ADDENDUM #1

INCIDENTAL HARASSMENT AUTHORIZATION APPLICATION FOR NAVY TRAINING CONDUCTED WITHIN THE SILVER STRAND TRAINING COMPLEX

Submitted to:

Office of Protected Resources,

National Marine Fisheries Service,

National Oceanographic and Atmospheric Administration

Prepared by:

Commander, U.S. Pacific Fleet

Department of The Navy

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ADDENDUM NOTES (October 12, 2011)

This contains a change of the Navy's mitigation zone for underwater detonations to 700 yards for positive control detonations.

An additional set of mitigation measures for underwater detonations using any type of timed delay are proposed. Mitigation zones for timed-delayed detonations vary from 1,000 to 1,500 yards depending on charge weight and length of delay. Derivation of the timed delay mitigation is explained.

A new training sub-area is also designated for some underwater detonations.

Finally, four additional relatively rare dolphin species were added to the exposure analysis. These species are not expected to be part of the normal average species assemblage in the Silver Strand Training Complex ocean boat lanes, but are considered in this Addendum as a conservative measure.

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1 DESCRIPTION OF ACTIVITIES

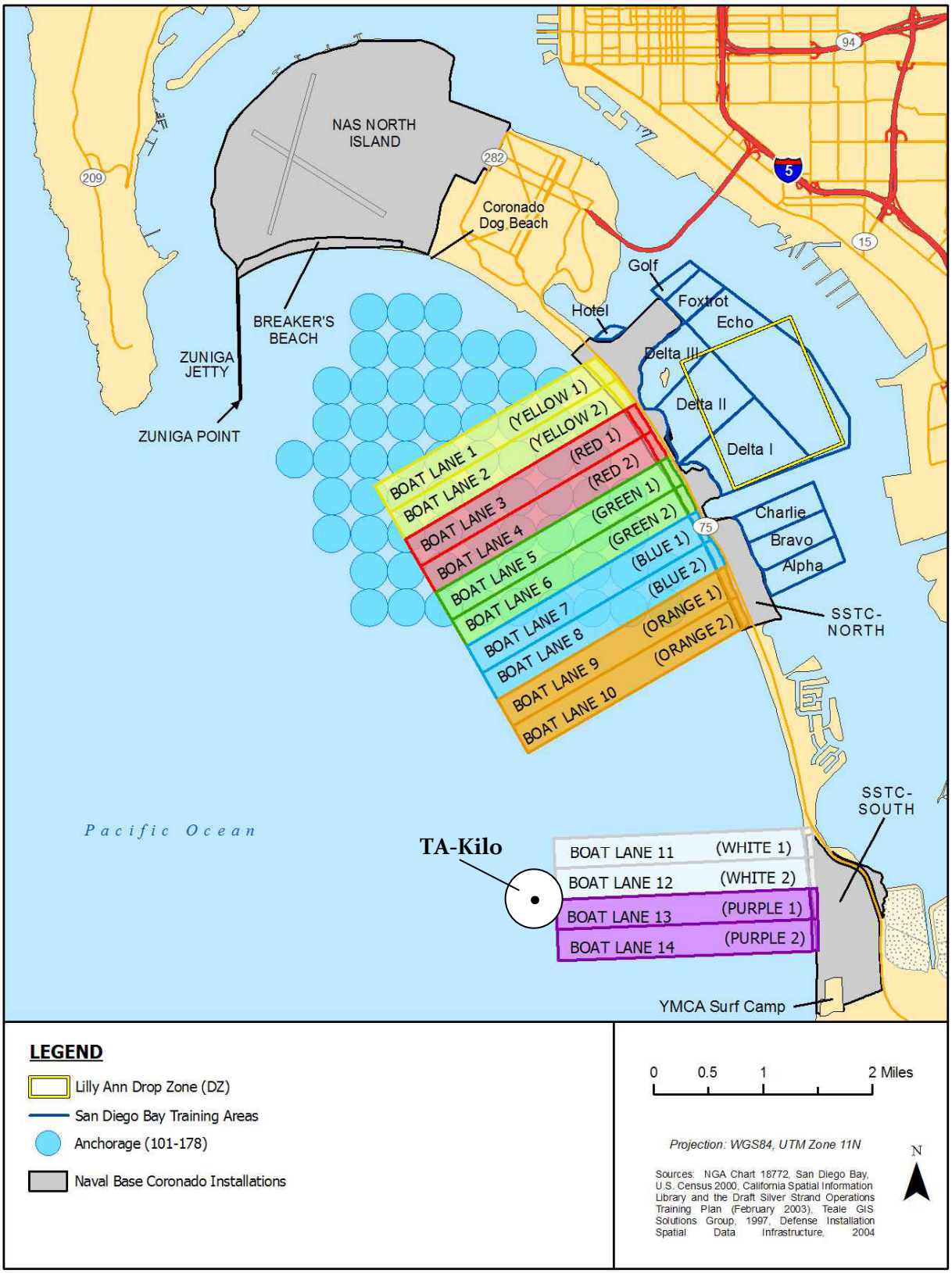
This Section remains unchanged as described in the Navy's Silver Strand Training Complex (SSTC) Incidental Harassment Authorization application through version 3 of December 28, 2010, with the following additions:

