUS

BIA boundaries handbook which establishes tribal boundaries -which has been violated by navy and ccc -on involving santa ynez band of mission indians -way off their reservation and trespassing on our documented territory -including islands -SNI -
STANDARDS FOR INDIAN TRUST LANDS BOUNDARY EVIDENCE HANDBOOK
https://www.bia.gov/cs/groups/xraca/documents/text/idc-018418.pdf

On Thu, Feb 23, 2017 at 10:43 AM, Johntommy Rosas <tattnlaw@gmail.com> wrote:
for the admin record /staff report
again please add all my submitted exhibits
and stamped as received
thanks jt

On Thu, Feb 23, 2017 at 10:37 AM, Johntommy Rosas <tattnlaw@gmail.com> wrote:

On Wed, Feb 22, 2017 at 1:21 PM, Johntommy Rosas <tattnlaw@gmail.com> wrote:
please make sure all my ref materials I sent you are also in the admin record and cited -
thanks jt

On Wed, Feb 22, 2017 at 1:03 PM, Johntommy Rosas <tattnlaw@gmail.com> wrote:
thanks

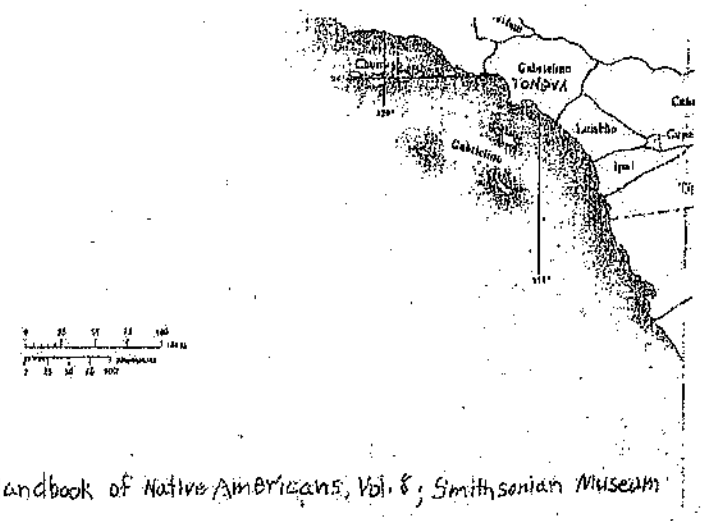
On Wed, Feb 22, 2017 at 12:56 PM, Simon, Larry@Coastal <Larry.Simon@coastal.ca.gov> wrote:
Mr. Rosas,

The Navy's response to your earlier comments on the FOCUS-II project are attached. Note that these were prepared prior to your phone call yesterday with the Navy. The Navy hopes to send out a summary of the phone call later this week or early next week. Regards,

Exhibit 21
CD-0006-16
Page 7 of 14

Simon, Larry@Coastal

From:	Johntommy Rosas <tattnlaw@gmail.com>
Sent:	Friday, February 24, 2017 2:35 PM
To:	Simon, Larry@Coastal; McKay, Deborah E CIV CNRSW, N40 (deborah.mckay@navy.mil); Ainsworth, John@Coastal; JOHNTOMMY ROSAS
Subject:	Re: FW: FOCUS
Attachments:	TONGVA MAP SMITHSONIAN HEIZER.PNG



Handbook of Native Americans, Vol. 8; Smithsonian Museum

On Thu, Feb 23, 2017 at 11:10 AM, Johntommy Rosas <tattnlaw@gmail.com> wrote:
BIA boundaries handbook which establishes tribal boundaries -which has been violated by navy and ccc -on involving santa ynez band of mission indians -way off their reservation and trespassing on our documented territory -including islands -SNI -
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Exhibit 21
CD-0006-16
Page 8 of 14

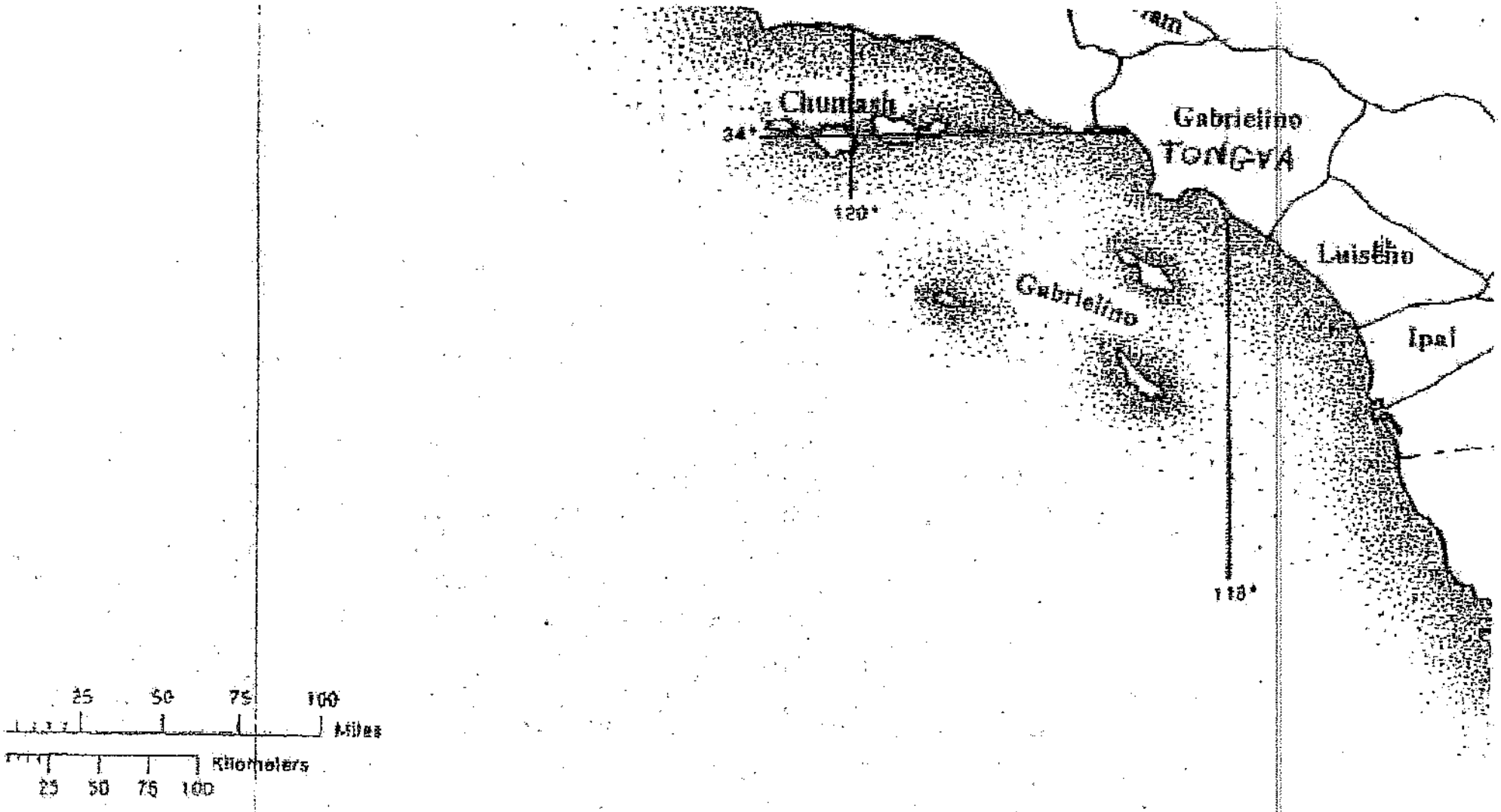
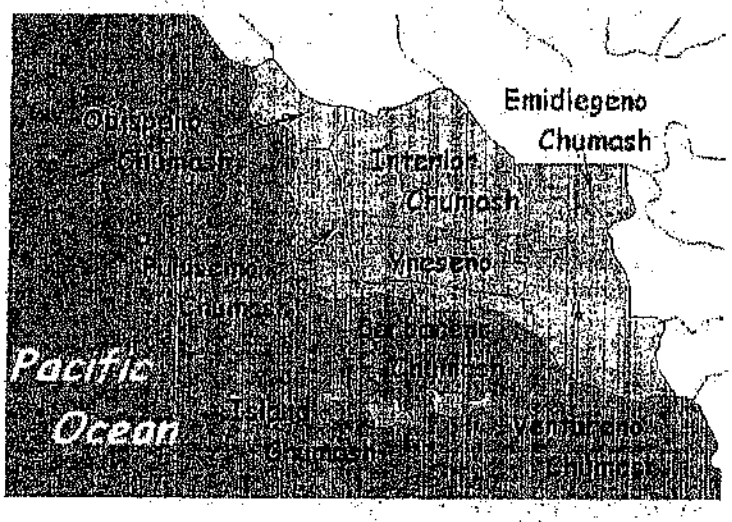


Exhibit 21
CD-0006-16
Page 9 of 14

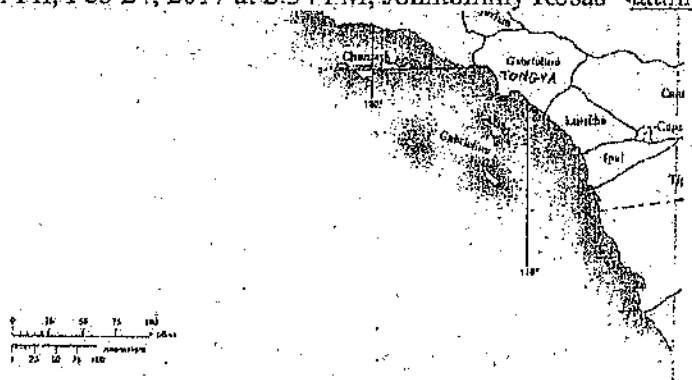
dbook of Native Americans, Vol. 8; Smithsonian Museu

Simon, Larry@Coastal

From: Johntommy Rosas <tattnlaw@gmail.com>
Sent: Friday, February 24, 2017 3:35 PM
To: Simon, Larry@Coastal; McKay, Deborah E-CIV CNRSW, N40 (deborah.mckay@navy.mil); Ainsworth, John@Coastal; JOHNTOMMY ROSAS
Subject: Re: FW: FOCUS



On Fri, Feb 24, 2017 at 2:34 PM, Johntommy Rosas <tattnlaw@gmail.com> wrote:



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On Thu, Feb 23, 2017 at 11:10 AM, Johntommy Rosas <tattnlaw@gmail.com> wrote:
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for the admin record /staff report
again please add all my submitted exhibits
and stamped as received

Exhibit 21
CD-0006-16
Page 10 of 14

Simon, Larry@Coastal

From:	Johntommy Rosas <tattnlaw@gmail.com>
Sent:	Monday, February 27, 2017 2:15 PM
To:	Simon, Larry@Coastal
Subject:	Re: CD-0006-16, Navy

thanks - this part you folks is incorrect- see below- you folks did a very good on the amendments and its very detailed which is new for CCC -so congrats on that -even tho I dont agree or concur with most of the navy s claims which arent written by them -that I have seen - ///
ajr 42 as chaptered has the UNDRIP -fyi -
http://www.leginfo.ca.gov/pub/13-14/bill/asm/ab_0001-0050/ajr_42_bill_20140811_chaptered.html

BILL NUMBER: AJR 42 CHAPTERED
BILL TEXT

RESOLUTION CHAPTER 105
FILED WITH SECRETARY OF STATE AUGUST 11, 2014
ADOPTED IN SENATE AUGUST 4, 2014
ADOPTED IN ASSEMBLY JUNE 5, 2014
AMENDED IN ASSEMBLY JUNE 2, 2014

INTRODUCED BY Assembly Member Williams
(Principal coauthor: Assembly Member Alejo)
(Coauthor: Senator Monning)

MARCH 24, 2014

Relative to indigenous peoples.

LEGISLATIVE COUNSEL'S DIGEST

AJR 42, Williams. Indigenous peoples: declaration of rights.
This measure would express the Legislature's endorsement of the principles of the United Nations Declaration on the Rights of Indigenous Peoples. The resolution would, among other things, call for increased awareness, sensitivity, and respect for tribal governments, related to the history of Native Americans and indigenous peoples.

WHEREAS, The United Nations General Assembly adopted the United Nations Declaration on the Rights of Indigenous Peoples on September 13, 2007, establishing a new systemic standard of recognition, respect, and protection for the rights of indigenous peoples of the world; and

WHEREAS, The United Nations Declaration on the Rights of Indigenous Peoples was approved by the National Latino Congreso on January 31, 2010, in El Paso, Texas, and has been endorsed by hundreds of Native American, Latino, and progressive community organizations across this country; and

WHEREAS, On November 5, 2009, at a historic summit in Washington, D.C., hosted by President Barack Obama, Chairman Joe Kennedy from the Timbisha Shoshone Tribe of the Western Shoshone Nation delivered a message on behalf of the indigenous peoples and nations of North America calling for immediate action by the President of the United States to support the United Nations Declaration on the Rights of Indigenous Peoples; and

WHEREAS, In December 2010, the United States announced support for the United Nations Declaration on the Rights of Indigenous Peoples. In announcing this support, President Obama stated: "The aspirations it affirms, including the respect for the institutions and rich cultures of native peoples, are ones we must always seek to fulfill... [illegible] and

WHEREAS, The "Doctrine of Discovery," emanating from the European colonization after 1492 of the continents later to be known as the Americas, has had profound and lasting negative effects on the cultures and populations of the indigenous peoples and nations of the Americas; and

WHEREAS, Although jurisdiction over Indigenous affairs is divided between the federal government, state governments, and the tribes, it is clear that the Indigenous peoples within the State of California and state governments should be aware of the principles contained in the United Nations Declaration of the Rights of Indigenous Peoples and consider these principles in the various decisions of state authorities; and

WHEREAS, This resolution is not intended to create, and does not create, any rights or benefits, whether substantive or procedural, or enforceable at law or in equity, against the State of California or its agencies, departments, entities, officers, employees, or any other person; now, therefore, be it

Resolved by the Assembly and the Senate of the State of California, jointly, That the Legislature of California expresses its endorsement of the principles of the United Nations Declaration on the Rights of Indigenous Peoples adopted by the United Nations General Assembly, and recognizes the deep hurt, sensitivity, and respect for issues of sovereignty, sacred and historic sites, and traditions, and other vital aspects of the heritage of Native American and Indigenous peoples implicated in those principles, notwithstanding the non-binding nature of the declaration; and be it further

Resolved, That the Chief Clerk of the Assembly transmit copies of this resolution to the President, Vice President, and Attorney General of the United States, the Speaker of the House of Representatives, the Majority Leader of the Senate, to each Senator and Representative from California in the Congress of the United States, the Legal Adviser to the United States Department of State, the United Nations High Commissioner for Human Rights, the Chair of the Human Rights Committee of the United Nations, and the United Nations Special Rapporteur on the rights of indigenous peoples.

////

It is important here to note that in his email communications to the CCC, Mr. Rosas describes TATTN as a "tribal sovereign nation" under the United Nations "Declaration on the Rights of Indigenous Peoples", and a California Native American Tribe under the SB18, AB52 and other amendments to the California Environmental Quality Act. For federal lands and federal actions, "tribal sovereignty" in the United States is a status conveyed through federal recognition and not through state law. While SB 18 and AB 52 apply to state planning laws and state environmental impact analyses, and may not, in and of themselves, be directly applicable to federal agency activities submitted under the Coastal Zone Management Act, the Commission finds that, in performing its review under the enforceable policies of the Coastal Act (i.e., state law), which include protecting cultural resources under Section 30244, the Commission is clearly not limited to analysis based solely on consultation with federally recognized Tribes. The Commission further notes that federal guidance suggest that federal agencies should consider consultation or other forms of communication with non-federally recognized Tribes. For example, the December 2012 Section 106 Handbook published by the Advisory Council on Historic Preservation suggests (p. 11):

On Mon, Feb 27, 2017 at 8:34 AM, Simon, Larry@Coastal <Larry.Simon@coastal.ca.gov> wrote:

Your most recent emails received last Thursday and Friday, and any materials we receive this week before 5:00 pm Friday March 3, will be included in an addendum.

Larry Simon

Federal Consistency Coordinator

Energy, Ocean Resources and

Federal Consistency Division

California Coastal Commission

45 Fremont Street, Suite 2000

San Francisco, CA 94105-2219

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--

JOHN TOMMY ROSAS
TRIBAL ADMINISTRATOR
TRIBAL LITIGATOR
TONGVA ANCESTRAL TERRITORIAL TRIBAL NATION
A TRIBAL SOVEREIGN NATION UNDER UNDRIP WITH DNA AUTHENCATION ON CHANNEL ISLANDS AND COASTAL VILLAGES - AND AS A CALIFORNIA NATIVE AMERICAN TRIBE / SB18-AB 52-AJR 42

25 U.S. Code § 1679 - Public Law 85-671
August 18, 1958 | [H. R. 2824] 72 Stat. 619
Tribal sovereignty in the United States is the inherent authority of indigenous tribes to govern themselves within and outside the borders and waters of the United States of America .

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Exhibit 21
CD-0006-16
Page 14 of 14

STATE OF CALIFORNIA – THE NATURAL RESOURCES AGENCY

EDMUND G. BROWN, JR., *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

February 14, 2017

Refer to: USN_2016_1223_001

Captain C.D. Janke
Department of the Navy
Naval Base Ventura County
311 Main Road, Suite 1
Point Mugu, CA 93042-5033

RE: Fiber Optic Cable Undersea System (FOCUS) Replacement, NAVAIR Sea Range, Point Mugu (your letter 5090 Ser N0000CV/1301 of 19 December 2016)

Dear Captain Janke:

The Department of the Navy (Navy) is initiating its consultation on the above cited undertaking, in accordance with Section 106 of the *National Historic Preservation Act* (16 U.S.C. §306108), as amended, and its implementing regulations found at 36 CFR Part 800. The Navy is proposing to replace the existing Fiber Optic Communications Undersea System (FOCUS-I) between Naval Base Ventura County (NBVC) Point Mugu and NBVC San Nicolas Island (SNI) and the existing microwave communications system link between NBVC Point Mugu and Santa Cruz Island (SCrI) with a new fiber optic system (FOCUS-II). FOCUS-II will connect NBVC Point Mugu, SNI, and SCrI via new undersea fiber optic cables. Additionally, a new fresh water supply line will be installed to support operations on SCrI.

Succinctly, the proposed undertaking will include the following components:

- Approximately 234 nautical miles of cable will be laid on the seafloor between horizontal directional drilling entrance/exit sites located at NBVC Point Mugu, SNI, and SCrI. Offshore cable alignments were developed to avoid known historic shipwrecks and aircraft crash sites;
- On SNI and SCrI, the fiber optic cable will be connected to communications buildings or existing manhole systems via conduits which may be buried in a trench, laid upon the ground surface, or supported in above-ground channels;
- Where needed, trenches would be dug along existing roads and within previously disturbed or developed areas, with widths ranging from 4 to 20 inches and depths down to 40 inches; and
- On SCrI, a new 3-inch polyvinyl chloride water line will be installed in trenches or above-ground channels between the well site and the Navy Site, which will replace a metal pipeline that was originally installed in 1951.

The area of potential effect (APE) will contain the components described above. Access to the APE will be by existing paved and dirt roads. The components of the proposed undertaking were discussed thoroughly in your submission.

As documentation for your finding of effect, you provided an *Environmental Assessment/Overseas Environmental Assessment* (EA) dated September 2016, which contained information on cultural resources potentially affected by the proposed undertaking, and a *FOCUS Cable Installation Archaeological Testing Plan, Santa Cruz Island, California*, dated August 2016 and prepared by Dr. Jennifer E. Perry, Amanda L. Martinez, Dr. Colleen M. Delaney, and Dr. Robert M. Yohe (Epsilon Systems Solutions, Inc.). No cultural resources were identified within the project sites at NBVC Point Mugu because that portion of the APE is located in previously disturbed areas that previously have been filled deeply and paved. No cultural resources were identified within the APE on SNI because that area has been previously subjected to archaeological inventory and determined to be absent archaeological deposits, as a result of it being a previously disturbed area.

On SCrI, five archaeological sites (CA-SCrI-96, CA-SCrI-240/439, CA-SCrI-464, CA-SCrI-465, and CA-SCrI-466) are located within the APE. All of those sites are contributing sites within the larger Santa Cruz Island Archaeological District. For four of the sites (does not include CA-SCrI-240/439), their archaeological deposits had been removed down to the bedrock within the roadbed of Navy Road when it was initially constructed and the remaining portions of those sites are located outside of the roadbed of that road. The cable will be installed in a trench in the roadbed of Navy Road and to ensure avoidance of off-road archaeological deposits, stakes will be placed around the boundaries of those sites including a 50-meter buffer zone for each site prior to construction. Both archaeological and Native American monitors will be present for all ground disturbing activities in the vicinity of those sites.

A portion of the cable and the new water line will be installed within and across the mapped area of CA-SCrI-240/439, either by trenching or an elevated channel located above ground. That site will be tested in accordance with the testing plan identified above to determine the presence or absence of any archaeological deposit, the integrity of any deposits, and how those deposits may contribute to the further understanding of that site. The Channel Island National Park (NPS) has consulted with the Santa Ynez Band of Chumash Elders Council, who supported the testing plan and was interested in collaborating on the protection of this site. If the testing results indicate the presence of intact, significant archaeological deposits that will be affected directly by the proposed undertaking, the Navy will work with CA SHPO, NPS, and the Santa Ynez Band of Chumash Indians to determine the appropriate treatment of those deposits. A Native American monitor will be present during implementation of the testing plan.

Based on the previous surveys, tribal consultation, and that both archaeological and Native American monitors will be present during ground disturbing activities, the Navy has determined that a finding of No Adverse Effect is appropriate for this proposed

undertaking. That determination is made pursuant to the condition that the Navy will continue this consultation with the Office of Historic Preservation it that is warranted.

After reviewing the information submitted with your letter, I offer the following comments:

- I have no objections to your identification and delineation of the APE, pursuant to 36 CFR Parts 800.4(a)(1) and 800.16(d);
- I do not object to the use of both archaeological and Native American monitors during ground disturbing activities associated with the proposed undertaking;
- After reviewing the enclosed testing plan, I found it to be adequate for identifying and assessing potential project effects on any buried archaeological components that may be encountered during the implementation of the proposed undertaking;
- I look forward to continuing this consultation with you if that is warranted, and
- I do not object to your finding of No Adverse Effect and believe that it is appropriate for the proposed undertaking, as described.

Be advised that under certain circumstances, such as an unanticipated discovery or a change in project description, you may have additional future responsibilities for this undertaking under 36 CFR Part 800. Should you encounter cultural artifacts during ground disturbing activities, please halt all work until a qualified archaeologist can be consulted on the nature and significance of such artifacts.

If you have any questions or concerns, please contact Tristan Tozer at (916) 445-7027 or via e-mail at Tristan.Tozer@parks.ca.gov.

Sincerely,

Julianne Polanco
State Historic Preservation Officer

Documents, Letters, and Reports Submitted in Electronic Format by John Tommy Rosas regarding Cultural Resources and History in the Project Area, Federal Tribal Recognition, and the National Historic Preservation Act Section 106 Process.

1. 36 CFR Part 800 – Protection of Historic Properties
2. Undated, TATTN comments on Revised Findings for CDP 5-15-2097 (Newport Banning Ranch LLC)
3. Undated, DNA and Mitochondrial Haplogroup Information
4. February 27, 2015, letter from John Johnson, Ph.D., Santa Barbara Museum of Natural History to Joseph Montoya, Naval Base Ventura County
5. April 29, 2016, letter from Reid Nelson, Advisory Council on Historic Preservation to C.D. Janke, Naval Base Ventura County
6. Undated, Southern Channel Islands Mitochondrial DNA Results
7. May 1, 2015, letter (with enclosures) from C.D. Janke, Naval Base Ventura County to John Tommy Rosas, TATTN
8. Undated letter from Patricia Martz, Ph.D. to Joseph Montoya, Naval Base Ventura County
9. March 14, 2015, letter from Terry Jones, Cal Poly San Luis Obispo to Joseph Montoya, Naval Base Ventura County
10. Site Chronology on San Nicolas Island, CA; C. Goldberg et al, Pacific Coast Archaeological Society Quarterly, Vol. 36, No. 1, Winter 2000
11. An Olivella Grooved Rectangle Bead Cluster from San Nicolas Island, CA; R. Vellanoweth et al, Journal of California and Great Basin Anthropology, Vol. 34, No. 2, 2014
12. A Programmatic Approach to Determine Eligibility of Prehistoric Sites in the San Diego Subregion, Southern Coast Archeological Region, California, for the National Register of Historic Places; S. Reddy, Department of Defense, May 2007
13. Population Replacement on the Southern Channel Islands: New Evidence form San Nicolas Island; S. Kerr and G. Hawley, undated
14. Prehistoric Settlement and Subsistence on San Nicolas Island; Patricia Martz, Ph.D., undated
15. A Preliminary Survey of Historic Sites on San Nicolas Island; S. Schwartz and K. Rossbach, Proceedings of the Society for California Archaeology, Vol. 6, 1993
16. Permitting Program for Archaeological Investigations and Other Activities Directed at Sunken Military Craft and Terrestrial Military Craft under the Jurisdiction of the Department of the Navy; Navy History and Heritage Command, undated
17. Convention on the Protection of the Underwater Cultural Heritage; UNESCO, 2001

Exhibit 23
CD-0006-16

Simon, Larry@Coastal

From: Kirn, Laura <laura_kirn@nps.gov>
Sent: Tuesday, February 28, 2017 11:53 AM
To: Simon, Larry@Coastal
Cc: Russell Galipeau
Subject: Re: Tribal consultation regarding Navy FOCUS project on Santa Cruz Island

Dear Mr. Simon

Thank you for contacting me about the NPS' tribal consultation for the Navy's proposed FOCUS-II project component on Santa Cruz Island, within Channel Islands National Park.

We identified the Santa Ynez Band of Chumash Mission Indians as the federally recognized tribe with the closest cultural affiliation to Santa Cruz Island based on information received from the California State Native American Heritage Commission. In addition, Channel Islands NP has a long-standing government-to-government relationship with the Santa Ynez Band, with whom we regularly consult on matters of mutual interest and concern. In addition, we requested that the Navy invite Julie Tumamait-Stensle, Chair of the Barbareno/Venturano Band of Chumash Mission Indians, to an early scoping visit to the site. This request was based on our relationship with this non-federally recognized but traditionally associated group as an organized entity representing a descendant tribal community that traces ancestry to Santa Cruz Island.

We also requested that the Navy provide the NPS with any comments received from tribal entities on the EA specific to treatment of park resources on Santa Cruz Island.

I hope this information is helpful. Please feel free to contact me either by email or at the telephone number below if you have further questions.

Exhibit 24
CD-0006-16

Appendix D: Focus Cable Replacement Archaeological Testing Plan

FOCUS Cable Installation
Archeological Testing Plan
Santa Cruz Island, California

August 2016

Naval Air Warfare Center Weapons Division

Prepared by:
Epsilon Systems Solutions, Inc.
Jennifer E. Perry, Ph.D., Amanda L. Martinez, M.A., Colleen M., Delaney, Ph.D., and Robert M. Yohe, Ph.D
NAVAIR Contract Number:
N68936-13-D-0015-00030I
Delivery Order #5

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Appendix A: DPR Site Forms
Appendix B: NAGPRA Plan of Action

1. INTRODUCTION

The Naval Air Warfare Center Weapons Division (NAWCWD) Point Mugu Sea Range plans to install a Fiber Optic Communications Undersea System-II (FOCUS) Cable between Point Mugu, San Nicolas Island (SNI) and Santa Cruz Island (SCrI) California (Figure 1-1). The purpose of the Testing Plan is to determine the potential effects to sites that are located within the Area of Direct Impact (ADI) of the FOCUS Cable installation project. The Testing Plan was developed to determine potential effects to five previously recorded sites and two previously undocumented historic sites on SCrI from the FOCUS installation. The five previously recorded sites are CA-SCrI-96, CA-SCrI-240/439, CA-SCrI-464, CA-SCrI-465, and CA-SCrI-466. The two previously undocumented sites include the Navy Road and the 1887 Warehouse at Prisoners Harbor. NAWCWD and the National Park Service (NPS) will evaluate the potential effects to those sites to determine if the FOCUS Cable installation project will affect the National Register of Historic Places (NRHP) eligibility of those sites or any historic properties along the proposed FOCUS Cable line.

Project Description

NAWCWD is in the process of formalizing an Environmental Assessment (EA) for a proposed FOCUS Cable installation. As documented in the EA, the U.S. Navy proposes to replace the existing undersea cable, FOCUS-I, between Naval Base Ventura County (NBVC) Point Mugu and NBVC SNI and the microwave communications system link between NBVC Point Mugu and SCrI with a single new system. This new system, FOCUS-II, will connect NBVC Point Mugu, NBVC SNI, and SCrI via new undersea fiber optic cables. The following is a brief overview of the project description. For a complete description of the project, review the Final Draft Environmental Assessment/Overseas Environmental Assessment – Fiber Optic Communications Undersea System (FOCUS) Replacement (NAWCWD 2016).

The purpose of the Proposed Action is to provide continued reliable operation of the real-time intra-range and inter-range communications capability for the Sea Range with an effective increase in bandwidth required to satisfy customer requirements. This real-time capability includes all data communications between NBVC Point Mugu, NBVC SNI, and SCrI.

The need for the Proposed Action is two-fold: 1) reliability of FOCUS-I is degrading; and 2) increased bandwidth is necessary in the SCrI microwave system.

The communications capability is required to support NAWCWD customers (e.g., U.S. military and allied forces with weapon systems testing needs) and allows for real-time access and relay of research, development, acquisition, test, and evaluation (RDAT&E) and training data on the Sea Range.

The FOCUS-II cable will come ashore at Prisoners Harbor on the northern shore of SCrI. The transition from undersea cable to the shoreline would use horizontal directional drilling (HDD). HDD equipment would be delivered to Prisoners Harbor using the existing barge landing and the drill pad would be to the west of the Prisoners' pier. Equipment staging areas will be adjacent to or within the vicinity of the drilling pad. Additional equipment will be staged on previously graded areas near the SCrI well site. Drilling equipment and facilities will be removed upon completion of HDD and the HDD pad will be returned to its original condition.

On SCrI, the cable will be installed in trenches up to 102 centimeters (cm, 40 inches [in]) deep and up to 51 cm (20 in) wide along existing roads and/or be installed within an elevated channel system along existing roads. As a part of this project, Navy and contracted archaeologists visited the project ADI. This Testing Plan provides methods and protocols for evaluating potential impacts to existing cultural

resources within the ADI, updating site records (where necessary), and subsurface testing to determine the potential effects of the installation of the new FOCUS-II cable, hereafter referred to as FOCUS Cable.

Determinations of effect will be based on the potential of a site to contribute significantly to ongoing regional research issues. The evaluation of effects approach and field and analytic methods employed during this project will be consistent with previously employed field and laboratory methods used on SCrI and other northern Channel Islands.

The field phase of the project will occur in the latter part of 2016. An Accident Prevention Plan (APP)/Activity Hazard Analysis (AHA) will be drafted before work commences.

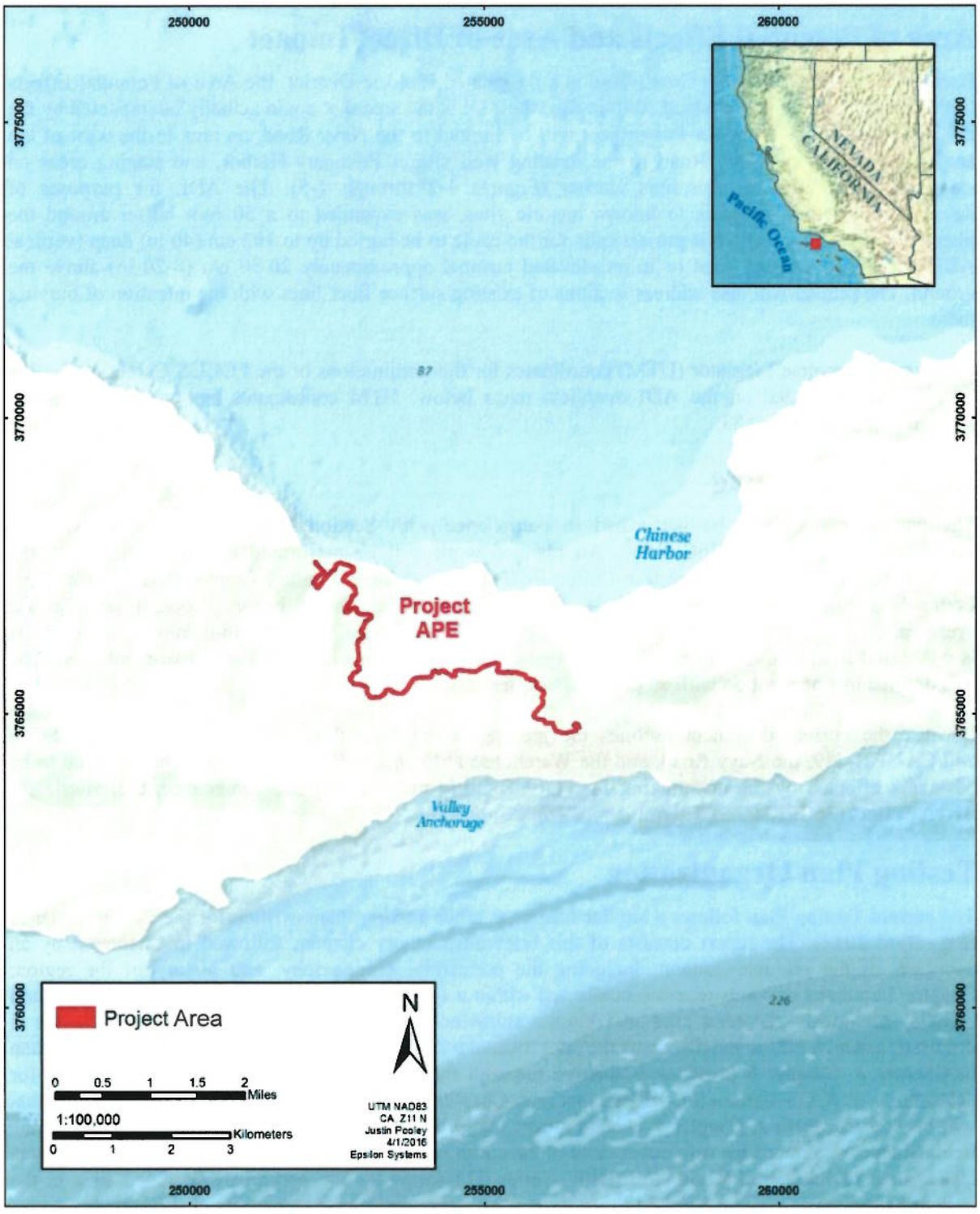

Figure 1-1. SCrI FOCUS Cable installation and maintenance project overview at 1:100,000 scale.

Area of Potential Effects and Area of Direct Impact

Because the entirety of Santa Cruz Island is a designated Historic District, the Area of Potential Effects (APE) consists of the entire island. Within this, the ADI is the area that could actually be impacted by the FOCUS installation. Work for this project will be limited to the Navy Road, an area to the west of the access road from the Navy Road to the existing well site at Prisoners Harbor, and staging areas on existing graded areas at Prisoners Harbor (Figures 1-2 through 1-5). The ADI, for purposes of determining potential impacts to known historic sites, was expanded to a 50 foot buffer around the planned construction path. The project calls for the cable to be buried up to 102 cm (40 in) deep (vertical ADI) within the existing road or in an elevated channel approximately 20-50 cm (8-20 in) above the ground. The project will also address sections of existing surface fiber lines with the intention of burying them.

Universal Transverse Mercator (UTM) coordinates for the terminations of the FOCUS Cable installation locations are provided on the ADI overview maps below. UTM coordinates are provided in North American Datum (NAD) 83.

Regulatory Setting

The current project will be performed in compliance with Section 106 of the National Historic Preservation Act (NHPA) 36CFR800. All planned work will be performed in consultation with the California State Historic Preservation Office (SHPO), Naval Base Ventura County (NBVC) for SCrI, Channel Islands National Park (CINP), the Chumash Tribe, the Advisory Council on Historic Preservation (ACHP), and any other consulting parties. The principal federal land-owning entity on SCrI is CINP and it will have the Lead Federal Agency role under 36CFR800.2. The above-mentioned ADI was defined by consultation with all parties listed here.

Because the current document outlines the presence of at least three historic properties (CA-SCrI-240/CA-SCrI-439, the Navy Road, and the Warehouse at Prisoners Harbor) that have the potential to be adversely effected by the undertaking for FOCUS Cable installation and maintenance, the criteria for adverse effect (36CFR800.5) determinations will be applied.

Testing Plan Organization

The current Testing Plan follows a similar format as other Testing Plans written for the Channel Islands (e.g., Byrd 2012). The report consists of this brief introductory chapter, followed in Chapter 2 by an overview of the regional context, including the prehistory, ethnography, and history of the region; Chapter 3 contains previous research conducted within a 1-kilometer (km) radius of the project ADI, and includes previously recorded sites and known shipwrecks located off the coast of SCrI. Chapter 4 discusses research issues and discusses the sites located within the FOCUS Cable ADI in more detail than in Chapter 3. Chapter 5 provides evaluative research themes, research questions, and data needs for determining FOCUS Cable effect determinations. Chapter 6 provides field and laboratory methods that will be used for testing. Chapter 7 contains tasks that will be performed after data are collected in the field. Chapter 8 contains the references cited in the current document. Appendix A contains the California Department of Parks and Recreation (DPR) Series 523 forms for the previously recorded sites in the current project.

All original field notes and paperwork related to the evaluation will be retained in an appropriate facility as determined by NPS and NAWCWD. Geographic information systems (GIS) data gathered for the project will be provided in electronic format for incorporation into the cultural resources layer of the Navy's Channel Islands database.

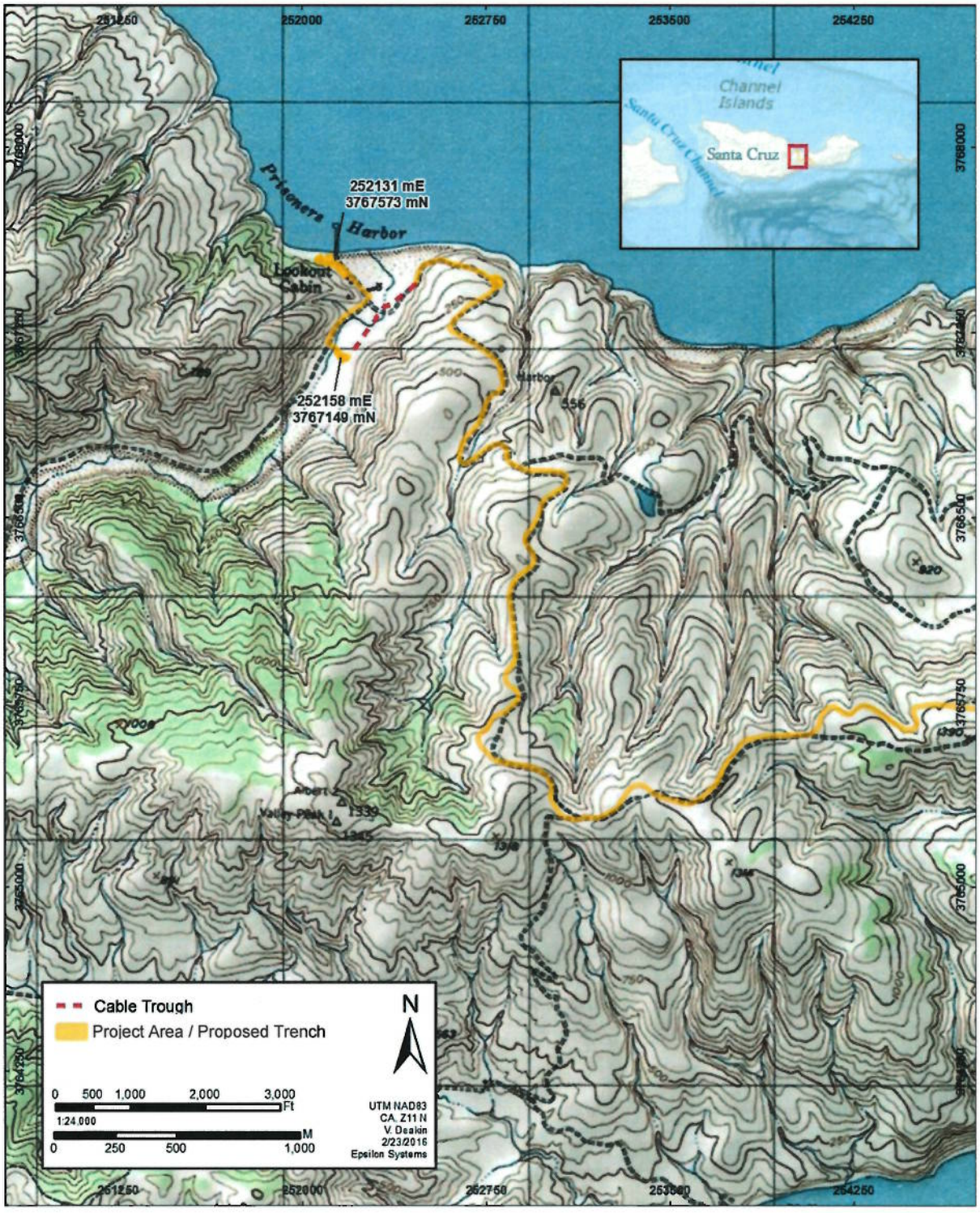

Figure 1-2. West end of SCrI FOCUS Cable ADI on topographic map at 1:24,000 scale.

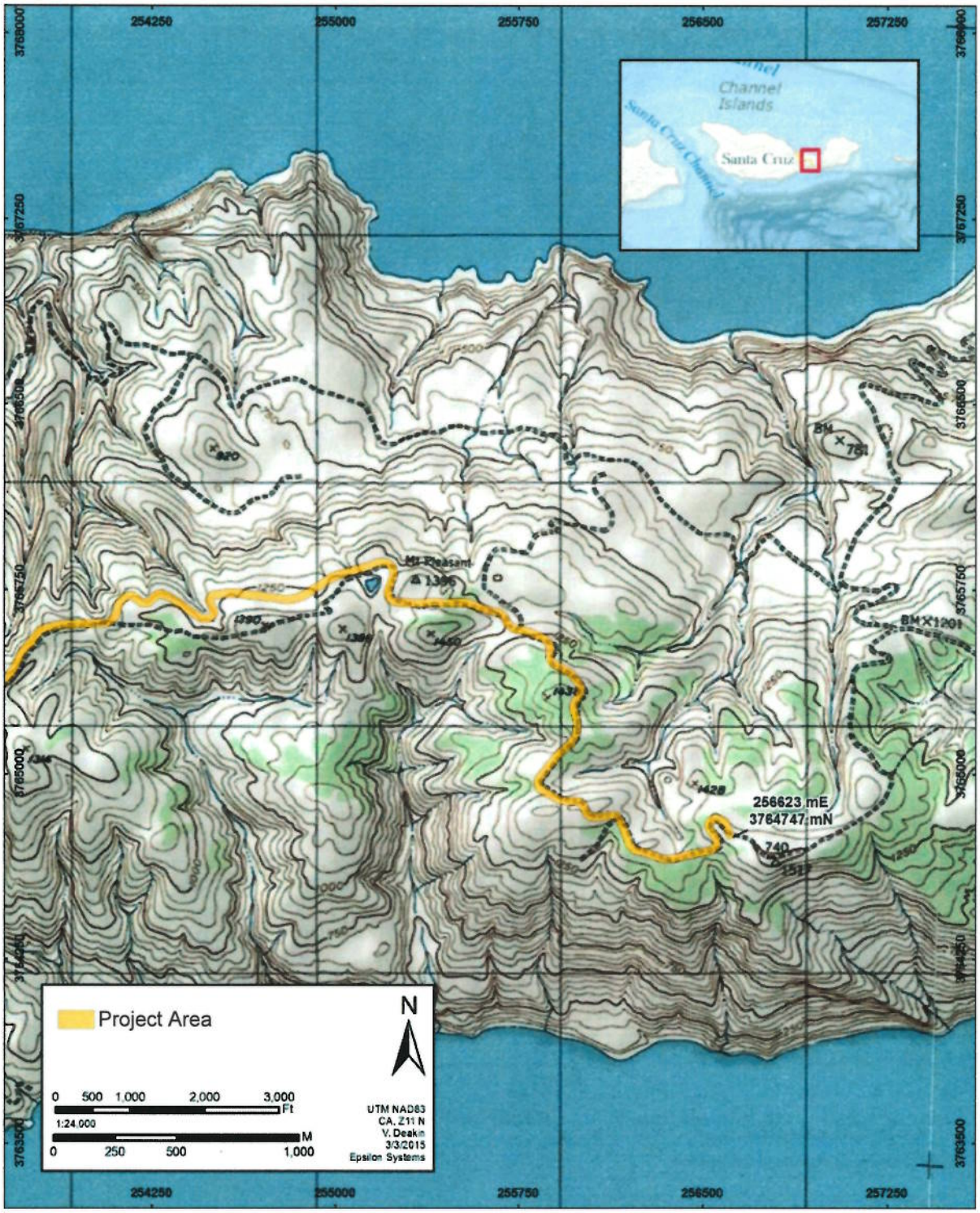

Figure 1-3. East end of SCrI FOCUS Cable ADI on topographic map at 1:24,000 scale.

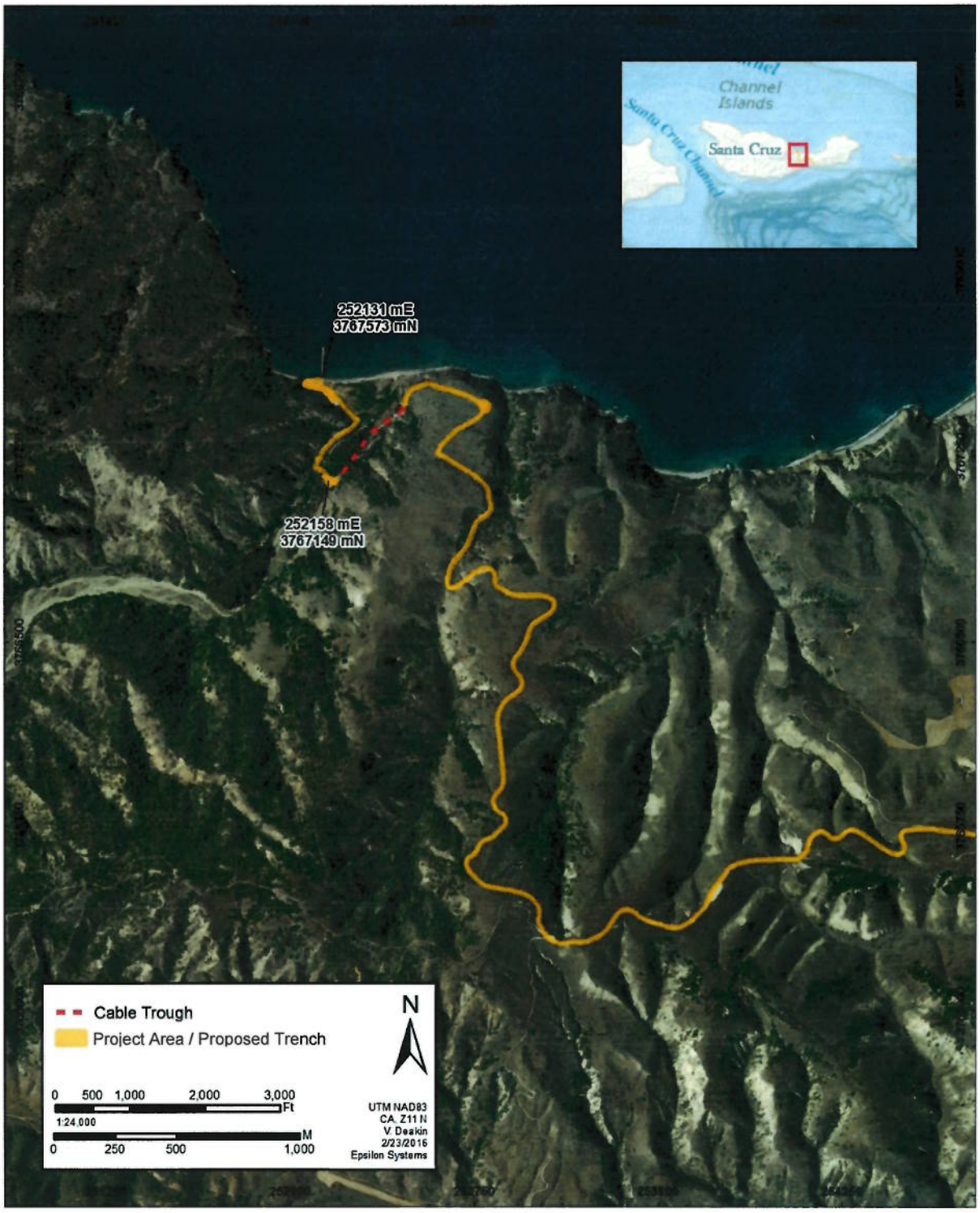

Figure 1-4. West end of SCrI FOCUS Cable ADI on aerial imagery at 1:24,000 scale.

Figure 1-5. East end of SCrI FOCUS Cable ADI on aerial imagery at 1:24,000 scale.

2. PROJECT AREA BACKGROUND

Santa Cruz Island has the distinction of being both the largest of the northern Channel Islands and one of the richest in terms of indigenous prehistory, ethnohistory, and post-contact history (Glassow 2010). Given that the complexity of this history of human occupation spans over the past 13,000 years, only the most basic summary can be covered in the following pages in the interest of time and resources. A more complete summary of the archaeology, ethnohistory, ethnography, and history of Santa Cruz and the other northern Channel Islands can be found in Glassow (2010), which has served as one of the main sources in this summary. Other important sources include Arnold (1987, 2001a), Glassow (1997; 2013), Glassow et al. (2007, 2008), Jazwa and Perry (2013a), Kennett (2005), and Livingstone (2006).

Environmental Context of Santa Cruz Island

Santa Cruz Island is the largest and most diverse of all of the Channel Islands in terms of topography, geology, and plant communities (see summary in Jazwa and Perry 2013b). The island encompasses 96 square miles, and is about 24 miles long and 7.5 miles wide at its widest point (Figure 2-1; Junak et al. 1995:2). Just as the northern Channel Islands as a whole represent a continuum of environmental variability from east to west, Santa Cruz Island exhibits similar variability due to differences in air and sea temperature as well as wind and ocean currents. Ocean waters transition from warmer in the east to cooler in the west, and warmer in the south to cooler in the north (Engle 1994; Kennett 2005). The intersection of these currents and the resulting nutrient upwelling sustains large and healthy marine populations of edible invertebrates, fishes, and sea mammals ranging from black turban snails to whales, attracting humans from prehistoric to contemporary times.

Resources available within the rich and varied terrestrial environment complement the bounty of the ocean. Santa Cruz Island has a wide range of environmental zones, including grasslands, coastal scrub, chaparral, pine forests, and numerous riparian zones that provide resources such as acorns, grass seeds, and fruits as well as edible bulbs and corms (Gill 2013, 2014, 2015; Junak et al. 1995; Martin and Popper 2001; Timbrook 1993, 2007). The major regions of relevance to this project are the East End and Central Valley, the Isthmus, and Prisoners Harbor. Each of these regions differ in topography, geologic substrate, vegetation communities, and exposure to wind and ocean currents; accordingly, there are significant differences in the kinds of resources available for human food and animal forage, building and tool-making, and other uses through time.

East End and Central Valley

Two major ridges, the North and South Ridges, trend east to west along the length of Santa Cruz Island and bound the northern and southern shorelines (Junak et al. 1995:3). The highest elevation on the Channel Islands, 747 meters (m, 2,450 feet [ft]), is at Mount Diablo (or Devils Peak) on the North Ridge, attesting to the rugged and steep nature of its terrain. The large Central Valley is located between these ridges, serving as a major environmental division and containing land not influenced directly by the island coastline and maritime conditions. The smaller East End is separated from this region by the Isthmus, which is a long, elevated ridge trending roughly east to west from which ridges and canyons extend to the north and south. Separating the Isthmus from the East End is the El Montañon ridgeline, which trends northwest to southeast at a maximum elevation of 549 m (1,800 ft; Junak et al. 1995:3).

The only viable way to travel by land between the East End and areas of the island to the west is on a narrow strip of flat land approximately 100 m across from southwest to northeast between the heads of two canyons that bound the western side of El Montañon (an area referred to as No Man's Land; Perry 2003). No roads have ever connected the East End to the rest of the island because of the ruggedness of

this ridge. Instead, land travel between the East End and the Isthmus requires hiking to the top of El Montañon and then descending to cross No Man's Land via the narrow strip. Importantly, because canyons bisect the northern and southern slopes of the Isthmus, the easiest way to continue traveling westward is to stay on top of the Isthmus, as reflected in the locations of National Park Service (NPS) and Navy sections of the dirt road that spans between the narrow strip and Prisoners Harbor to the west. Today hikers regularly traverse between Prisoners Harbor and Scorpion Anchorage on the East End, a one-way distance of 22.5 km (14 miles).

During the historic ranching era, ranch employees traveled by horse between the Central Valley and the East End to access different animal pastures, agricultural fields, and ranch buildings at Scorpion Anchorage and Smugglers Cove (see McElrath [1993] for descriptions of the journey in the early 1900s). During the island's indigenous occupation, inhabitants would have made this trip to interact with different social groups for marriage and ceremonies, as well as to obtain resources available in large quantities on the East End. In particular, chert is a toolstone that was of great importance to residents of the northern Channel Islands throughout prehistory for the manufacture of knives, drills, projectile points, and other tools. Although chert outcrops occur elsewhere on the northern Channel Islands (Erlandson et al. 1997, 1998, 2012; Jew et al. 2015; Rick 2006), they do not compare with the vast quantities of usable materials on eastern Santa Cruz Island (Arnold 1987; Kennett 2005; Perry and Jazwa 2010). The most abundant and highest-quality chert sources are situated on and around El Montañon. A minimum of 26 chert quarry sites, with evidence of quarrying and tool production spanning at least 7,000 years, attest to the enduring importance of this lithic resource to islanders. Although small outcrops of low-quality chert have been identified in canyons south of Prisoners Harbor (Perry and Jazwa 2010:180), chert found in abundance at archaeological sites on the Isthmus and in the Central Valley most likely originated on the East End.

Isthmus

The eastern end of Santa Cruz Island tends to be more arid than the western end except for the Isthmus. The Isthmus averages between 305 and 457 m (1,000 and 1,500 ft) in elevation along its major ridge, and tends to receive more annual precipitation than lower-lying areas to the east and west (Junak et al. 1995). In addition to rainfall, the marine fog layer provides substantial moisture for higher-elevation plants, the ceiling of which tends to fluctuate between 213 and 427 m (700 and 1,400 ft). Marine fog and moisture-laden air are pushed onto the north-facing slopes of this area by the prevailing northwest winds, which help to recharge the aquifers in this area. On the north side of the Isthmus, fresh water is available more reliably at the heads of drainages than in the canyon bottoms because more springs and seeps are located at higher elevations.

Overall, the north side of the Isthmus is much more hospitable than the south side because of freshwater availability, plant resources, and beach access. For example, these conditions support the westernmost mixed conifer forest on Santa Cruz Island (Junak et al. 1995). Located on the north side of the Isthmus upslope from China Harbor, China Pines consists of pines, primarily Bishop pines (*Pinus muricata*); oaks (*Quercus* sp.); toyon (*Heteromeles arbutifolia*); and manzanita (*Arctostaphylos* sp.). All of these plants were ethnographically important resources to the Chumash for food, tool-making and building materials, and firewood (Timbrook 2007).

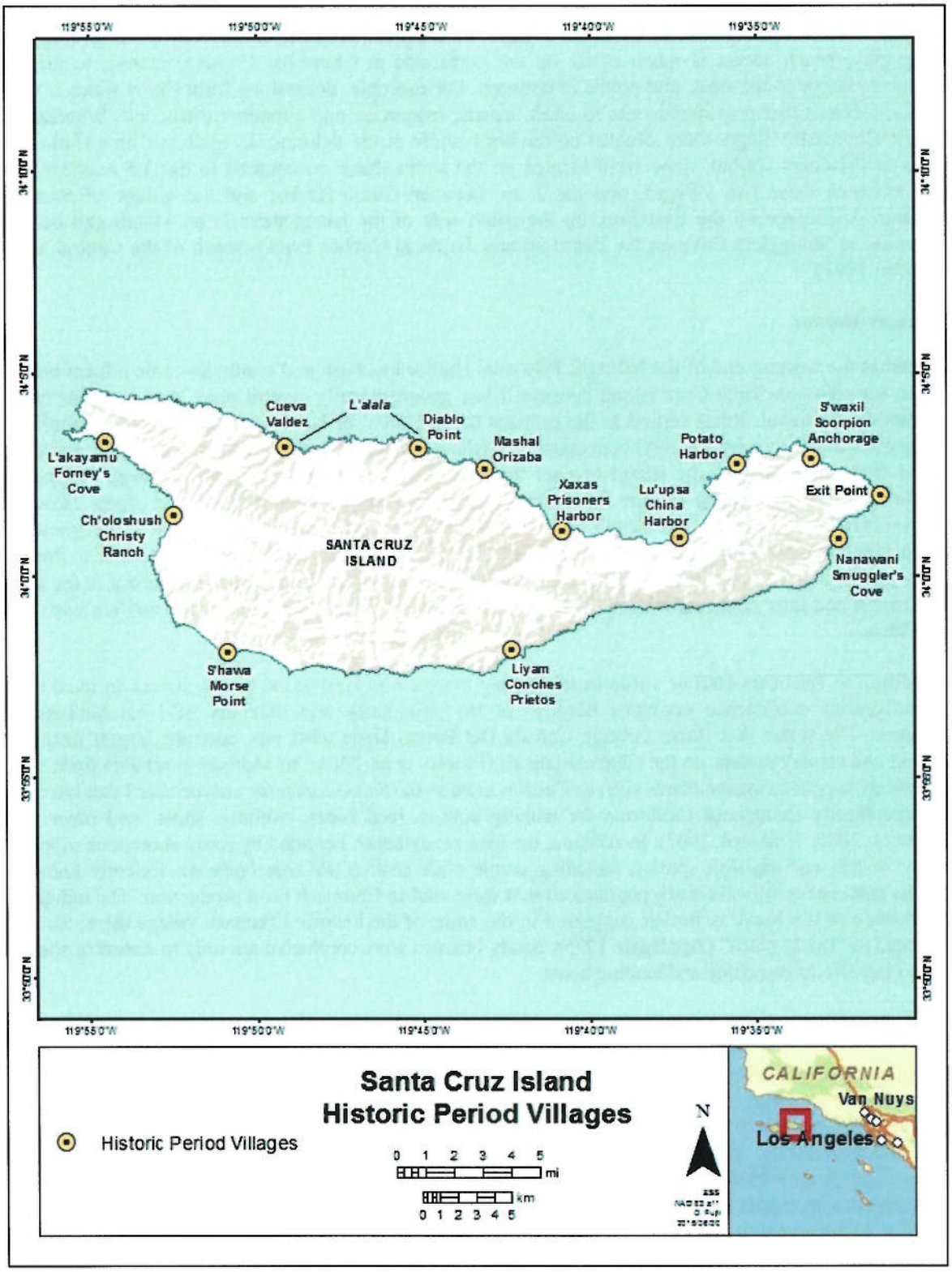

Figure 2-1. Proposed locations for the historic villages documented from ethnohistoric sources.

Furthermore, most of the shoreline on the south side of the Isthmus is inaccessible due to heavily eroded drainages and sea cliffs several hundred ft high. In contrast, because of differences in geology and topography, beach access is much easier on the north side at China (or Chinese) Harbor to the east, Prisoners Harbor to the west, and points in between. For example, downslope from China Pines is China Harbor, a beach that provided access to chert, marine resources, and abundant driftwood. Whereas two historic Chumash villages were situated on the north shore of the Isthmus, *Lu'upsh* at China Harbor and *Xaxas* at Prisoners Harbor, none were located on the south shore. In contrast to the 3.5 nautical miles (nm) between these two villages, and the 2 nm between China Harbor and the village of *Swaxil* at Scorpion Anchorage on the East End, on the south side of the island there is an 11-nm gap between *Nanawani* at Smugglers Cove on the East End and *Liyam* at Coches Prietos south of the Central Valley (Johnson 1993).

Prisoners Harbor

Located at the western end of the Isthmus, Prisoners Harbor has been and continues to be a focal point of human activities on Santa Cruz Island because it is a geographically central place that connects marine and land-based travel. It has served as the primary landing area for boats used by ranchers, the military, and tourists traveling with the NPS concessionaire Island Packers to transport people, animals, and goods to and from anywhere on the island (except the East End for reasons mentioned above). Defined by ridgelines and canyons, the terrain surrounding the harbor is generally rugged and steep. However, Prisoners Harbor is located at the mouth of Cañada Del Puerto, a wide canyon that provides comparatively easy passage into the island's large Central Valley and, via the Central Valley, to areas farther to the west (Perry and Delaney-Rivera 2011). To the east, the Navy Road snakes from Prisoners Harbor to the top of the Isthmus and later connects with the NPS portion of the road that terminates at the western base of El Montañon.

In addition to Prisoners Harbor's role in facilitating marine and land-based travel, it was an ideal locale for indigenous subsistence activities because of the abundance and diversity of local habitats and resources. The water that flows through Cañada Del Puerto feeds what was once the largest freshwater wetland and estuary system on the Channel Islands (Powers et al. 2014). In addition to reliable fresh water, this estuary supports riparian plants such as California bulrush (*Schoenoplectus californicus*) that were used ethnographically throughout California for making houses, reed boats, clothing, shoes, and other items (Anderson 2006; Timbrook 2007). In addition, the long sandy beach bounded by rocky shorelines supports a variety of fish and shellfish species, including purple olive snail (*Callianax biplicata*, formerly known as *Olivella biplicata* or Olivella shell) populations that were vital to Chumash bead production. The indigenous significance of the beach is further suggested in the name of the historic Chumash village there; *Xaxas* is translated as "sandy place" (Applegate 1975). Sandy beaches were conducive not only to desirable shellfish species but also to launching and landing boats.

The Prehistory of the Northern Channel Islands

Human occupation on the northern Channel Islands extends back to the Pleistocene and includes some of the earliest known evidence of human occupation in the New World (human remains from Arlington Springs on Santa Rosa Island date to 13,000 years before present [BP]). Indigenous peoples lived on the island through 1822 (Johnson 2001). The entire island was designated the Santa Cruz Island Archeological District (Glassow 2013; NPS 1980) and was deemed eligible for listing in the NRHP under Criterion A (the property is associated with events that have made a significant contribution to the broad patterns of our history) and Criterion D (potential to contribute information about national, regional and local history). Over 800 archaeological sites are currently recorded for the island, although archaeologists estimate the island contains over 3,000 sites (Glassow 2013).

To create a prehistoric overview of the northern Channel Islands, Glassow (2010) divided the prehistory of the Channel Islands National Park (Park) into four broad periods of occupation: Terminal Pleistocene and Early Holocene (13,000–7,000 years BP), Earlier Middle Holocene (7,000–5,000 years BP), Middle to Late Holocene (5,000–1,000 years BP), and Late Holocene (<1,000 years BP). This most recent chronology replaces those proposed earlier for the northern islands (i.e., King 1990; Olson 1930; Rogers 1929; Warren 1968). Below is a summary of each of these time periods as described in Glassow (2010) that includes the major archaeological manifestations found within each chronological period. These temporal periods also roughly correspond with sea level periods modeled by Reeder-Myers (2012). Changes in sea level have influenced the locations of human activities in the past, as well as the identification of sites today. Reeder-Myers's temporal periods are Late Pleistocene colonization (before 11,000 years BP), a rapid rise in sea level (11,000–9,000 years BP), an estuary period (9,000–7,000 years BP), and a slower rise with sea level stabilization (7,000–5,000 years BP).

Terminal Pleistocene and Early Holocene (13,000–7,000 Years BP)

Terminal Pleistocene

In the past, archaeologists believed that the offshore islands were not occupied until fairly late due to the absence of the typical Milling Stone Horizon associated with the early mainland coastal sites (see Olson 1930; Rogers 1929; Rozaire 1967; Wallace 1955). Subsequent intensive surveys of sediments dating to the Terminal Pleistocene and Early Holocene; the identification of the antiquity of Channel Island Barbed (CIB) points, Amol points, and flaked stone crescents; and extensive radiocarbon dating have refined archaeological perspectives and demonstrate that humans occupied the California Channel Islands as early as the Late Pleistocene (Braje et al. 2013; Erlandson et al. 2008a and 2008b, 2011, 2012, 2015; Glassow et al. 2008; Gusick 2012, 2013; Johnson et al. 2002; Rick et al. 2001, 2003, 2005).

Paleocoastal sites are difficult to identify because up to 80 percent of the Pleistocene coastal lowlands have been lost to rising sea levels (Braje et al. 2013:26; Reeder-Myers 2012). Most recorded Late Pleistocene sites are located at a distance from the then-shoreline, which leads to issues of interpretation as humans often process subsistence items elsewhere to ease transport to the final destination; this in turn makes the reconstruction of past lifeways difficult. The analysis of archaeological materials from Late Pleistocene sites indicates that Paleocoastal peoples exploited rocky intertidal zones as well as waterfowl, sea mammals, and nearshore fish (Braje et al. 2013; Erlandson 2001; Rick and Erlandson 2001). The stone tool technology and recovered faunal remains demonstrate that the Paleocoastal and Early Holocene humans employed sophisticated maritime hunting technologies (Braje et al. 2013; Glassow et al. 2008; Rick et al. 2001).

Several sites on San Miguel and Santa Rosa Islands in particular have improved our understanding of early human occupation on the islands. A reassessment of earlier archaeological work on Santa Rosa Island undertaken by Orr (1967, 1968) at the Arlington Springs locality (CA-SRI-173) has verified the presence of humans on this island through direct radiocarbon dating of human bone to 13,000 years BP (Johnson et al. 2002). Other sites on Santa Rosa and San Miguel Islands (Rick and Erlandson 2009), and those recently identified on Santa Cruz Island (Erlandson et al. 2015), have provided additional evidence of Terminal Pleistocene activity. The earliest temporal subdivision is based on archaeological investigations on San Miguel Island at Daisy Cave (CA-SMI-261; Erlandson 2007; Erlandson et al. 1996) as well as several sites at Cardwell Bluffs (CA-SMI-678, CA-SMI-679, and CA-SMI-680; Erlandson et al. 2008a). A lower stratum in Daisy Cave confirms a human presence at 11,500 years BP, while the Cardwell Bluff midden sites have yielded dates ranging from 11,500 to 12,000 years BP (Rick and Erlandson 2009). On the mainland, flaked-stone crescents and stemmed point artifacts found throughout much of the Far West are often associated with Clovis-aged (and possibly pre-Clovis) sites (Beck and Jones 2009; Jenkins et al. 2012) and avian hunting (Moss and Erlandson 2013).

Functional interpretation of the stemmed points and crescents are varied (hunting, fishing, zoomorphic effigies; see Braje et al. 2013:34 for a summary). Many of the CIB points and crescents on Santa Rosa and San Miguel Islands come from surface contexts and/or from sites with faunal assemblages dominated by shellfish (Braje et al. 2013:35). In most cases, these sites are 1 km to more than 10 km from the old coastline. Braje and his colleagues (2013:35) suggest that in some cases humans at these Late Pleistocene and Early Holocene sites processed vertebrate remains offsite, limiting the recovery of faunal elements and overemphasizing the presence of shellfish. One exception is the faunal assemblage at CA-SRI-512, which was dominated by waterfowl (cormorant, *Phalacrocorax* spp.; albatross, *Phoebastria albatrus*; Canada goose, *Branta canadensis*; and the extinct flightless duck *Chendytes lawi*). The presence of 67 stemmed CIB points and 19 crescents at CA-SRI-512, as well as the identification of more than 5,000 bone fragments, also suggests hunting and perhaps fishing were important to these early island residents (Braje et al. 2013; Glassow 2010).

Early Holocene

The earliest portion of the Early Holocene (ca. 10,500–8,500 years BP) is best represented by archaeological data recovered from Daisy Cave (CA-SMI-261) and Seal Cave (CA-SMI-604) on San Miguel Island, which have discrete depositional units beginning around 10,200 years BP (Erlandson et al. 1999; Rick et al. 2001). At Daisy Cave, there appears to be relatively continual occupation from 10,000 to 8,600 years BP, with the Early Holocene represented by frequent, short-term, intensive occupations (Rick et al. 2001:598). Artifacts within these strata include items made from stone, shell, bone, and plant fibers (Vellanoweth et al. 2003). Most flaked stone material is restricted to expedient flake tools with very few projectile points. Spire-removed Olivella beads are commonplace. Also, what are believed to be the earliest known fishhooks from North America (Erlandson 2007) are frequently found and are associated with 27,000 fish bones (Rick et al. 2001), indicating that fishing was important in certain contexts during this temporal subdivision. Cordage fragments of twisted sea grass appear to be remnants of pieces cut during the construction of fishing nets. Within recent years, additional Paleocoastal sites have been identified on San Miguel and Santa Rosa Islands that fall within this time range (Braje et al. 2013; Erlandson et al. 2007; Erlandson et al. 2008b), varying from short-term camps to more sustained habitation sites. This temporal subdivision suggests continued dependence on shellfish but with greater dependence on fishing and the addition of seal, otter, and birds. Plant resources are also likely to have played important roles in the subsistence of early islanders. Direct archaeological evidence for plant use is limited, although it is improving as researchers target archaeological samples for paleoethnobotanical ecofacts and as they recover plant-processing tools during excavations. Gusick, for example, has noted evidence of plant resources during the Early Holocene on Santa Cruz Island (2012, 2013).

The last temporal subdivision for the Terminal Pleistocene and Early Holocene is the later Early Holocene (8,500–7,000 years BP); this subdivision is best demonstrated by evidence from three of the four northern Channel Islands: San Miguel, Santa Rosa, and Santa Cruz. Interestingly, Daisy Cave does not have a component that dates to this time period, but the lowest component of nearby Cave of the Chimneys (CA-SMI-603) dates from 8,400 to 7,500 years BP (Vellanoweth et al. 2003). This stratum contains knotted sea grass cordage and Olivella spire-removed shell beads (Vellanoweth et al. 2003). A site at Tecolote Point (CA-SRI-3) on Santa Rosa Island has a significant later Early Holocene component, including a cemetery (Cemetery A; Orr 1968). Red abalone (*Haliotis rufescens*) were found within the midden and have been associated with some of the 79 human burials. Radiocarbon dates obtained by Orr (1968), Erlandson (1994), and Lambert (noted in Glassow 2010:2.7) suggest the cemetery was in use approximately 7,700 to 7,400 years BP. The CA-SRI-3 cemetery is important for several reasons:

(1) sedentism/somewhat-permanent settlements were established earlier than previously thought;

(2) bioarchaeological studies indicate morphological similarities between these early individuals and historic Island Chumash, suggesting a long-term genetic and cultural continuity (Glassow 2010); and

(3) mortuary-associated artifacts demonstrate that attributes associated with sociocultural complexity (economic diversity, sedentism, and an elaborate material culture) were already under development during the Early Holocene.

Fewer Late Pleistocene and Early Holocene sites are identified on Santa Cruz Island compared with San Miguel and Santa Rosa Islands, although more have been identified during recent targeted surveys (Erlandson et al. 2015). One deeply stratified site (CA-SCrI-109) at Punta Arena has a shell midden with a basal stratum dated to 8,400 years BP (Glassow et al. 2008), and researchers recovered three CIB projectile points from this deepest stratum. For the rest of Santa Cruz Island, Early Holocene occupations are comparatively few, and seem to represent repeated, short-term occupations where inhabitants focused on locally available resources (Gusick 2012, 2013). Interpretations of plant usage are always problematic at archaeological sites, especially those occupied during the Early Holocene and Late Pleistocene. However, Gusick identified a few paleobotanical remains from Early Holocene sites near Christy Beach on Santa Cruz Island (2012), as well as one metate fragment from CA-SCrI-549. Taken together, this evidence does suggest humans living at these early sites were consuming floral resources, which improves our interpretations of past human activities during the Early Holocene.

Earlier Middle Holocene (7,000–5,000 Years BP)

During the earlier Middle Holocene, as with earlier time frames, there is evidence of human occupation of the larger islands but not on the smaller islands of Anacapa and Santa Barbara (Erlandson et al. 1992; Kennett 2005; Rick 2006; Rick and Erlandson 2001). This 2,000-year period seems to be one of cultural transition as well as environmental change (Glassow 2010), which is not completely unexpected given the change in sea levels. This time period is represented by a restart of sea level rise and stabilization after a stable estuary period (as modeled by Reeder-Myers 2012). This period may also provide evidence for human impacts on local environments as well as the impact of the changing environment on local resources. Small red abalone middens have been identified on San Miguel and Santa Rosa Islands during the earlier Early Holocene, but are absent during the late Early Holocene. The absence may be due to changes in water temperatures (Glassow et al. 1994; Kennett 2005). Whereas Erlandson et al. (2005), Braje et al. (2009) and others have speculated that the large red abalone middens identified during the subsequent Middle Holocene would only be possible if otter populations were decreased, presumably by human hunting and other interference. Terrestrial anthropogenic changes include the introduction of dogs and foxes at some point prior to 7,000 years BP and the probable disruption of the flightless duck rookeries on the northern Channel Islands, which led to the eventual extinction of this species (Jones et al. 2008).

We follow Glassow (2010) and subdivide the earlier Middle Holocene into three "intervals": 7,000 to 6,300 years BP, 6,300 to 5,300 years BP, and 5,300 to 5,000 years BP. The significance of each of these sub-periods is summarized as follows:

7,000 to 6,300 years BP. This sub-period is one of the least understood time frames for the islands (Glassow 2010). On San Miguel Island, Daisy Cave (CA-SMI-261) contains deposits that date to 6,900 to 6,600 years BP (Erlandson et al. 1996, 2005; Rick et al 2001), and CA-SRI-192 on Santa Rosa Island contains strata dating to 6,650 years BP (Erlandson et al. 1996). Estuarine shellfish remains recovered indicate the exploitation of the Abalone Rocks Estuary. On Santa Cruz Island, at least ten sites are known that contain deposits specific to this sub-period, which are dispersed throughout the island in interior and coastal locales (Kennett 2005; Perry 2003, 2004; Perry and Glassow 2015).

The data from the sites during this sub-period suggest highly mobile, smaller populations with an emphasis on shellfish (particularly mussels), although birds (especially cormorants), sea mammals, and fishes were also consumed. The identification of nearshore fish and bone gorges suggests the emphasis was nearshore fishing (Glassow 2010:2.10). Plants may have played an important role, although botanical remains and associated plant processing artifacts are rare (in the case of digging stick weights, also called "donut" stones) or unknown.

6,300 to 5,300 years BP. Island inhabitants during this time period, particularly on Santa Cruz Island, appear to have been more reliant on subtidal shellfish (Glassow 2013a; Perry and Hoppa 2012). Subtidal shellfish found in abundance include red abalone and wavy top turban (*Megastraea undosa,* formerly known as *Lithopoma undosum* and *Astraea undosa)*), of which red abalone has been a focus of Glassow's research on Santa Cruz Island (Glassow 2015; Glassow et al. 2008). Most of the red abalone middens are relatively small in size, with sites averaging 20 m (66 ft) in diameter and 30 cm (12 in) in depth. One site (CA-SCrI-333) on western Santa Cruz Island at El Monton extends 100 m (328 ft) in diameter and has a midden 1.5 m (5 ft) deep. Whereas red abalone middens are more common on the western end of the island because of their cooler water preferences, wavy top turban middens are more prevalent on the eastern end of the island because of their ability to thrive in warmer waters (Perry and Hoppa 2012).

Archaeologists are not in agreement regarding the settlement systems on the northern Channel Islands during this sub-period (Glassow 2010, 2013a; Kennett 2005). These differences of opinion may be due to differing taphonomic processes between the islands that result in different occupational signatures (midden buried by sand on Santa Cruz Island vs. middens deflated on Santa Rosa and San Miguel Islands), the differing sizes of red abalone midden sites on Santa Cruz Island, and the distinctive environmental and social histories of each island.

Until recently, the presence of tools such as digging stick weights/donut stones were used to infer the prehistoric use of various paleoethnobotanical plants and plant parts (such as corms and bulbs) by inhabitants of the islands because little direct evidence of plant resource exploitation had been recorded for the Channel Islands. With refined techniques, archaeologists are building a database of geophytes, seeds, corms, and other paleoethnobotanical remains recovered from archaeological sites on the offshore islands (Gill 2013, 2014, 2015; Martin and Popper 2001; Reddy and Erlandson 2012). These include remains that come from Early to Late Holocene deposits at sites such as Daisy Cave on San Miguel Island; corm/bulb (species unidentified) and plant processing ground stone artifacts from Punta Arena on southern Santa Cruz Island (Glassow et al. 2008); and an abundance of blue dicks (*Dichelostemma capitatum*) corms recovered from the Diablo Valdez site (CA-SCrI-619/620) on northern Santa Cruz Island (Gill 2013, 2015). In sum, it appears that shellfish exploitation remained important, but fishing and hunting of sea mammals intensified; plants were likely consumed seasonally; and some evidence suggests that social complexity increased during this time.

5,300 to 5,000 years BP. During this sub-period there seems to have been substantial settlement shifts accompanied by possible depopulation, although too few sites have been identified that date specifically to this time period (Glassow 2010; Perry and Glassow 2015). Kennett (2005:130–133) identifies seven sites that fall within this sub-period, although the accuracy of the dating of at least two of these sites, one of which is on Santa Cruz Island (CA-SRI-147), remains questionable (Glassow 2010). What data there are on Santa Cruz Island indicate that subtidal shellfish such as red abalone ceased to be as important during and after this time (Glassow 2015). The reason for these changes may be related to climatic changes that altered the water temperature enough to affect marine-resource productivity (for further details, see Kennett 2005).

Middle to Late Holocene (5,000–1,000 Years BP)

The transition from the Middle to Late Holocene marks complex changes in population size, settlement patterns, social organization, and technology. Information from this period may seem minimal compared with that of earlier and later periods, perhaps as a result of the greater interest in identifying the earliest and later pre- and post-contact archaeological sites. However, recent focus on the interior of Santa Cruz Island has resulted in the identification of a larger number of sites dating to this time frame (Perry and Glassow 2015).

Significant technological changes that occur during this period include the introduction of mortars and pestles; stone net-weights and sinkers around 3,500 years BP; and circular fish hooks, plank canoes, and the bow and arrow by 1,500 years BP (Glassow 2010). Diet breadth also increased during this time with the exploitation of a broad range of both marine and terrestrial resources, including fish and sea mammals, as well as various plant resources including acorn and various starchy root plant species (see Glassow 1996; Timbrook 1993). This diversity in subsistence, which presumably included dependence on terrestrial plants, is also suggested by the prevalence of interior sites on Santa Cruz Island that date between 5,000 and 3,000 years BP compared to earlier and later time periods (Perry and Glassow 2015).

Evident during this period is the intensification of fishing and trade with mainland Chumash populations and others (for example, see Arnold 1992, 2001; Erlandson 2001, Erlandson et al. 2005, Glassow et al. 2007). The intensification of fishing is apparent at many sites on the three largest islands; analysis of faunal assemblages at many of these sites indicate shellfish was the major source of protein between 5,000 and 2,500 years BP (70–96 percent), but this changes dramatically in sites dating after 2,500 years BP, where fish contribute between 18 and 80 percent of protein to the diet (Glassow 1993, 2010). This increased emphasis on fishing and other maritime activities corresponds with a decline in interior sites, with Perry and Glassow (2015) noting only four sites (out of a database of 42 interior sites) having deposits that date between 3,000 and 1,500 years BP.

Trade items produced on the islands during this transitional period may include mortars and pestles on San Miguel Island at CA-SMI-503 and CA-SMI-504 beginning between 2,653 and 2,370 years BP, along with another 16 sites that show evidence of mortar and pestle production from porphyrytic rhyolite (Conlee 2000). Many of these were for local use, but the scale of production suggests export to other islands or the mainland. Local use of such grinding implements seems to decrease on Santa Cruz Island during the Late Holocene after AD 1200 compared with that of the Middle Period (Delaney-Rivera 2001), though reasons for this decline remain to be determined (shifting to different processing tools, decreased consumption of resources processed by mortars and pestles, etc.). Intensification of shell bead manufacturing also occurs during this period.

To summarize this period, it seems that indigenous lifeways on all three of the larger northern Channel Islands went through similar phases, including adoption of new technologies and residency behavior that changed from occupation of the interior parts of the islands and exploitation of the terrestrial resources found therein (i.e., plants and lithics) to increased central place residency in the form of sedentary villages along the coasts during the early Late Holocene and thereafter (Kennett 2005; Perry 2003, 2004; Perry and Glassow 2015). The earliest evidence of people on the smaller islands, Anacapa and Santa Barbara, dates to this time (Erlandson et al. 1992; Rick 2006; Rick and Erlandson 2001); travel to remote Santa Barbara Island in particular indicates that longer voyages were made with greater frequency using Chumash *tomols* (or plank canoes). Greater status differentiation is noted in burials from this time period, which is in keeping with a time period further associated with denser populations resulting from the sedentism and population growth that characterizes the Late Holocene (Glassow 2010).

Late Holocene after 1,000 Years BP

The archaeological record for the Late Holocene is much richer and well represented on all the Channel Islands. Significant cultural change is noted from this period, and has been instrumental in developing a better understanding of mainland coastal Chumash as well. Glassow (2010) subdivides this time frame into three sub-periods: (1) development prior to the Middle-Late Transition; (2) the Middle-Late Transition (800–650 years BP); and the (3) the consolidation of Chumash lifeways (650 years BP to the Protohistoric Period). Some Channel Islands researchers (e.g., Arnold 1993; Kennett 2005) have credited climatic change with fueling culture change, as the already sophisticated Island Chumash responded to the largely unfavorable climate changes that resulted from the Medieval Climatic Anomaly (MCA) and the subsequent Little Ice Age. It is posited that the complex sociopolitical and economic diversification of the Island Chumash were likely adaptive strategies used to ensure their survival and growth, all of which is covered in greater depth under each sub-period below.

1,000 to 800 years BP: Development prior to the Middle-Late Transition. This sub-period is marked by changes in settlement, trade, health, and warfare. Subsistence during this time seems to be consistent with regard to resource exploitation from 1,000 years BP until the Historic Period. Although there are sites from this period where fish outnumber marine mammals and shellfish, nearshore and pelagic fishing was further intensified in subsequent time periods. Despite the ongoing importance of the interior of the islands for the collection of specific resources (e.g., chert and plants), most permanent settlements from this time until contact appear to have been located on the coast (Perry and Glassow 2015; Perry and Jazwa 2010).

One economic change that resonated throughout Chumash culture was the mass production and distribution of Olivella shell beads initially identified by Arnold (1987, 1991, 1992, 2001) at sites on Santa Cruz Island through the analysis of trapezoidal microblades made of chert and their role in the shell bead industry. Arnold (1987) purports that the beginning of such blade production specifically to use as drill bits in the manufacture of shell beads began as early as 1,100 years BP. Such trapezoidal microblades have been identified from archaeological sites across the islands (Kennett 2005); this indicates that the production of shell beads was not limited exclusively to a few sites on Santa Cruz Island, although thus far the greatest density of these microblade production sites, as well as most bead production, appears to be based on Santa Cruz Island (Arnold et al. 2001; Perry 2004; Perry and Jazwa 2010; Preziosi 2001).

Bioarchaeological studies of human remains from the Channel Islands provide evidence of both poor health and inter- (and perhaps intra-) tribal conflicts during the late Middle Period (1,500–800 years BP), confirmed by the presence of stone projectile points embedded in various human skeletal elements (Lambert 1994). The stresses brought on by climate change (specifically the MCA; see Raab and Larson 1997) certainly contributed to subsistence changes, but poor health and warfare suggest possible food shortages at times. The mass production of shell beads supported economic expansion and interactions with populations on the other islands and mainland, a theme that continues through the remainder of prehistory on the northern islands.