For this Incidental Harassment Authorization application, the Navy determined that only underwater detonations near and in the SSTC Boat Lanes and Training Area Kilo (TA-K), and ELCAS pile driving and pile removal training events at SSTC have the potential to rise to the level of harassment as defined under Marine Mammal Protection Act of 1972, as amended in 1994, and are therefore considered in this application.

A new point sub-area Training Area-Kilo (TA-K) is designated 500 yards west of the SSTC-SOUTH boat lanes with a 500 radius (Table 1-1, Figure 1-1).

ADDENDUM Table 1-1. Description of additional SSTC in-water training sub-area.

Training Sub-Area	Description	How Sub-area Applies To This Application
Training Area-Kilo (TA-K)	TA-K is a spot location approximately 500 yards past the end of the SSTC-SOUTH boat lanes that has been designated for some underwater detonations. This location is a point with a 500 yard circular buffer around it and shares the same bathymetry and bottom conditions as the Boat Lanes. TA-K site is used to avoid training conflicts with other SSTC training (underwater detonation and non-underwater detonation) within the SSTC-SOUTH boat lanes (ex. AMNS Table 1-2)	Small charge weight (< 29 lbs) underwater detonations



ADDENDUM Figure 1-1. Silver Strand Training Complex showing additional training area TA-K.

Description of Training- Underwater Detonations

Table 1-2 and **Table 2-1** describes the types of underwater detonation training events conducted within the SSTC.

The basic discussions of some underwater detonation procedures below typically apply to all underwater detonation training events at SSTC with the exception of the Unmanned Underwater Vehicle Neutralization and Airborne Mine Neutralization System (*see Table 1-2*).

General Underwater Detonation Procedures

-Prior to getting underway, all EOD and NSW conduct a detailed safety and procedure briefing to familiarize everyone with the goals, objectives, and safety requirements (including mitigation zones) applicable to the particular training event.

- Underwater detonations only occur during daylight.

-EOD or NSW personnel can be transported to the planned detonation site via small boat or helicopter depending on the training event (*see Table 1-2*). Small boats can include 7-m Rigid Hull Inflatable Boats (RHIB), zodiacs, or other similar craft as available to the particular unit.

-Once on site, the applicable mitigation zone is established and visual survey commences for 30 minutes. Divers enter the water to conduct the training objective which could include searching for a training object such as a simulated mine or mine-like shape.

-For the detonation part of the training, the explosive charge and associate charge initiating device are taken to the detonation point. The explosives Navy EOD and NSW use are military forms of C-4. In order to detonate C-4, a fusing and initiating device is required. The two main types of Navy charge initiating devices are discussed in a subsequent section.

-Following a particular underwater detonation, additional personnel in the support boats (or helicopter) keep watch within the mitigation zone for 30 minutes.

-Concurrent with the post-detonation survey, divers return to the detonation site to confirm the explosives detonated correctly and retrieve any residual material.