800 to 650 years BP: The Middle-Late Transition. Based on the work of Arnold (1992), the Middle-Late Transition was marked by significant economic and political change that brought about the Chumash "culture" most anthropologists would recognize before it was disrupted by colonialism and missionization. Interestingly, several sites on the islands appear to have been unoccupied during this 150-year period, and some of the smaller and more arid islands may have been abandoned temporarily. According to Raab and Larson (1997), this period represents the worst conditions caused by the MCA. Based on the analysis of fish remains, it appears that greater emphasis was placed on species of fish found in deeper waters farther offshore (Pletka 2001), suggesting overfishing of those species of fish living closest to shore and/or changes in water temperature (warmer) that affected species nearer to the shores.

Evidence of increased aridity on the islands comes from macrobotanical remains from deposits dating to this time which contain large quantities of prickly pear cactus and an absence of bulrush, a marshland plant that previously had been common (Martin and Popper 2001).

One important economic change visible during this period is the expansion of sites containing microblades used for drilling beads and other aspects of bead production, accompanied by shell bead production waste (Arnold and Graesch 2001; Perry 2004; Perry and Jazwa 2010). Furthermore, some bead producers were starting to produce the triangular blades with dorsal retouch rather than the trapezoidal blades (Preziosi 2001), suggesting increased formalization of the industry.

650 years BP to the Protohistoric Period: Consolidation of Chumash lifeways. This period is one of the best known simply because it is the most recent and has been studied the most intensely compared with earlier times. Most scholars specializing in this region agree that most of the sociopolitical, economic, and subsistence systems in place at the time of European contact were also in place during late prehistory (Glassow 2010). Several changes in beads and other shell ornaments occur during this period, which King (1990) has evaluated and described. The major change in subsistence is the increased emphasis on maritime resources, particularly fish. Fish that gain particular new importance during this time period are rockfish and surfperch, indicating the use of boats around kelp beds rather than shore fishing. One study (Colten 2001:203) of coastal sites on Santa Cruz Island shows that the protein contributions from fish changes from 43 to 62 percent during this time period, with reductions in the contributions of sea mammals and shellfish. Unfortunately, the contribution of botanical food resources is not well known for this period; this is probably the greatest gap in knowledge that should be the focus of future research projects.

European explorers first visited the California Channel Islands in 1542, with the first of the Spanish missions established in San Diego in AD 1769. Mission San Buenaventura on the mainland coast to the east was established in AD 1782, as was the Santa Barbara Presidio. Located due north of Santa Cruz Island, Mission Santa Barbara was established on the mainland in AD 1786. The establishment of European missions and settlements significantly affected Chumash society and culture. The introduction of new diseases caused rapid population decline, and the movement of peoples into the missions (either voluntarily or by force) disrupted sociocultural, economic, sociopolitical, and religious connections on the islands and mainland.

Archaeological sites on the mainland, including settlements and cemeteries, provide evidence for the impact that European arrival had on Chumash society (see for example, Bernard 2008; Green 1999; L. King 1982). Direct impacts for island Chumash have not been well-documented archaeologically except for indications that villages directly involved with chert microdrill production on Santa Cruz Island were depopulated more rapidly because of the Spanish introduction of metal drills (Arnold 1987). Written documents suggest that the last of the Chumash still living on Santa Cruz Island came to the mainland in 1822 (Johnson 1982:75).

This discussion provides just the briefest archaeological overview of the four northern Channel Islands, of which only three have played major roles in prehistory: San Miguel, Santa Rosa, and Santa Cruz islands. Over the last 13,000 years (or more), significant culture change has taken place on these islands, and their economic interdependence with the mainland seems to have increased in later times due to a number of environmental factors, as well as larger and more sedentary populations living in coastal villages. It is apparent that exchange with mainland Chumash and other groups intensified with time, especially the exchange of shell beads for exotic materials such as obsidian, rabbit-skin blankets, and deer bone.

Ethnohistory and Ethnography

Linguists, prehistorians, and ethnologists have long recognized the Chumash as being among the most complex hunter-gatherer societies to exist in California, occupying considerable territory from as far inland as the Cuyama Valley to the westernmost of the northern Channel Islands (Gamble 2008; Grant 1965, 1978a, 1978b, 1978c; Heizer 1952; Kroeber 1925). With the addition of ethnohistoric data provided by mission records of marriages and baptisms (Johnson 1982, 1988, 1993, 2000, 2001), a partial image of Chumash society is visible both during and after the Mission Period, which, for the Chumash, lasted from 1772 to 1834 (Grant 1978c). At the time of Spanish contact, the Chumash had high population densities, elaborate social organization and material culture, intensive island-mainland exchange, occupational guilds, ritual specialists, and formalized political leadership (Arnold 2001a; Gamble 2008; Hollimon 1990; Johnson 1988, 2000; King 1990; Larson et al. 1994). What follows is a necessarily brief overview of pan-Chumash culture in general, with Chumash life specific to Santa Cruz Island explored in somewhat greater depth.

Chumash Territory and Linguistic Affiliations

The territory occupied by the Chumash covered a considerable area that included the southern California coast stretching from Morro Bay in the north to Malibu Canyon in the south, inland as far east as the western edge of the San Joaquin Valley, and as far west as the northern Channel Islands of San Miguel, Santa Rosa, Santa Cruz, and Anacapa. Chumash territory was divided into different religious provinces and village territories in which eight different linguistic dialects were spoken; each of the three permanently inhabited islands (San Miguel, Santa Rosa, and Santa Cruz) possessed their own unique dialects. Until recently, researchers believed the Chumash language was part of the Hokan stock that is relatively common among indigenous groups in Northern California as well as extreme southern Alta and northern Baja California (compare Moratto 1984 and Shipley 1978); current thinking is that both Chumash and Yukian are unaffiliated with any of the other language groups in California and the Great Basin, and are not related to one another (Golla 2007). It has been hypothesized that the Chumash language stock represents a very ancient language group that is a vestige of early colonization of the early California coast during the Terminal Pleistocene or Early Holocene (Golla 2007:81).

The distinct dialect units of the Chumash included Channel Island (distinct for each of the three inhabited islands), mainland coastal, and inland districts. The coastal districts include the Obispeño (near San Luis Obispo), Purisemeño (between Santa Maria and Lompoc), the Barbereño (long stretch of coast including modern Santa Barbara), and the Ventureño, which also consisted of a significant inland component. The exclusively inland units were the Ynezeño (Santa Ynez), the Cuyama (Cuyama Valley), the Emigdiaño (mostly remote and now part of the Wind Wolves Preserve), and the Castaic. Apart from linguistic differences, there were certain minor cultural characteristics that distinguished the inland groups from those with direct coastal access, but since the focus of the current project is Santa Cruz Island, the summary that follows is more applicable to coastal and island Chumash peoples.

Chumash Ethnohistory

Given that most of the information specific to the indigenous peoples of Santa Cruz Island is based largely on ethnohistoric sources or reconstructions based on material culture recovered archaeologically, an ethnographic background based on the Eastern Coastal Chumash, or *Barbareño*, is provided here to put the Island Chumash in context (Gamble 2008; Grant 1978d). It, too, is based mostly on ethnohistoric accounts, but since the Spanish spent more time in the Santa Barbara mainland area than on the islands, more information was recorded there.

Among the first descriptions of the mainland Chumash are those from Juan Rodriguez Cabrillo in 1542:

> They were dressed in skins and wore their hair very long and tied up with long strings interwoven with the hair, there being attached to the strings many gewgaws of flint, bone and wood (Bolton 1925:27).

Additional details about the appearance of these people is provided by Pedro Font in 1775:

> The dress of the men is total nakedness. For adornment only they are in the habit of wearing around the waist a string or other gewgaw which covers nothing.... Some of them have the cartilage of the nose pierced, and all have the ears perforated with two large holes in which they wear little canes like two horns as thick as the little finger...in which they are accustomed to carry powder made of their wild tobacco... (Font 1930:250–251).

Many early writers who came in contact with the Chumash were favorably impressed regarding their temperaments, described by Fages as being of "good disposition, affable, and friendly..." (Fages 1937:47). Another, Palou, in 1778, described them as "extremely intelligent and skillful" (Palou 1926:3–32).

One of the reasons the Spanish were impressed with the Chumash was the central role they played in the regional exchange system of southern California. Facilitating trade and interaction between coastal communities of the mainland and islands were the plank canoes, or *tomols*, and their antecedents (Arnold 1995; Gamble 2002; Hudson et al. 1978). Stitching and gluing planks of redwood and pine together, the Chumash assembled sophisticated ocean-going watercraft used for trade, transportation, and offshore fishing. Tomols require greater labor investment than other boat technologies in North America; each boat required approximately six months of construction effort by an experienced group of boat-makers, as well as large quantities of driftwood, cordage, asphaltum, pine pitch, and chert drills. Their construction was the responsibility of the "Brotherhood of the Tomol," an occupational guild that controlled access to the technical knowledge, tools, and rituals required to make and use plank canoes. In contrast to the Pacific Northwest, where boat use was common and widespread, there were far fewer boats per Chumash village and fewer people controlled their use. Instead, there was a strong correlation between boat owners and people of high political status; all chiefs had boats, but not all boat-owners were chiefs (Arnold 1995).

Achieved and ascribed roles based on gender, age, and lineage permeated Chumash society. Individual households specialized in the manufacture of beads, cordage, leather, baskets, nets, bows and arrows, and/or stone tools, among other items (Arnold 2001a; Blackburn 1975; Gamble 2008). In addition to economic specialization, other positions were political—such as chiefs and messengers—and ritual, such as ceremonial leaders, astronomers and astrologers, undertakers, dancers, singers, and shamans (Hudson and Underhay 1978).

In historic times, Chumash on the mainland and islands participated in a regional ritual organization known as the *'antap* (Kroeber 1976; McCawley 1996), which was one of the primary ways in which different villages were interconnected through ceremonial obligation (Blackburn 1975; Gamble 2008; Hudson and Underhay 1978). Members of the regional *'antap* organization resided in each Chumash village (Bean and King 1974; Blackburn 1975; Hudson and Underhay 1978). The "Twenty" were organized into the "Twelve," who were the major officials, and the *shan* (the other eight), who played lesser roles as assistants. *'Antap* members, some of whom were shamans, were responsible for healing, rain-making, predicting the future, making astronomical observances, and organizing feasts and ceremonies such as those related to winter solstice (Bean and King 1974; Hudson et al. 1977:50–63; Hudson and Underhay 1978:62). As in other societies, the Chumash regard the winter solstice a critical time when the Sun, the giver of life and death, is at its farthest south. Different ceremonies to ensure the

Sun's return and restoration of cosmic balance were conducted in ceremonial enclosures (*siliyik*) in villages as well as at mountain shrines (Blackburn 1974:104; Hudson and Blackburn 1986:56–60, 84–90; Hudson et al. 1977). Central to these shrines is the construction, use, and destruction of feathered poles that represented the *axis mundalis*, the connection between Earth and Sun, and associated offerings of seeds and beads (see summary in Perry 2007). Evidence of winter solstice ceremonies conducted on the northern Channel Islands includes references to *'antap* members residing in the "Island Province," which included all of the northern Channel Islands (Hudson et al. 1977:17–18; Hudson and Underhay 1978:31; Johnson 2001).

Based on mission records from San Buenaventura and Santa Barbara, Johnson (2001) was able to identify particular social, economic, and ceremonial roles among villagers on Santa Cruz Island who later became incorporated into the mission system. Johnson (2001:61–62, Table 3.4) mentions the following ritual roles specifically: dancers, singers, those who "made offerings to the sea," those who had sweatlodges, those who administered toloache (*Datura wrightii)*, one of the "Twenty," and shamans. References to participants in the winter solstice and *Xutash* ceremonies, and specifically to *'antap* members, illustrate the rich and complex ceremonial life that existed on the islands in historic times and earlier, for which there are specific archaeological correlates. Such ritual practices may have continued on Santa Cruz Island until 1824, the time of the Chumash revolt when people returned to the island temporarily (Hudson 1976); these ceremonies were continued on the mainland by island descendants into the 1870s (Hudson and Underhay 1978:69).

Perry (2013) provides a summary of ethnographic, historic, and archaeological evidence relating to ritual throughout the Channel Islands. Material correlates include portable items (such as shamanic regalia), shrines, rock art, animal effigies and burials, and ceremonial enclosures. In general, this evidence has been found on the larger islands where there were larger and more permanent habitations. There is no obvious evidence of ritual activity on Anacapa or Santa Barbara Island, although that does not rule out the possibility that there were also important elements of the sacred landscapes and seascapes of the Channel Islands. Among the Chumash, the human-occupied world was conceptualized as the *'antap* plain of the mainland and all of the islands. West of the islands, beyond the horizon, is the Land-of-the-Dead, where Chumash spirits went to reside (Hudson and Underhay 1978:40–41).

Although specific villages were bound together through ceremonial obligations, marriages, and alliances, most operated independently from one another with respect to economic decision-making, political authority, and social identity. Chumash society is most commonly characterized as a simple chiefdom organized at the village level (Arnold 2001a; Gamble 2008; Kennett 2005) with a few examples of paramount chiefs with regional influence. In her discussion of the differences between affluent and complex hunter-gatherer societies, Arnold (2001a:3) argues that the Chumash were complex based on their ascribed status, hierarchical structure, and specifically the "formalization and centralization of political power in the hands of hereditary leaders."

Based on Johnson's (2000) analysis of mission records and ethnographic accounts, each village represented an amalgamation of different rules of social organization depending on inherited status. Whereas most Chumash people were monogamous and practiced matrilocal residence after marriage, chiefs tended to be polygamous and patrilocal, intermarrying into the elite families of other villages. Johnson (2000:305) argued that the overriding practice of matrilocality relates to the high levels of male mortality due to incessant inter-village warfare and lethal violence during the Late Holocene (Lambert and Walker 1991). In response to environmental variability and climatic instability, the Chumash engaged in alternate strategies that mirror the celestial *peon* game, with drought, stress, and inter-village warfare on the one hand, and resource abundance, exchange, and interaction on the other.

The material culture of the Chumash was diverse, including a wide range of items used in daily and ceremonial activities as well as those manufactured for trade. The Spanish were greatly impressed with the artistry inherent in many utilitarian objects, such as polished abalone shell inlaid into bowls, trays, and other containers, and various stone objects, including charmstones. The availability of steatite from the Gabrielino-controlled soapstone quarries on Santa Catalina Island as well as steatite quarries within inland Chumash territory allowed for the production of a wide array of implements and objects from this material, both utilitarian and decorative. Steatite comols and ollas were used for cooking, but smaller, decorated bowls could be used for storing of personal objects. Beads, effigies, pipes, medicine tubes, arrow-shaft straighteners, and sometimes charmstones were made from steatite. Sandstone and other types of rock were used to make bowl mortars, hopper mortars, and pestles. So-called donut stones are assumed to have been used as digging stick weights, and vary greatly in size and weight. Flaked stone artifacts, primarily knives and projectile points, were made from local cherts and sometimes obsidian that was traded from interior sources in eastern California. Asphaltum, which occurred in natural seeps along the coast, was collected and used for an adhesive (for hafting flaked stone knives to handles and arrow points to fore shafts or main shafts, inlaying shell into wood or bone, attaching funnel-shaped baskets to the surface of milling platforms to make hopper mortars, etc.) and for waterproofing water-holding basket jugs (Grant 1978c).

The Spanish were equally impressed with Chumash woodworking, particularly in the construction of their plank canoes, or *tomols*, that varied in size from 12 to 30 ft in length (Hudson et al. 1978). Using wedges made from whalebone (Heizer 1938), timbers were split into planks that were tied together with strong rope and sealed with asphaltum. Pedro Font described the construction of such a boat in 1775:

> They are very carefully made of several planks which they work with no other tool than their shells and flints. They join them at the seams by sewing with very strong thread which they have, and fit the joints with pitch.... In the middle there is a somewhat elevated plank laid across from side to side to serve as a seat and preserve the convexity of the frame. Each launch is composed of some twenty long and narrow pieces.... In each launch...ordinarily not more than two Indians ride one in each end... (Font 1930:252–253).

The early Spanish also admired their wood bowls and boxes, many of them inlaid with abalone shell for decorations. The boxes were made from small planks sewn together.

Basketry among the Chumash, as in much of California, was highly sophisticated; the Chumash excelled in the production of both coiled and twined baskets. Twined water bottles were made watertight by adding pulverized asphaltum to the interior and then adding several heated, round stones, after which the basket was twirled and shaken to ensure the inside of the basket was well sealed. Other types of woven artifacts were many types of twisted cordage, including ropes, twine, and string all made from natural fibers from sea grass, nettles, milkweed, and Indian hemp.

Shell and bone served as raw materials for many types of tools, containers, and decorations. Abalone (*Haliotis* spp.) shell was commonplace and versatile in its many uses. Whole shells could be used as bowls or ladles once the siphon holes were sealed using asphaltum. Abalone also served as the raw material for circular fishhooks and all forms of decoration on clothing as well as for inlay into wooden bowls and boxes, various bone tools, and stone bowls. Olivella was the shell of choice for bead making of various types, including those used as shell money. Bones from many of the animals hunted by the Chumash were useful for tools, musical instruments, and furniture. Deer bones were used for making bone awls for basket making, to fashion needles and make beads, and to make whistles that were used for ceremonial purposes (Corbett 2004). Ribs of larger mammals (deer, bear) were sometimes used for sweat scrapers, wands, and other ceremonial implements (Grant 1978d).

Archaeologists realize humans used plants resources for many activities beyond subsistence (cordage, mats, basketry, etc.), and that concerns related to plant resources may also have influenced site placement. Historically, however, plant remains are difficult to recover archaeologically. Archaeologists often assume plant use with the presence of ground stone tools (mortars, pestles, manos, metates), although these tools could process other resources as well (shellfish, small mammals, etc.). Although archaeologists frequently discuss the relative lack of floral diversity on the islands compared with that of the mainland, Glassow notes mortar and pestles, often equated with plant processing, appear at the same time on the islands as on the mainland (Glassow et al. 2007). One particular artifact found in great quantity on the northern Channel Islands is the perforated stone (often called a donut stone, mentioned above). While this artifact type probably served multiple functions, the majority of those recovered from the northern Channel Islands are believed to have been used as digging stick weights to assist in the removal of corms and other geophytes from the subsurface (Gill 2013, 2014, 2015; Hollimon 1990; Sutton 2014).

The rich ethnohistoric/ethnographic record associated with the Chumash, along with the diversity of plant communities on the islands suggests that humans in the past used a wide variety of plants for everyday activities (cordage, basketry, etc.; see Timbrook 2007), and that plant use went beyond subsistence. Although the plant communities are less diverse on the islands compared with those of the mainland, island inhabitants appear to have used local species in place of more desirable species not present on the islands (for example, using surf grass [*Phyllospadux* spp.] to make artifacts on the islands, as opposed to tule [*Scirpus* sp.]; Gill 2013:114; Timbrook 1993). Recent targeting of archaeological sediments for paleobotanical remains has built on the work of Martin and Popper (2001), and has yielded success (i.e., Gill 2013, 2014, 2015; Hoppa 2014). Archaeologists have noted paleoethnobotanical remains on northern and southern Channel Islands (i.e., Eisentraut 1990; Glassow et al. 2008; Reddy and Erlandson 2012). For example, at Daisy Cave on Santa Rosa Island, Reddy and Erlandson (2012) identified corm fragments from sediments dating from the Early to Late Holocene. In addition, red maid (*Calandrinia* sp.) and chenopodium (*Chenopodium* sp.) seeds were also recovered, though in low densities.

The Chumash of Santa Cruz Island

What we know about the Island Chumash, especially the inhabitants of Santa Cruz Island, comes from a few ethnohistoric accounts, various records from the Mission Period, and archaeological interpretations based on the excavation of Late Period through Mission Period habitation sites. It is worth noting that the name "Chumash" was used by Coastal Chumash people to refer to the native inhabitants of Santa Cruz Island (as well as the island itself), and was picked by Powell (1891) to label the Channel Island and mainland coastal peoples that shared numerous cultural traits as well as linguistically related dialects (Grant 1978d). The earliest contact by Europeans with Island Chumash took place in 1542 when the explorer Juan Cabrillo stopped at the islands and provided a less-than-flattering description of the inhabitants:

> The Indians of these islands are very poor. They are fishermen; they eat nothing but fish: they sleep on the ground; their sole business and employment is to fish. They say that in each house are fifty souls. They live very swinishly and go about naked (Bolton 1925:34).

During his visit to Santa Cruz Island that same year, Cabrillo noted ten "rancherias," although none of the names sound like Chumash words and the supposed locations do not match later Mission Period villages (in fact, there is much confusion and repetition among the accounts of Cabrillo; see Glassow 2010; Grant 1978c). In 1602, the voyage of Sebastian Vizcaino included a stop at Santa Catalina Island and in December made port near Santa Cruz Island, whereupon the native inhabitants in wooden-planked boats greeted him. These encounters were recorded in two sources: the diary of Vizcaino himself, and the

writings of missionary Fr. Antonio de Ascencion. The first crude map of the island results from this journey; Santa Cruz Island is designated as "*isla de gente barbada*," or "Island of the Bearded People," indicating that some of the males native to the island had beards (Wagner 1929:238; also see Glassow 2010). The island was not visited again until 1769, when a provision ship for Father Junipero Serra on its way to San Diego, under the command of Juan Perez, became lost and landed in what is today's Prisoners Harbor. A walking stick affixed with an iron crucifix carried by Father Juan Vizcaino was mistakenly left on the island, but was later returned to the Father by island natives. This act of honesty led to the Spaniards naming the island, in recognition of this event, "Sacred Cross" or Santa Cruz, an appellation that has remained today (Vizcaino 1959 in Grant 1978a). Unfortunately, although the ship stayed at Santa Cruz Island nearly six days, the bad weather minimized contact between the islanders and their disoriented visitors.

Scholars have debated at length whether or not the three periods of contact with the peoples of Santa Cruz began the process of population decimation as a result of introduced diseases such as influenza, small pox, measles, and venereal diseases (especially syphilis) (Glassow 2010; Grant 1978c). Most California ethnographers and archaeologists have come to accept generally that the introduction of these diseases were quite early and may have led to population decline on the Channel Islands (see Erlandson and Bartoy 1995, 1996; Erlandson et al. 2001). However, based on the current evidence (both archaeological and archival), there is little evidence to support such a model of early disease introduction, at least to pandemic levels. The first noticeable drop in population seems to correlate to a measles epidemic that started in Baja California and made its way north in the 1760s. Apart from this anomaly, it seems that population numbers, both mainland and island, did not change dramatically until the Mission Period, which began in 1776 and ended in 1834 (Glassow 2010; Grant 1978c; Johnson 1982).

Apart from the minimal ethnohistoric observations made by early explorers, our ability to reconstruct Chumash society, particularly sociopolitical organization, comes from comparison of data found in the records of marriages, baptisms, and deaths meticulously kept by the Franciscan missionaries during the Mission Period (1769–1834). Considerable progress has been made over the last few decades in studying and translating these records (Johnson 1982, 1993, 2000, 2001; Johnson and McLendon 2002; McLendon and Johnson 1999). When this information is combined with the later ethnographic information collected from elder informants by J. P. Harrington and others (Harrington 1978, 1986; Hudson et al. 1977; Hudson and Underhay 1978), a more complete picture of the Island Chumash, especially the Santa Cruz Island peoples, emerges. The mission registers hold a wealth of information about place names, individuals' names, kinship relations, and much more that we would not have if required to interpret these complex relationships based solely on the archaeological record.

Location of Historic Villages (Rancherias) on Santa Cruz Island.

The location and names of historic village sites on the Channel Islands have gone through many adjustments over the years, especially as a result of correlating ethnohistoric place names with known archaeological sites. Johnson's (1982) changes to King's (1975) map was a refinement based on a reevaluation of both ethnohistoric and ethnographic data, and subsequent archaeological work has identified those locations most likely to have been occupied during the Mission Period due to the presence of historic artifacts (Arnold 1990). Further research has resulted in maps that reflect the most recent archaeological research (Johnson 1993, 1999; Kennett 2005) (see Figure 2-1). Archaeological correlations have been made with the rancheria/village locations documented by Juan Esteban Pico in 1884 (McLendon and Johnson 1999) and mission register information that not only identifies the names and locations of the villages, but inter-village kinship relationships as well (Johnson 1999). Pico (1841–1901) was an educated member of the San Buenaventura Chumash community. His father and the parents of his first wife were born on the Channel Islands, so Pico had a keen interest in preserving the information about the various rancherias there. Working closely with the linguist Henry Henshaw, Pico compiled a list of island villages based in part on an interview with an elder named Martina Leqte, who had been born on

Santa Cruz Island and moved to Mission Santa Barbara during her childhood (Johnson 1999). The strong correlation between the name list composed by Pico and Henshaw and the names preserved in the mission records supports their verity; ten of the 12 named villages match the mission records for Santa Cruz Island.

Independent verification of the Pico-Henshaw list of known rancherias comes from two ethnographic sources: independent interviews of Martina Leqte by the French archaeologist Léon de Cessac, who had conducted excavations on Santa Cruz Island in 1877, and an interview by J. P. Harrington of the Chumash informant Fernando Librado Kitsepawit (Johnson 1982). Martina was able to identify the village in which she had been born, called "Jasjas" (*Xaxas*), which had been correctly placed by Pico. Some 35 years later, Harrington had enlisted the assistance of Librado on reconciling the place names on the islands. He correctly identified "Scorpion Anchorage," or *Swaxil* on Santa Cruz Island, as the rancheria where his mother had been born, another consistency with the Pico-Henshaw list (Glassow 2010). This list of known Chumash villages, their general locations, archaeological site numbers, and certainty of identification are listed in Table 2-1 (from Glassow 2010:3.12, Table 3.2).

Reconstructing Island Chumash Culture

Archival research among the mission records has provided ethnographers and archaeologists with population estimations, marriage patterns, and sociopolitical organization found among the occupants of the rancherias occupied during the Mission Period (Johnson 1982, 1993, 1999, 2001). The most recent population estimates, undertaken using baptismal records and GIS database applications (Milliken 2006), show the highest population densities on eastern Santa Cruz Island at 45 people per square mile (or 17.4 people per square km). Using this model with baptismal records results in a total population of 3,199 people (Glassow 2010) on all the northern Channel Islands, a figure very close to Johnson's (1982:109–114) calculation of 3,253 people. The fact that two different calculations independently came up with very similar results indicates that the total populations for all the islands was around 3,200 people at the beginning of the Mission Period.

Table 2-1. Sites on Santa Cruz Island with artifacts dating to the Mission Period

Chumash Placename	Site No.	General Location	Certainty of Identification or Site Type
Xaxas	CA-SCrI-240/439*	Prisoners Harbor	Definite
Nimatlala	CA-SCrI-324, CA-SCrI-384	Central Valley	Very Likely
Mashchal	CA- SCrI -434, CA- SCrI -435	Orizaba Cove	Very Likely
Ch'ishi	Unidentified	Platt's Harbor Vicinity	Uncertain
L'alale	CA- SCrI -436	Diablo Point Vicinity	Uncertain
L'akayamu	CA- SCrI -328– CA- SCrI -330	Forney's Cove	Likely
Ch'oloshish	CA- SCrI -236	Christy	Likely
Shawa	CA- SCrI -192	Morse Point	Likely
Liyam	CA- SCrI -I	Coches Prietos	Very Likely
Nanawani	CA- SCrI -504, CA- SCrI -506	Smugglers Cove	Very Likely
Swaxil	CA- SCrI -423, CA- SCrI -507	Scorpion Anchorage	Definite
Lu'upsh	CA- SCrI -306, CA- SCrI -392, CA- SCrI -416, - CA- SCrI -20— CA- SCrI -422	Chinese Harbor	Very Likely
Unknown	CA- SCrI -496	Willows	Temporary Camp?
Unknown	CA- SCrI -711	San Pedro Point	Shrine
Unknown	CA- SCrI -440	Northwest Coast	Temporary Camp

Note: From Glassow (2010). *Site is within the project ADI.

Mission register data have also been useful in attempts to reconstruct marriage and residence patterns, along with sociopolitical organization (Glassow 2010). Matrilocal postmarital residency is typical of mainland Chumash and has been proven to be the case for the Island Chumash as well based on genealogical studies (Johnson 1982, 1999, 2001). Assuming this pattern of matrilocal postmarital residency predates protohistoric and historic behavior, this knowledge can have profound implications for archaeological research; coevally occupied house depressions within a single village would likely hold potential evidence of socioeconomic cooperation among those females in residence, so patterns of similar handcrafts may be observable. The antiquity of this pattern of marriage residency could also be tested through the analysis of mitochondrial DNA (mDNA) under the right circumstances (compare with Johnson and Lorenz 2006).

Ethnographic data given by Chumash informant Fernando Librado to J. P. Harrington have provided the best insight into Channel Island sociopolitical organization, particularly for Santa Cruz Island (Glassow 2010; Johnson 1999, 2001). Only the largest villages—of which there were four (*Liyam, Mashchal, Swaxil, and Xaxas*)—had "chiefs" (Hudson et al. 1977), which is further supported by the mission registers. Among these chiefs on Santa Cruz Island was a "big chief" from the village of *Liyam*, the last of whom to be baptized was Jose Crespin (*Kamuliyatsei*). His marriage residency pattern was patrilocal, a pattern also observed among the mainland chiefs (Johnson 1982, 1988, 2001). There is also evidence of a division of the Island Chumash into two major subregional groups in which San Miguel and Santa Rosa comprised one geopolitical unit and Santa Cruz yet another, a pattern supported by a cluster analysis of island marriages (Johnson 1993). Johnson (1988, 2001) further notes that cross-channel trade could be controlled by the important chiefs whose villages were located in the best positions to oversee such economic activities.

In sum, our knowledge of the prehistoric, protohistoric, and Mission Period Island Chumash has been enhanced dramatically as a result of both the thoughtful and meticulous research of mission archival records and the intensified effort by archaeologists to identify and evaluate archaeological sites using more systematic and scientific applications (compare with Arnold 2001b).

Post-Chumash Island History

The historic use of the Channel Islands after their abandonment by the Chumash has varied through time and space. In addition to the ranching activities, which are relatively well documented, people engaging in various illegal and legal/sanctioned activities also used the northern Channel Islands, Santa Cruz Island in particular. Illegal actions included smuggling, illegal hunting and fishing, and squatting. Examples of legal and sanctioned activities include hunting, fishing, and shellfish gathering; mapping the coastline for the U.S. Coast Survey; archaeological expeditions and collecting; movie making; and vacationing at camps and resorts (Eaton 1980; Gherini 1997; Livingstone 2006; National Park Service 2004). These activities are highlighted below.

Ranching

Many of the ranching related features in the ADI are included in the Santa Cruz Island Ranching District (Glassow 2013). This NRHP-eligible district includes features associated with historic ranching between 1880 and 1952, which include buildings and structures, trails and roads, small-scale features such as troughs and fence lines, and archaeological sites related to the period of significance (Glassow 2013; NPS 2004). The history of ranching related activities on Santa Cruz Island, outlined below, derives primarily from Gherini (1997), Glassow (2010), and Livingstone (2006). Readers are directed to these sources for more detailed information.

After the last Chumash occupants were incorporated into the mainland missions in 1822, the Mexican government deeded Santa Cruz Island to Andres Castillero in 1838. Dr. James Barron Shaw served as Castillero's manager/agent during the 1850s (or possibly as the agent for Castillero's partners; Livingstone 2006) and improved the island by constructing housing for him and his ranch employees; building corrals, roads, and "canals"; and introducing cattle, horses, and sheep. The first group of sheep brought to the island (200 in total) were purchased from Alphonso Thompson, owner of one-half of Santa Rosa Island. In 1853 Shaw also expelled a squatter, James Box, from the island. Box reportedly lived in a shack at Prisoners Harbor and may be the person who introduced pigs to the island. A ranch was established in the Central Valley, and by the late 1850s additional buildings were noted in Scorpion Valley on the East End, and another on the west end of the island. Coast Survey employees who worked on the island in 1855 and 1856 noted and recorded 12 structures on the island at that time.

The island was then sold to William E. Barron in 1857, although Barron kept Shaw on to manage island activities. Shaw is reported to have purchased Merino sheep during the Barron ownership period, a breed noted for its particularly high-quality wool. Barron owned the island for 12 years before selling it in 1869 to the Santa Cruz Island Company, a French-American land development company. Shaw's management position ended at this time, and he left Santa Cruz Island. Shaw transformed the island into a high-quality sheep ranch (Gherini 1997:60) and directed the construction of features such as corrals and shearing sheds, roads, and the substantial wooden pier at Prisoners Harbor.

The Santa Cruz Island Company originally had ten investors, but by 1880 the sole stockholder was a French immigrant named Justinian Caire. Caire planned to maximize the use of the island's 64,000 acres, establishing a number of diversified ranches throughout the island. The central ranch, or Main Ranch, was located in the Central Valley, or Cañada del Medio, with nine other ranches or "out-ranches" established elsewhere on the island. Cattle, pigs, and sheep were raised here, along with maize, potatoes, beans, wine

grapes, and alfalfa (Livingston 2006). Resources were added to other ranches where appropriate, such as an olive grove at Smugglers Cove on the East End. Caire directed his workers to expand the water system on the island, which included hand-dug wells and the construction of two covered concrete reservoirs. Although the island boasted extensive ranching-related buildings, the living conditions were reported as minimal when Caire visited the island in 1880 (Gherini 1997). The living quarters were also updated as part of Caire's expansion of ranching on the island, as was the construction of a hand-crank telephone system between 1885 and 1888 so contact could be maintained between the isolated ranches on the island.

Caire fashioned his agricultural system and constructed support buildings similar to those he knew from his homeland near the French Alps, even employing French and Italian craftsman to build in the manner of structures found in Europe. At the Rancho la Playa near Prisoners Harbor, an existing adobe structure was expanded to a ten-room, two-story building with decorative wrought iron and an outside kitchen. This building was dismantled in 1960 after severe flooding damaged the building (Gherini 1997:92). Caire also had a narrow-gauge railroad built from the harbor to the house.

After Caire's death in 1897, a family feud over ownership ensued that continued until 1918, culminating in the court ordering the parceling of the island into seven separate parcels, one each for Albina Caire, Justinain's wife, and their six children. The eastern side of the island was later consolidated and run by the Gherini family, who developed the property for sheep raising under the name National Trading Company (Gherini 1997).

Accumulated debt resulting from the long-term litigation forced the Caire family to sell the western portion of Santa Cruz Island. The entire island was sold to Edwin Stanton, a businessman from Los Angeles, in 1937. Stanton turned from Caire's traditional model of mixed agricultural to straight cattle ranching by 1939. He established a new ranch, Rancho del Norte, which was established on the grasslands of the Isthmus east of Prisoners Harbor. At Edwin Stanton's death in 1963, family dissent again occurred. Eventually Stanton's son Dr. Carey Stanton sold his western half of the island to The Nature Conservancy in 1978.

The Stanton family lived in San Francisco, and came to the island in the summer to vacation on the eastern lands still owned by the National Trading Company. In 1979, the sheep operations were leased to William "Pete" Peterson, who implemented long-overdue rehabilitation to the ranching facilities on the East End. However, the lease was not renewed in 1984, and the sheep operation was turned into a private recreational complex known as Island Adventure Club. This complex included a bed-and-breakfast facility at Smugglers Cove and facilities for camping, hunting, and kayaking. The Island Adventures Club continued until 1997, when the NPS purchased the eastern portion of Santa Cruz Island (Livingstone 2006). Today, The Nature Conservancy owns the western 76 percent of the island, and the NPS owns the remaining 24 percent east of Prisoners Harbor.

Non-Ranching Island Occupation and Visitation

This section discusses humans engaged in additional activities that had less impact on the islands than animal grazing, farming, and other ranching activities. In many cases little archaeological evidence remains of these activities, although some evidence still exists (for example, Braje et al.'s [2014] work with historic fishing camps on San Miguel Island). Such activities include fishing, hunting, hiking/vacationing, and filmmaking (Eaton 1980).

Hunting

Throughout the nineteenth and twentieth centuries Santa Cruz Island provided opportunities for hunting by the owners (e.g., the Caire family) as well as by guests and permitted hunting club members (Gherini 1997; Hillinger 1958; Livingstone 2006). In addition to the ubiquitous feral pigs, which the ranchers

wanted to remove given the damage they caused, hunters also pursued introduced wild turkeys and feral sheep, as well as indigenous birds such as bald eagles (Livingstone 2006:575). Carey Stanton, for example, established a hunt club and permitted killing of feral pigs. In the late nineteenth century, hunters also captured sea lions in the offshore waters, many of which were destined for zoos and circuses (Livingstone 2006:583–585).

Smugglers and Otter Hunters

The islands have long been noted as a point of operation for smugglers of goods and people, as illustrated by the name of Smugglers Cove on the East End of Santa Cruz Island. The Spanish lamented the use of the island by sea otter hunters, which is one reason a mission was initially proposed for Santa Cruz Island (Gherini 1997:34). Illegal fishing and smuggling (of illicit drugs, for example) continue to occur on and around the islands.

Coast Survey

The U.S. Coast Survey visited Santa Cruz Island in the 1850s and the early 1870s. Of utmost importance for the United States, their survey work created maps of the mainland and island coastlines, which improved maritime navigation. From a historical perspective, the written records and maps created by Survey employees have improved our knowledge of structures and activities at the time the work was undertaken. In addition to noting the location of harbors and points of land, the Coast Survey also created topographic maps, which included both natural and human-made features. For example, the survey recorded the buildings located at the Main Ranch on Santa Cruz in both the 1850s and 1870s. The original survey by Greenwell noted six structures in the Main Ranch vicinity, two of which were small, as well as two corrals, one at a distance from the main buildings (Livingstone 2006:414–416). The wooden pier at Prisoners Harbor was first constructed in the 1860s (Gherini 1997).

The 1870s survey of the Main Ranch and Prisoners Harbor areas (directed by Stehman Forney) noted changes to the ranch, such as cultivated fields and two buildings in the vicinity of the later chapel. He mapped the road to Prisoners Harbor, noting the multiple creek crossings (Livingstone 2006:435). In notes and completed maps, Forney recorded a wide array of information, including vegetation, topography, springs, buildings, wells, and fences.

Fishermen

In addition to the illegal fishing, fishermen were also allowed to legally ply the island's waters in boats and could build structures adjacent to the shoreline. The island owners charged minimal rent (Livingstone 2006). These fishermen harvested lobster (called crawfish at this time) and abalone, and fished in the island waters. One of the best accounts of fish camps on Santa Cruz Island is by Margaret Eaton, who visited and/or lived on Santa Cruz Island for approximately 25 years in the early twentieth century; see Eaton (1980) for a more detailed description.

Resorts, Camping, and Film Making

In the twentieth century, various parties camped on Santa Cruz Island, sometimes legally, but often illegally (Livingstone 2006:584–585). From 1913 until the late 1930s Ira and Margaret Eaton operated the best known of these legal resorts at Pelican Bay west of Prisoners Harbor (Eaton 1980; Livingstone 2006). At its height, the camp had 15 structures. Several movie productions used the Pelican Bay Resort as their base. The buildings deteriorated and were eventually dismantled, although concrete foundations, fragments of window glass, and other construction-related debris is still visible.

The Cold War and the Pacific Missile Range: Military and Navigation Facilities

Although relatively recent in time the Navy presence on Santa Cruz Island, represented by the Navy installation and the "Navy Road," exemplifies an important point in U.S. history. The installation was part

of a system of military structures and features, which served as a major part of the military's development and testing of guided missiles.

The Point Mugu Navy installation on the mainland was designated the site for the Naval Air Missile Test Center (NAMTC) in 1946. The location was chosen given the unobstructed sea view between the mainland and the observation posts established on the islands (Anacapa, Santa Cruz, San Miguel, San Nicolas, and Santa Rosa Islands; Wee and Byrd 2000:23–24). In 1949 the Navy leased land from Edwin L. Stanton to build an installation on Mount Pleasant, a high point on the Isthmus of Santa Cruz Island. By 1950, a 6.5-mile road was built to the installation from the newly reconstructed pier and pontoon-landing ramp at Prisoners Harbor. Portions of this road were new; other portions were derived from previous trails and roads.

Named the David Taylor Compound, the installation covers 10.8 acres (Dulka et al. 1993:Section 19-1; Wee and Byrd 2000) and still serves as a communications relay station for NAMTC. Structures built in 1950 as a part of the installation included a transmitter building, a receiver building, a barracks, a mess hall, a powerhouse, and a water supply system that piped freshwater from a spring more than 6 miles from the installation (Wee and Byrd 2000:116–117).

After 1958 the NAMTC became part of the national Pacific Missile Range. In the period from 1958 to 1974 the instrumentation at the Santa Cruz Island facility was updated to include a microwave communication tower and a metric optical station, while additional buildings constructed included a garage for a fire pumper and two public works storage facilities (Wee and Byrd 2000:182). Between 1975 and 1991 the installation was expanded to include a new SSS radar tower, an Extended Area Test System (EATS) antenna, an emergency generator, and new housing (Wee and Byrd 2000:198). In addition to testing new missile systems, activities at these ranges included working with existing weapon systems to keep them safe and reliable (Wee and Byrd 2000:198). Weapons tested included Sparrow II, Sidewinder, Tomahawk, and Trident 1 systems (Wee and Byrd 2000:199–200).

Historically the lease required Navy personnel to stay within the leased areas. More recently, the lease with The Nature Conservancy has expanded Navy access to the island for recreational purposes (Dulka et al. 1993:Section 18-2). In addition, the Navy has nonexclusive use of an aircraft landing strip, pier, and boat landing site (Dulka et al. 1993:Section 18-2). As part of the lease agreement with The Nature Conservancy, the Navy provides benefits to The Nature Conservancy on an "as available" basis. These benefits include "telephone system, radio communication, excess power and water, surface transportation, fire protection, maintenance of three roadways and protection against unauthorized entry" (Dulka et al. 1993:18-2). Although the facilities at Point Mugu and the overall historic Cold War operations were considered eligible for listing in the NRHP (Wee and Byrd 2000), a smaller study (Bischoff 2004) that examined only the David Taylor Compound Navy installation on the Santa Cruz Island deemed the facility and structures on Mount Pleasant ineligible for listing in the NRHP.

3. PREVIOUS RESEARCH

The following is a summary and discussion of the prehistoric, protohistoric, and Mission Period sites within the FOCUS Cable ADI. A cultural resources records search for the project was performed at the Central Coast Information Center at the University of California, Santa Barbara, on September 10, 2014, to identify previously recorded sites and previous cultural resource studies conducted within the project and within a 1-km radius of the project. The NPS performed another records search and determined the results were the accurate locations of sites and previous research on Santa Cruz Island. The following is a compilation of those NPS results: seven previous cultural resource studies and 38 previously recorded sites located within or within a 1-km radius of the FOCUS Cable ADI. The previous research and previously recorded sites documented within the study area are discussed individually below.

Previous Inventories

Seven previous cultural resources studies have been conducted within or within a 1-km radius of the FOCUS Cable project (Figure 3-1; Table 3-1).

Study 1, titled *Follow-up Field Trip After the 1974 Season Santa Cruz Island Project*, was prepared in 1974 by Glassow to summarize the results of the collection of column samples at CA-SCrI-369 and CA-SCrI-393. The project resulted in limited collection of shell and flakes with some possible artifacts also recovered. No additional detail was provided (Glassow 1974). This study is located outside the project ADI.

Study 2, titled *An Archaeological Overview of the Northern Channel Islands Including Santa Barbara Island*, was prepared by the University of California, Santa Barbara (Glassow 1977). The study provides an overview of the archaeological research that had occurred within the Channel Islands, a prehistoric context for the islands, and management recommendations for archaeological resources found on the islands. No specific site information is included in the document. This study intersects the project ADI.

Study 3, titled *Archaeological Survey at a GTE Mobilenet Repeater Site and Two Existing Communication Sites on Santa Cruz Island*, was prepared by Science Applications International Corporation (SAIC) in 1992. The letter report summarizes the results of an intensive pedestrian survey of three small areas on the island; the results were negative and no newly identified or previously recorded sites or studies were located during the survey (Sheets 1992). This study is located outside of the project ADI, but within a 1-km radius.

Study 4, titled *Santa Cruz Island Investigations*, is a summary of work performed by Jeanne Arnold at Santa Cruz Island between 1981 and 1993. No fieldwork was performed and no new resources were identified (Arnold 1993). This study intersects the project ADI.

Study 5, titled *Phase I Cultural Resources Survey, Santa Cruz Island Acoustic Range Facility Demobilization, Site CA-SCrI-495, Santa Barbara County, California*, was prepared by Fugro West, Inc., in 1996. One site, CA-SCrI-495, described as "a very large, significant village," was recorded and mapped as a part of the Santa Cruz Island NRHP District (Maki 1996). This study is located outside of the project ADI, but within a 1-km radius.

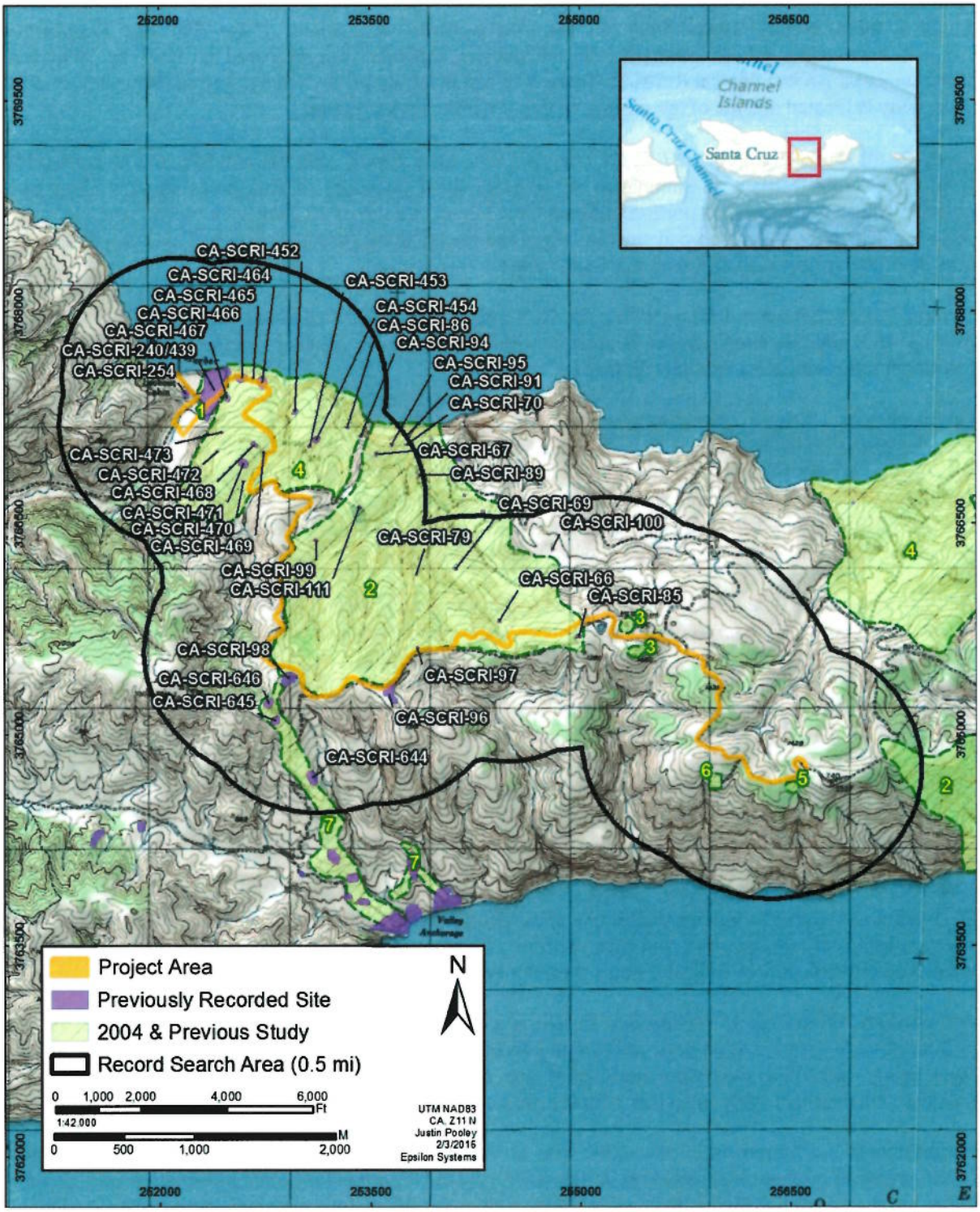

Figure 3-1. ADI with all previous studies and previously recorded cultural resources.

Study 6, titled *Archaeological Study for the Environmental Assessment of the Blue Site Restoration Project, Santa Cruz Island, Santa Barbara County, California,* was prepared in 1997 by Historical Environmental Archaeological Research Team. The results of the survey were negative (Wlordaski 1997). This study is located outside of the project ADI, but within a 1-km radius.

Study 7, titled *Anthropology 181 Field Trip to Santa Cruz Island,* was prepared by the University of California, Santa Barbara, to summarize an archaeological inventory of four areas situated along two adjacent ridges in the isthmus portion of Santa Cruz Island. A total of 20 sites were located and recorded, including two previously recorded sites in one of the survey areas (Glassow 2000). This study is located outside of the project ADI, but within a 1-km radius.

Several studies that are not found within the NPS search results were conducted. These studies were not given a study identification number because no information can be gleaned from them and they have no locational information associated with them.

One such study, titled *Cultural Resources Monitoring at Site CA-SCrI-495 for the Collection of Soil Samples at the White Site, Santa Cruz Island, California,* was prepared by ENSR in 1999 to summarize the results of sampling of contaminated soils within NRHP-listed site CA-SCrI-495. Thirty-nine boreholes were subjected to archaeological monitoring as they were excavated; it was determined that no adverse effects resulted from this disturbance (Maki 1999). As site CA-SCrI-495 is located outside the project ADI, this study does not intersect with the project ADI.

Another study, titled *Cultural Resources Monitoring for the Collection of Thirteen Soil Samples at the White Site, Santa Cruz Island, California,* was prepared in 2001 by Conejo Archaeological Consultants. The project involved further soil sampling within the boundaries of CA-SCrI-495. Thirteen borings were excavated using a hand auger; it was determined that no adverse effects have occurred as a result of continued soil sampling within the site (Maki 2001). As site CA-SCrI-495 is located outside the project ADI, this study does not intersect with the project ADI.

A third study, titled *A Journal of the Activities of M. A. Glassow and Crew During the 1974 Field Season of the Santa Cruz Island Project,* was prepared by Glassow to summarize the activities and results of fieldwork during the 1974 University of California, Santa Barbara field season. Numerous sites were identified and documented, including CA-SCrI-347 through CA-SCrI-390. The project also relocated sites CA-SCrI-178, CA-SCrI-180, CA-SCrI-181, CA-SCrI-195, CA-SCrI-199, CA-SCrI-227, and CA-SCrI-228 and collected column samples. All sites identified are prehistoric, including shell middens, rock shelters, lithic scatters, quarries, and rock platforms (Glassow 1974). As the sites in Glassow's study are located outside the project ADI, this study does not intersect with the project ADI.

A final study, titled *East of Pelican Bay Survey,* is a collection of field notes prepared by Heather Hucks in 2008 to summarize a systematic pedestrian survey of selected prehistoric sites on Santa Cruz Island. Nine newly identified sites were discovered and documented during the study (Hucks 2008). It is unknown whether this study intersects with the project ADI.

In addition to the aforementioned studies with no locational data, two studies were performed by the CINP as part of proposed undertakings on Santa Cruz Island. There is locational information provided for these, but they were not filed at the California Historical Resources Information System center, so did not receive study identification numbers.

The first was performed in 2007 by Kelly R. Minas, Park Archaeologist (Minas 2007). It entailed subsurface testing at Prisoners Harbor in preparation for a parking facility that was proposed inside the boundaries of site CA-SCrI-240/439. Five augers were placed within the proposed parking facility. All of

the augers resulted in the identification of cultural materials at 40-67 cm (15.7-26.4 in) below ground surface, and the parking lot was never placed in the proposed vicinity. The results were presented in a Memorandum for Record title "Subsurface Testing at Prisoners Harbor".

The second study was the result of monitoring subsurface disturbance for the Wetland Restoration Program at Prisoners Harbor. The CINP, specifically Kelly R. Minas (Park Archaeologist), wrote a description of cultural deposits that were identified during archaeological monitoring of the Wetland Restoration (Minas 2016). Two areas with intact subsurface cultural deposits were identified. One of these locations is inside the western extent of site CA-SCrI-240/439. The other is located just west of the existing boundaries of the site. Both are considered to be remnants of the existing site.

Table 3-1. Previous cultural inventories completed within or within a 1-km radius of the Project Area

Map Reference No.	IC Report No.	Company Responsible	Author(s)	Report Title	Relationship to ADI
1	N/A	Channel Islands National Park	Minas, K	Memorandum for Record: Subsurface Testing at Prisoner's Harbor.	Inside
1	N/A	Channel Islands National Park	Minas, K	Archaeological Testing of Exposed Deposits in Support of the Prisoner's Harbor Wetlands Restoration Program Santa Cruz Island, CA	Inside
1	IS-00051	University of California, Santa Barbara	Glassow, Michael	Follow Up Field Trip After the 1974 Season Santa Cruz Island Project	Outside
2	IS-00001	University of California, Santa Barbara	Glassow, Michael	An Archaeological Overview of the Northern Channel Islands Including Santa Barbara Island	Intersects
3	IS-00024	SAIC	Sheets, Robert	Archaeological Survey at a GTE Mobilenet Repeater Site and Two Existing Communication Sites on Santa Cruz Island	Outside
4	IS-00025	University of California, Los Angeles	Arnold, Jeanne	Santa Cruz Island Investigations	Intersects
5	IS-00028	Fugro West, Inc.	Maki, Mary	Phase I Cultural Resources Survey, Santa Cruz Island Acoustic Range Facility Demobilization, Site CA-SCrI-495, Santa Barbara County, California	Outside
6	IS-00032	Historical, Environmental, Archaeological Research, Inc.	Wlodarski, Robert	Archaeological Study for the Environmental Assessment of the Blue Site Restoration Project, Santa Cruz Island, Santa Barbara County, California	Outside
7	IS-00040	University of California, Santa Barbara	Glassow, Michael	Anthropology 181 Field Trip to Santa Cruz Island	Outside

Resources within the ADI

Five previously recorded sites are within the project ADI (CA-SCrI-96, 240/439, 464, 465, and 466, Figures 3-1, 3-2; Table 3-2). An additional 33 sites are outside the ADI, though within a 1-km radius. This includes CA-SCrI-254 which appears to intersect the ADI on maps but is actually 100 ft above the ADI on a ridge overlooking Prisoners Harbor to the north. It is not located adjacent to the Navy Road or any other road. All archaeological sites on Santa Cruz Island are considered "historic properties" under 36CFR800.4 as contributors to either the whole island, the NRHP-listed Santa Cruz Island Archaeological District, or the NRHP-eligible Santa Cruz Island Ranching District, unless individually determined to be "not eligible" or "non contributing". NRHP eligibility recommendations on these sites are not part of the current undertaking; however, they are contributing elements of the Santa Cruz Island Archaeological District. Chapter Four provides a more thorough discussion of each site.

Although several dirt roads, four-wheel drive tracks, and trails exist within the Isthmus of Santa Cruz Island, one of the most important is known as the "Navy Road" (Huston 2013). While the Navy constructed the Navy Road, portions of it connected previously existing roads and trails (NPS 2004). Further, the road became an integral part of the Stanton ranching operations on the Isthmus. The facilities at Point Mugu and the overall historic Cold War operations are considered eligible for listing in the NRHP (Wee and Byrd 2000). The Navy Road on Santa Cruz Island has never been officially recorded or documented; however, it is a contributing element to the Santa Cruz Island Ranching District.

Part of the FOCUS Cable ADI is located within part of the Prisoners Harbor Cluster. Contributing elements of this cluster include a masonry warehouse and a scale house. The warehouse was built in 1887 and measures 54 ft × 45 ft (16.5 m × 13.7 m) and rests on a mortared rubble foundation. It has parallel twin front gable roofs and is built of native-island brick and stone. There are two arched door openings on the northeast side. The scale house, built after 1918, is a wood frame structure with a rectangular plan. It has a corrugated metal roof and open sides (NPS 2004).

Non-contributing elements of the Prisoners Harbor Cluster include a pier, kiosk, and picnic area on the west end of the cluster; an NPS restroom building on the east side of the warehouse; and the parking area on the east end of the cluster at the junction of Navy Road (JRP 2012).

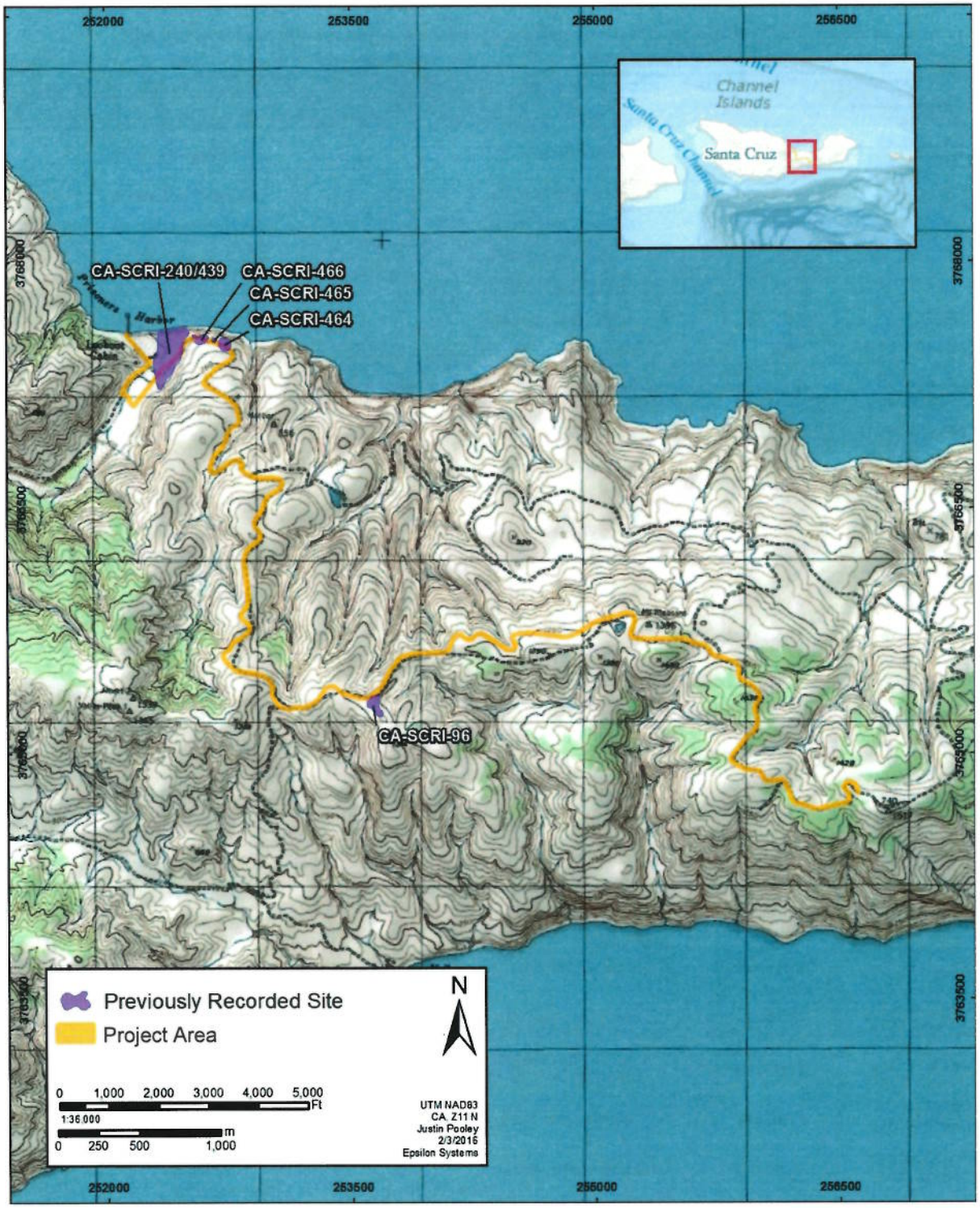

Figure 3-2. ADI with previously recorded cultural resources that intersect with the ADI.

Table 3-2. Prehistoric sites previously recorded sites within a 1-km radius of the ADI.

Site Designation (Primary No.)	Temporal Affiliation	Site Description	NRHP Eligibility Status
CA- SCrI -66 (P-42-025066)	N/A	No site form available.	Contributing Element[1]
CA- SCrI -67	N/A	No site form available.	Contributing Element
CA- SCrI -69	N/A	No site form available.	Contributing Element
CA- SCrI -70	N/A	No site form available.	Contributing Element
CA- SCrI -79	N/A	No site form available.	Contributing Element
CA- SCrI -82	N/A	No site form available.	Contributing Element
CA- SCrI -83	N/A	No site form available.	Contributing Element
CA- SCrI -85 (P-42-025085)	Prehistoric	Shell midden with lithics and possible associated house depression	Contributing Element
CA- SCrI -86	N/A	No site form available.	Contributing Element
CA- SCrI -89	N/A	No site form available.	Contributing Element
CA- SCrI -91	N/A	No site form available.	Contributing Element
CA- SCrI -94	N/A	No site form available.	Contributing Element
CA- SCrI -95	N/A	No site form available.	Contributing Element
CA- SCrI -96 (P-42-025096)	**Prehistoric**	**Lithic scatter with tools.**	**Contributing Element**
CA- SCrI -97 (P-42-025097)	Prehistoric	Lithic scatter with marine mammal bone and tools	Contributing Element
CA- SCrI -98 (P-42-025098)	Prehistoric	Lithic scatter with shell and one tool	Contributing Element
CA- SCrI -99 (P-42-025099)	Prehistoric	Lithic scatter with mammal bone and tools	Contributing Element
CA- SCrI -100	N/A	No site form available.	Contributing Element
CA- SCrI -103	N/A	No site form available.	Contributing Element
CA- SCrI -111	Prehistoric	Lithic scatter with tools and ground stone	Contributing Element
CA- SCrI -240/ CA- SCrI -439 (P-42-025439)	**Prehistoric**	**Shell midden with marine mammal bone and tools/ Shell midden with marine mammal bone, tools, and fire-affected rock**	**Determined eligible (Glassow 1980).**
CA- SCrI -254 (P-42-025254)	Prehistoric	Shell midden with tools and flakes	Contributing Element
CA- SCrI -452 (P-42-025452)	Prehistoric	Lithic scatter with tools and shell	Contributing Element
CA- SCrI -453	Prehistoric	Shell midden with one possible ground stone fragment	Contributing Element
CA- SCrI -454 (P-42-025452)	Prehistoric	Lithic and shell scatter with ground stone	Contributing Element
CA- SCrI -464 (P-42-025464)	**Prehistoric**	**Lithic scatter with shell**	**Contributing Element**
CA- SCrI -465 (P-42-025465)	**Prehistoric**	**Lithic scatter with shell and mammal bone**	**Contributing Element**
CA- SCrI -466 (P-42-025466)	**Prehistoric**	**Shell midden with lithics and marine mammal bone**	**Contributing Element**
CA- SCrI -467 (P-42-025467)	Prehistoric	Shell midden with lithics and tools	Contributing Element

Table 3-2. Prehistoric sites previously recorded sites within a 1-km radius of the ADI.

Site Designation (Primary No.)	Temporal Affiliation	Site Description	NRHP Eligibility Status
CA- SCrI -468 (P-42-025468)	Prehistoric	Lithic and shell scatter with mammal bone and tools and one shell bead	Contributing Element
CA- SCrI -469 (P-42-025469)	Prehistoric	Shell midden with associated cores and mammal bone	Contributing Element
CA- SCrI -470 (P-42-025470)	Prehistoric	Shell midden with flakes, cores, and marine mammal bone	Contributing Element
CA- SCrI -471 (P-42-025471)	Prehistoric	Shell and lithic scatter with associated mammal bone	Contributing Element
CA- SCrI -472 (P-42-025472)	Prehistoric	Shell midden with lithics and marine mammal bone	Contributing Element
CA- SCrI -473 (P-42-025473)	Prehistoric	Shell scatter	Contributing Element
CA- SCrI -644 (P-42-025644)	Prehistoric	Shell midden with lithics and fire-affected rock	Contributing Element
CA- SCrI -645 (P-42-025645)	Prehistoric	Shell midden with fire-affected rock	Contributing Element
CA- SCrI -646 (P-42-025646)	Prehistoric	Shell midden with lithics	Contributing Element

Bold indicates site is located within the project ADI.
[1] Contributing element to the Santa Cruz Island Historic Distric

Submerged Resources Associated with Santa Cruz Island

Based on current knowledge, a total of five submerged vessels including cargo, military, and civilian wrecks exist off the coast of Santa Cruz Island, comprising a small portion of the 150 reported wrecks on the beaches and in the ocean waters surrounding the northern Channel Islands. Although it is conceivable that underwater prehistoric archaeological resources may also exist, especially given the antiquity of human occupation of the Channel Islands (see above), no such resources are currently known to exist, apart from an isolated stone bowl. One of the five known submerged resources is a military aircraft (Grumman *Guardian*). Of the five submerged vessels, which range in date of sinking from 1952 to 1980, three are potentially eligible for nomination to the NRHP based on age alone. Only three of the five resources have been identified or investigated by NPS personnel; what follows is a description of each of the resources based on Glassow (2010) and Morris and Lima (1996). None of these shipwrecks are known to be within the current project ADI.

Grumman Guardian

This is one of only two known aircraft wrecks associated with the Channel Islands. The Grumman *Guardian* is an anti-submarine aircraft that was "ditched" in 1954 on the south side of Santa Cruz Island. Peter Howorth undertook the initial investigation of this wreck in August 1985, and then led NPS specialists to the locality. The site has not been officially recorded and no artifacts are currently curated by the NPS. It is possible that certain artifacts that have disappeared over the years, such as control panel instruments, are in the hands of amateur divers. No military records have yet been researched, nor have oral histories of possible observers of the crash been solicited. This wreck is located outside the ADI for the FOCUS Cable installation project.

Santa Cruz Shipwreck

The *Santa Cruz* shipwreck, a general cargo ship, was first identified by NPS underwater archaeologist Don Morris in August 1991. A basic map, photographs, and field notes are curated by the NPS. Although this wreck is located in Prisoners Harbor, it is outside the FOCUS Cable installation project ADI. Horizontal directional drilling (HDD) will be used to bury the FOCUS Cable under the ocean floor, and any wrecks will be avoided by a wide girth.

Other Wrecks

The three remaining submerged resources around Santa Cruz Island include (1) the *Billcona*, a tugboat that went down in 1952 (the location of which is tentative; Braje et al. 2010); (2) the *Englyn*, a pleasure cruise boat that disappeared in 1974; and (3) The vessel formally identified as the *Peacock* is actually the *Spirit of America*, and sunk in 1980. It was initially misidentified as the *Peacock*, but subsequent archival research suggests that the *Peacock* was sold as scrap. There is currently no information regarding the original identity of *the Spirit of America* other than it being a World War II era minesweeper that was converted to a private recreational craft. It is situated in the vicinity of Scorpion Rock. The NPS has recently completed a baseline map of the wreckage and continues to photo-document the wreck site.

Until more information is available on these resources, their eligibility for listing in NRHP cannot be determined. Further, the locations of these three vessels is unknown, but they are likely to be outside the FOCUS Cable installation project ADI.

4. SITES LOCATED WITHIN THE ADI

The following are descriptions of the five prehistoric sites located within the FOCUS Cable installation project alignment and ADI. Site descriptions are based on original site records, as none of these records have been updated and no subsurface testing has been conducted at these sites. CA-SCrI-240 is discussed last because of the long history of archaeological research conducted there and the cultural significance of the site. In addition, CA-SCrI-240 is the only site on which subsurface testing is proposed. However, there are two previously undocumented cultural resources located within the FOCUS Cable ADI: the Navy Road and the 1887 Warehouse at Prisoners Harbor. No further work is recommended at either of these sites (see below for an in-depth discussion).

To discuss the potential effects to cultural resources during installation and maintenance of the FOCUS Cable, an understanding of the Santa Cruz Island landscape is important. The FOCUS Cable will be installed within the confines of the existing Navy Road in a trench or in an elevated channel along the edge of the road.

All but one of the archaeological sites directly touched by the ADI have had their archaeological deposits between the disturbed shoulders of the road removed down to bedrock, either at the time of the Navy Road's original construction or by recurring maintenance. The only exception to this is where the Navy Road and the water well access roads transect the recorded portion of site CA-SCrI-240/CA-SCrI-439. For this reason, this site is the only previously recorded historic property that requires subsurface testing to determine the effects of the FOCUS Cable installation and maintenance.

It is important to note that all work for installing and maintaining the trench line for the FOCUS Cable will stay within the confines of the road and existing and proposed staging areas. All work for installing and maintaining the elevated channel line in and around CA-SCrI-240/CA-SCrI-439 will involve limited subsurface disturbance, as discussed below. Work will be confined to the road because the topography of the island mandates that the work stay in the road. The island (as noted in Chapter 2) contains steep, rising cliff faces that descend to the north and into the ocean. The Navy Road (in which the FOCUS Cable will be installed) is located atop some of these cliff faces (see Figure 4-1). For the most part, the slopes that drop into the ocean to the north of the Navy Road are usually greater than 31 degrees, and are too steep for mechanized vehicles to traverse or even for humans to walk safely. Also, note in Figures 4-2 and 4-3 that the prehistoric sites are located in areas where the slopes are too steep for mechanized vehicles, except CA-SCrI-240/CA-SCrI-439. The following is a discussion of each resource and the potential effects to each resource that intersects the project ADI.

Prehistoric Resources

The five previously recorded prehistoric resources that intersect the FOCUS Cable ADI are discussed in numerical order below, except CA-SCrI-240, which is discussed last because of the long history of archaeological research conducted there, the fact that it is the only site where subsurface testing is proposed, and the cultural significance of the site.

CA-SCrI-96

Recorded in 1973, this site is described as being southeast of and adjacent to the Navy Road on a hill where two animal corrals were located. This low-density chert lithic scatter extends into a saddle to the east and downslope to the northwest, north, and south. In addition to nondescript chert flakes, a utilized flake and possible core were noted. No marine shell was observed.

The boundaries of this site are located adjacent to the current FOCUS Cable installation ADI (Figure 4-4; Photograph 4-1). To aid in the determination of effects to historic properties, the site was revisited to create a cross-section of the road and a profile of the stratigraphy in the road cut (Figure 4-5). Due to several invasive plant species, the ground surface outside the road cut is no longer visible. Therefore, a profile of the stratigraphy in the road cut was created to illustrate: 1) the lack of cultural resources in the profile; and 2) that the contents of the site will be avoided during installation and maintenance because it is located 0.5 to 1.5 m above the road bed, where all construction will occur. The Navy Road, near the boundaries of CA-SCrI-96, has been notched into the native bedrock. Construction equipment and all personnel will stay outside the site boundaries, primarily because the slope leading up to the site is steep, treacherous, and slippery; machines cannot approach the site and cause damage.

Due to the dense vegetation coverage on Santa Cruz Island, updated recordation and documentation of the sites within the ADI would require subsurface investigations. Subsurface investigations are not only costly and time-consuming, but they also cause unnecessary damage to sites. Therefore, in the event that a cultural resource can be avoided (as with CA-SCrI-96), no further documentation or subsurface testing is proposed.

To ensure avoidance of the site, stakes will be placed around the site boundaries prior to construction. These stakes need only mark the presence of a resource, because the resource will be easily avoided during construction. These stakes will be inserted into the ground at 20-30 cm (8-12 in) below the modern ground surface. They will be removed once construction is complete. No further testing or mitigation measures is recommended at this site.

Photograph 4-1. Photograph of the stratigraphy for the road cut at CA-SCrI-96.

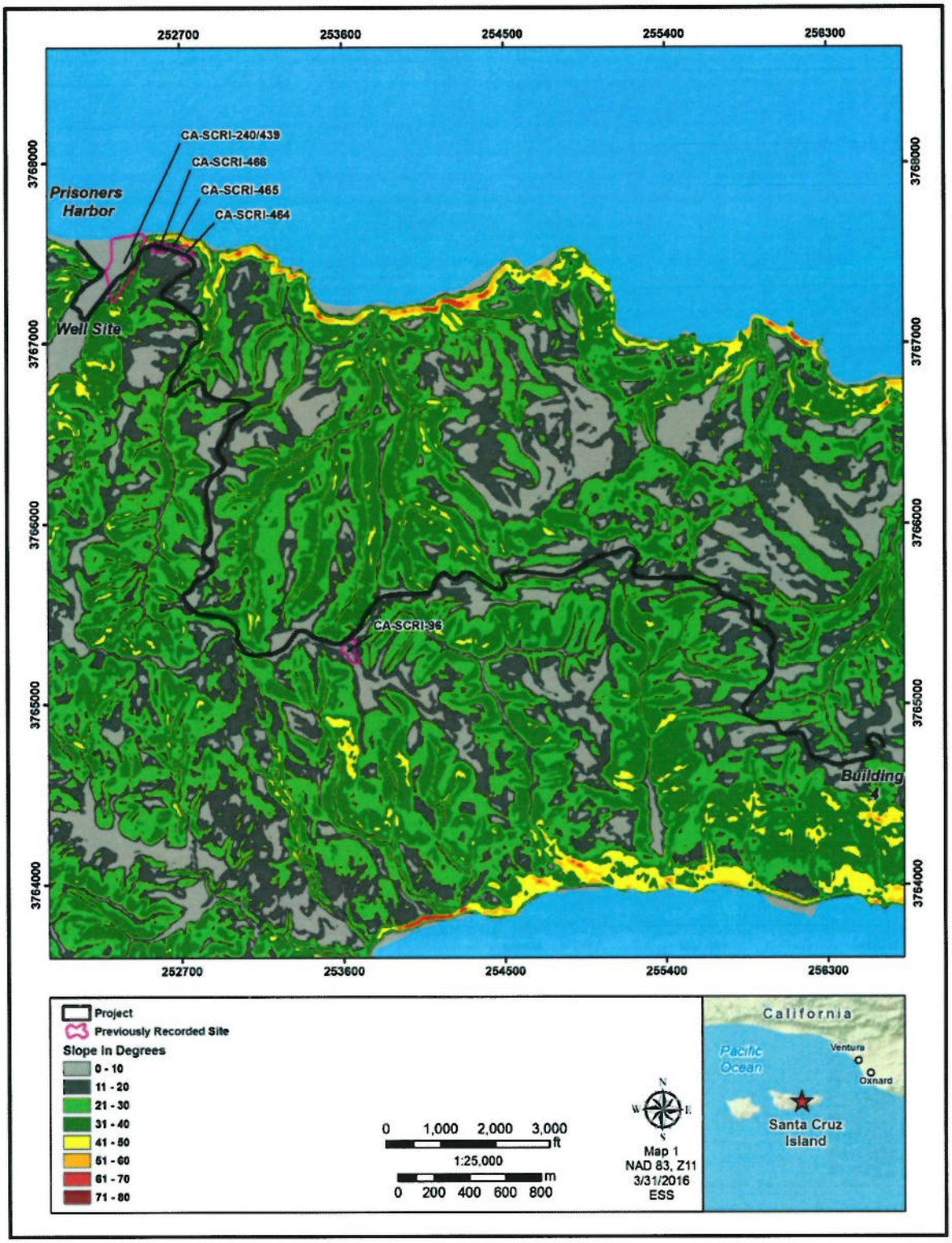

Figure 4-1. Overview of the steep slopes on Santa Cruz Island near the ADI.

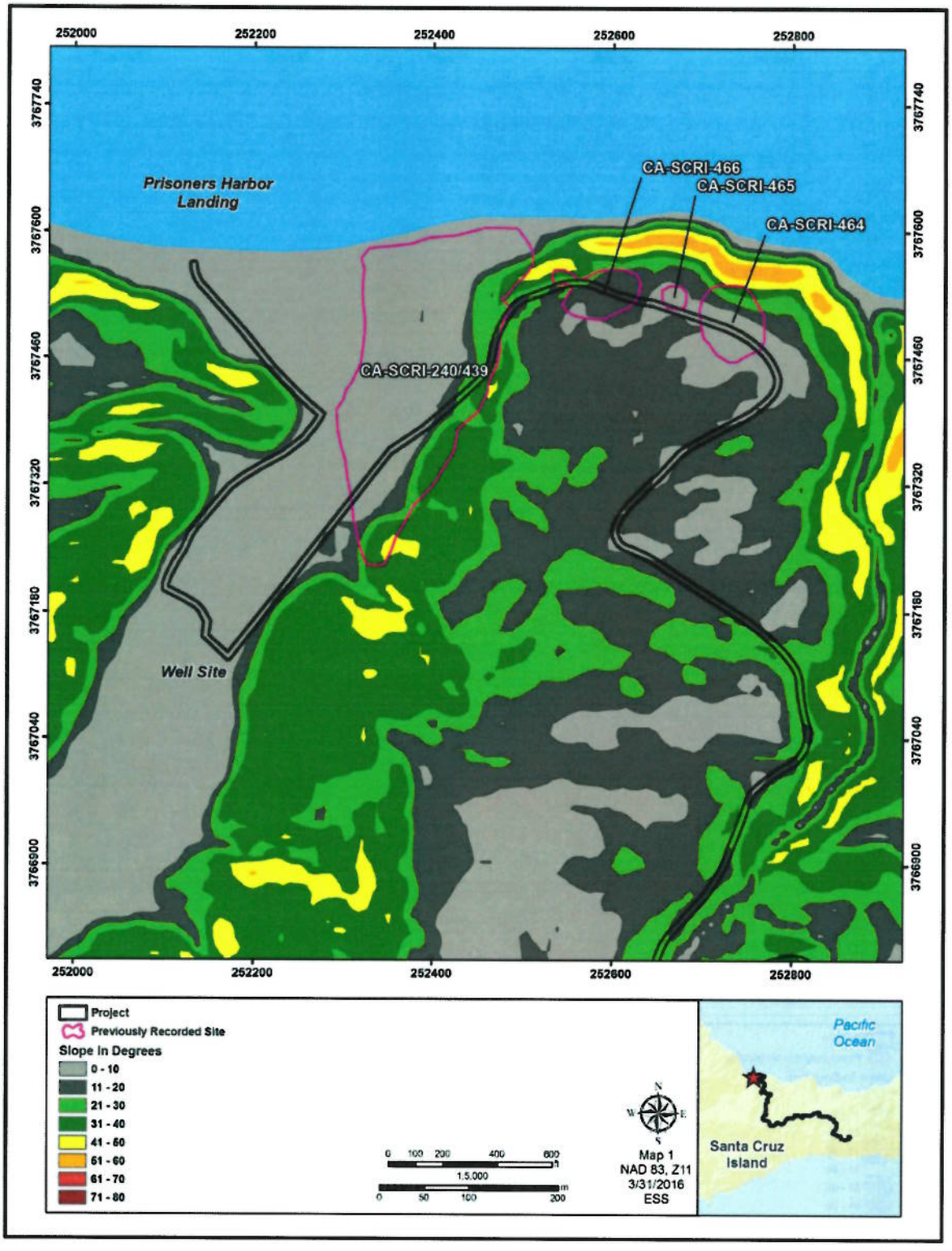

Figure 4-2. Detail of the steep slopes and cultural resources within the ADI, Map 1.

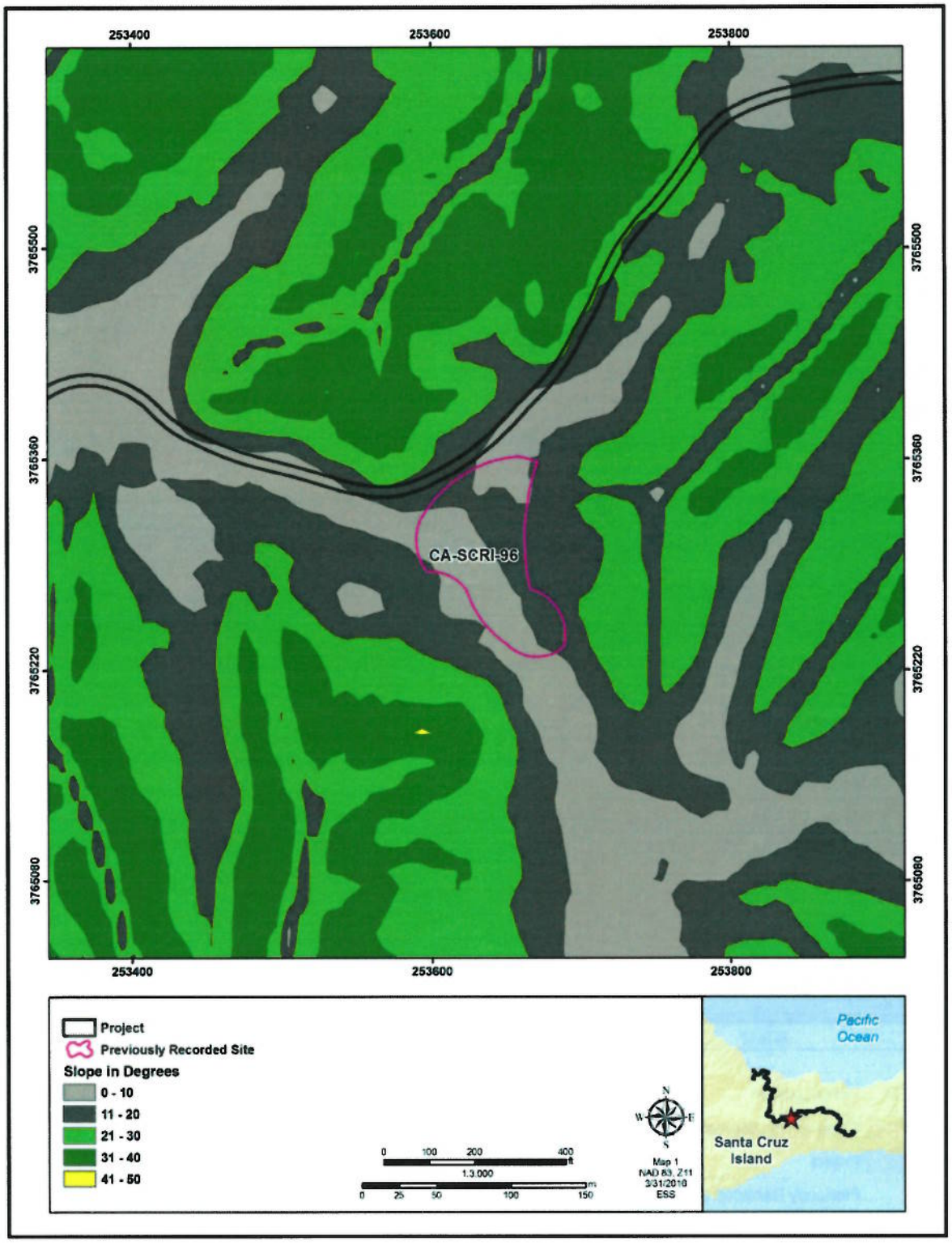

Figure 4-3. Detail of the steep slopes and cultural resources within the ADI, Map 2.