Types of Detonation Initiating Devices

The Navy uses both timed-delayed and positive control to initiate a particular underwater detonation depending on the training event in question (**Table 1-2**) and in particular, the training objectives applicable to that underwater detonation. The time-delay firing is called the Timed Delay Firing Device (TDFD). The most common positive control firing is called a Remote Firing Device (RFD). TDFDs are the simplest, safest, most operationally sound method of initiating a demolition charge on a floating mine or mine at depth. TDFDs are used because of their light weight ease of employment and low magnetic signature in cases of mines sensitive to magnetic fields. In addition, TDFD are HERO [1] safe meaning there is reduced risk of accidental detonations from nearby radios or other electromagnetic radiation producing devices. The use of TDFD eliminates the need to re-deploy swimmers from a helicopter or boat to recover equipment used with positive control firing devices such as the RFD. The TDFD also allows sufficient time for EOD personnel to swim outside of the detonation plume radius and human safety buffer zone after the timer is set. For a surface mine neutralization training event involving a helicopter or a boat, the minimum time-delay that is reasonable for EOD divers to make their way outside of the detonation human safety buffer zone is approximately 10 minutes. For a mine neutralization training event at depth using small boats, the time-delay can be minimized to five minutes, however, this would require the instructors to handle initiation of the detonation and therefore would result in decreased training value for students.

A RFD, a type of positive control device, can be used to initiate an underwater detonation, but it is not normally preferred as the primary firing device due to HERO concerns with electric detonators, Operational Risk Management (i.e., safety) considerations, and established Navy tactical procedures. Current Navy RFD use a radio signal to remotely detonate a charge. By using electronic positive control devices such as the RFD as an the only alternative to a TDFD, additional electronic signals, and metal from the receiver and wiring is unnecessarily introduced into an influence ordnance operating environment. It is not sound safety principles or good demolition practice to combine different firing circuits to a demolition charge. For instance, in a live mine field, Navy dive platoons expect there to be additional risks, such as unknown mines with different types of influence firing circuits (i.e., detonated by contact, magnetic field, or certain sounds) in close proximity to a mine they are trying to destroy. The use of a TDFD reduces these risks by limiting the possibility of an unintentionally triggering detonation from unknown mine types. Underwater demolition needs to be kept as simple and streamlined as possible, especially when divers and influence ordnance are considered. In an open ocean environment, universal use of RFDs would greatly increase the risk of misfire due to component failure, and put unnecessary stress on all needed connections and devices (adding 600 – 1,000 feet of firing wire; building\deploying an improvised, bulky, floating system for the RFD receiver; adding another 180 feet of detonating cord plus 10 feet of additional material).

RFDs, therefore, are not considered a practicable alternative for all underwater detonations. While positive control devices do allow for instantaneous detonation of a charge and are used for some SSTC training events, exclusive use of RFD introduce operationally unsound tactics, thereby increasing future risks to Navy dive teams. It is essential that EOD and NSW platoons qualify annually with necessary time-delay certification, maintain proficiency, and train to face real-world scenarios that require use of TDFDs.

[1] Hazards of Electromagnetic Radiation to Ordnance (HERO)- High intensity radio frequency fields produced by modern radio and radar transmitting equipment can cause sensitive electroexplosive devices contained in ordnance systems and detonators to detonate prematurely. HERO safe items are resistant to this interference.

ADDENDUM Table 1-2. Detailed descriptions of SSTC underwater detonation training events with indication of those that can use either timed delay or remote firing.