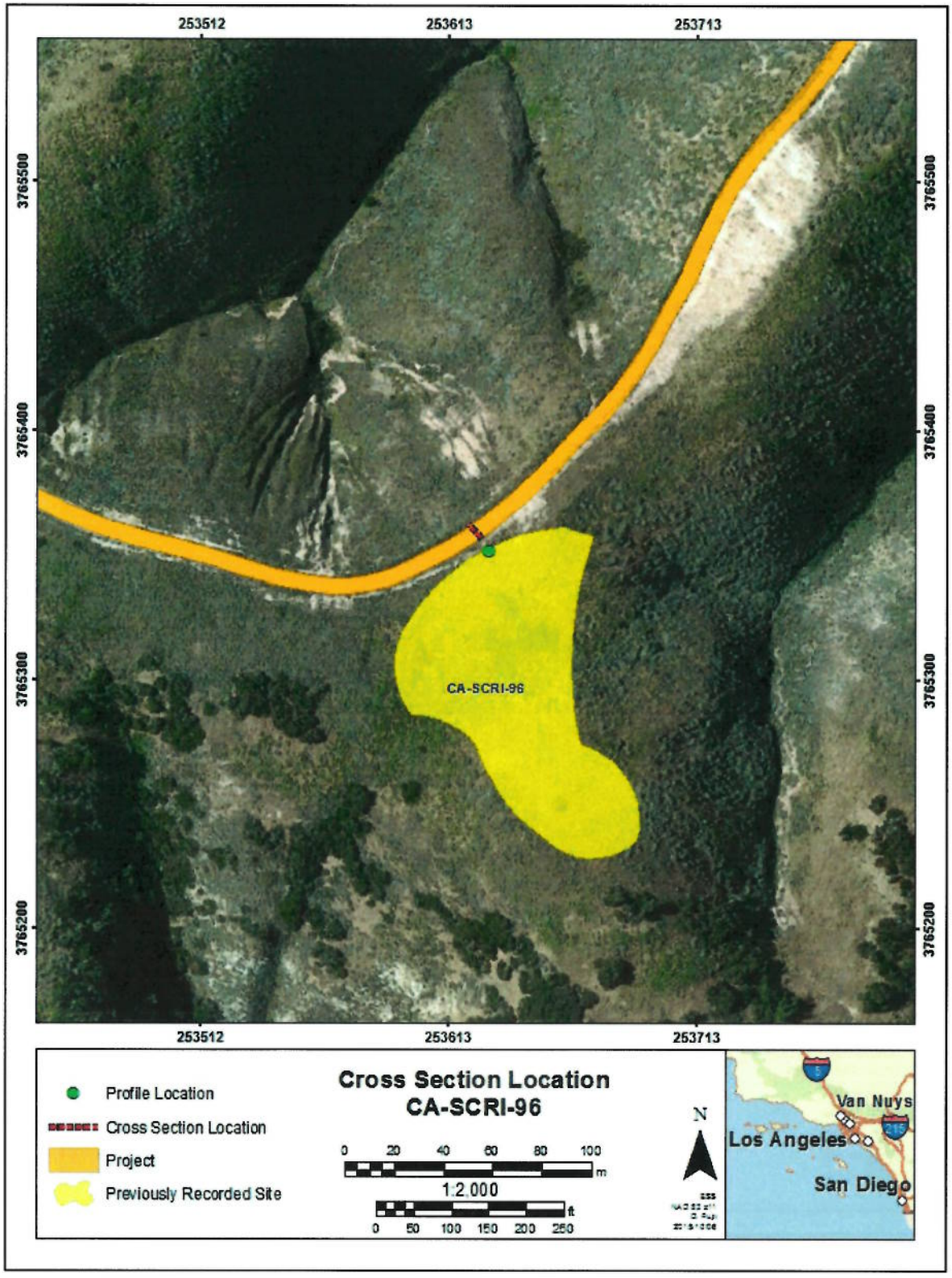

Figure 4-4. Location of the cross-section and profile at CA-SCrI-96 within the ADI.

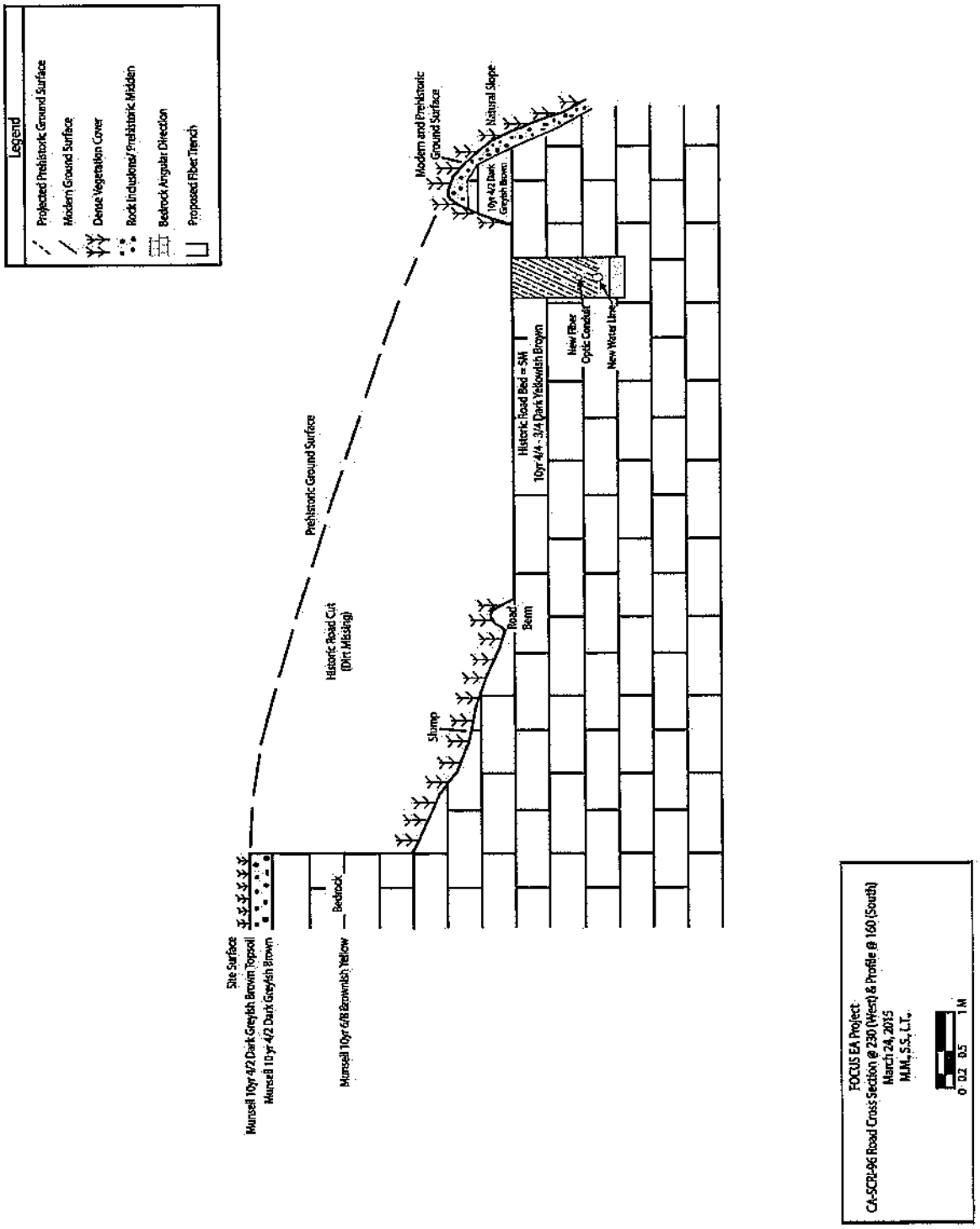

Figure 4-5. Cross-section and profile of stratigraphy for the road cut at CA-SCrI-96.

CA-SCrI-464

Recorded in 1988, site CA-SCrI-464 is described as a shell midden located at the northern end of the first ridge east of Prisoners Harbor. The Navy Road runs through the southern portion of the site. Although other shellfish species and a small amount of sea mammal bone were observed on the site surface, the shell midden is dominated by wavy top turban. "Numerous" cores and flakes of chert and igneous materials were noted throughout the site, as well as hammerstones, a biface, and a pestle and other possible ground stone fragments. In addition, human remains—a mandible fragment and teeth—were observed on the site surface.

The FOCUS Cable installation ADI transects the southern portion of site CA-SCrI-464 (Figure 4-6). To aid in the determination of effects to historic properties, the site was revisited to create a cross-section of the road and a profile of the stratigraphy (Figure 4-7) found in the road cut (see also Photograph 4-2). Due to several invasive plant species, the ground surface outside the road cut is no longer visible. Therefore, a cross-section was created of the road cut to illustrate: 1) the lack of cultural resources in the bedrock; and 2) that the contents of the site will be avoided during installation and maintenance because the site is located 0.5 m above the road bed, where all construction will occur. The Navy Road, within the boundaries of CA-SCrI-464, has been notched into the native bedrock. Construction equipment and all personnel will stay outside the site boundaries, primarily because the slope leading up to the site is steep, treacherous, and slippery; machines cannot approach the site and cause damage.

Due to the dense vegetation coverage on Santa Cruz Island, updated recordation and documentation of the sites within the ADI would require subsurface investigations. Subsurface investigations are not only costly and time-consuming, but they unnecessarily cause damage to sites. Therefore, in the event that a cultural resource can be avoided (like CA-SCrI-464), no further documentation or subsurface testing is proposed.

To ensure avoidance of the site, stakes will be placed around the site boundaries prior to construction. These stakes need only mark the presence of a resource, because the resource will be easily avoided during construction. These stakes will be inserted into the ground at 20-30 cm (8-12 in) below the modern ground surface. They will be removed once construction is complete. No further testing or mitigation measures are recommended at this site.

Photograph 4-2. Navy Road cut near site CA-SCrI-464.

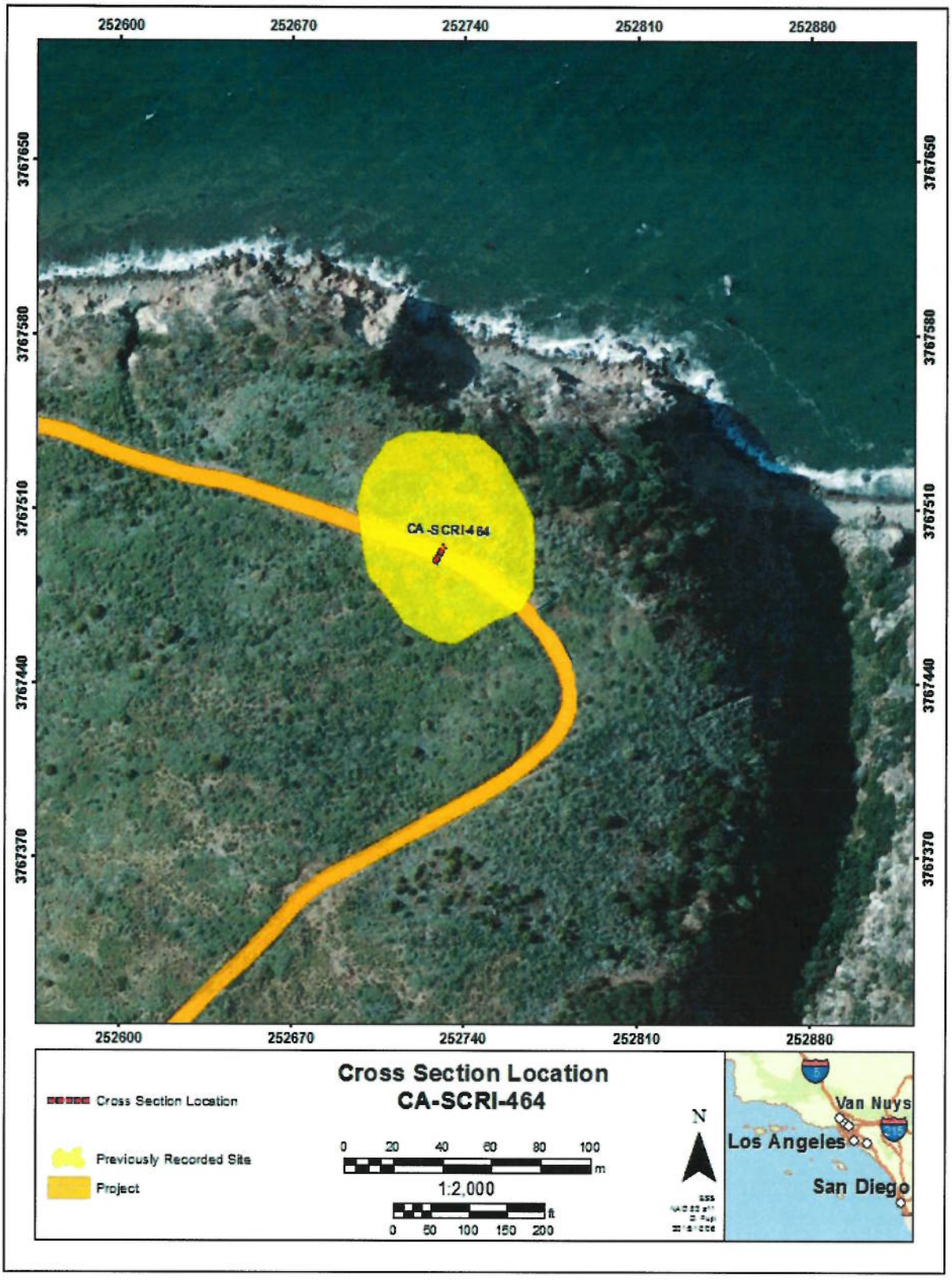

Figure 4-6. Location of the cross-section and profile at CA-SCrI-464 within the ADI.

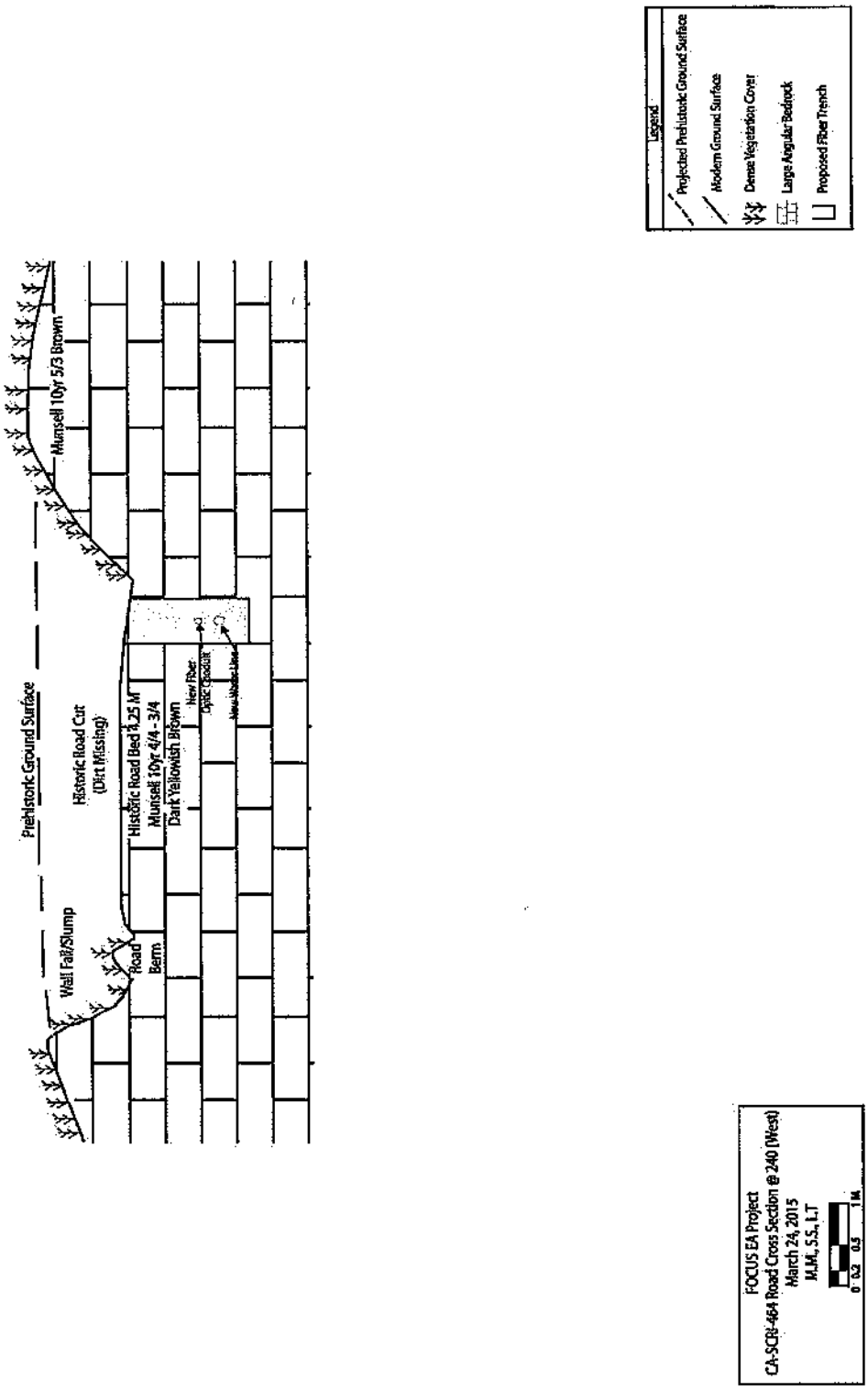

Figure 4-7. Cross-section and profile of stratigraphy for the road cut at CA-SCrI-464.

CA-SCrI-465

Recorded in 1988, site CA-SCrI-465 is a low-density lithic and shell scatter situated on the northern end of a knoll on the first ridge east of Prisoners Harbor. The Navy Road intersects this site at its southern boundary. The site record suggests that CA-SCrI-464 (which is 100 m upslope to the east) and CA-SCrI-465 are part of the same site because of their proximity and the small amount of sterile soil observed in between. Cultural materials include chert and igneous flakes, a chert core, and fragments of wavy top turban. During fieldwork, it was noted that the Navy Road is cut 0.5 m below the surface of the site. The Navy Road, within the boundaries of CA-SCrI-465, has been notched into the native bedrock

The FOCUS Cable ADI transects the extreme southern edge of site CA-SCrI-465 (Figure 4-8). To aid in the determination of effects to historic properties, the site was revisited; however, due to dense vegetation covered by invasive plant species, no profile could be created at this site (Photograph 4-2). The ground surface outside the road cut is no longer visible, including the slopes that trend up the edge of the road. Construction equipment and all personnel will stay outside the site boundaries, primarily because the slope leading up to the site is steep, treacherous, and slippery; machines cannot approach the site and cause damage.

Due to the dense vegetation coverage on Santa Cruz Island, updated recordation and documentation of the sites within the ADI would require subsurface investigations. Subsurface investigations are not only costly and time-consuming, but they also cause unnecessary damage to sites. Therefore, in the event that a cultural resource can be avoided (like CA-SCrI-465), no further documentation or subsurface testing is proposed.

To ensure avoidance of the site, stakes will be placed around the site boundaries prior to construction. These stakes need only mark the presence of a resource, because the resource will be easily avoided during construction. These stakes will be inserted into the ground at 20-30 cm (8-12 in) below the modern ground surface. They will be removed once construction is complete. No further testing or mitigation measures are recommended at this site.

Photograph 4-3. Navy Road near CA-SCrI-465. No profile could be drawn due to dense vegetation coverage and lack of profile visibility.

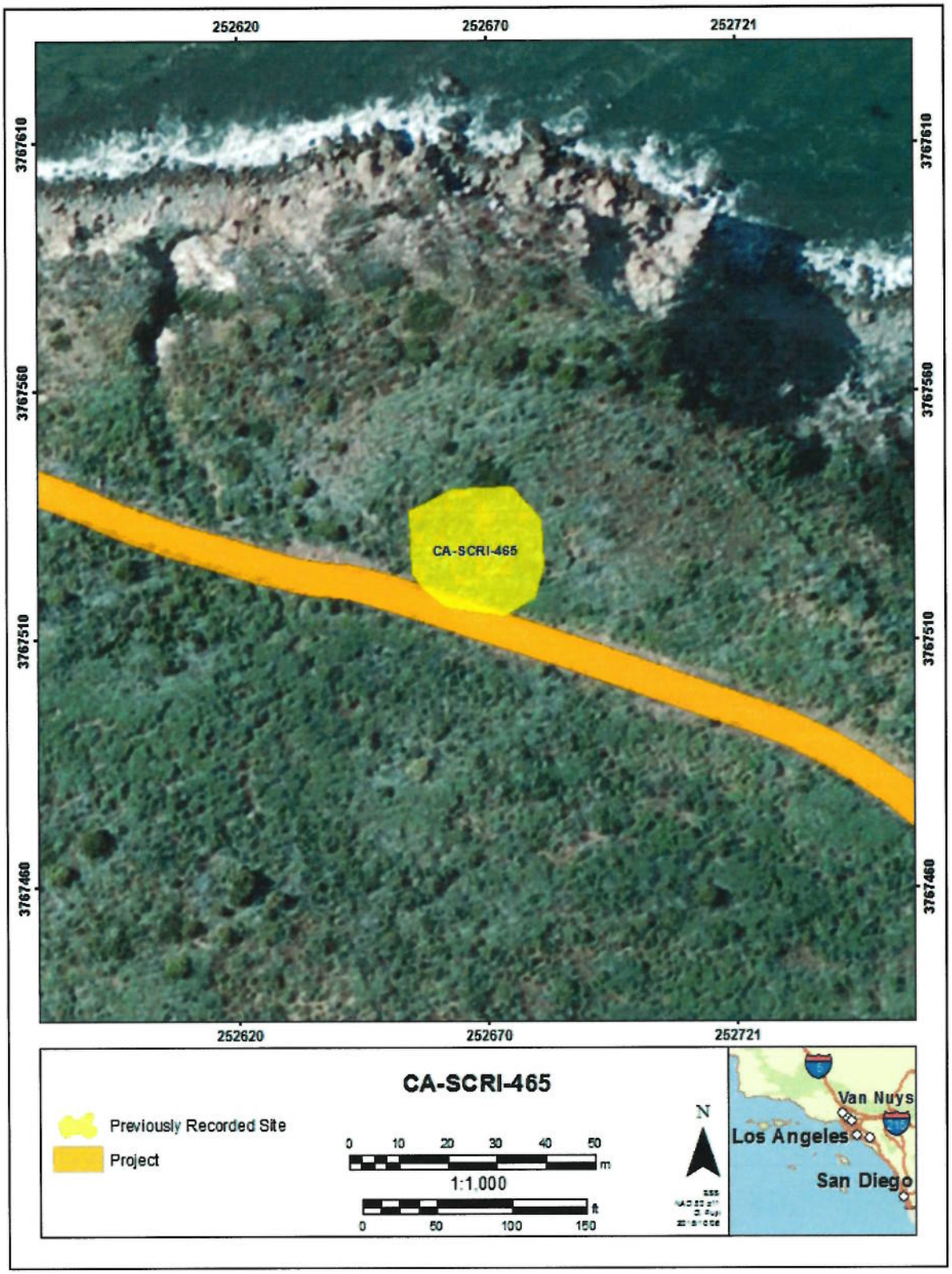

Figure 4-8. Location of CA-SCrI-465 in relation to the ADI.

CA-SCrI-466

Recorded in 1988, this site consists of a shell midden and lithic scatter. It is situated on the northern and western edges of the first ridge east of Prisoners Harbor. Intact shell midden is located primarily south and upslope from the Navy Road. The site map indicates that a secondary deposit of shell and flake is intersected by the road and continues northward and downslope (toward the ocean). The steep road cut to the south is suspected to have been the result of either slope wash or the construction and maintenance of the Navy Road. The most prevalent shellfish species observed are California mussel (*Mytilus californianus*) and black abalone (*Haliotis cracherodii*), but also include wavy top turban and barnacles. Chert flakes, a chert core, two mortar fragments (material type not listed), and one marine mammal bone were noted.

The FOCUS Cable ADI bisects site CA-SCrI-466 (Figure 4-9), but as discussed above, the majority of cultural material at this site is found upslope and south of the Navy Road. To aid in the determination of effects to historic properties, the site was revisited to create a cross-section of the road and a profile of the stratigraphy found in the road cut (Figure 4-10; Photograph 4-4). Due to several invasive plant species, the ground surface outside the road cut is no longer visible. Therefore, a profile was created of the stratigraphy in the road cut to illustrate: 1) the lack of cultural resources in the profile; and 2) that the contents of the site will be avoided during installation and maintenance because it is located 0.25 to 3 m above the road bed, where all construction will occur. The Navy Road, within the boundaries of CA-SCrI-466, has been notched into the native bedrock. Construction equipment and all personnel will stay outside the site boundaries, primarily because the slope leading up to the site is steep, treacherous, and slippery; machines cannot approach the site and cause damage.

Due to the dense vegetation coverage of invasive and native species on Santa Cruz Island, updated recordation and documentation of the sites within the ADI would require subsurface investigations. Subsurface investigations are not only costly and time-consuming, but they cause unnecessary damage to sites. Therefore, in the event that a cultural resource can be avoided (like CA-SCrI-466), no further documentation or subsurface testing is proposed.

To ensure avoidance of the site, stakes will be placed around the site boundaries prior to construction. These stakes need only mark the presence of a resource because the resource will be easily avoided during construction. These stakes will be inserted into the ground at 20-30 cm (8-12 in) below the modern ground surface. They will be removed once construction is complete. No further testing or mitigation measures are recommended at this site.

Photograph 4-4. View of the stratigraphy in the road cut near CA-SCrI-466.

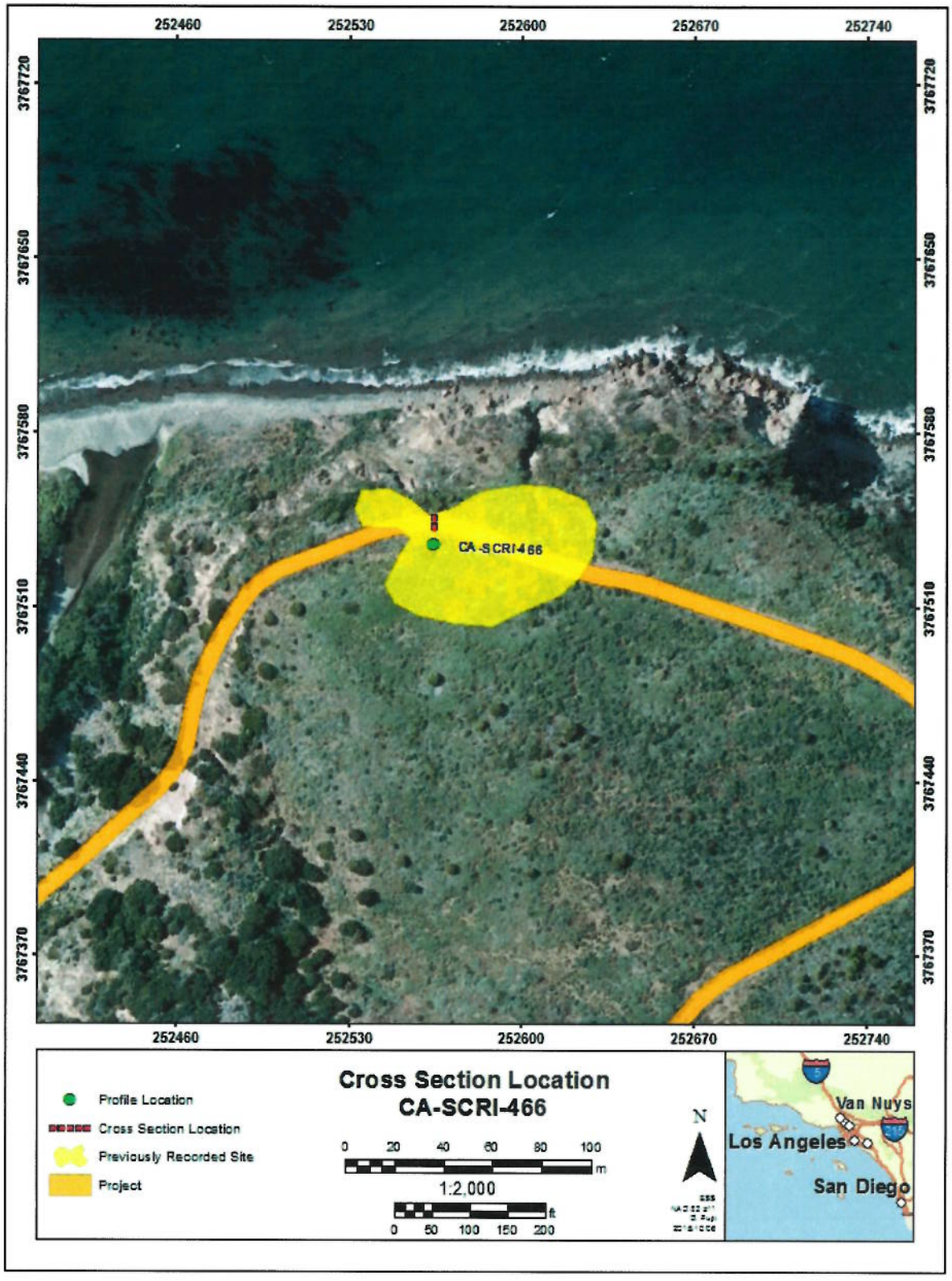

Figure 4-9. Location of the cross-section and profile at CA-SCrI-466 within the ADI.

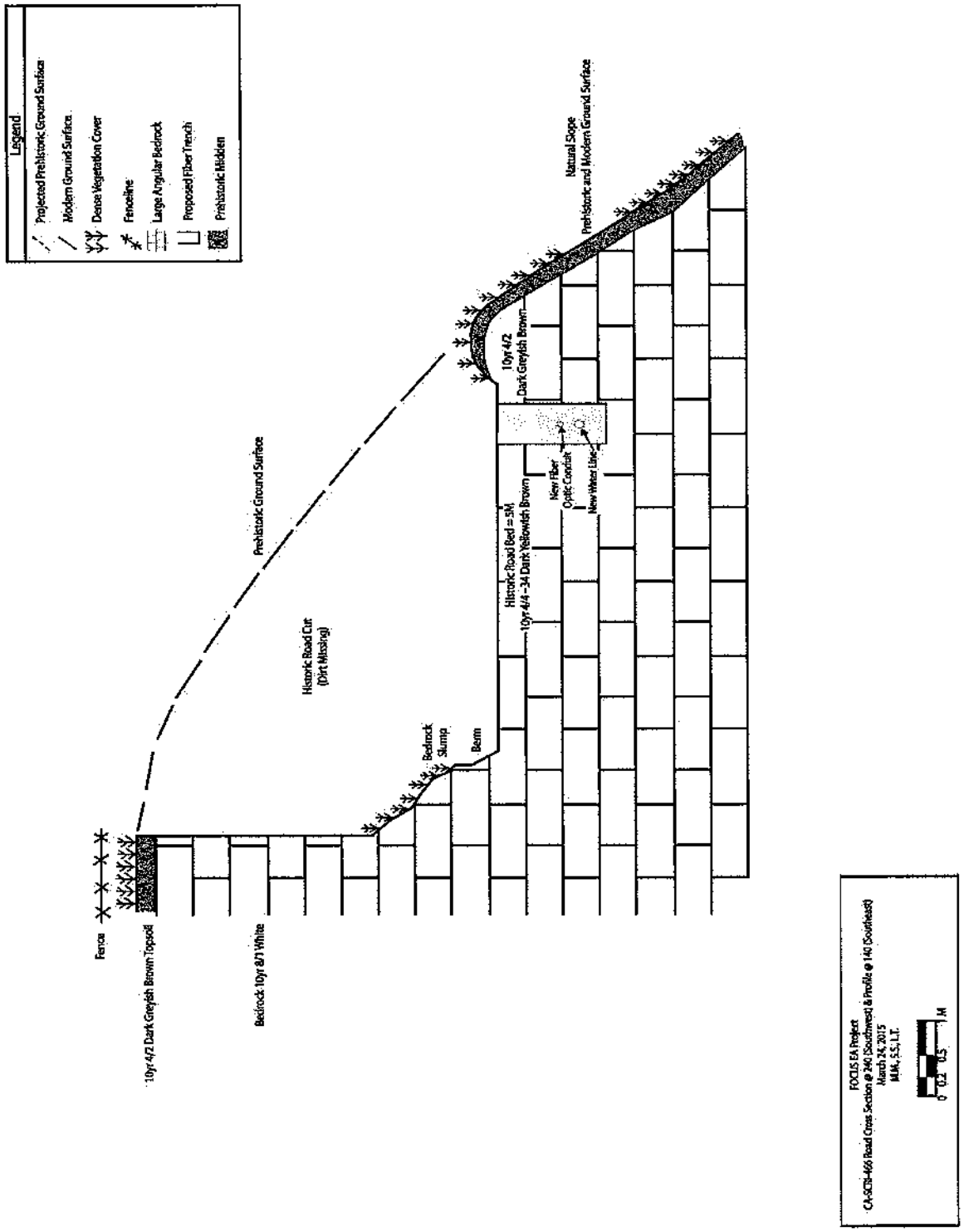

Figure 4-10. Cross-section and profile of stratigraphy for the roadcut at CA-SCrI-466.

CA-SCrI-240/CA-SCrI-439

The site form description of site CA-SCrI-439 (which is now part of site CA-SCrI-240) is short. Recorded in 1987, this site is described as a shell midden situated on the western side of a prominent hill that forms the eastern boundary of Prisoners Harbor (Figure 4-11). The form indicates that the Navy Road runs throughout the northern portion of the site, and that its construction and maintenance had resulted in the removal of midden materials. Abundant shellfish species include California mussel, black abalone, and wavy top turban. Chert cores and flakes, as well as basalt flakes, were noted at low densities. Artifacts observed include chert bifaces, chert core tools, battered and pitted basalt cobbles, and hammerstones. This site has been combined with site CA-SCrI-240 and is hereafter referred to as CA-SCrI-240.

The large shell mound in site CA-SCrI-240 at Prisoners Harbor has attracted the attention of archaeologists since the late 1800s, and its artifacts have long played important roles in understanding the chronology of the island's occupation. Paul Schumacher conducted the first casual excavation there (and at other sites on the island) in 1875, during which he exposed 40 skeletons and collected fishhooks (Glassow 2010:A.20). Unfortunately, since Schumacher kept no provenience information, none of the artifacts obtained during this excavation and others on Santa Cruz Island, which are housed at the Smithsonian Institution, can be associated with specific sites. Other early reconnaissance of coastal sites, including at CA-SCrI-240 (UCB-SCrI-147), were conducted by Leonard Outhwaite in 1916, David Banks Rogers in 1927, and Ronald Olson in 1927 and 1928 (Glassow 2010:A.21–A.27). In 1950, Phil Orr visited the site, apparently with the intent of salvaging two human burials that were eroding from the stream channel (Glassow 2010:A.31). In 1968, Robert Hoover (1971) revisited sites that Olson had excavated, including CA-SCrI-240, to refine Olson's artifact typologies and island chronology. He conducted topographic mapping, surface collections, and limited excavations to assist in interpreting Olson's materials (Glassow 2010:A.34). Most of the artifacts associated with these various projects are housed at the Santa Barbara Museum of Natural History and the Lowie Museum at the University of California, Berkeley. Significant outcomes of this early research include Olson establishing the first chronology of the island and Hoover's subsequent refinement, as well as Rogers (1929) publishing one of the earliest regional archaeological syntheses, *Prehistoric Man of the Santa Barbara Coast, California.*

Beginning in 1973, Albert Spaulding and Michael Glassow conducted a survey and excavation at CA-SCrI-240 and in the vicinity of Prisoners Harbor (Glassow 2010:A.37). It was during this survey that a new site numbering system was established for the island because of the inability to correlate site locations with older maps stored at UC Berkeley. The shell mound at Prisoners Harbor, formerly recorded as UCB-SCrI-147, was assigned its current trinomial: CA-SCrI-240. In the process of recording the site, their field crew (Ehmann, Horne, and Hewitt) also noticed human remains eroding from the stream channel, but did not remove them. With respect to cultural materials on the site surface, they observed "many" cores, flakes, and manos; a metate and a charmstone; and abundant fire-affected rock. No specific shellfish species are listed on the site record, but it does document the presence of whale, marine mammal, and fish bone. The diversity of artifacts, the abundance of flaked stone tools in particular, and the presence of human burials is consistent with previous observations.

In 1974 and 1976, Spaulding and Glassow conducted excavations at CA-SCrI-240 (Glassow 2010:6.12–6.13; A.39–A.42). Their goals included determining the maximum depth of deposits, obtaining midden samples using modern volumetric controls, and obtaining radiocarbon samples. The maximum depth reached was 5 m in a trench excavated on the south side of the mound; however, because they had to stop their excavations when they reached the water table, they did not reach the bottom of the midden deposits. They collected a variety of flaked and ground stone tools, consisting of chert flakes and cores, with the majority of the collection stored at the University of California, Santa Barbara. In 1976, they conducted a small-scale excavation during which they were able to continue to a depth of 180 cm (71 in) below what was reached in 1974 (Glassow 2010:6.12). One of the outcomes of this research was the collection of

radiocarbon samples that indicate that CA-SCrI-240 was inhabited for at least 3,000 years (Arnold 1987, 1990; Kennett 2005:260, Table 14).

Since then, Jeanne Arnold (2001a) has conducted the most substantial archaeological investigations at Prisoners Harbor, beginning with a survey to the east of CA-SCrI-240 in 1988 (Glassow 2010:6.29–6.30). In the summers of 1991 to 1997, she excavated a total of 13 units at CA-SCrI-240 to depths of 55-70 cm (22-28 in, see map of excavation units in Arnold 2001b:49; Glassow 2010:6.41–6.42). Arnold concentrated her efforts in the western portion of the site with the intent to avoid previous excavations and human burials (2001b:50). As a result, she identified a house feature that became the focus of a multi-year project. The house floor, referred to as House 1, is defined by a perimeter of broken, but upright, redwood posts, with surrounding cultural materials dating to the Late Period and Historic Period (Arnold 2001b:50–51).

In 1995 Arnold and her colleagues conducted a geophysical survey in two areas of the southwestern portion of the site; in 1995 and 1996 she and Anna Noah (2005) also excavated two auger samples. None of this fieldwork identified other discrete cultural features such as house floors (Glassow 2010:6.49–6.52). However, the areas sampled were small compared with the overall site area and therefore are not reflective of the site as a whole.

Subsequent archaeological testing has been limited to auger testing to determine site boundaries with greater confidence. In association with the restoration of wetlands at Prisoners Harbor by Channel Islands National Park, in 2007 Nichole Jordan and Amy Kovak at Pacific Legacy focused on the western boundary of the site where little research has been conducted (Jackson and Jordan 2007). Because of the dense vegetation and limited ground visibility, they excavated 18 auger samples spaced at 20 m apart, of which six yielded cultural materials. Since their objective was to determine site boundaries and not the maximum depth of deposits, the auger probes were terminated as soon as they found cultural materials. In addition to the abundant marine shell and flaked stone, they observed marine mammal bone and Olivella shell bead blanks.

As a result, Jackson and Jordan (2007) revised the site boundaries to 145 m north-south and 80 m east-west. The auger probe results along the western edge largely conform to the previous western site boundary established by Arnold in the 1990s. They acknowledged that midden deposits extend eastward beyond the streambed. The most current maps of site boundaries and subsurface testing are found in Arnold (2001:49, Table 2.26; 50, Table 2.27) and Jackson and Jordan (2007: Figure 1). However, because of the dense vegetation and the shifting trajectory of the creek, among other impacts, the site boundaries are not known confidently in all directions at CA-SCrI-240.

In addition to Arnold's excavations and investigations, CINP has conducted limited subsurface investigations over the years. One such investigation was the placement of five augers near the southwestern boundary of site CA-SCrI-240 (Minas 2007). Another investigation was performed near the western edge of the site, both within and just outside of the known site boundary (Minas 2016). See Figure 4-11 for locations of these subsurface investigations.

In 2007, the NPS proposed the installation of a new parking lot within the boundaries of site CA-SCrI-240. In an effort to determine if intact subsurface deposits were located within the proposed lot, Kelly Minas (2007) placed five augers within the proposed 10 × 20 m parking area (augers identified on Figure 4-11). The augers were placed at 5-m (16 ft) intervals and excavated at 10-cm (4 in) levels. The results indicated that cultural materials were not present within the top 40 cm of sediment. Depending on the auger, cultural materials were encountered from 40 to 67 cm (15.7-26.4 in) below ground surface.

In 2016, the CINP began restoration of wetlands within and adjacent to site CA-SCrI-240. During the restoration, some sediment was excavated near and within the boundaries of the site (Minas 2016). All ground disturbing activities were monitored by an archaeologist and a Native American. Two areas (identified on Figure 4-11) resulted in the identification of intact, subsurface, cultural deposits. These deposits are thin lenses of cultural strata that measure 6-30 cm (2-12 in) in thickness. The deposits were encountered from 8-20 cm (3-8 in) below ground surface during excavation and they consisted of both historic and prehistoric remnants.

***Cultural Significance of Prisoners Harbor, CA-SCrI-240, and the Chumash village of* Xaxas**

Based on the excavations conducted at CA-SCrI-240 in the 1970s and 1990s, the area of Prisoners Harbor was occupied without significant interruption for approximately 3,000 years (Arnold 2001b:48–52). Based on Spanish mission records from Mission Santa Barbara and Mission San Buenaventura, the village of *Xaxas* was abandoned by 1819, making it the last probable place on the northern Channel Islands to be permanently occupied by the Chumash people (Johnson 2001:64). The definitive association between CA-SCrI-240 and *Xaxas* is based on historic evidence, including written reference to the village when Spanish missionaries visited what is now known as Prisoners Harbor in the early 1800s and proposed the establishment of a mission there (Johnson 1993:23), as well as the description of the village location by Juan Estaban Pico (Glassow 2010:3.9, Table 3.1). Supporting ethnohistoric and archaeological evidence includes Spanish mission records describing individuals who lived at *Xaxas* and their specific roles in Chumash society (Johnson 2001); the archaeological identification of cultural materials associated with activities conducted in the context of these roles; and artifacts dating to the Historic Period, including those from the missions on the mainland (Arnold 2001a).

Overall, the archaeological and ethnohistoric data highlight the tremendous cultural significance of CA-SCrI-240 as a large Chumash village, regional economic center, and home of political elites. Its stratified deposits date to the Late Holocene and continue to provide important insights into the Middle Period, Late Period, and Historic Period on the Channel Islands. As stated by Noah (2005:322), "The potential for learning more about the layout and economic relationships involving a community such as *Xaxas* that supported elite families and served as a regional trade center can hardly be overestimated."

Archaeological Evidence

Despite excavation at various times during the past 125 years, most of the current archaeological information about CA-SCrI-240 is derived from Arnold's excavations and analyses. Research at CA-SCrI-240 is detailed by Arnold (1987), Arnold et al. (2001a) in the chapters of her edited volume, and by Noah (2005), who conducted detailed analyses of faunal remains at CA-SCrI-240 and discusses it further in the context of her doctoral dissertation. A short synopsis of the history of research at the site is provided by Arnold (2001b:48–52). The following is a summary of their findings and interpretations of Late Holocene deposits, with emphasis on two strata in the area of the house floor dating to the Historic Period.