TRAINING Event /duration	**Description: Table 1-2 details total amount of annual underwater explosive use for SSTC. Below descriptions talk about % of training that may also include non-explosive training periods. ALL explosive training occurs on the ocean side of SSTC with the exception of SWAG which could be done in both the ocean and south San Diego Bay.** **Training events that use time-delay indicated. More details on charge weight and expected use provided in Table 2-1.**
Shock Wave Action Generator (SWAG) 1 day 74 per year-Bay 16 per year- ocean	SWAG is a tool used by Explosive Ordnance Disposal (EOD) to disarm enemy limpet mines which have been attached to the hull of a ship. The SWAG is composed of a cylindrical steel tube, 3 inches long and 1 inch wide, containing approximately 0.033 lbs of explosives. The single explosive charge is highly focused. For SWAG training, a metal sheet containing an inert mine is lowered from the side of a small vessel, or small boat. Divers place a single SWAG on the mine that is located mid-water column, within water depths of 10-20 feet. A bag is placed over the mine to catch falling debris. SWAG training is the ONLY explosive event that take place within south San Diego Bay [Area "Echo" (see Figure 1-1)], and within the oceanside areas of the SSTC.
Mine Counter Measure (MCM) 1 day 58 per year (time-delay)	MCM training events are performed from a small boat to locate and identify suspected inert training mine(s) either at mid-column or on the sea floor at a water depth generally ≤ 72 feet near or within the SSTC oceanside Boat Lanes. An EOD dive team dives to locate the suspected mine. Once located, a single explosive charge (≤10-20 lbs NEW) using either a TDFD or RFD is placed next to the mine to neutralize it (i.e., placing explosives on mines for the purposes of destroying them). The EOD team returns to the boat and pulls back to a safe distance prior to detonation of the single countercharge. The "neutralized" training mine or mine-shape is then raised, towed to shore, beached, and retrieved.
Floating Mine 1 day 53 per year (time-delay)	EOD divers are inserted into the ocean via helicopter or small boat. They then subsequently swim to an inert, floating mine or mine-shaped object in water depths of less than 72 feet near or within the SSTC oceanside Boat Lanes. A single explosive countercharge (≤ 5 lbs NEW) is placed on the mine\mine-shape using either a TDFD or RFD. The EOD team returns to the boat (or helicopter) and pulls back to a safe distance prior to detonation of the countercharge.
Dive Platoon 1 day 8 per year (time-delay)	EOD divers are inserted into the ocean via helicopter or small boat, dive to depths of 30-72 feet near or within the SSTC oceanside Boat Lanes, and locate inert training mine or mine shapes. Once located, sequential detonation charges (≤3.5 lbs NEW) using either a TDFD or RFD are placed on the mine shape. The EOD team returns to the boat (or helicopter) and pulls back to a safe distance prior to detonation of the countercharge.
Very Shallow Water (VSW) Mine Counter Measure 1 day 60 per year (time-delay)	VSW MCM involves training on locating, identifying, and neutralizing mines placed either mid-column or on the sea floor at a water depth of ≤ 24 feet near or within the SSTC oceanside Boat Lanes. Detonation charges (≤10-20 lbs NEW) with either a TDFD or RFD are used. Actual detonations occur during approximately 60 % of these training events and will ONLY occur near and within the SSTC oceanside Boat Lanes. Complimentary in-Bay training (40%) will not use any explosives and is designed to train divers on underwater navigation and mine localization.
Unmanned Underwater Vehicle (UUV) 1 day 4 per year	This training is for EOD divers to learn how to deploy UUVs. One to two small boats transport personnel to a site. UUVs explore the area, photograph, and collect hydrographic information. After analysis is complete, Navy marine mammals are dispatched to localize and mark potential suspect objects, followed by divers to confirm identification. Approximately 3% of events involve divers placing a single charge (≤10-15 lbs NEW) to neutralize the simulated mine using RFD in water depths from 10 to 72 feet near and within the SSTC oceanside Boat Lanes (on the bottom or up to 20 feet from the surface). Complimentary training within south San Diego Bay is strictly for UUV operator training and does not use underwater detonations.