Deposits spanning the Middle and Late Periods were first identified during Spaulding and Glassow's excavations in 1974. The subsequent analysis of chert microblades and microblade cores, shell beads, and radiocarbon dates obtained from these deposits were critical to establishing the chronology of chert microdrill production associated with Olivella shell bead manufacture. Spaudling and Glassow's excavations and Arnold's analyses are summarized in Arnold (1987:191–200).

Arnold's subsequent excavations in the western portion of the site were concentrated in the upper 60 to 70 cm (24 to 28 in) of deposits, where she identified a house feature. The three strata identified at House 1 are referred to as the upper stratum, abalone stratum, and house floor or floor accretion in Noah's (2005) detailed analysis. The "upper stratum" refers to a Historic Period midden that extended from 15 to 25 or

30 cm (12 in) in depth across all of the units. Below this layer is the "abalone stratum" that varies from 5 to 15 cm (2 to 6 in) in depth and is characterized by an abundance of whole abalone shells and complete animal bones. The maximum dimensions of this deposit are unknown but extend at least 5 m (16 ft) east-west and 4 m (13 ft) north-south across the excavation units. Below this stratum is the house floor with redwood posts, indicating that the "abalone stratum" was deposited after the house was abandoned. As discussed in Arnold's (2001a) edited volume and Noah's (2005) dissertation, there are significant differences between these strata with respect to the density and diversity of faunal remains and artifacts.

Site occupants relied upon a variety of marine and terrestrial species, with fish, shellfish, and sea mammals, respectively, being the most important contributors to the diet in terms of animal protein (Noah 2005:221–230). The shellfish species identified are those prevalent at many coastal middens on Santa Cruz Island, including abalones, limpets, and barnacles, with the California mussel dominant in terms of count and weight (Noah 2005:250). The most common fish include rockfish, surfperch, Pacific mackerel, and billfish, which Noah interprets as having been caught primarily with harpoons and nets. Some of these, such as swordfish and Pacific mackerel, are pelagic species that would have required the use of boats. Sea otters, seals, sea lions, and dolphins are also represented in the faunal remains (Noah 2005:230–236, 252). Marine and terrestrial birds were less important to subsistence.

In addition to everyday staple foods, the abalone stratum also contains the remains of what are regarded as desirable or high-status foods including swordfish, dolphin and other marine mammals, and sea turtle (Noah 2005:254, 312). Furthermore, the higher proportions of forelimb elements compared with less meaty hind limbs in site deposits has been interpreted by Colten (2001) and Noah (2005:252) as reflective of higher-status cuts of meat. Other ways in which the abalone stratum differs from other strata is the higher proportion of large-bodied shellfish such as abalone and the subtidal wavy top turban, as well as their occurrence as whole rather than fragmented shells.

Residents of CA-SCrI-240 were involved with a variety of craft specializations, including the making and use of shell beads, ornaments, and fishhooks (Arnold and Graesch 2001); bone tools such as awls and barbs (Wake 2001); and flaked stone tools including macrodrills and microdrills (Arnold 1987; Arnold et al. 2001; Preziosi 2001). Beads were manufactured from several different types of shell including Olivella, Pismo clam (*Tivela stultorum*), red abalone, and California mussel (Arnold and Graesch 2001). Compared with the other village sites that Arnold and her team analyzed on Santa Cruz Island, the excavated deposits at CA-SCrI-240 also contained a higher number of shell ornaments, including types that are relatively rare on the northern Channel Islands (Arnold and Graesch 2001:107).

In particular, inhabitants of *Xaxas* were involved with craft specializations related to the production of the Olivella shell currency (see Arnold and Graesch [2001:87–90] for in-depth discussion of Olivella shell bead making at CA-SCrI-240). Because of intra-island environmental differences described previously, people in villages on the eastern end of the island were primarily involved with the chert microdrill industry, whereas those to the west, where sandy beaches are more common, were focused on shell bead production. CA-SCrI-240 represents somewhat of a unique situation in the island economy in that its occupants produced large quantities of both the shell beads and the chert microdrills used to make the beads (Arnold 1987, 2001b; Arnold et al. 2001; Arnold and Graesch 2001; Preziosi 2001). As Arnold (2001b) noted, this was possible because of the central location and environmental characteristics of Prisoners Harbor, as well as the marriage and economic networks that connected villages throughout the island.

Not only were village residents involved with island craft industries, and likely exported their manufactured goods to other villages, they also imported a variety of items from the mainland, including the bones of deer (Graesch 2001; Noah 2005; Wake 2001). Of the village sites that Arnold and her team excavated on Santa Cruz Island, "...the greatest diversity and the highest densities of European-made and

other exotic artifacts" were found in the excavated deposits at *Xaxas* (Graesch 2001:282). Included in this list are artifacts that were manufactured elsewhere on the islands, such as soapstone (steatite) comals (heating stones), ollas (bowls), and other vessels (Graesch 2001:269). European-made goods include metal items such as iron nails and copper vessels; glass, especially dark green bottle glass, of which some was flaked to make tools; and glass beads (see also Noah 2005:272, Table 9.13). As Graesch (2001) and Noah (2005:273) observed, the majority of the exotic items found at CA-SCrI-240, including "copper, soapstone, ceramic, and glass vessel fragments come predominantly, and in some cases exclusively, from levels within the abalone stratum."

Furthermore, CA-SCrI-240 is one of the few sites on Santa Cruz Island that is definitely associated with a named village and where Spanish mission artifacts have been found in its deposits (Arnold 1994, 2001b; Graesch 2001, 2004; Noah 2005). These mission items include a "Mission Pottery" sherd and two bronze crucifixes (Graesch 2001:267; Noah 2005:273), which date the deposits between 1786 (the founding of Mission Santa Barbara) and 1819 (the year of the last baptisms recorded for *Xaxas* residents) or 1824 (the year of the Chumash revolt in which some islanders returned to Santa Cruz Island for a short period of time (Hudson 1976). The crucifixes were recovered from the top of the abalone stratum, suggesting that Christianized Chumash people with whom they traded were present at the feast or other important occasion (Noah 2005:281).

Arnold and her colleagues have interpreted these data as being reflective of *Xaxas* as a major economic center and the home of craft specialists and elite Chumash families for decades, if not hundreds of years. Supporting lines of evidence include the construction of the house using redwood posts and the relative abundance and diversity of high-status items contained therein (Arnold 2001a; Graesch 2004). In addition, Arnold (2001a) and Noah (2005) have made a convincing argument for the occurrence of a feast after the abandonment of the house, as represented by the unusual abundance and diversity of cultural materials in the abalone stratum. As summarized below, the available ethnohistoric data support these interpretations.

Ethnohistoric Evidence

The majority of the ethnohistoric evidence regarding the village of *Xaxas* (also referred to as *Cajats*) is the result of extensive archival research conducted by Johnson (1982, 1988, 1993, 1999, 2001). The majority of the baptized Chumash who came from *Xaxas* went to Mission Santa Barbara, while the rest went to Mission San Buenaventura, where most of the residents of the villages of *Liyam* and *Swax#l* also went (Johnson 2001). According to baptismal records from these missions, *Xaxas* (n = 130) was one of the largest Chumash villages on the Channel Islands, second to *Swax#l* on eastern Santa Cruz Island.

Johnson's research (1999, 2001) also supports archaeological interpretations that *Xaxas* was the residence of craft specialists and elite families during the Historic Period. Individuals identified in the mission records include those who were makers of shell beads and chert microdrills, plank canoe owners, dancers, and members of the *'antap* ritual organization (Johnson 2001:61, Table 3.4). The written documentation of plank canoe owners is corroborated with the archaeological recovery of pelagic fish species such as swordfish that had to be caught in tomols on the open ocean.

In addition, it is evident that the elites of *Xaxas* were connected to other important villages on the island and mainland through marriage. According to Johnson (2001), a chief and a wife of a chief of *Liyam* (a politically important village on the south shore of the island), and the father of the wife referred to above may have been the paramount chief of Santa Cruz Island (Johnson 2001:64), further illustrating the important political connections between residents of *Liyam* and *Xaxas*. According to Warren (1977), another woman at *Xaxas* was married to Yanonali, and two of their children were born there. Yanonali was the chief of *Syuxtun*, an important village in present-day Santa Barbara, and his political influence extended to other, possibly as many as 13, mainland villages (L. King 1982).

Whereas most of the island Chumash had entered the mission system by 1816, some families stayed at *Xaxas* until 1819 (Johnson 2001:64). Based on Johnson's analysis, it appears that these were no ordinary families; instead, they were among the last of the political elites to remain on the northern Channel Islands.

NRHP Eligibility Status for CA-SCrI-240

Site CA-SCrI-240 is a contributing element to the Santa Cruz Archaeological District. The site is likely also eligible individually under Criterion A because it was occupied for 3,000 years continuously and can be documented by archaeological and ethnohistoric evidence. Site CA-SCrI-240 is also eligible for listing under Criterion D because it contains much further subsurface data potential, including (but not limited to) other house features, tool manufacturing loci, and human burials (Glassow 2013).

To aid in the determination of effects to historic properties, the site was revisited to create a cross-section of the road and a profile of the stratigraphy (Figure 4-12; Photograph 4-5) found in the road cut. Due to several invasive and native plant species, the ground surface outside the road cut is no longer visible. Therefore, a profile was created of the stratigraphy in the road cut to illustrate the lack of cultural resources in the profile (sterile fill that was used to build up the road). Construction equipment and all personnel will stay in the road cut during installation in the eastern half of the site because the slope leading up to the Navy Road is steep, treacherous, and slippery; thus, machines could not approach the road shoulders in the eastern portion of the site and cause damage. Proposed testing of this site is described in Chapter 6 below.

Historic Resources

There are two historic resources that intersect with the FOCUS Cable installation ADI: the Navy Road and the 1887 Warehouse at Prisoners Harbor. All other historic resources located near the ADI will be avoided during construction and maintenance of the FOCUS Cable.

Navy Road

The Navy Road extends across most of Santa Cruz Island. Portions of the Navy Road connected previously existing roads and trails (NPS 2004). Further, the road became an integral part of the Stanton ranching operations and subsequent NPS activities.

As noted in Chapter 3, the facilities at Point Mugu and the overall historic Cold War operations are considered eligible for listing in the NRHP (Wee and Byrd 2000). The Navy Road is also a contributing element to the Santa Cruz Island Historic Ranching District, which is an NRHP-eligible district. However, since the Navy Road will be returned to its current state after FOCUS Cable installation and maintenance, no further work is proposed for the Navy Road.

1887 Warehouse at Prisoners Harbor

One of the most important features related to historic ranching activities within the project area is found at Prisoners Harbor. Rancho la Playa, the ranching facility at the harbor, was developed by Justinian Caire between 1857 and 1892. This ranch was a significant early settlement on the island, consisting of a ten-room, two-story living structure with several outbuildings, including a separate kitchen, a shed, a warehouse, a slaughterhouse, chicken coops, a turkey cage, and a watchtower. There were also three major agricultural fields for hay and alfalfa associated with Prisoners Harbor and the ranch, called Campo Primero, Campo Segunda, and Campo Tercero. Caire also planted a number of trees, including a row of eucalyptus trees around the warehouse and sheep pens. Unfortunately, few of these original features exist

today, with the exception of the warehouse, some eucalyptus trees, and corrals, which are considered important contributing elements to the district.

The Warehouse at Prisoners Harbor on Santa Cruz Island is a contributing element to the Santa Cruz Island Historic Ranching District, which is an NRHP-eligible district. However, the FOCUS Cable installation will only temporarily affect the setting of this resource. Staging areas and construction equipment will be temporarily located near the site (Figure 4-13). After installation is complete, the setting of the site will be returned to its current condition. During construction of the FOCUS Cable, the Warehouse and all its outbuildings will be avoided. No further work is proposed at the Warehouse..

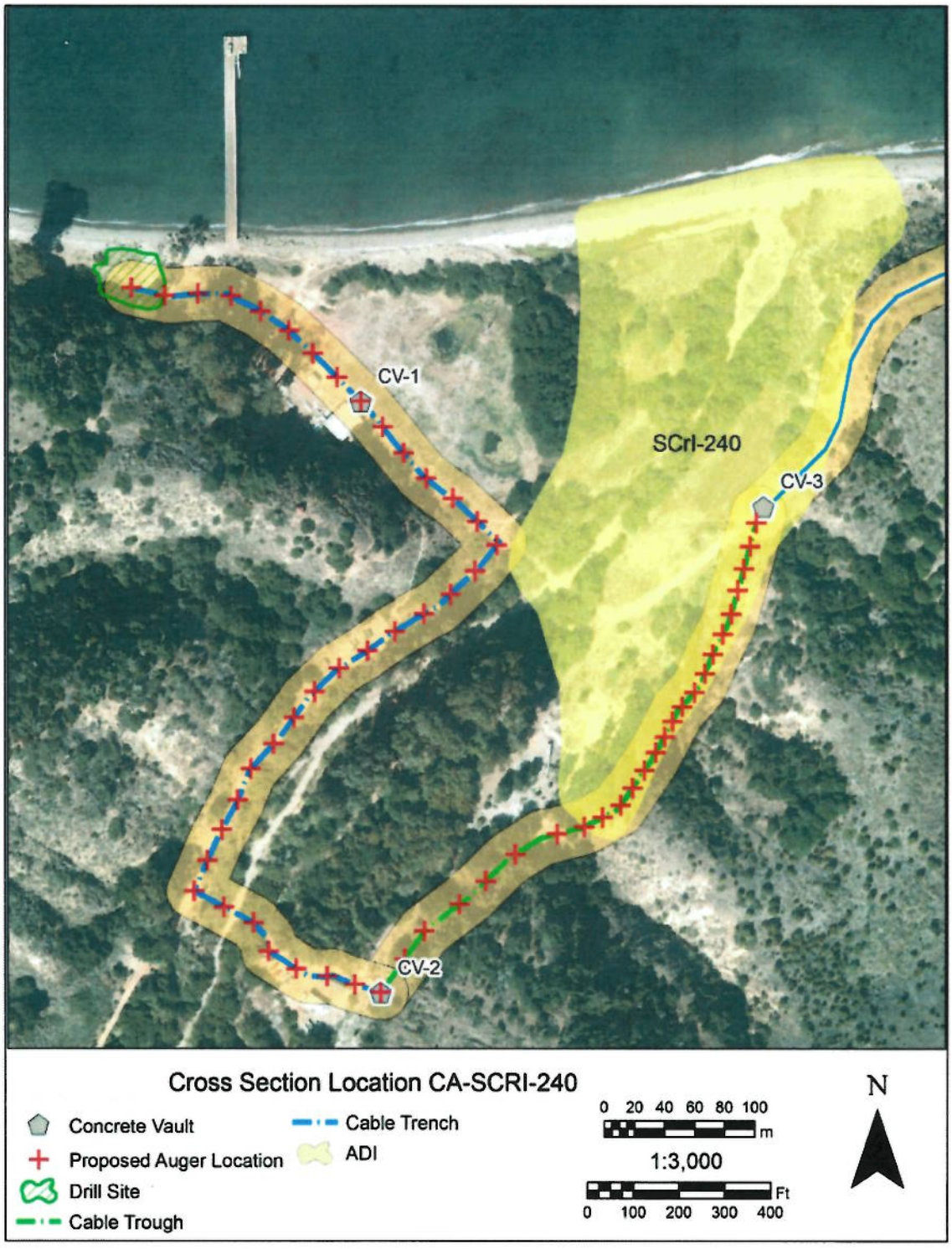

Figure 4-11. The location of the cross section and profile at CA-SCrI-240/439 within the ADI.

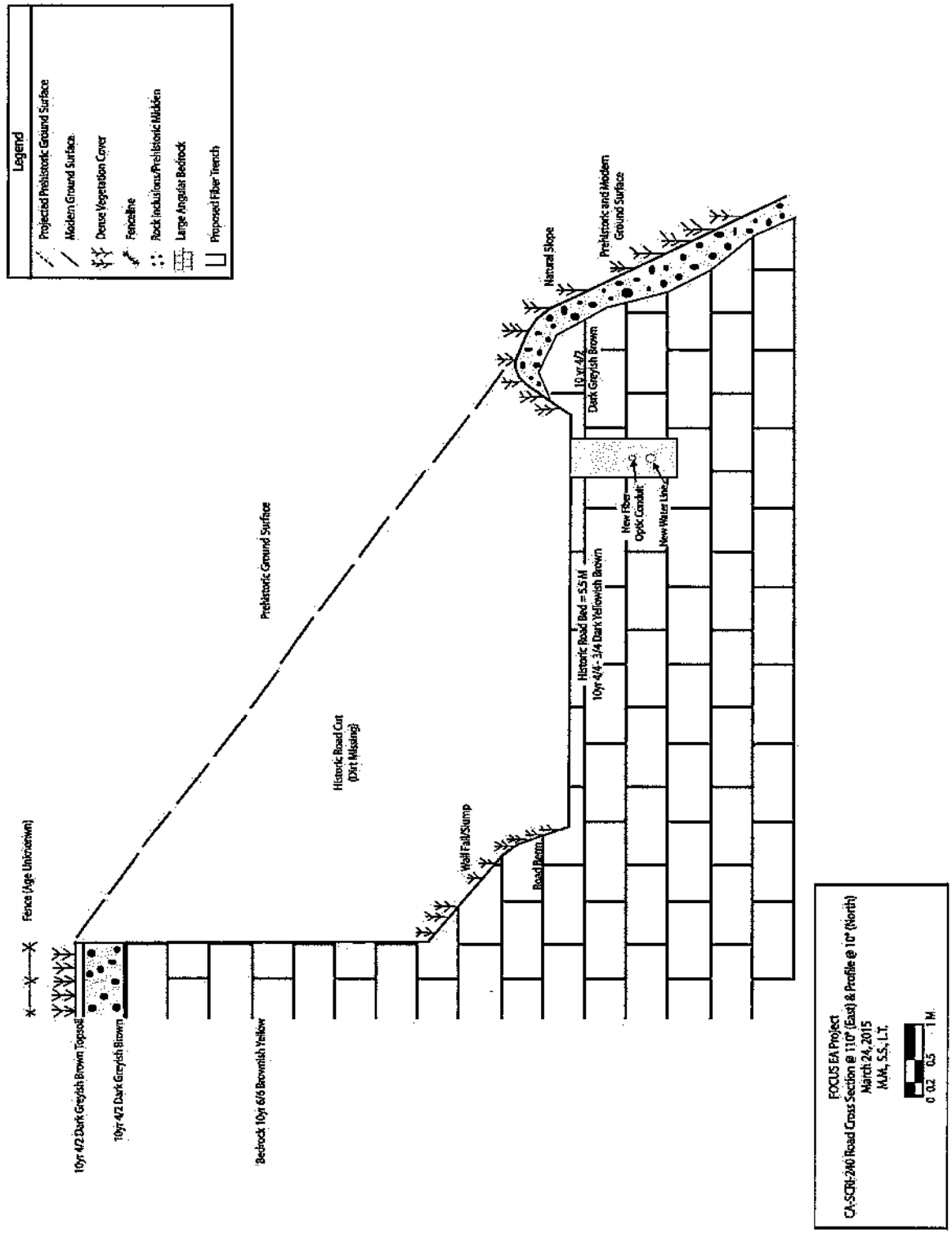

Figure 4-12. Cross-section and profile of stratigraphy for the roadcut at CA-SCrI-240/439.

Photograph 4-5. View of stratigraphy in the road cut in the northeast portion of CA-SCrI-240/439.

Figure 4-13. The location of the 1887 Warehouse at Prisoners Harbor.

5. EVALUATIVE RESEARCH THEMES

Based on the review of the cultural context of the study area and environs discussed in Chapter 2, multiple research issues relevant to the current project can be developed. The research issues discussed below serve three main purposes. First, they address the direction of current research concerns for the area. Second, the research issues provide a framework for testing sites encountered during the current project. Finally, they aid in determining whether or not FOCUS Cable installation and maintenance will adversely affect any cultural resources.

Research Questions

Specific research questions have been developed to determine if the sites identified within the ADI have the potential to contribute pertinent data to the research themes. Further, the CINP Overview and Assessment (Glassow 2010) lists attributes that illustrate special significance for sites and groups of sites on the Channel Islands, which the following list incorporates.

The following are questions that pertain to any site within the ADI where subsurface testing locates cultural deposits:

- Based on radiocarbon dating and temporally diagnostic artifacts, what is the chronology of site occupation?
- Do any site deposits date to the Early Holocene or earlier?
- Do any site deposits date to the Middle Holocene and, if so, do they fit within the regional pattern defined by previous researchers? In particular, is there any evidence of subtidal shellfish exploitation?
- Are any midden deposits contemporaneous with Late Period or Historic Period occupation?
- Is there any evidence of craft specialist activities such as the production of microdrills, Olivella shell beads, or other shell beads or ornaments?
- Are any of the artifacts identified during surface observations or subsurface testing items that were definitively imported from the mainland or other islands (e.g., lithic materials such as obsidian, fused shale, and Franciscan chert; and other items such as deer bone)?

The following are additional questions that relate to cultural deposits found at CA-SCrI-240 specifically:

- Do radiocarbon dates obtained from auger testing support prior interpretations about the site's chronology or suggest even greater complexity in site occupation?
- Is there any evidence of house structures (e.g., house floors, posts/postholes) or other significant features (e.g., roasting pits)?
- In addition to evidence of craft specialists, is there any other evidence of the historically documented roles that Chumash residents played in different economic, political, and ritual settings?
- Is there evidence of Mission artifacts? If so, are these findings consistent with what has been found previously at this site?

Prehistoric Research Issues

The prehistoric research issues pertinent to the current project and specifically to CA-SCrI-240 are 1) site chronology; 2) Middle Holocene and earlier occupation; 3) Late Period and Historic Period occupation; 4) site layout; and 5) site function.

Site Chronology

With the exception of CA-SCrI-240, few radiocarbon dates have been obtained from sites on and near the Isthmus. Shell midden sites within the project alignment have the potential to contribute significantly to the understanding of cultural and environmental variability on Santa Cruz Island. In regard to CA-SCrI-240, radiocarbon dates have been obtained from select areas of the site during previous excavations. Much of this research has been focused on deposits dating to the Late Holocene, specifically the Middle, Late, and Historic periods. What remains unclear is whether the current understanding of the site's chronology is reflective of the site as a whole, particularly with respect to occupation prior to the Middle Period. Further, given that previous excavations reached the water table before encountering sterile deposits, it is possible that the site and overall area of Prisoners Harbor may have been initially inhabited earlier in time.

Middle Holocene and Earlier Occupation

As previously documented, a regional pattern has been identified on the northern Channel Islands, in which people shifted to becoming increasingly tethered to the coast during the Late Holocene. During the Middle Holocene, islanders spent some of their time living in interior and upland locales presumably to take advantage of a range of terrestrial resources and pathways. With respect to marine resources, they also appear to have targeted subtidal shellfish (such as red abalone and wavy top turban) and transported them throughout the island. CA-SCrI-240 is the only site within the ADI that is known to have deposits dating to the Middle Holocene and they are poorly understood compared to the site's Late Holocene occupation. Additional data sets from CA-SCrI-240 or any of the shell middens within the ADI that may have Middle Holocene deposits have the potential to yield specific insights into the regional pattern of coastal-interior settlement at this time and the relationship between terrestrial and marine resource exploitation.

Although the number of sites known to have deposits dating to the Early Holocene is growing on Santa Cruz Island, the earliest occupation of the island is not well understood compared to other northern islands. It is possible that deposits dating to this earlier time frame may be identified during testing at any of the sites within the ADI; however, only site CA-SCrI-240 will be tested.

Late Period and Historic Period Occupation

Compared with the ethnohistoric information about coastal villages during the Historic Period and what is already known archaeologically about villages such as *Xaxas* (CA-SCrI-240), less is known about the places to which villagers presumably conducted logistical forays to collect different resources. If any of the shell middens within the ADI have deposits dating to the Late or Historic Period, they present a unique opportunity to evaluate sites that are contemporaneous with and in proximity of a known historic village locale. Rather than interpreting the village in isolation, these other sites could contribute to understanding the broader catchment or cultural landscape of *Xaxas*. Although CA-SCrI-240 is the only site that will be tested, it is possible that outlying activity areas will be encountered. If they are, data from these can help address this research issue.

Site Layout

The archaeological boundaries of CA-SCrI-240 are unclear because of ongoing natural and human impacts, as well as a previous lack of a systematic approach to identifying the depth and extent of its subsurface deposits. Any testing conducted at this site should be focused on boundary delineation and general characterizations of site layout. What is better understood about the site is the presence of intact house features with indicators of elite status and ceremonial activity. Although no additional house or ceremonial features may be identified through testing, if any are, they would help to illuminate household structure and possibly elite roles and ritual activities.

Site Function

CA-SCrI-240 is one of the most significant archaeological sites on the northern Channel Islands because of its association with the historic village of *Xaxas*, one of the most important economic centers in this region. Ethnohistoric information about island Chumash communities correlates well with archaeological evidence of craft specialization and specialist roles, as well as involvement in regional trade. This site is rather unique in having evidence of people making both chert drills and Olivella shell beads, whereas village sites on eastern and western Santa Cruz Island only have evidence of one or the other, respectively. It is also unique in terms of the abundance and diversity of evidence of trade and interaction with the mainland through historic times. Additional testing at CA-SCrI-240 could potentially provide information about craft specialization and exchange, and thereby contribute to better understanding the relationship between trade and political complexity among the Chumash.

Historic-Era Site Types

Two major historic resource types have been identified consistent with resources identified and described in the Santa Cruz Island Historic Ranching District (HABS CA-2888; Huston 2013) and the NPS Cultural Landscapes Inventory of this district (NPS 2004) for CINP. The most significant types are those related to 1) ranching and associated settlement architecture and other features; and 2) historic roadways that have served as contributing elements to the historic district (compare with historic-era research issues in Huston 2013). Both of these types of resources are found within the project ADI and are discussed below. From these historic-era site types, and the prehistoric site types, general research issues can be developed and are discussed below.

Ranching and Settlement

As noted in Chapter 4, one of the most important features related to historic ranching activities within the project area is found at Prisoners Harbor: Rancho la Playa. Unfortunately, few of the original features associated with the Ranch still exist today, with the exception of the Warehouse and corrals, which are considered important contributing elements to the district and are located near the current project area.

Several other ranch locations within the Santa Cruz Island Ranching District, including the Main Ranch (Rancho del Medio), Scorpion Ranch, and Smugglers Ranch, still have architectural features that are considered contributing elements to the district, but are all outside the current project area.

Historic Roads

Although several dirt roads, four-wheel-drive tracks, and trails exist within the Isthmus of Santa Cruz Island (Figures 5-1 through 5-4), one of the most important is the major portion of the project area: the Navy Road. Portions of this road connect previously existing roads and trails (NPS 2004). Further, the road became an integral part of the Stanton ranching operations. In addition to the Navy Road, there are several historic roads that are considered contributing elements to the Santa Cruz Island Ranching

District, including the Loma Pelona Loop and the Isthmus Hiking Trail (see Figures 5-1 through 5-4 for an illustration of the network of trails and roads on SCrI).

General Research Issues

Communication and Trade

Because Prisoners Harbor is a central hub of both prehistoric and historic-era settlement, it can be a valuable location for furthering our understanding of intra-island, inter-island, and island-to-mainland communication. Prehistorically, how roads, trails, and boats were used to communicate with tribes and villages on other islands and the mainland is important. Little is known about the trade network among Chumash groups before contact. As noted above, site CA-SCrI-240 is particularly well-suited to answer questions of trade because it contains a unique assemblage on SCrI. Additional testing at CA-SCrI-240 could potentially provide information about trade networks and exchange, and therefore contribute to better understanding of the relationship between trade and political complexity among the Chumash.

Historically, roads and trails (as well as boats) were used to connect the various pastures and out-ranches throughout the island. Because Prisoners Harbor played such an important role in the historic-era settlement of SCrI, the resources found there could shed light on the communication and trade network within the island, with other islands, and with the mainland. Also, Prisoners Harbor could shed light on the technology used for such networks.

Needs Assessment Related to the Research Questions

Although many sites may provide pertinent information to the research questions listed below, these sites are not automatically eligible for listing in the NRHP. In addition to the ability to answer the research questions, sites must:

- maintain depositional integrity (e.g., there is an intact shell midden deposit);
- provide datable materials (e.g., radiocarbon samples such as marine shell or charcoal; temporally diagnostic artifacts such as chert microblades and specific types of Olivella shell beads);
- contain definable components (e.g., temporal components that are not mixed); and
- maintain research potential (e.g., presence of subsurface deposits indicating the potential for continued research).

Figure 5-1. Roads, trails, and features of Santa Cruz Island (from Junak et al. 1995).

6. FIELD AND LABORATORY METHODS

Field and laboratory efforts are designed to be broadly consistent with recent archaeological investigation on all northern Channel Islands, while at the same time employing investigative procedures that will be effective for determining potential impacts to site CA-SCrI-240. Because sites CA-SCrI-96, CA-SCrI-464, CA-SCrI-465, CA-SCrI-466, the Navy Road, and the 1887 Warehouse at Prisoners Harbor will be avoided during construction and maintenance of the FOCUS Cable, no further work is proposed at those sites (see Chapter 4 for complete discussion). However, to determine the potential effects to site CA-SCrI-240, fieldwork will consist of capturing a larger extent of the site both horizontally and vertically and obtaining sufficient samples of cultural deposits from the site to assess whether it will be adversely affected by the installation and maintenance of the FOCUS Cable. The following is a discussion of the proposed FOCUS Cable work within the vicinity of site CA-SCrI-240, the proposed testing for the site to occur before the work, and the proposed analysis to be conducted after the testing.

Given the need to protect and preserve the environmental integrity of Santa Cruz Island, all efforts proposed in this Testing Plan will adhere to the Biosecurity Protocols Preventing the Introduction of Nonnative Species to Channel Islands National Park, as outlined in Appendix G of the *Channel Islands National Park Final General Management Plan/Wilderness Study/Environmental Impact Statement* (NPS 2015). All applicable protocols involving personal gear, equipment and supplies, waste, dumpsters, vessels, planes, soil and gravel, and personnel education will be followed.

Proposed FOCUS Cable Work

In an effort to avoid adverse impacts to site CA-SCrI-240, the proposed FOCUS Cable installation method within the site boundaries and for all FOCUS Cable work west of the current boundaries of CA-SCrI-240. The FOCUS Cable will be installed subsurface within the existing roadbed of the Navy Road to a concrete vault (CV-1; Figure 4-11), a distance of approximately 160 m (525 ft). The Cable will continue subsurface within the existing Navy Road's roadbed to an unnamed road, where the installation will turn southwest. The cable will again be installed subsurface within the existing roadbed and follow the road as it turns southeast past the existing well pad to the road edge near the Navy's storage area. At that point, another vault will be installed: CV-2. The distance from CV-1 to CV-2 is approximately 600 m (1,970 ft). After the juncture with CV-2, the cable will be installed above ground in a channel suspended on posts along the base of the slope to the east of the access road and turn northeast until it intersects with a third concrete vault, CV-3 on the Navy Road; this section will measure approximately 350 m (1,150 ft). The cable will then be buried in the Navy Road for the remainder of the installation, which measures another 11.73 km.

Proposed Trench Line: The proposed trench line will be buried 102 cm (40 in) below the modern ground surface and will measure 30 to 51 cm (12 to 20 in) wide and 11.73 km (7.3 miles) in total length across the island. The trench will be dug using machinery and the cable will be placed in the trench along with a new water line. The trench will then be backfilled and the Navy Road will be returned to its current appearance.

Proposed Elevated Channel: The proposed elevated channel (which begins at CV-2) will be located to the east of the existing road, following the base of the slope and trend northeast toward the intersection with CV-3. The proposed elevated channel will be 16 cm (6 in) wide and suspended approximately 20 to 50 cm (8 to 20 in) above the modern ground surface. The elevated channel will be constructed of glass-fiber reinforced concrete. The elevated channel will need to be suspended using 5-cm x 10-cm (2-in x 4-in) stakes that will be inserted at 50 cm (20 in) below the modern ground surface. These stakes will be driven into the ground (not augered) and placed every 3 m (10 ft) along the elevated channel line. Those

stakes will be the only subsurface disturbance within the existing boundaries of site CA-SCrI-240 in conjunction with the FOCUS Cable installation and maintenance. The proposed elevated channel line will measure 430 m (1,410 ft) long from CV-2 (near the existing well) to the point where the cable becomes buried in a trench again at CV-3 (see Figure 6-1).

The location of CV-3 (where the FOCUS Cable returns to a trench) will be placed where the filled grade of the Navy Road is 101 cm (40 in; the proposed depth of the FOCUS Cable trench line) or more above the original ground surface.

Fieldwork

All augers will be excavated using split-core auger techniques. Split-core augers will be used because they allow for a window into the auger core while still in the auger. If possible, an auger machine that can be hand-carried will be used. If not, an auger machine that can be mounted on a vehicle with rubber tires will be used.

During all ground disturbing activities associated with the current Testing Plan, a Secretary of the Interior (SOI)-qualified archaeologist will be present.

All field excavation units (augers and Test Units [TUs]) will have an appropriate field form. Collections from each field excavation provenience will be bagged and labeled with the site number, unit designation, level, date, and excavator. A crew chief or the field director will check the bags at the end of each field day. The field director and/or crew chief will maintain the field documentation associated with the excavation unit, and the completed bags will be placed in labeled cardboard boxes until the completion of all subsurface investigations, when they will be prepared for transport to an appropriate research facility.

Overall Field Approach

The objective of the current Testing Plan is to determine if site CA-SCrI-240 will be adversely affected by installation and maintenance of the FOCUS Cable. This will be accomplished through a staged investigation at the site that variously employs the use of site recordation/documentation, auger holes, TUs, column samples, radiocarbon samples, artifact analysis, and other techniques as needed. Each technique is detailed below. To meet the project objectives, a flexible approach will be followed based on field results.

The following methods are employed to attempt to answer as many research questions as possible. Because the research questions posed are theoretical, the data collected from the following strategies may or may not be able to answer the questions.

Permitting

Permits to perform fieldwork will be facilitated by the standing relationship between CINP (the permitting agency) and NAWCWD (the project proponent). The permit will be a NPS Research and Collections permit. Additionally, an ARPA permit, authorized by the NPS regional director, will be required. These permits will allow the entire Testing Plan to be implemented and will be acquired prior to fieldwork associated with the current Testing Plan.

Site Recordation

Portions of the Navy Road and the 1887 Warehouse at Prisoners Harbor will be photographed within the FOCUS Cable installation ADI. No additional work is recommended at the Navy Road or Warehouse at Prisoners Harbor.

At CA-SCrI-240, all site documentation will be updated when and if boundaries are altered. The content of the site will be updated based on the results of the below testing procedures proposed near or within the site.

Augers

There will be a total of approximately 60 augers excavated in the vicinity of CA-SCrI-240 (Figure 4-11). Augers will be excavated using machinery that can be walked by hand between holes or by rubber-tired transport. The augers will be excavated in 6.35-cm (2.5 in) diameter holes using 46 cm (18 in) long "spoons". Spoon is the term used to define the hard-metal, hollow tube that is split in half lengthwise on split core augers. The spoon is the mechanism in which sediment is collected during split-core augering.

The sediment from all split cores will be observed for shell midden or organic (dark sediment) midden deposits. If midden deposits of any kind are identified, the boundaries of the site will be augmented to include those augers. If midden deposits are not identified, the auger fill will be dry screened using 1/8-in (3-millimete [mm]) mesh to recover any cultural material. If cultural material is identified, the boundaries of the site will be augmented to include the area with those augers.

All sediment changes that indicate the presence of cultural material (shell or organic midden) will be measured from the modern ground surface to the top of the deposit and the bottom of the deposit. This procedure will allow for any necessary TUs (described below) to be excavated in natural stratigraphic levels instead of arbitrary levels.

The water table on Santa Cruz Island is varied and in the vicinity of the augers, the water table depth is unknown. However, if the water table is reached during auger excavation, the auger will continue to be excavated to the proposed depth. Although at that point, if sediment needs to be screened, it will be screened using 3.175 mm (1/8-in) mesh but with wet screening methods.

Where shell middens either intersect or have the potential to intersect the proposed trench installation of the FOCUS Cable, the maximum horizontal extent and depth of the midden deposits will be determined through auger testing. In these instances, extra auger spoons (each 46 cm [18 in] long) can be excavated along the proposed trench to determine the depth of cultural deposits. Also, in these instances, extra auger holes can be excavated to determine the breadth of intact cultural deposits and to determine a location that will avoid intact cultural deposits for trench excavation and FOCUS Cable installation.

While in the field during auger testing, observations will be made of the relative density and diversity of cultural materials as well as the presence of any temporally diagnostic artifacts and samples for radiocarbon dating. Only diagnostic artifacts and appropriate samples will be collected. All other materials will be placed back in the original auger hole.

During screening, quantities and characteristics of bone, lithic debitage, shell, or any other cultural material will be recorded, but the items will be placed back in the original, respective auger hole. Diagnostic items that can help shed light on the above mentioned research issues will be collected. These can include (but are not limited to): shell beads and ornaments; lithic artifacts such as projectile points and microdrills; exotic materials such as obsidian, fused shale, Franciscan chert, or deer bone; radiocarbon samples; and any other diagnostic items. In the event that materials recovered during augering are too dirty for reasonable assessment (e.g., lithics, shell) then the items might be collected for laboratory analysis.

Charcoal or large marine shells recovered from the deepest levels will be collected for the purpose of obtaining at least one radiocarbon date from each shell midden to evaluate the age of the oldest deposits.

Ideally, a minimum of four radiocarbon dates will be obtained during auger testing at site CA-SCrI-240: two from shallower deposits and two from deeper deposits to assess the potential temporal range of site occupation (i.e., short-term or long-term).

All auger holes will be backfilled using the sediment removed from the augers. The augers excavated along the proposed elevated channel line will be marked such that subsurface disturbance during elevated channel installation will adhere to the footprint of previously excavated auger holes.

The augers can help answer the following research questions at CA-SCrI-240:

- Is there any evidence of house structures (e.g., house floors, posts/postholes) or other significant features (e.g., roasting pits)?
- In addition to evidence of craft specialists, is there any other evidence of the historically documented roles that Chumash residents played in different economic, political, and ritual settings?
- Is there evidence of Mission artifacts? If so, are these findings consistent with what has been previously found at this site?
- Is there any evidence of craft specialist activities such as the production of microdrills, Olivella shell beads, or other shell beads or ornaments?
- Are any of the artifacts identified during surface observations or subsurface testing items that were definitively imported from the mainland or other islands (e.g., lithic materials such as obsidian, fused shale, and Franciscan chert; and other items such as deer bone)?

Further, augers should be able to determine if the portion of the site that intersects the FOCUS Cable trench or elevated channel line maintains depositional integrity, can provide datable materials, contains definable components, and/or maintains research potential. If this is unclear based on auger excavation, then TUs may be placed. The determination on whether or not to place TUs will be made in consultation with the NPS archaeologist.

Test Units

TUs are designed to gain insight into site content near the location of the FOCUS Cable installation and maintenance, and to gather representative and statistically meaningful samples of radiocarbon dates, artifacts, and ecofacts. TUs will only be placed if the archaeologists in the field decide that subsurface deposits (encountered during augering) can answer any of the research questions outlined in Chapter 5. The TUs are elective, but if elected they will each measure 0.5 m × 1 m (1.6 ft × 3.3 ft).

TUs will be excavated in natural stratigraphic levels, but in the absence of evident stratigraphy, arbitrary 10-centimeter levels will be employed. All sediment will be dry screened using 3.175 mm (1/8-in) mesh to recover cultural material. The water table on Santa Cruz Island is varied and in the vicinity of the FOCUS Cable, the water table depth is unknown. However, during TU excavation, if the water table is reached, excavation in the TU will cease. Anything excavated that is too wet to dry screen will be screened using 3.175 mm (1/8-in) mesh but with wet screening methods.

In the case of the TUs, all identified cultural materials will be collected and provenience will be applied. Point provenience will be employed (when possible) for all diagnostic artifacts recovered.

All features will be excavated by first exposing the entire horizontal area of the feature and then bisecting the feature. If possible, one half of the feature will be excavated and screened through 3.175 mm (1/8-in). The other half of the feature will be collected for further analysis in the lab. Fully exposing, and excavating out half of a substantial feature, however, is very likely more destructive than necessary for this testing project. The decision on amount of feature exposure and excavation will be made in consultation with the park archeologist depending upon conditions of the individual feature. Radiocarbon dates will be collected from features when appropriate. Protein residue samples will be taken (when possible) for all diagnostic lithic tools found in situ.

If the depth of cultural deposits identified is too deep to safely excavate within one 0.5-m × 1.0-m TU, an adjacent test unit will be excavated in a step-down fashion. Adjacent TUs can continue to be excavated down to a safe level as described in OSHA (Occupational Safety and Health Administration) procedures.

During excavation of the TUs, quantities and characteristics of bone, lithic debitage, shell, or any other cultural material will be recorded and the items will be collected. Any kind of marine shells identified in the TUs would indicate cultural activity and will be collected. Diagnostic artifacts and appropriate radiocarbon samples will be collected and bagged separately from other cultural materials from the TUs. The profile of at least one representative unit wall will be drawn and photographed in each TU. Upon completion of fieldwork, each unit will be backfilled with the sediment that was removed from the individual TU.

If TUs are placed at the site, the data from them can help answer the following research questions:

- Is there any evidence of house structures (e.g., house floors, posts/postholes) or other significant features (e.g., roasting pits)?
- In addition to evidence of craft specialists, is there any other evidence of the historically documented roles that Chumash residents played in different economic, political, and ritual settings?
- Is there evidence of Mission artifacts? If so, are these findings consistent with what has been previously found at this site?
- Is there any evidence of craft specialist activities such as the production of microdrills, Olivella shell beads, or other shell beads or ornaments?
- Are any of the artifacts identified during surface observations or subsurface testing items that were definitively imported from the mainland or other islands (e.g., lithic materials such as obsidian, fused shale, and Franciscan chert; and other items such as deer bone)?