TRAINING Event /duration	**Description: Table 1-2 details total amount of annual underwater explosive use for SSTC. Below descriptions talk about % of training that may also include non-explosive training periods. ALL explosive training occurs on the ocean side of SSTC with the exception of SWAG which could be done in both the ocean and south San Diego Bay.** **Training events that use time-delay indicated. More details on charge weight and expected use provided in Table 2-1.**
MK8 Marine Mammal / Marine Mammal Systems (MMS) 1 day 16 per year (time-delay)	EOD divers work with the assistance from the Navy's trained marine mammals to detect underwater objects and simulated mines. Approximately 10% of training involves the setting of a charge (≤13- or ≤29 lbs NEW) using either a TDFD or RFD to detonate simulated mines. Single charges are laid within water depths of 24 to 72 feet, 20 feet from the surface or below near and within the SSTC oceanside Boat Lanes. In some cases, sequential bottom laid detonations are used and charges are places in water depths of 10 to 72 feet near and within the SSTC oceanside Boat Lanes.
Mine Neutralization 1 day 4 per year (time-delay)	EOD divers are inserted via helicopter or boat for underwater demolition training. Divers search at depth to locate suspected inert mine or mine shapes. Once located, underwater detonation is performed with eight sequential charges (≤3.5 lbs NEW each) using either a TDFD or RFD in water depths of 30 to 72 feet near and within the SSTC oceanside Boat Lanes.
Surf Zone Test & Evaluation 1 day 2 per year (time-delay)	To support improving clearance capability in the surf zone (out to 10 feet of water), EOD tests and evaluates effectiveness of new detection and neutralization equipment in surf conditions near or within the SSTC oceanside Boat Lanes. Actual use of explosives occurs during only 1% of training events and involves deployment of a single charge (≤20 lbs NEW) using either a TDFD or RFD.
Unmanned Underwater Vehicle Neutralization 1 day 4 per year	Training consists of placing 2 sequential charges consisting of a Seafox (3.3 lbs NEW) or Archerfish (3.57 lbs NEW) charge placed from depths of 10 feet to the bottom in water depth less than 72 feet near or within the SSTC oceanside Boat Lanes.
Airborne Mine Neutralization System (AMNS) 1 day 10 per year	A MH-60S helicopter deploys an AMNS underwater vehicle into the water near or within the SSTC oceanside Boat Lanes. In training, the AMNS is used to search, locate, and destroy simulated mines or mine shapes. The AMNS vehicle is self-propelled and unmanned. Approximately 20% of the training would involve using remotely detonated charges (≤3.5 lbs NEW) placed by the AMNS.
Naval Special Warfare (NSW) Underwater Demolition Qualification/ Certification 1 day 12 per year	Provides NSW teams with experience in underwater detonations. At water depths of 10 to 72 feet near or within the SSTC oceanside Boat Lanes, NSW divers place either 2 sequential charges (≤ 12.5-13.75 lbs NEW) using either a TDFD or RFD on metal plates along the bottom, or a single charge (≤25.5 lbs NEW) using either a TDFD or RFD placed on a metal plate from a depth of 20 feet to the bottom.
Naval Special Warfare (NSW) Underwater Demolition Training 1 day 12 per year	Up to 40 NSW personnel participate in this training activity involving small groups swimming to shore from small inflatable boats located approximately 1,000 yards offshore; boats may also be beached on shore. For underwater detonation training, a single charge (≤ 10 lbs NEW) using either a TDFD or RFD may be placed and detonated on the bottom near or within the oceanside SSTC Boat Lanes or a single charge (≤ 3.6 lbs NEW) (if within five feet of the surface) is manually detonated in water less than 24 feet deep.
Naval Special Warfare (NSW) SEAL Delivery Vehicle (SDV) /Advanced SEAL Delivery System Certification to Deploy 14 day 40 per year	Designed to certify SDV Team operators for deployment, events include direct action, reconnaissance, and counter-terrorism. Training may include navigation runs into and out of the San Diego Bay, hydrographic reconnaissance, over the beach training, combat swimmer, and underwater detonation training. Based on training tempo, multiple events could occur. Underwater detonation events that may be coordinated with other SDV training involve placing a single charge (≤ 10 lbs NEW) in water depths of 24 feet or less from mid-water column to the seafloor near or within the SSTC oceanside Boat Lanes. The entire SDV Certification process is a 14 day evolution, although underwater detonations would not be used every day.

2 DURATION AND LOCATION OF ACTIVITIES

This Section remains unchanged as described in the Navy's Silver Strand Training Complex (SSTC) Incidental Harassment Authorization application through version 3 of December 28, 2010, with the following additions:

Duration and Annual Amount of SSTC Underwater detonations

Table 2-1 shows the underwater detonation training event types described in section 1 along with the net equivalent weight (NEW) for the charges involved, water depth, number of events per year, and indication if a particular event could use timed delay.

ADDENDUM Figure 2-1. Representative U.S. Navy Explosive Ordnance Disposal in-water training.

(*from left to right*: diving navigation, dive support from 7-m RHIB, preparing for floating mine underwater detonation, UUV deployment from 7-m RHIB, preparing detonation charges from standard 1.25 lb blocks of C-4 explosive (Navy photos, publically released)

ADDENDUM Table 2-1. SSTC annual underwater detonation events with indication of timed delay use.