Column Samples

During the excavation of the TUs, the field archaeologists will determine if column samples are appropriate. Column samples will be taken if intact stratigraphy and shell midden deposits are identified during excavation of the TUs. These column samples will be extracted from the profile of the TUs. They will be excavated in 10 cm cubes (i.e., 10 × 10 × 10 cm, 4 × 4 × 4 in). The samples will be taken using a trowel that has been washed and cleaned. The location of the samples will be marked with a Trimble GeoXT ® unit with sub-meter accuracy. In addition, the samples will be mapped in the unit plan view and profile, where applicable. The samples will be bagged by 10 cm cubes into paper collection bags and tagged appropriately.

Radiocarbon Dating

During the excavation (of augers, TUs, or column samples) in and around CA-SCrI-240, radiocarbon sampling will be performed. Depending on what data are revealed or collected during excavation of either augers or TUs, this sampling will include between four and 15 radiocarbon dates. Where possible, two samples will be collected from the deepest and two samples will be collected from the shallowest cultural deposits encountered during excavation of the TUs or column samples. If TUs are not conducive to radiocarbon sampling, then samples may also be taken from augers. In both cases, the goal will be to establish the span of occupation at site CA-SCrI-240.

Radiocarbon dates collected from the site can help answer important research questions specific to site CA-SCrI-240:

- What is the span of occupation at site CA-SCrI-240?
- Do radiocarbon dates obtained from auger testing support prior interpretations about the site's chronology or suggest even greater complexity in site occupation?
- Based on radiocarbon dating and temporally diagnostic artifacts, what is the chronology of site occupation?
- Do any site deposits date to the Early Holocene or earlier?
- Do any site deposits date to the Middle Holocene and, if so, do they fit within the regional pattern defined by previous researchers? In particular, is there any evidence of subtidal shellfish exploitation?
- Are any midden deposits contemporaneous with Late Period or Historic Period occupation?

Human Remains

It is the policy of the NPS cultural resources management program to leave human remains in situ whenever possible; recovery of Native American human remains is not a goal of this project. However, portions of site CA-SCrI-240 are known to contain human remains. If human remains are encountered during fieldwork, excavation at that location will immediately halt and the remains respectfully protected. CINP, NAWCWD, and NBVC archaeologists will be contacted immediately in person or via phone. CINP will then determine the appropriate protocol to follow consistent with the Native American Graves Protection and Repatriation Act (NAGPRA). It will be the responsibility of the CINP to consult with the tribe culturally affiliated with the discovered human remains, which for SCrI will be the Santa Ynez Band of Chumash Indians, or other Chumash lineal descendants, determined in consultation with the Tribe. A NAGPRA Plan of Action has been developed and is attached as Appendix B.

Native American Monitoring

Per NPS protocols, a Native American monitor will be present for all ground disturbing activities associated with this testing plan.

Site-Specific Field Efforts

CA-SCrI-240

Subsurface testing will be conducted at site CA-SCrI-240 to explore the possibility of intact, subsurface deposits. Because there will be two methods for installing the FOCUS Cable near site CA-SCrI-240, there are two methods for subsurface testing proposed: one for within the area that the cable will be installed within an elevated channel and another within the area that the cable will be installed in a subsurface trench.

There will be approximately 35 augers excavated to a depth of 137 cm (54 in) within the prisoners harbor portion of the proposed FOCUS Cable trench line. There will be approximately 25 augers excavated to a depth of 50 cm (20 in) within the proposed FOUCS Cable elevated channel line installation. The total number required, will depend upon the terrain and final route. Therefore, there are minimally 60 total augers that will be excavated in the vicinity of CA-SCrI-240 (Figure 4-11), with the possibility that additional augers will be placed at the discretion of the field archaeologist in consultation with the CINP archeologist.

Trench Line Augers: In 2016, when the CINP discovered subsurface deposits outside the boundaries of CA-SCrI-240, the site boundaries were not augmented. Part of the proposed trench line for the FOCUS Cable installation is located near these subsurface deposits. To investigate those deposits and avoid adverse impacts to site CA-SCrI-240, auger excavation will be conducted along the proposed trench line at 20-m intervals (see Figure 4-11). This auger testing will be conducted from the HDD location to CV-1 and from CV-1 to CV-2, a total of approximately 760 m (2,490 ft). There will be 35 augers spaced at 20-m intervals located outside the current known boundaries of site CA-SCrI-240, along the proposed trench line. Each of these augers will be excavated to a depth of 137 cm (54 in, or three 46cm/18-in split core spoons) in order to exceed the depth of proposed trenching (102 cm [40 in]).

Each of these augers will be excavated to explore for possible subsurface deposits that would be encountered by planned installation and maintenance of the FOCUS Cable; if cultural deposits are identified, the boundaries of the site will be augmented to include those areas. Further, in 2016 during monitoring of wetland restoration, Minas (2016) identified subsurface deposits near the proposed trench line (see Figure 4-11). These deposits were encountered somewhere between 8 to 20 cm (3 to 8 in) below the modern ground surface. The deposits were 6 to 30 cm (2 to 12 in) thick. Therefore, the 137-cm-deep (54-in-deep) augers within the trench line will be deep enough to explore subsurface deposits in this area.

Elevated Channel Augers: At CV-2, the FOCUS Cable will shift to an elevated channel. Auger excavation will be conducted within site CA-SCrI-240 and outside the known boundaries of the site. These augers will begin at CV-2 in the west (Figure 4-11). These augers will continue at 21-m intervals along the proposed elevated channel installation route to the current southwestern boundary of the site. The proposed 21-m intervals will coincide with every seventh stake location for the elevated channel line (each stake is spaced at 3-m intervals). Each auger will be excavated to 91cm (36 in) below the modern ground surface. The rationale is that the subsurface disturbance of elevated channel line stakes will be less than 51 cm (20 in) below the modern ground surface and 91 cm (36 in; the length of two segments [46 cm/18 in each] of split core cup sets) is sufficient to explore for positive subsurface deposits within the site.

In addition, augers will continue northeast along the slope bottom to the east of the unnamed road at 12-m intervals within the current, known boundaries of site CA-SCrI-240. These augers will continue along the slope base and turn onto the Navy Road until intersection with CV-3 (where the Cable will be installed subsurface in a trench again). These augers spaced at 12-m intervals will coincide with every fourth stake location for the elevated channel line. Each auger will be excavated to explore for possible subsurface

deposits that would be encountered by planned installation of the FOCUS Cable; if cultural deposits are identified, the boundaries of the site will be augmented to include those areas. Each auger will be excavated to only 91 cm (36 in) below the modern ground surface.

The rationale is that the subsurface disturbance for the elevated channel line will only be 51 cm (20 in) below the modern ground surface and 91 cm (36 in; the length of two segments [46 cm/18 in each] of split core spoon) is sufficient to explore for positive subsurface deposits within the site. Further, in 2007 subsurface testing for a proposed parking lot (that was never established), Minas (2007) identified subsurface deposits near the proposed elevated channel line (see Figure 4-11). These deposits were encountered somewhere between 40 to 67 cm (12 to 26 in) below the modern ground surface. The extent of the deposits is unknown. Therefore, the 91-cm-deep/36-in-deep augers within the elevated channel line will be deep enough to explore subsurface deposits in this area.

Based on the above auger spacing and distance, approximately 60 augers will be excavated during the implementation of the current Testing Plan. In addition to these augers, the field archaeologists, in consultation with the NPS archaeologist, may deem it necessary to excavate additional augers with the intent of avoiding intact, subsurface, cultural deposits during FOCUS Cable installation and maintenance.

Test Units: If needed to more completely investigate cultural deposits found during the auger testing, up to five subsurface archaeological TUs can be placed in search of intact, subsurface deposits associated with site CA-SCrI-240. These units will measure 0.5 m × 1 m and will be placed adjacent to the elevated channel or trench lines to explore intact deposits. The quantity and placement of these units will depend on the results of the augers. The purpose of these units is to identify subsurface deposits that can help answer the research questions developed in the previous chapter. The subsurface investigations will help indicate whether site CA-SCrI-240 will be adversely affected by installation and maintenance of the FOCUS Cable.

Boundary Markers: Based on the results of the augers, the boundaries of site CA-SCrI-240 may be augmented. After this is completed, to ensure avoidance of the site, stakes will be placed around the new site boundaries prior to construction. These stakes will be inserted into the ground at 20-30 cm (8-12 in) below the modern ground surface. They will be removed once construction is complete.

Laboratory Methods

Analysis

As noted above, only diagnostic artifacts will be collected from augers. If TUs are conducted, all artifacts, including marine shell, and bone, will be collected. All collected items recovered during the project will be taken to an appropriate archaeological laboratory. They will be washed, counted, weighed, and cataloged. The analyses of collected materials will commence after the completion and review of the complete catalog. Although specific procedures for the analyses will depend to some extent on the findings at the site, several classes of material are likely to be recovered. These include flaked stone artifacts, ground and battered stone artifacts, shellfish, and faunal remains. Appropriate metric and observational analyses will be undertaken on artifacts, faunal remains, shellfish, and, if recovered, on carbonized plant remains. Recovery of minimum number of individuals diagnostic portions is preferred for analysis.

Bulk sediment samples will be processed using a bucket-flotation technique. These methods are designed to recover plant macrobotanical specimens from the light fraction as well as site micro-constituents (e.g., fishbone, shell beads, micro-debitage) from the heavy fraction. The analytical results of the field efforts will then be compared with data sets from other excavations on the island to better assess the research significance of the recovered data.

The analyses of these materials will be directed at 1) determining the presence of subsurface cultural materials along the proposed trenching transects; and, when present, 2) evaluating the density, diversity, and integrity of buried deposits; as well as 3) characterizing the data constituents (artifacts, ecofacts, datable remains, features, etc.) available to address local and regional research questions when appropriate.

Radiocarbon Dates

If collected, at least two samples and up to 20 samples from site CA-SCrI-240 will be submitted to Beta Analytic for accelerated mass spectrometry (AMS) radiometric dating. All samples will be corrected for $^{13}C/^{12}C$ fractionation and calibrated using standard dendrochronological calibration curves. If no carbonized plant remains or charcoal are available from the limited testing of the site, marine shell will be submitted; the calibration of shell samples will also include a marine reservoir correction factor. All data from radiometric analyses will be in included the final evaluation report.

7. POST-FIELDWORK TASKS

Field Review of Findings

A Field Review of Findings will be prepared in a brief report within 15 days after fieldwork. The report will summarize the field efforts at each site and provide a preliminary assessment of the results.

Evaluation Report

The results of the Testing Plan will be reported in detail in an Archaeological Evaluation Report. The report will include background sections detailing the environment and cultural history of the island and key regional research issues, similar to this Testing Plan. The report will include descriptions of the methods and results of testing at CA-SCrI-240. The site report for CA-SCrI-240 will discuss whether intact site deposits were present and consider whether they are sufficiently undisturbed, or intact, to maintain their integrity in terms of NRHP eligibility. The site form update will include a new sketch map and continuation form. These will be appended to the draft report. Last, and most important, the report will discuss whether the installation and maintenance of the FOCUS Cable will have an adverse effect to any historic properties on Santa Cruz Island.

As stated in Chapter 3, CA-SCrI-240 is recommended eligible for listing in the NRHP and is a contributing element to the Santa Cruz Island Archaeological District. For the purposes of this Testing Plan the Navy Road and the Warehouse at Prisoners Harbor are assumed to be eligible for listing in the NRHP and that the latter is a contributing element to the Santa Cruz Island Ranching District.

If the results of the current Testing Plan indicate that adverse effects will occur to site CA-SCrI-240, then NPS and the Navy will consult with all interested parties to resolve the adverse effects. This can include data recovery, further documentation (larger-scale excavation), research (artifact analysis, radiocarbon dating, etc.), Tribal consultation, and more. Assuming intact deposits are encountered during trenching, then a Memorandum of Agreement (MOA) will be developed between SHPO, NPS, NBVC, and possibly the ACHP.

Curation

All cultural material collected during test excavations will be prepared for long-term storage in a manner consistent with federal curation standards. Upon completion of the final report, the cultural material will be transferred to the CINP, or whichever facility they choose, for long-term storage. In addition to the collected cultural materials, all original field records, photographs, data logs, field notes, maps, original reports of special studies, databases, and other related documents will curated. These materials will be catalogued using a template provided by NPS. All materials will be housed in a repository that meets federal standards for museum collections.

Schedule

The schedule of the enclosed, proposed Testing Plan will follow that of the Navy's convenience to be determined during a meeting with all appropriate stakeholders.

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Appendix A

DPR Site Forms

Department of Anthropology, University of California, Santa Barbara

P-42-025026 SANTA CRUZ ISLAND ARCHAEOLOGICAL SITE RECORD

No. of attached sheets 0

1. UCSB site no. SCrI96 2. Berkeley site no. _____ 3. Sample unit no. 34

4. Criteria for defining boundaries: shell ___, soil discoloration ___ artifacts X

other _____

5. Location in relation to natural and modern cultural features on the site of two animal corrals and an east-west trending fence. Adjacent (southeast of ridge road)

6. Location in relation to nearest site: UCSB site no. _____ is _____ meters at _____ degrees from mag. north. 7. Contour elevation 1300-1250

8. Description of landform on which site exists at top of drainage on hill and saddle area (to the east) and slope of hill (northwest, north, and south

9. Site dimensions measured from aluminum stake: 85 meters at 30 degrees; 114 meters at 190 degrees; 29 meters at 190 degrees from mag. north; 34 meters at 280°

10. Position of alum. stake with respect to site area or physiography on the outside but adjacent to the southern corral - 1 meter east of southern opening of the corral

11. Est. max. depth — meters; based on exposure ___, or mound height ___

12. Midden observed? yes ___, no X. If yes, midden soil color/texture is _____

13. No. of house depressions 0, comments on house depressions _____

14. Nearest observable fresh water: type _____, distance _____ meters at _____ degrees from mag. north. 15. Vegetation type and density on site contiguous Bromus spp.; perennial grasses outside corral area

16. Adjacent vegetation and location from site two clusters Quercus dumosa to the east, one cluster Quercus dumosa to the southwest and one to the south; contiguous Bromus spp.; perennial grasses surrounding

17. Disturbances to site deposit (natural, looting, plowing, construction, etc.) construction of corrals and use by animals

18. Est. % of site removed 30-50% by what agency? construction + use of corral

19. Previous excavators (incl. dates) None

20. Flakes on site surface

material	est. no. per sq. m.	material	est. no. per sq. m.
chert	4		
flint	rare (2 collected)		
? metamorphosed silt stone	1 (2 collected)		

21. Animal bones on site surface

type	est. no. per sq. m.
none	

22. Human bone on site surface? yes ____, no X ;

Comments on types and densities _____

23. Artifacts on site surface

type	quantity	no. coll.
possible core	rare	1
utilized flake	rare	0

24. Fire-altered rock on site surface

material	est. no. per sq. m.
none	

Non-cultural for Eng
Pers. [illegible]
Glass [illegible]
Herne [illegible]

25. Shellfish species noted in order of abundance

species	abundant? yes	abundant? no
none		

26. Midden samples collected

samp. no.	depth	m. from alum. stake	degrees from mag. North
none			

27. Photographs of site: film type and size Tri X 35mm

roll no.	frame no.	perm. photo no.	deg. from mag. north	subject
9	06		310	distance shot of site to w/ [illegible]

28. Remarks no shell was found, scatter of flake is fairly light; much broken slate on site.

29. Recorder Elmore, other crew members Poussen

30. Date 27 July 72

Department of Anthropology, University of California, Santa Barbara

SANTA CRUZ ISLAND ARCHAEOLOGICAL SITE RECORD

RAZ 025240

No. of attached sheets 0

1. UCSB site no. SCrI240 2. Berkeley site no. _____ 3. Sample unit no. Prisoners 32

Criteria for defining boundaries: shell ✓, soil discoloration ✓, artifacts ✓, other _____

5. Location in relation to natural and modern cultural features Prisoners Harbor east of the dock at the mouth of stream

6. Location in relation to nearest site: UCSB site no. _____ is _____ meters at _____ degrees from mag. north. 7. Contour elevation 10 ft

8. Description of landform on which site exists terrace at stream mouth, with main part of site forming a mound

9. Site dimensions measured from aluminum stake: 47 meters at 0 degrees; 16m @ 90° 290 meters at 180° degrees; 26 meters at 270° degrees from mag. north. 100m

10. Position of alum. stake with respect to site area or physiography In approx. center of secondary l. of shell mound

11. Est. max. depth 4 meters; based on exposure ✓, or mound height ___.

12. Midden observed? yes ✓, no ___. If yes, midden soil color/texture is dark brown

13. No. of house depressions ___; comments on house depressions _____

14. Nearest observable fresh water: type stream, distance on site meters at _____ degrees from mag. north. 15. Vegetation type and density on site coastal sward, also Rhus laurina, Salix sp.

16. Adjacent vegetation and location from site same, + chaparral species and Eucalyptus

17. Disturbances to site deposit (natural, looting, plowing, construction, etc.) Heavy erosion + scattered to south and west

18. Est. % of site removed 10-5, by what agency? streams + tides

19. Previous excavators (incl. dates) none known

20. Flakes on site surface

material	est. no. per sq. m.	material	est. no. per sq. m.
Chert	7		

[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
wood Scrap	1	1
Coral	[illegible]	

[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	

[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Department of Anthropology, University of California, Santa Barbara

SANTA CRUZ ISLAND ARCHAEOLOGICAL SITE RECORD

P42-025439 Prisoners East #1

No. of attached sheets _____ MAPPED

1. UCSB site no. 439 2. Berkeley site no. 145 3. Sample unit no. _____

4. Criteria for defining boundaries: shell X, soil discoloration X, artifacts ___, Other _____

5. Location in relation to natural and modern cultural features _____
Overlooking Prisoners Harbor to the east, Navy road has removed a portion of the N. part of the site

6. Location in relation to nearest site: UCSB site no. 240 is ____ meters at 240 degrees from mag. north. 7. Contour elevation 125'

8. Description of landform on which site exists on W. side of prominent hill which forms the eastern boundary of Prisoners Harbor

9. Site dimensions measured from alum. stake: ____m. at ____deg.; ____m. at ____deg.; ____m. at ____deg.; ____m. at ____deg. from mag. north.

10. Position of alum. stake with respect to site area or physiography _____
N/A

11. Est. max. depth 1 meters; based on exposure X, or mound height _____.

12. Midden observed? yes X, no ____. If yes, midden soil color/texture is _____
Dark grey-brown loam
and surrounding soil color/texture is Light tan clay-loam

13. No. of house depressions Ø; comments on house depressions _____

14. Nearest observable fresh water: type Creek + Marsh, distance ____ meters at ____ degrees from mag. north. 15. Vegetation type and density on site Annual grasses, Eriogonum sp., Chorizopis, Fennel, Baccharis

16. Adjacent vegetation and location from site _____
Marsh, Riparian, + Oaks in Prisoners Harbor canyon

17. Disturbance to site deposit (natural, looting, plowing, construction, etc.)
Navy road through N. part of site; site is extensively pitted with large holes from pig-rooting

18. Est. % of site removed ____, by what agency? U.S. Navy

19. Previous excavators (incl. dates) None

20. Flakes on site surface

material	est. no. per sq. m.	material	est. no. per sq. m.
chert	1-2		
basalt	<1		

21. Animal bones on site surface

type	est. no. per sq. m.
Whale	<1

22. Human bone on site surface? yes ____, no X ;
Comments on types and densities _____

23. Artifacts on site surface

type	qty.	no. coll.
chert cores & core tools		
large point	1	Prev. collected by Griggs
knife	1	
biface midsection	1	
atlatl barb	1	
large hammerstones	1	
donut stone "start"	1	
Pitted basalt cobble	1	0
Battered basalt cobble	1	0
~~large basalt chopper~~		

24. Fire-altered rock on site surface

material	est. no. per sq. m.
Basalt	5

25. Shellfish species noted in order of abundance

species	abundant? yes	no
Mytilus sp.	X	
Haliotis cracherodii	X	
Haliotis sp. (Green)		X
Astraea undosa	X	
Ostrea lurida		X
Balanus		X
Haliotis sp. (Pink?)		X

26. Midden samples collected

samp. no.	depth	m. from alum. stake	degrees from mag. North

27. Photographs of site: film type and size Kodachrome 64

roll no. roll no.	frame no.	perm. photo no.	deg. from mag. north	subject

28. Remarks _____

29. Recorder V. Johnson, D. Griggs, other crew members _____

30. Date 24 Aug 1987

SITE LOCATION MAP

Site no. SCrI-439

Field no. Prisoners East #1

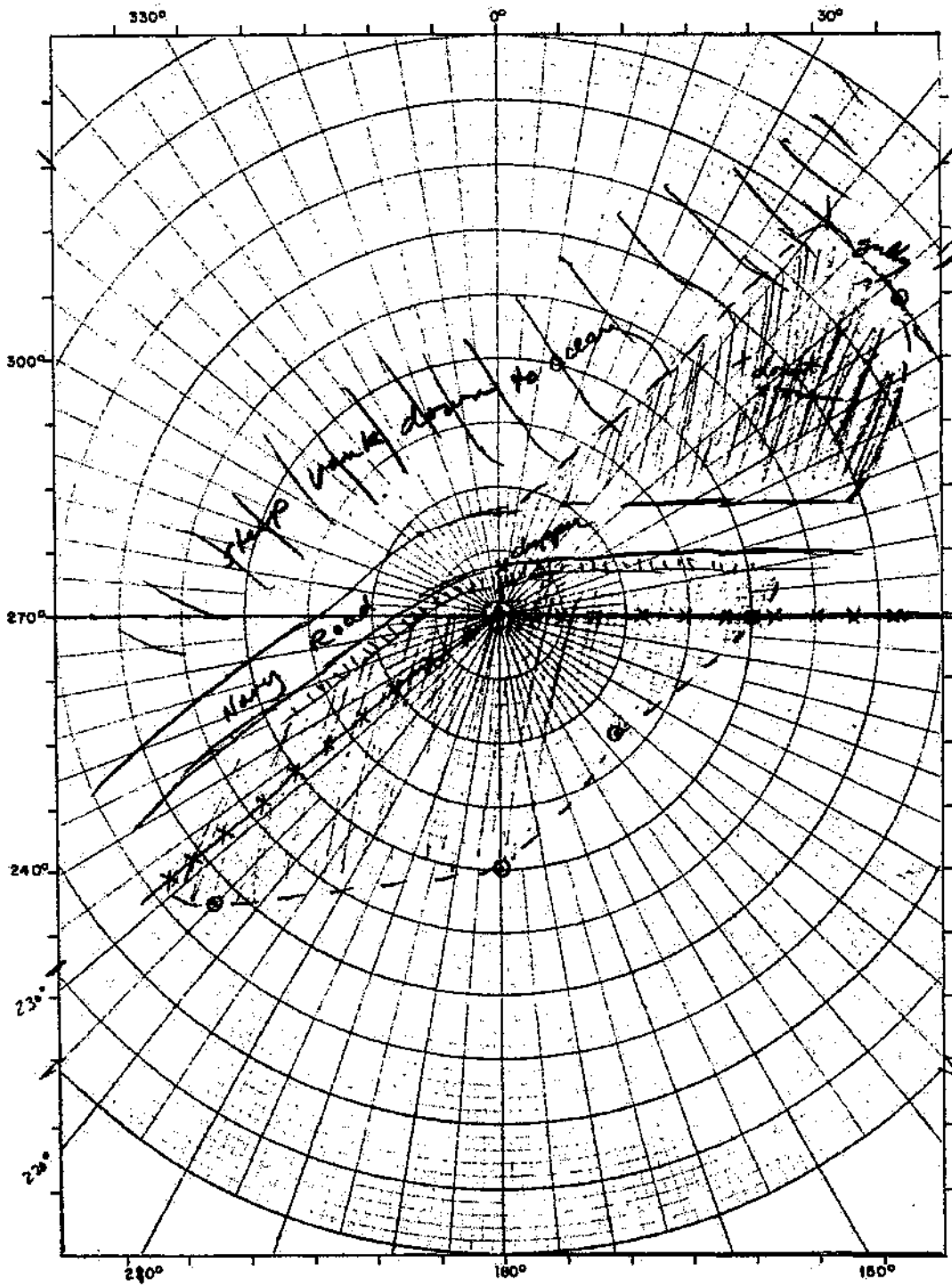
Legend

- Spring
- Intermittant Stream
- Perennial Stream
- Road ----- Trail
- Fence
- Site Boundary
- ⊙ Mapped point on site boundary

NOTE: Site boundary azimuths should be taken from a point represented by the center of the circle

- Rock outcrop
- Tree or Bushes
- Midden
- Unvegetated sand

road is 6m wide



Mag. north is zero unless designated otherwise

① S 20m to edge of midden upslope

② N 2m to 3m high bank down to rd. 10m at other side of road

③ SW 32m edge of midden towards Prisoners

④ 232° azimuth of fence line west

⑤ E (azimuth of fence line east) 20m

⑥ SE 13m to edge of midden upslope

⑦ W 6m to bank down to road 9m at road surface

⑧ NW 3m to bank down 13m at other side of road

⑨ NE 4m to bank down 10m at road edge 14m at other side of road

⑩ 52° 40m edge of midden at gullies on N. side of road

⑪ 44° 28m to donut stone freq. exposed in pty roofing

Scale _____ Date 24 Aug 1987 Drawn by J. Johnson

Notes Temp datum at fence post, corner in fence

MAPPED

Department of Anthropology, University of California, Santa Barbara

SANTA CRUZ ISLAND ARCHAEOLOGICAL SITE RECORD

ALSO 450th, 144R P-42-025464

Temp. site no. 1988-18 No. of attached sheets 1-map

1. UCSB site no. 464 2. Berkeley site no. 144 3. Sample unit no. _____

4. Criteria for defining boundaries: shell X, soil discoloration X, artifacts X, Other Artifacts include 1 large bifacial chert flake; cores of island & non-island chert; pestle frags; hammerstones, etc

5. Location in relation to natural and modern cultural features Site is at northern extreme of first ridge east of Prisoners Harbor; 95% of site rests north of road; bearing to northwest tip of Prisoners Harbor is 292°; bearing to Coche Point is 51°.

6. Location in relation to nearest site: UCSB site no. 240 is 325 meters at 250 degrees from mag. north. 7. Contour elevation 150-175'

8. Description of landform on which site exists Northern extreme of first ridge east of Prisoners Harbor

9. Site dimensions measured from alum. stake: 28 m. at 0 deg.; 22 m. at 90 deg.; 19 m. at 180 deg.; 18 m. at 270 deg. from mag. north.

10. Position of alum. stake with respect to site area or physiography Wooden stake is at site center.

11. Est. max. depth at least 25cm meters; based on exposure X, or mound height _____.

12. Midden observed? yes X, no ____. If yes, midden soil color/texture is Grey-brown loam

and surrounding soil color/texture is Brown to reddish-brown clayey loam

13. No. of house depressions none; comments on house depressions _____

14. Nearest observable fresh water: type stream, distance 325 meters at 250 degrees from mag. north. 15. Vegetation type and density on site Foxtail grasses, fennel, greasewood

16. Adjacent vegetation and location from site Foxtail grasses, fennel, greasewood, toyon, scrub oak (to north)

17. Disturbance to site deposit (natural, looting, plowing, construction, etc.) Road to Prisoners Harbor cuts through south margin; pig rooting is locally intensiv

18. Est. % of site removed 1-2%, by what agency? Roadcut, pigs

19. Previous excavators (incl. dates) none

20. Flakes on site surface

material	est. no. per sq. m.	material	est. no. per sq. m.
Island chert (N=10+)		Igneous (N=20+)	
Non-island chert (N=5+)			

21. Animal bones on site surface

type	est. no. per sq. m.
Sea mammal (N=1)	

22. Human bone on site surface? yes X, no ____;

Comments on types and densities Half a mandible fragment, teeth heavily worn; near fence, on surface.

23. Artifacts on site surface

type	qty.	no. coll.
Large bifacially worked chert flake (Vandenberg chert)	1	–
Pestle frag.	1	–
Hammerstones (igneous, sedimentary)	2	–
Cores (island chert, non-island chert, igneous)	5	–

24. Fire-altered rock on site surface

material	est. no. per sq. m.
Igneous	
Sandstone	
Shale	–

25. Shellfish species noted in order of abundance

species	abundant? yes	abundant? no
Astraea undosa	X	
Haliotis cracherodii		X
Mytilus californianus		X
Balanus sp.		X
Olivella biplicata		X

26. Midden samples collected

samp. no.	depth	m. from alum. stake	degrees from mag. North
none			

27. Photographs of site: film type and size Fujichrome 100; 28mm lens

roll no.	frame no.	perm. photo no.	deg. from mag. north	subject
3	6		270°	Overview of site from S/SE margin

28. Remarks Astraea undosa dominates shellfish assemblage (columellae and rims and opercu are everywhere); numerous chipped stone artifacts include dozens of non-island chert/island chert/igneous flakes, worked flakes, cores; 1 pestle frag; hammerstones

29. Recorder Arnold, other crew members Munns, Colten, Gibson, Hoffmann, Schub

30. Date 10/6/88

SITE LOCATION MAP

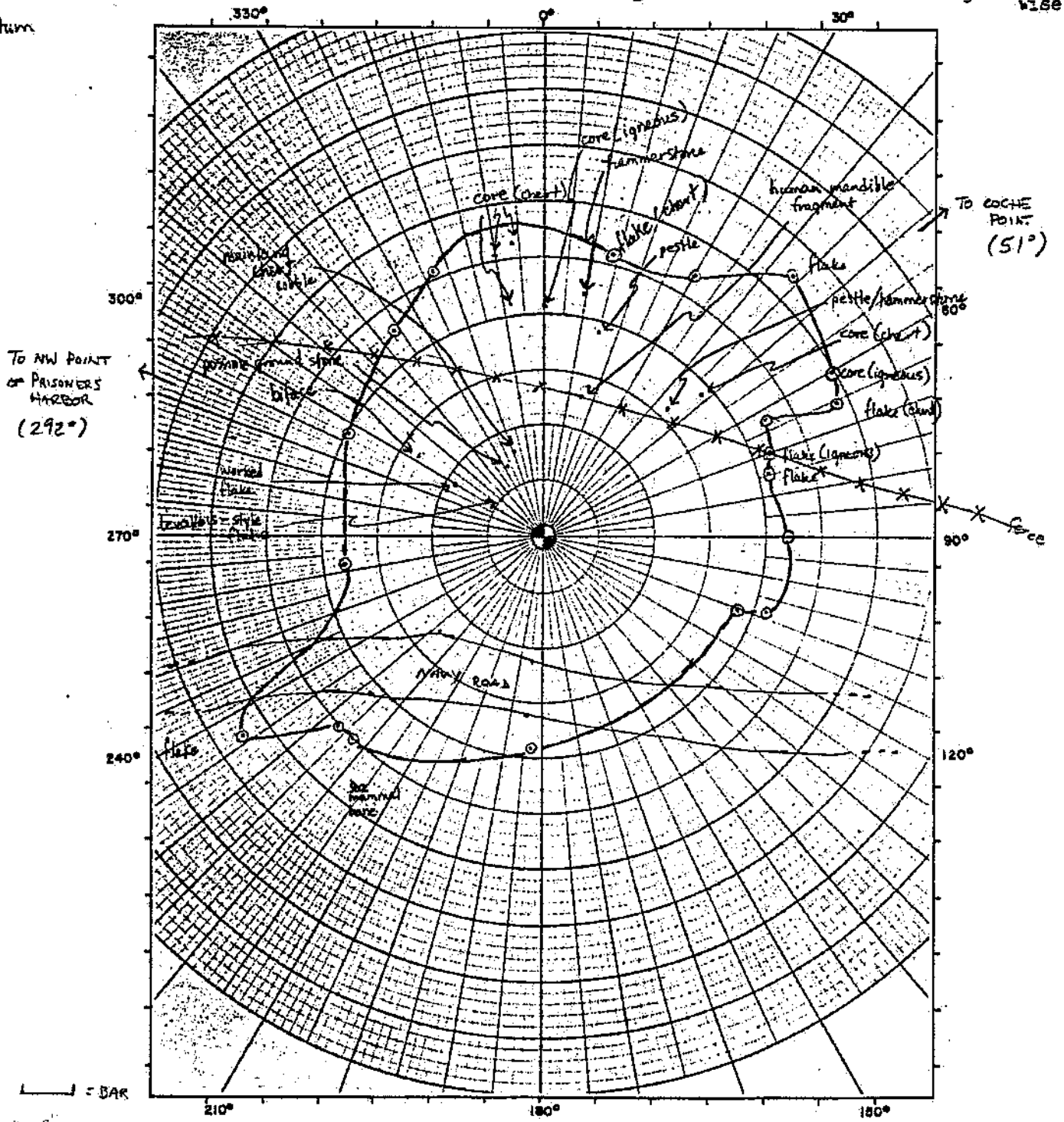
Site no. SCRI-464

Field no. 1988-18

Legend

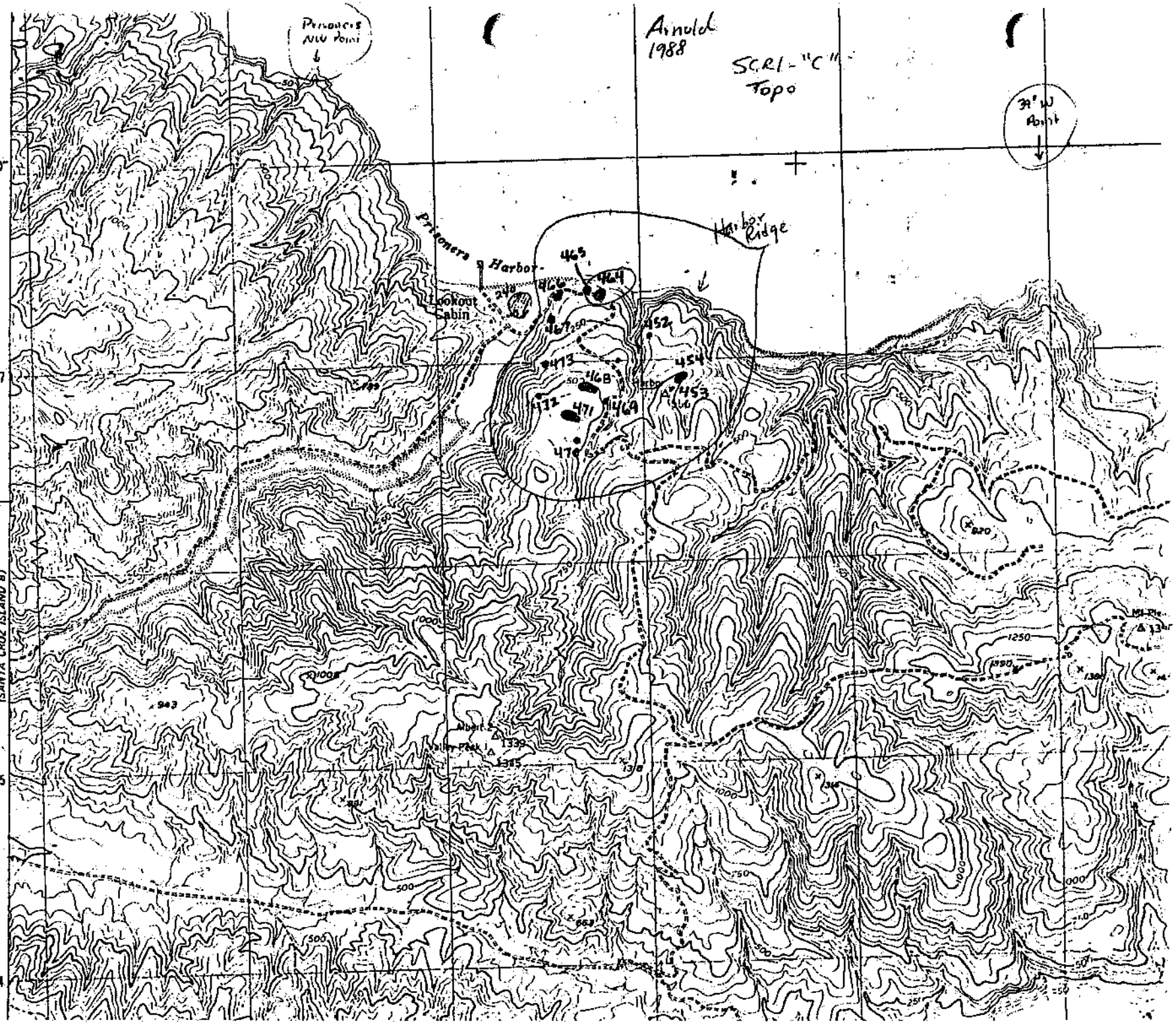
- Spring
- Intermittant Stream
- Perennial Stream
- Road ------ Trail
- Fence
- Site Boundary
- ⊙ Mapped point on site boundary
- Rock Outcrop
- Tree or Bushes
- Midden
- Unvegetated sand

NOTE: Site boundary azimuths should be taken from a point represented by the center of the circle. Mag. north is zero unless desig. otherwise



Scale bar = 5m Date 6 Oct 1988 Drawn by A Munns

Notes original map scale was bar = 10m [illegible] redrawn with new scale


Arnold
1988
SCRI - "C"
Topo
Prisoners NW Point
Prisoners Harbor
Harbor Ridge
Lookout Cabin
465
464
466
467
452
473
468
454
453
472
471
469
470
1'30"
3767
3765
3764
2052 II SW—B SE
(SANTA CRUZ ISLAND B)
Albert
Valley Peak
1339
1345
1250
1000
500
943
820
1390
1380
1310
881
663

MAPPED

Department of Anthropology, University of California, Santa Barbara

SANTA CRUZ ISLAND ARCHAEOLOGICAL SITE RECORD

P-42-025465

Temp. site no. 1988-19 No. of attached sheets 1-map

1. UCSB site no. 465 2. Berkeley site no. ____ 3. Sample unit no. ____

4. Criteria for defining boundaries: shell X, soil discoloration ___, artifacts X, Other Chert core, chert uniface

5. Location in relation to natural and modern cultural features Site is north of Navy Road (and contiguous); about 400m northeast of intersection of Navy Rd./Prisoners-Ranch road (see topo); bearing to projection just east of Coche Pt. is 52°; bearing to point northwest of Prisoners Harbor is 292°.

6. Location in relation to nearest site: UCSB site no. 240 is 300 meters at 245° degrees from mag. north. 7. Contour elevation 150-175'

8. Description of landform on which site exists Northern edge of knoll, on first ridge east of Prisoners Harbor, northernmost margin.

9. Site dimensions measured from alum. stake: 30 m. at 0 deg.; 11 m. at 90 deg.; 25 m. at 180 deg.; 23 m. at 270 deg. from mag. north.

10. Position of alum. stake with respect to site area or physiography Wooden stake at approximate site center

11. Est. max. depth unknown meters; based on exposure ___, or mound height ___.

12. Midden observed? yes ___, no X. If yes, midden soil color/texture is ___

and surrounding soil color/texture is ___

13. No. of house depressions none; comments on house depressions ___

14. Nearest observable fresh water: type creek, distance 300 meters at 245° degrees from mag. north. 15. Vegetation type and density on site Fennel and grass, moderate to high density.

16. Adjacent vegetation and location from site Fennel, grass, toyon, choreopsis

17. Disturbance to site deposit (natural, looting, plowing, construction, etc.) Pig rooting, moderate; more extensive on steep slope

18. Est. % of site removed 1-2%, by what agency? pigs

19. Previous excavators (incl. dates) none

20. Flakes on site surface

material	est. no. per sq. m.	material	est. no. per sq. m.
Chert (N=40)			
Igneous (N=3)			

21. Animal bones on site surface

type	est. no. per sq. m.
Modern pig (?)	

22. Human bone on site surface? yes ___, no X ;
Comments on types and densities ___

23. Artifacts on site surface

type	qty.	no. coll.
Chert uniface	1	-
Chert chunk	1	-
Chert core	1	-

24. Fire-altered rock on site surface

material	est. no. per sq. m.
none	

25. Shellfish species noted in order of abundance

species	abundant? yes	abundant? no
Astraea undosa		X
Mytilus californianus		trace

26. Midden samples collected

samp. no.	depth	m. from alum. stake	degrees from mag. North
none			

27. Photographs of site: film type and size ___

roll no. roll no.	frame no.	perm. photo no.	deg. from mag. north	subject

28. Remarks Very close to 1988-18, which is less than 100m to the east, upslope. This could be part of that site, because there is little completely sterile soil between.

29. Recorder Arnold, Colten, other crew members Munns, Hoffmann, Gibson Schub

30. Date 10/7/88

SITE LOCATION MAP

Site no. SCRI-465

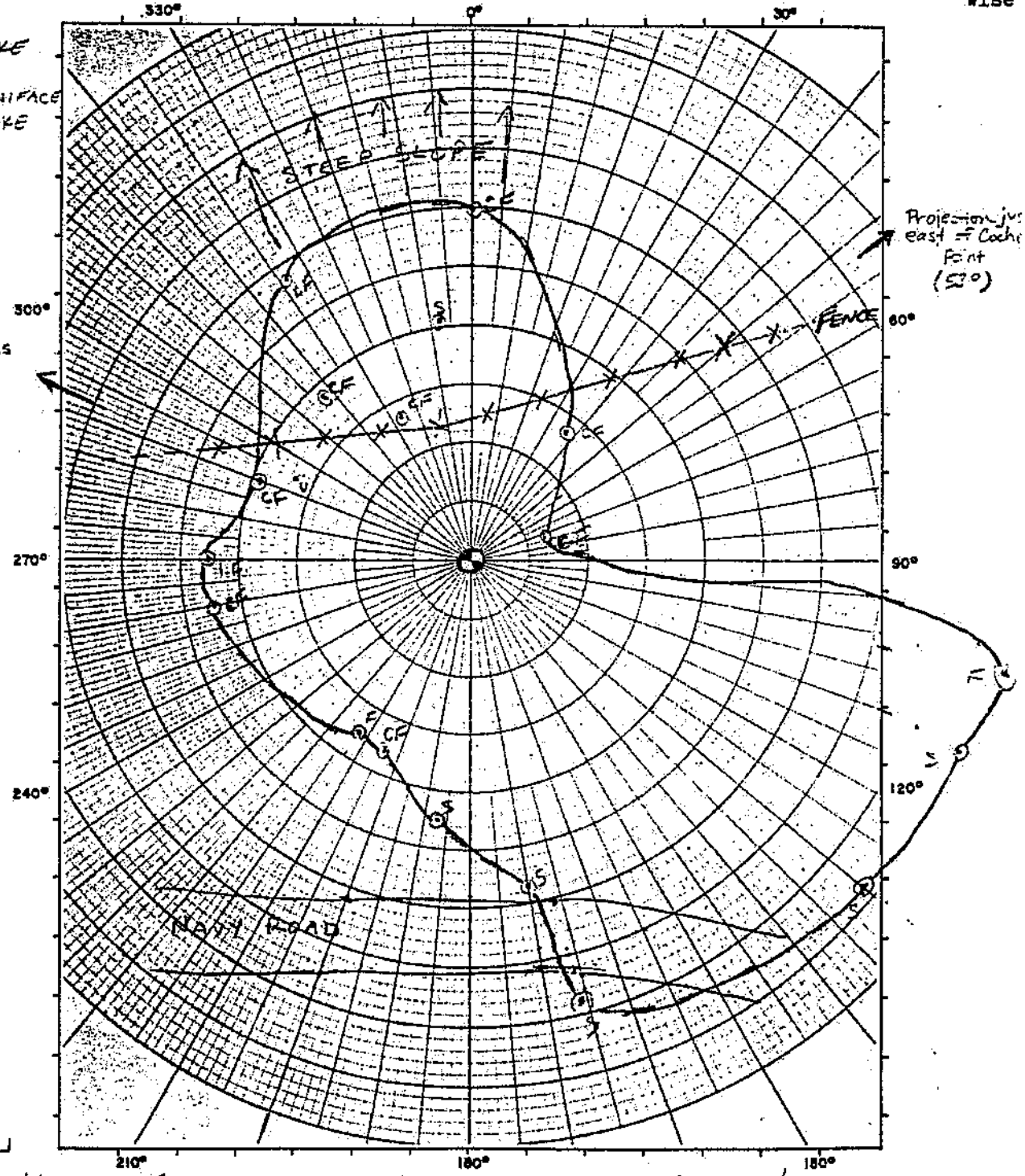
Field no. 1988-19

Legend

- Spring
- Intermittant Stream
- Perennial Stream
- Road ------ Trail
- Fence
- Site Boundary
- ⊙ Mapped point on site boundary
- Rock Outcrop
- Tree or Bushes
- Midden
- Unvegetated sand

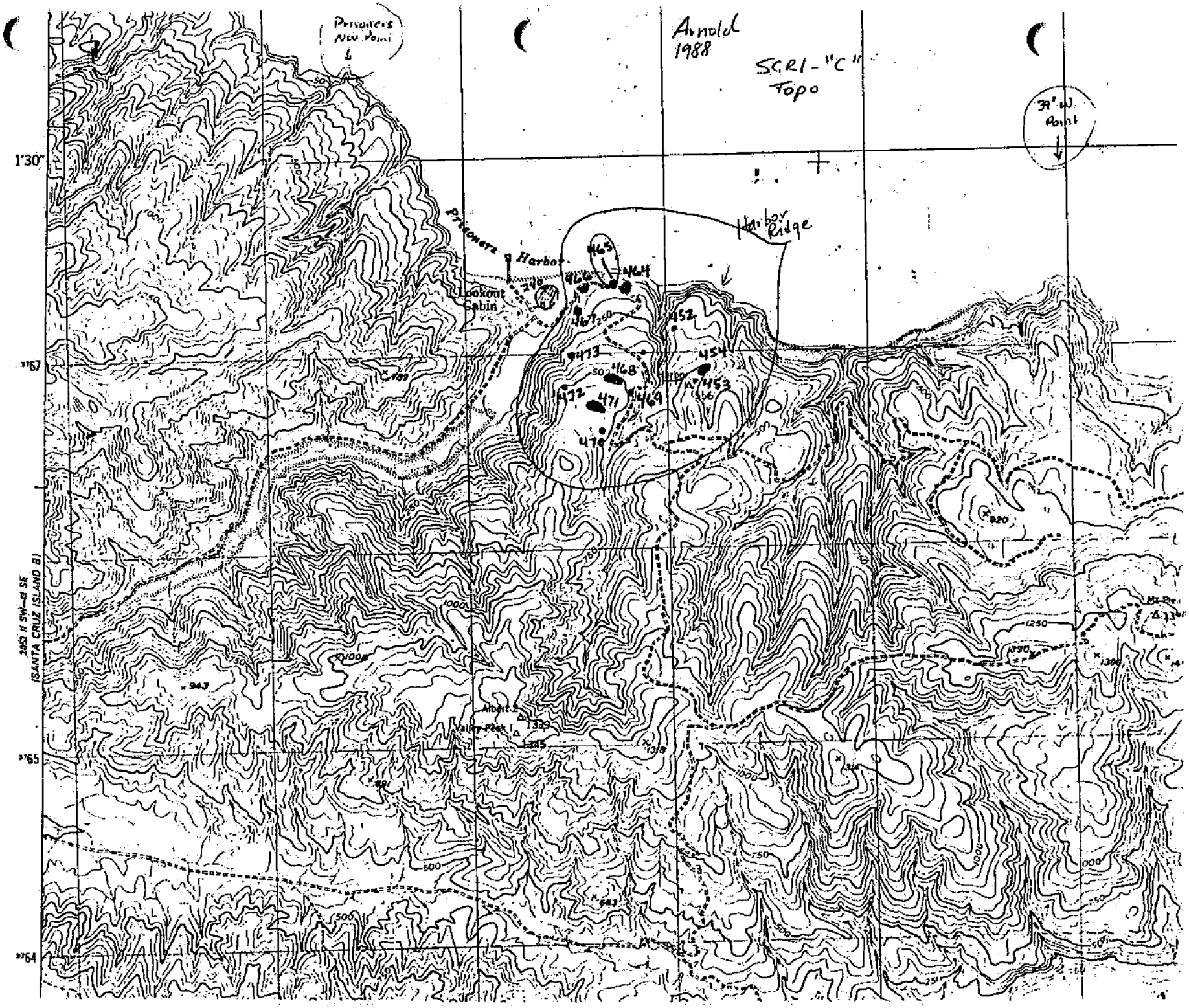
NOTE: Site boundary azimuths should be taken from a point represented by the center of the circle. Mag. north is zero unless desig. otherwise

⊙ = DATUM
CF - CHERT FLAKE
S - SHELL
U - POSSIBLE UNIFACE
IF - IGNEOUS FLAKE
F - FLAKE



Scale block = 5m Date 7 OCT 1988 Drawn by COLTMAN

Notes


Arnold
1988
SCRI-"C"
Topo
Prisoners
New Point
39' W
Point
Harbor
Ridge
Prisoners Harbor
Lookout
Cabin
465
464
466
467
452
473
468
454
453
472
471
469
470
1'30"
37'67
37'65
37'64
2853 II SW—II SE
(SANTA CRUZ ISLAND B)
Albert's
Valley Peak
1339
1345
1318
1250
1390
1300
920
1000
750
500
250

Department of Anthropology, University of California, Santa Barbara MAPPED

SANTA CRUZ ISLAND ARCHAEOLOGICAL SITE RECORD

P-42-025466

Temp. site no. 1988-20 No. of attached sheets 1-map

1. UCSB site no. 466 2. Berkeley site no. ____ 3. Sample unit no. ____

4. Criteria for defining boundaries: shell x, soil discoloration x, artifacts x, Other Mortar frags, cores

5. Location in relation to natural and modern cultural features Bearing to Prisoners Harbor Point is 295°; bearing to projection just east of Coche Point is 50°; site is south of the Navy Road where it curves eastward just east of Prisoners Harbor.

6. Location in relation to nearest site: UCSB site no. 240 is 100 meters at 255° degrees from mag. north. 7. Contour elevation 100'

8. Description of landform on which site exists Site conforms to the northern and western edge of the first ridge overlooking the east end of Prisoners Harbor

9. Site dimensions measured from alum. stake: 11 m. at 0 deg.; 10 m. at 90 deg.; 8 m. at 180 deg.; 27 m. at 270 deg. from mag. north.

10. Position of alum. stake with respect to site area or physiography Site datum is about 18 meters south of Navy Road; wooden stake in eastern third of site.

11. Est. max. depth at least 0.5 meters; based on exposure x, or mound height ____.

12. Midden observed? yes x, no ____. If yes, midden soil color/texture is Dark grey-brown, hard packed, extremely argillic with large cracks in some areas. and surrounding soil color/texture is Medium yellowish brown sandy soil.

13. No. of house depressions none; comments on house depressions ____

14. Nearest observable fresh water: type creek, distance 100 meters at 265 degrees from mag. north. 15. Vegetation type and density on site Fennel, grass, some coyote brush on northern margin; moderate to high density

16. Adjacent vegetation and location from site Same, plus some oak upslope in Prisoners Harbor canyon, choreopsis along northern and western edge of site.

17. Disturbance to site deposit (natural, looting, plowing, construction, etc.) Navy Road, pig rooting, fences, flagged stake at site center(?)

18. Est. % of site removed 10-20%, by what agency? Navy Road

19. Previous excavators (incl. dates) none

20. Flakes on site surface

material	est. no. per sq. m.	material	est. no. per sq. m.
Island chert (N=5+)			

21. Animal bones on site surface

type	est. no. per sq. m.
Sea mammal (N=1)	

22. Human bone on site surface? yes ___, no X ;
Comments on types and densities ___

23. Artifacts on site surface

type	qty.	no. coll.
Mortar frags	2	-
Core (island chert)	1	-

24. Fire-altered rock on site surface

material	est. no. per sq. m.
none	

25. Shellfish species noted in order of abundance

species	abundant? yes	abundant? no
Mytilus californianus	X	
Haliotis cracherodii	X	
Astraea undosa		X
Balanus spp.		X
Polinices spp. (moon shell)		X
Haliotis corrugata (?)		X

26. Midden samples collected

samp. no.	depth	m. from alum. stake	degrees from mag. North
none			

27. Photographs of site: film type and size ___

roll no. roll no.	frame no.	perm. photo no.	deg. from mag. north	subject

28. Remarks Northern site area downslope from Navy Road may be washed down from main site area, or be redeposited by road construction. There may be more midden buried upslope; this boundary is quite abrupt.

29. Recorder Arnold, Colten, other crew members Hoffmann, Schub, Gibson, Munns

30. Date 10/8/88

SITE LOCATION MAP

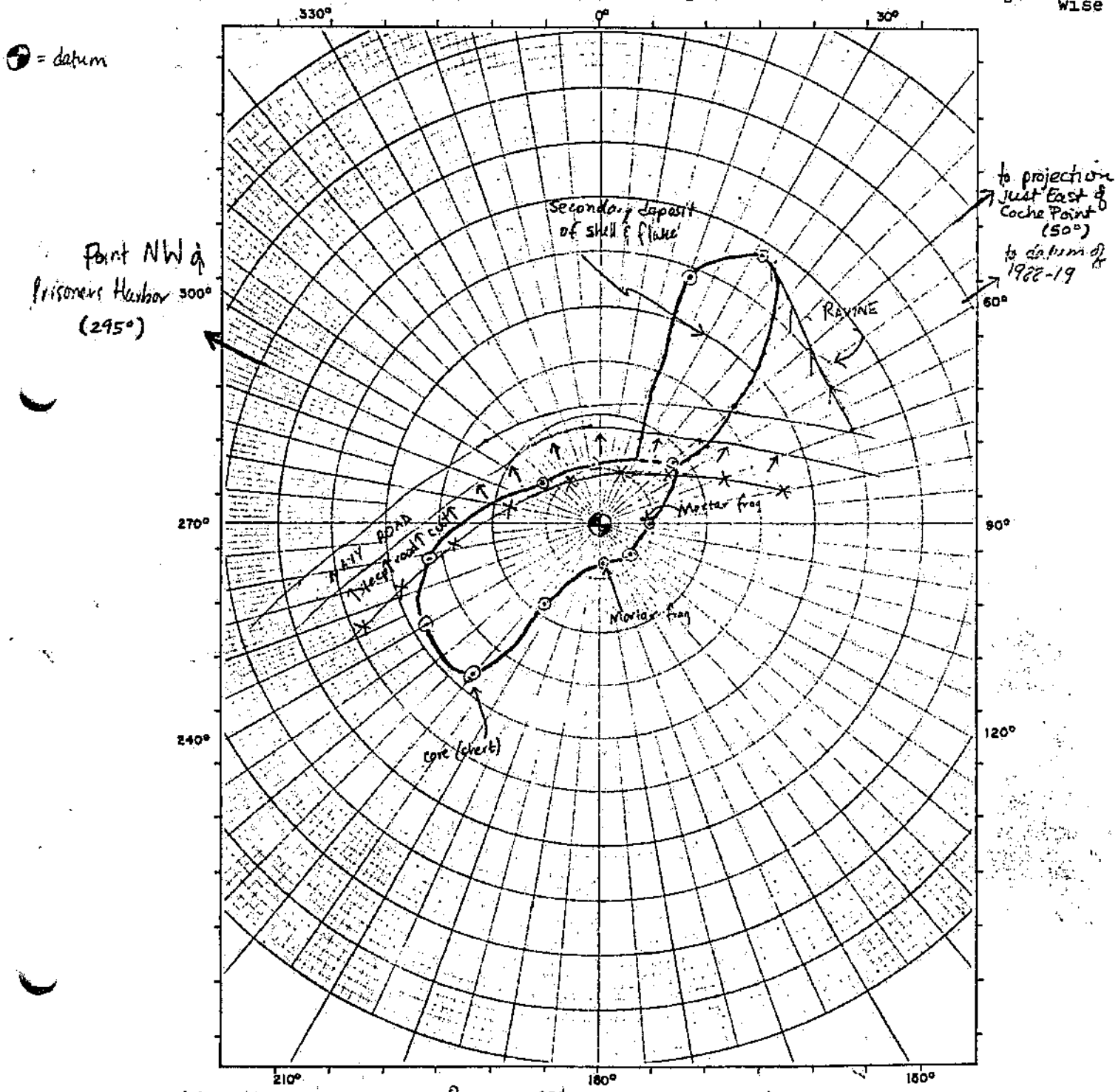
Site no. SCRI-466

Field no. 1988-20

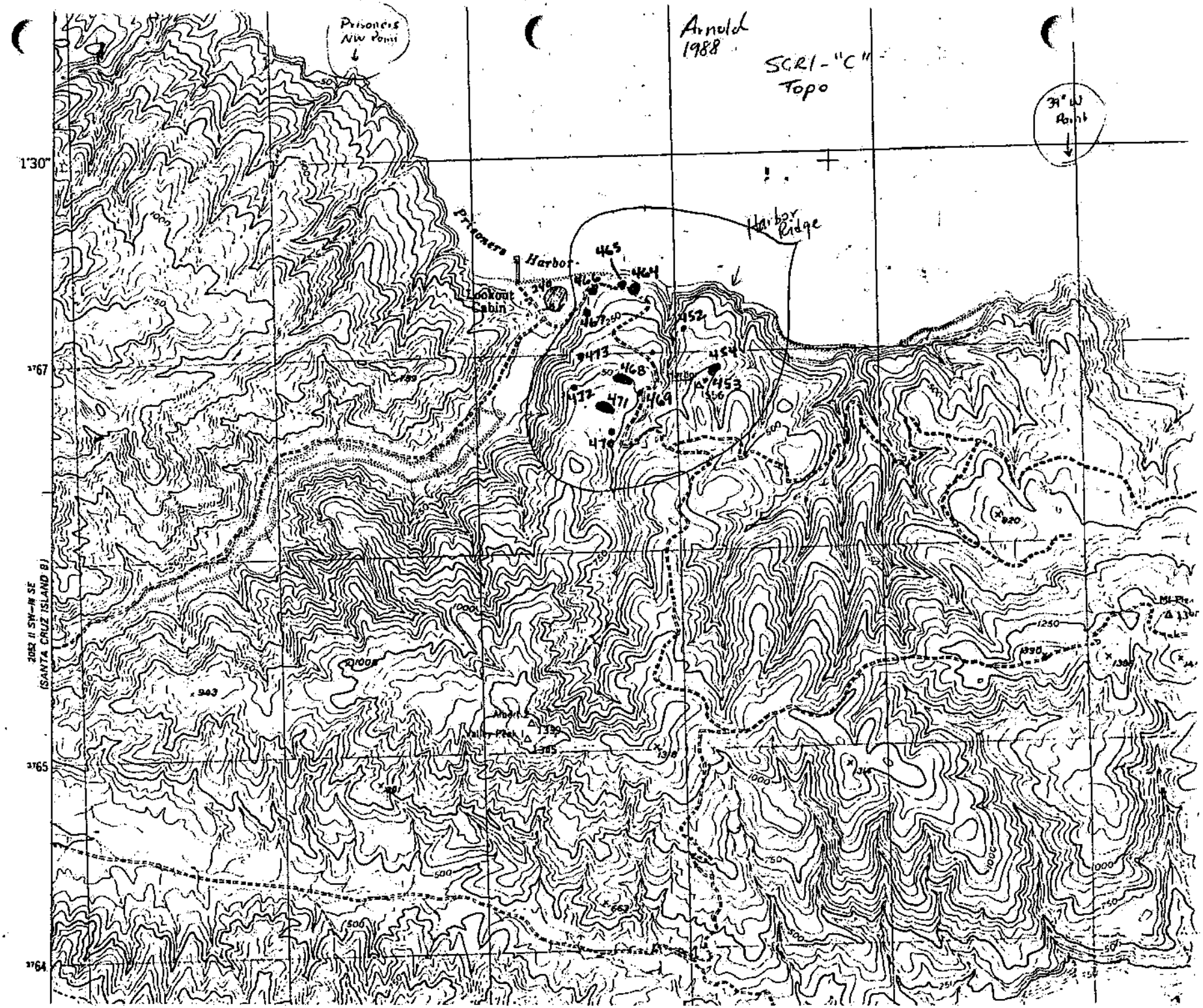
Legend

- Spring
- Intermittant Stream
- Perennial Stream
- Road ------ Trail
- Fence
- Site Boundary
- Mapped point on site boundary
- Rock Outcrop
- Tree or Bushes
- Midden
- Unvegetated sand

NOTE: Site boundary azimuths should be taken from a point represented by the center of the circle. Mag. north is zero unless desig. otherwise



Scale block = 10 m Date 8 Oct 1988 Drawn by A Munns


Prisoners NW Point
Arnold 1988
SCRI-"C" Topo
39° W Point
Harbor Ridge
Prisoners Harbor
Lookout Cabin
465
464
466
467
452
473
468
454
453
472
471
469
470
1'30"
3767
3765
3764
2052 II SW—IV SE
(SANTA CRUZ ISLAND B)
Alberts
Valley Peak
1339
1385
1250
1390
1000
750
500
250

Appendix B

NAGPRA Plan of Action

NAGPRA PLAN OF ACTION

CHANNEL ISLANDS NATIONAL PARK
SANTA CRUZ ISLAND CALIFORNIA

U.S. Navy Archeological Testing Plan
Prisoners Harbor FOCUS Cable Installation, Xaxas Village Site (CA-SCrI-240)

August 1, 2016

This Plan of Action describes the procedures for the treatment and disposition of Native American human skeletal remains, associated funerary objects, objects of cultural patrimony, and sacred objects that may be discovered during planned archeological testing of the Xaxas Village Site (CA-SCrI-24) at Prisoners Harbor, Santa Cruz Island, Channel Islands National Park. This Plan of Action shall comply with the requirements of the Native American Graves Protection and Repatriation Act (NAGPRA), *25 U.S.C. 3001 et seq.*, its implementing regulations as set forth in *43 CFR Part 10 (specifically §10.5[e])*, and the Archeological Resources Protection Act (ARPA), *16 U.S.C. 470 et seq.*, with its implementing regulations (43 CFR Part 7).

I. Project Information

A. Project: Archaeological testing and data recovery associated with the installation of a fiber optic cable and water line at Santa Cruz Island, Santa Barbara County, CA.

B. Project Sponsor: The United States Navy (Navy)

C. Lead Managing Agency: United States National Parks Service (NPS) Channel Islands National Park

D. Description of Project: The Navy is in the process of installing a new fiber optic cable communications system that will run from the Santa Cruz Island shoreline at Prisoners Harbor through a buried trench and elevated channel to the top of the island along the Navy Road. Santa Cruz is a unit within the NPS Channel Islands National Park. In order to protect the site and prevent the destruction of Native American remains and objects, the Navy will conduct pre-installment testing along the trench and elevated channel route through portions of the CA-SCrI-240 site.

The intent of this testing is to ensure that neither the trench nor the elevated channel will disturb archeological features in the area. The testing will be limited to auger test pits to determine if the portion of the site that intersects the FOCUS Cable trench or elevated channel line maintains depositional integrity, can provide datable materials, contains definable components, and/or maintains research potential. If this is unclear based on auger excavation, then test units may be placed.

II. Permits

A. A NPS Research and Collections permit and ARPA permit, authorized by the NPS regional director will be obtained by the Navy.

III. Site Information

The Xaxas Site (CA-SCrI-240) is located at Prisoners Harbor on the northern shoreline of Santa Cruz Island. Based on excavations conducted in the 1970s and 1990s, the area of Prisoners Harbor was occupied without significant interruption for approximately 3,000 years. Based on Spanish mission records from Mission Santa Barbara and Mission San Buenaventura, the village of Xaxas was abandoned by 1819, making it the last probable place on the northern Channel Islands to be permanently occupied by the Chumash people. Overall, the archaeological and ethnohistoric data highlight the tremendous cultural significance of Xaxas as a large Chumash village, regional economic center, and home of political elites. Its stratified deposits date to the Late Holocene and continue to provide important insights into the Middle Period, Late Period, and Historic Period on the Channel Islands.

The Xaxas Site at Prisoners Harbor has attracted the attention of archaeologists since the late 1800s, and its artifacts have long played important roles in understanding the chronology of the island's occupation. Paul Schumacher conducted the first casual excavation there in 1875, during which he exposed 40 skeletons and collected fishhooks. Multiple excavations further delineated the site in the early- to mid-1900's. Since then, Jeanne Arnold has conducted the most substantial archaeological investigations at Prisoners Harbor, beginning with a survey to the east of CA-SCrI-240 in 1988. In the summers of 1991 to 1997, she excavated a total of 13 units at CA-SCrI-240 to depths of 55-70 cm. Arnold concentrated her efforts in the western portion of the site with the intent to avoid previous excavations and human burials.

IV. Affiliated Tribe

The preponderance of geographical, archeological, linguistic, folklore, oral tradition, and historical evidence for the determination of custody for these cultural items identifies one contemporary American Indian tribe as traditionally associated with the northern California Channel Islands: the Chumash. This tribe is most likely to be culturally affiliated with earlier Chumash who occupied and used this unit of the national park system in past centuries.

V. Plan of Action

A. This plan focuses on the limited possibility of encountering Native American human skeletal remains and associated funerary objects as a result of the archeological testing in the Prisoners Harbor Area. The kinds of objects to be considered as associated funerary objects as defined in 43 CFR Part 10.2(d) are the following:
   a. Objects placed intentionally at the time of death or later with or near the human remains or within the burial pit. Historically, these items are projectile points, broken

pottery sherds, entire pottery vessels, and various European trade items (i.e. metal objects, glass and shell beads).

b. Sacred objects are specific ceremonial objects needed by traditional Native American religious leaders for the practice of traditional Native American religions by their present-day adherents. Objects falling under this definition have not yet been determined. Consultation will occur to determine whether or not objects recovered fall within this definition.

c. Objects of Cultural Patrimony are items having ongoing historical, traditional, or cultural importance central to the Indian tribe rather than property owned by an individual. No objects have been determined under this definition. Consultation will occur to determine whether or not objects recovered fall within this definition.

B. If Native American human skeletal remains are discovered as a result of the archeological testing, the Navy will cease activity in the immediate area of the human remains and objects, protect them from further disturbance, and provide immediate telephone notification of the discovery to the aforementioned tribal representatives. The telephone notification shall be followed by written notification. This notification shall include information about the kinds and condition of human remains and cultural items.

C. Traditional treatment of the burial while in situ, will consist of placing a white (unbleached) muslin (cotton) cloth over the internment, offer a prayer, and a small tobacco offering shall be placed near the remains.

D. If, following consultations, it is determined that exposed remains and associated cultural items should not or cannot be reburied in place, the items will be subject to preliminary archaeological recordation. Identification of the burial outline will be documented by taking dimensions, noting orientation and shape, and noting soil color. The soil surrounding the skeletal remains will be removed to expose the burial, and screened for artifacts. A sufficient number of measurements will be taken of the outline to permit reconstruction of the shape and dimensions of the pit after excavation. When the burial is completely exposed, sketches and diagrams will be drawn. Location, deposition, position, orientation, and depth will be recorded and complete measurement of the bones, artifacts, and pit will be noted while in situ. Any pathological conditions observed while in situ will be described in detail. No soil samples of the burial pit will be taken. No photographs of human remains will be taken. Estimation of sex, stature, and age will be documented while in situ. Additional non-destructive documentation of the remains and cultural items will be carried out in consultation with the Tribe.

E. Upon consultation with tribal representatives, any human remains and associated funerary objects will be exhumed and reinterred at a safe, undisturbed location adjacent to the portion of the site investigated, and the requirements of NAGPRA Section 3 will be carried out in consultation with the tribe.

VI. Reports

A. A comprehensive report on the results of the archaeological investigation, inadvertent discoveries, the nearby soils, any other related forms of documentation, and a record of consultation with the culturally affiliated tribes shall be prepared and kept on file as a part of the Navy's Environmental Assessment for the project.

_____ _____

Russell Galipeau, Superintendent
Channel Islands National Park

Date

_____ _____

Chumash Tribe of Indians

Date

Appendix E: Material Safety Data Sheets

VpCI™ ADDITIVES FOR FORMULATORS

S-69 Powder

VpCI Water Treatment Building Block

PRODUCT DESCRIPTION

S-69 Powder is a Vapor phase Corrosion Inhibitor (VpCI™) developed as a corrosion prevention additive for the water treatment industry. This building block provides multimetal protection including galvanized steel and yellow metals. The VpCI™s form a strong monomolecular layer on the metal surface that protects in all three phases - liquid, vapor and the vapor-liquid interface. S-69 Powder provides water treatment companies the ability to incorporate Cortec® VpCI technology into their specific formulations.

TYPICAL APPLICATIONS

S-69 Powder is an anticorrosion additive to water treatment formulations to replace chromates, nitrites, phosphonates, and other types of restricted corrosion inhibitors.

METHOD OF APPLICATION

a) Closed loop

The final concentration of S-69 Powder under operating conditions for a closed loop system formulation is 750 ppm - 1000 ppm.

b) Open loop

The final concentration varies with formulations. (Contact Cortec for your specific formulation needs.)

FEATURES

- Protects multimetals including galvanized steel and yellow metals
- Prevents corrosion and pitting at economical concentrations
- Effective for open and closed loop cooling systems
- Contains contact and vapor phase corrosion inhibitors
- Can be used as a corrosion inhibitor additive in the majority of water treatment programs
- Nitrite, chromate and heavy metal free
- Readily water-soluble powder for easy application
- Environmentally friendly formulation
- Compatible with the majority of commercially available biocides and antiscalants
- Eliminates environmental hazard and disposal problems
- Easily traceable utilizing a Molybdenum test kit. S-69P contains 2.1% Mo by weight, in the form of $Na_2MoO_4 \cdot 2H_2O$ (at 5.2% of total formulation). See reversed side for Mo vs. S-69P concentration chart

EPA/600/4-90/027F

Meets EPA requirements for discharge in seawater and freshwater in used concentration.

48-hour Static-renewal toxicity test:

EE#	Appendix	Sample ID	NOEC/LOEC, ppm D. pulex	P. Promelas
E-17766-01	A	S-69P	10,000/>10,000	10,000/>10,000

TYPICAL PROPERTIES

Appearance	White to off-white powder
pH	10 - 12 (1% aqueous)

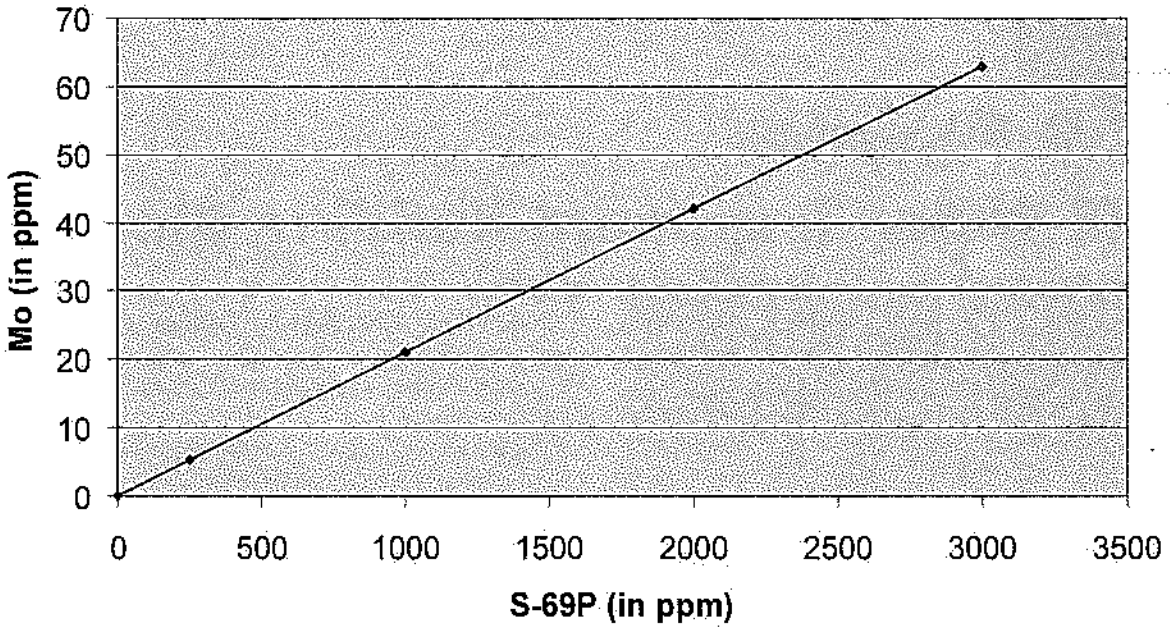
PACKAGING AND STORAGE

S-69 is packaged in 5 lb.(2.27 kg.) box, 50 lb.(22.7 kg.) and 100 lb.(45.3 kg)drums. It should be stored in a tightly closed container. The shelf life is 2 years.

CORTEC CORPORATION

Environmentally Safe VpCI™/MCI® Technologies

Theoretical concentration of Molybdenum vs. S-69P



FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY CLOSED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

LIMITED WARRANTY

All statements, technical information and recommendations contained herein are based on tests Cortec Corporation believes to be reliable, but the accuracy or completeness thereof is not guaranteed.

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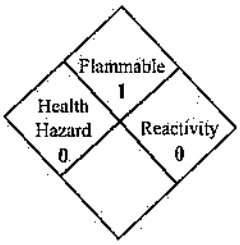
WYO-BEN, INC.

MATERIAL SAFETY DATA SHEET



NFPA FIRE HAZARD IDENTIFICATION SYSTEM

I. PRODUCT IDENTIFICATION

Trade Name(s): **DRIL-TROL™ "QD"**

Generic Name(s): Polyanionic cellulose

Chemical Name(s): Cellulose ether

Manufacturer: **WYO-BEN, INC.** Address: P.O. Box 1979 Billings, Montana 59103	Telephone Numbers: Information: (406) 652-6351 EMERGENCY: (406) 652-6351

II. HAZARDOUS INGREDIENTS

Ingredient	CAS No.	%	Hazard

This product does not meet the definition of a hazardous chemical given in 29 CFR Part 1910.1200 (OSHA). Information on this form is furnished as a customer service.

III. PHYSICAL DATA

Boiling Point (EF): NA	Specific Gravity (H_2O=1): 1.5
Vapor Pressure (mm. Hg): NA	Melting Point: ND
Vapor Density (Air = 1): NA	Evaporation Rate (Butyl Acetate = 1): NA
Solubility in Water: Complete	pH: 5.5 – 6.0 (1% aqueous solution)
Density (at 20E C): 94 lb / cu. Ft.	

Appearance and Odor: Light off-white colored powder. Odorless.

IV. FIRE AND EXPLOSION DATA

Flash Point: N/A	Flammable Limits: LEL: ND UEL: ND

Special Fire Fighting Procedures: Use NIOSH/MSHA approved SCBA with other protective equipment as necessary.

Unusual Fire and Explosion Hazards: If suspended in air in a finely divided state treat as a flammable dust. Material will not burn unless preheated. Cool fire exposed containers with water.

Extinguishing Media: Dry chemical, foam, CO_2. Water spray or fog may be used; however, product becomes very slippery when wet.

V. REACTIVITY

Stability: Stable at normal temperatures.

Hazardous Polymerization: None known.

Incompatibility: Avoid contact with strong oxidizing agents.

Hazardous Decomposition Products: Thermal decomposition may product carbon monoxide and carbon dioxide.

NA = Not Applicable ND = Not Determined

Date Prepared: January 4, 2010

Doc #: 4041-95

VI. HEALTH HAZARD INFORMATION

Routes of Exposure and Effects:

Eyes: Exposure to airborne dust may cause mechanical irritation.

Skin: Not expected to cause prolonged or significant irritation.

Inhalation: Non-irritating to mucous membranes, however, breathing high concentrations of airborne dust may cause mechanical irritation of the nose, throat, and upper respiratory tract.

Ingestion: Not expected to be harmful if swallowed. May cause some gastrointestinal upset.

Permissible Exposure Limits: (for air contaminants)	OSHA PEL	ACGIH TLV
As Particulate Not Otherwise Classified (PNOC):		
Respirable fraction	5 mg/m^3	ND
Total dust	15 mg/m^3	ND

Carcinogenicity:
Not listed by NTP, IARC or OSHA.

Acute Oral LD_{50}: >2,700 mg/kg (rats)	Acute inhalation LD_{50}: >2,700 mg/kg (rats)	Acute Dermal LD_{50}: >2,000 mg/kg (rabbit)	Aquatic Toxicology LC_{50}: ND

Emergency and First Aid Procedures:

Eyes: Flush with clear water for at least fifteen minutes; seek medical attention if irritation persists.

Skin: Wash with soap and water; seek medical attention if irritation persists.

Inhalation: Remove to dust free area. For severe symptoms give oxygen and seek medical attention.

Ingestion: Induce vomiting and seek medical attention. Keep respiratory tract clear. Do not give liquids to an unconscious person.

VII. HANDLING AND USE PRECAUTIONS

Steps to be Taken if Material is Released or Spilled: Contain spill. Sweep or vacuum up and place in disposal container. Keep out of water sources and sewers. Use caution if wet as product becomes very slippery.

Waste Disposal Methods: Product should be disposed of in accordance with applicable local, state and federal regulations.

Handling and Storage Precautions: Store in a cool, dry area in sealed containers or bags. Avoid breathing dust and contact with eyes or skin. Wash thoroughly after handling.

VIII. INDUSTRIAL HYGIENE CONTROL MEASURES

Ventilation Requirements: Use mechanical general room ventilation for enclosed areas.

Respirator: Not generally required unless needed to prevent respiratory irritation. Do not breathe dust at levels above recommended exposure limits.

Eye Protection: Not generally required unless needed to prevent eye irritation.

Gloves: Not necessary.

Other Protective Clothing or Equipment: Not necessary.

IX. SPECIAL PRECAUTIONS

Store in a cool dry area. Avoid breathing airborne dust.

DEPARTMENT OF TRANSPORTATION HAZARDOUS MATERIAL INFORMATION

Shipping Name: None	Hazard Class: None
Hazardous Substance: None	Cautionary Labeling: None

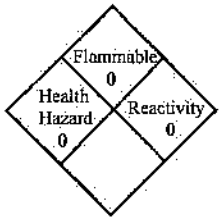
Date Prepared: January 4, 2010

Doc #: 4041-95

All information presented herein is believed to be accurate; however, it is the user's responsibility to determine in advance of need that the information is current and suitable for their circumstances. No warranty or guarantee, expressed or implied is made by WYO-BEN, INC. as to this information, or as to the safety, toxicity or effect of the use of this product.

WYO-BEN, INC.

MATERIAL SAFETY DATA SHEET



FPA FIRE HAZARD IDENTIFICATION SYSTEM

I. PRODUCT IDENTIFICATION

Trade Name(s): **SW-101™**

Generic Name(s): Wyoming (Western) Bentonite; Bentonite Clay (CAS No. 1302-78-9) and other proprietary ingredients

Chemical Name(s): Sodium Montmorillonite (CAS No. 1318-93-0) and other proprietary ingredients

Manufacturer: **WYO-BEN, INC.** Address: P.O. Box 1979 Billings, Montana 59103	Telephone Numbers: Information: (406) 652-6351 EMERGENCY: (406) 652-6351

II. HAZARDOUS INGREDIENTS

Ingredient	CAS NO.	%	Hazard
Crystalline Silica (SiO_2) as Quartz	14808-60-7	See Note	Low concentrations of crystalline silica (SiO_2) in the form of quartz may be present in airborne bentonite dust. See Section VI for discussion of health hazard.

Note 1: The specific chemical identity of this product is being withheld as a trade secret. In the event of a medical emergency it will be provided to a treating medical professional under the provisions of 29 CFR 1910.1200(i).

Note 2: Although the typical quartz content of western bentonite is in the range of 2 to 6% most of the quartz particles are larger than the 10 μ respirable threshold size. The actual respirable quartz concentration in airborne bentonite dust will depend upon bentonite source, fineness of product, moisture content of product, local humidity and wind condition at point of use and other use specific factors.

III. PHYSICAL DATA

Boiling Point (°F): NA	Specific Gravity (H_2O=1): 2.45-2.55
Vapor Pressure (mm. Hg): NA	Melting Point: Approx. 1450°C
Vapor Density (Air = 1): NA	Evaporation Rate (Butyl Acetate = 1): NA
Solubility in Water: Insoluble, forms colloidal suspension.	pH: 8-10 (5% aqueous suspension)
Density (at 20° C): 55 lbs./cu.ft. as product.	

Appearance and Odor: Bluegray to green as moist solid, light tan to gray as dry powder. No odor.

IV. FIRE AND EXPLOSION DATA

Flash Point: NA	Flammable Limits: LEL: NA UEL: NA

Special Fire Fighting Procedures: NA

Unusual Fire and Explosion Hazards: None. Product will not support combustion.

Extinguishing Media: None for product. Any media can be used for the packaging. Product becomes slippery when wet.

V. REACTIVITY

Stability: Stable

Hazardous Polymerization: None

Incompatibility: None

Hazardous Decomposition Products: None

NA = Not Applicable ND = Not Determined

Date Prepared: January 4, 2010

Doc #: 4360-00

VI. HEALTH HAZARD INFORMATION

Routes of Exposure and Effects:

Skin: Possible drying resulting in dermatitis.

Eyes: Mechanical irritant.

Inhalation: *Acute* (short term) exposure to dust levels exceeding the PEL may cause irritation of respiratory tract resulting in a dry cough. *Chronic* (long term) exposure to airborne bentonite dust containing respirable size (☐ 10 μ) quartz particles, where respirable quartz particle levels are higher than TLV's, may lead to development of silicosis or other respiratory problems. Persistent dry cough and labored breathing upon exertion may be symptomatic.

Ingestion: No adverse effects.

Permissible Exposure Limits: (for air contaminants)	OSHA PEL (8hr. TWA)	ACGIH TLV
Bentonite as "Particulates not otherwise regulated" (formerly nuisance dust)		
Total dust	15mg/m^3	ND
Respirable dust	5mg/m^3	ND
Crystalline Silica: Quartz (respirable)	10 mg/m^3 / % Silica + 2	0.025 mg/m^3

Carcinogenicity: Bentonite is not listed by ACGIH, IARC, NTP or OSHA. IARC, 1997, concludes that there is sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica from occupational sources (IARC Class 1), that carcinogenicity was not detected in all industrial circumstances studied and that carcinogenicity may depend on characteristics of the crystalline silica or on external factors affecting its biological activity. NTP classifies respirable crystalline silica as "known to be a human carcinogen" (NTP 9th Report on Carcinogens – 2000). ACGIH classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

Acute Oral LD_{50}: ND	Acute Dermal LD_{50}: ND	Aquatic Toxicology LC_{50}: ND

Emergency and First Aid Procedures:

Skin: Wash with soap and water until clean.

Eyes: Flush with water until irritation ceases.

Inhalation: Move to area free from dust. If symptoms of irritation persist contact physician. Inhalation may aggravate existing respiratory illness.

VII. HANDLING AND USE PRECAUTIONS

Steps to be Taken if Material is Released or Spilled: Avoid breathing dust; wear respirator approved for silica bearing dust. Vacuum up to avoid generating airborne dust. Avoid using water. Product slippery when wetted.

Waste Disposal Methods: Product should be disposed of in accordance with applicable local, state and federal regulations.

Handling and Storage Precautions: Use NIOSH/MSHA respirators approved for silica bearing dust when free silica containing airborne bentonite dust levels exceed PEL/TLV's. Clean up spills promptly to avoid making dust. Storage area floors may become slippery if wetted.

VIII. INDUSTRIAL HYGIENE CONTROL MEASURES

Ventilation Requirements: Mechanical, general room ventilation. Use local ventilation to maintain PEL's/TLV's.

Respirator: Use respirators approved by NIOSH/MSHA for silica bearing dust.

Eye Protection: Generally not necessary. Personal preference.

Gloves: Generally not necessary. Personal preference.

Other Protective Clothing or Equipment: None

IX. SPECIAL PRECAUTIONS

Avoid prolonged inhalation of airborne dust.

DEPARTMENT OF TRANSPORTATION HAZARDOUS MATERIAL INFORMATION

Shipping Name: NA (Not Regulated)	Hazard Class: NA
Hazardous Substance: NA	Caution Labeling: NA

Date Prepared: January 4, 2010 Doc #: 4360-00

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