#	Underwater Detonation Training Event Type	NEW (lbs)	# of Sequential Det-onations * (#/det)	Water Depth (feet)	Charge Depth	# of Training Events /yr	SSTC Location
N1	Shock wave action generator (SWAG)	0.033	1/det	10–20	Mid-water	74	South San Diego Bay (sub-area "Echo" only)
N1	SWAG	0.033	1/det	10–20	Mid-water	16	Oceanside Boat Lanes 1-10,11-14
5	Mine Counter Measure [T]	≤ 10 to 20	1/det	≤ 72	Mid-water	29	Oceanside Boat Lanes 1-10,11-14
5	Mine Counter Measure [T]	≤ 10 to 20	1/det	≤ 72	Bottom	29	Oceanside Boat Lanes 1-10,11-14
6	Floating Mine [T]	≤ 5	1/det	≤ 72	Surface (< 5 feet)	53	Oceanside Boat Lanes 1-10,11-14
7	Dive Platoon* [T]	≤ 3.5	8/det	30–72	Bottom	8	Oceanside Boat Lanes 1-10,11-14
9	Very Shallow Water Mine Counter Measure [T]	≤ 20	1/det	≤ 24	Bottom	60	Oceanside Boat Lanes 1-10,11-14
10	Unmanned Underwater Vehicle	≤ 10 to 15	1/det	10 ≤ 72	Bottom to 10 feet from surface	4	Oceanside Boat Lanes 1-10,11-14
11	Marine Mammal System [T]	≤ 13 & 29	2/det	10 ≤ 72	Bottom	8	Oceanside Boat Lanes 1-10,11-14
11	Marine Mammal System Operator Course	≤ 13 & 29	1/det	24 ≤ 72	Bottom to 20 feet from surface	8	Oceanside Boat Lanes 1-10,11-14
12	Mine Neutralization* [T]	≤ 3.5	8/det	30–72	Bottom	4	Oceanside Boat Lanes 1-10,11-14
N2	Surf Zone testing and evaluation [T]	≤ 20	1/det	≤ 24	Bottom	2	Oceanside Boat Lanes 1-10,11-14
N3	Unmanned Underwater Vehicle Neutralization	≤ 3.3 & 3.57	2/det	10–72	Bottom to 10 feet from surface	4	Oceanside Boat Lanes 1-10,11-14
N7	Airborne Mine Neutralization System	≤ 3.53	1/det	40–72	Mid-water to Bottom	10	Oceanside Boat Lanes 1-10,11-14
N9	Qualification/ Certification	≤ 12.5 to 13.75	2/det	10–72	Bottom	8	Oceanside Boat Lanes 1-10,11-14
N9	Qualification/ Certification	≤ 25.5	1/det	40–72	Bottom to 20 feet from surface	4	Oceanside Boat Lanes 1-10,11-14
N11	Naval Special Warfare Demolition Training	≤ 10	1/det	≤ 24	Bottom	4	Oceanside Boat Lanes 1-10,11-14
N11	Naval Special Warfare Demolition Training	≤ 3.6	1/det	≤ 24	Surface	8	Oceanside Boat Lanes 1-10,11-14
37	SEAL Delivery Vehicle\ Advance SEAL Delivery Vehicle	≤ 10	1/det	≤ 24	Bottom to Mid-water	40	Oceanside Boat Lanes 1-10,11-14

[T] Indicates that some events (but not all) could use time-delayed initiation (TDFD) or remote firing (RDF)

* # of training events is the total amount of underwater detonation training involving each particular Training Event Type. Most Training events are a single detonation (i.e., 1/detonation) per event. However, four of these Training Event Types (highlighted above) involve sequential charges during the same training event. Sequential charges are either conducted with a 10 second delay between detonations or 30 minute delay between detonations.

≤ indicates that less explosive weight could be used as deemed appropriate for a particular training event. Zones of Influence modeled for each training event category, however, were calculated based on the maximum charge weight for that event type.

3 MARINE MAMMAL SPECIES AND NUMBERS

This Section remains unchanged as described in the Navy's Silver Strand Training Complex (SSTC) Incidental Harassment Authorization application through version 3 of December 28, 2010.

4 ASSESSMENT OF MARINE MAMMAL SPECIES OR STOCKS THAT COULD POTENTIALLY BE AFFECTED

This Section remains unchanged as described in the Navy's Silver Strand Training Complex (SSTC) Incidental Harassment Authorization application through version 3 of December 28, 2010, with the following additions:

Marine Mammal Species Regularly Expected Within or Adjacent to SSTC

There are four marine mammal species within Silver Strand Training Complex (SSTC) marine waters with confirmed or historic occurrence in the study area as described in the Navy's Incidental Harassment Authorization application through version 3 of December 28, 2010. These include the California sea lion, Pacific harbor seal, California coastal stock of bottlenose dolphin, and more infrequently gray whale. None are listed as threatened or endangered under the Endangered Species Act.

Marine Mammal Species Not Regularly Expected Within or Adjacent to SSTC (Rare Species Relative to SSTC)

There are four marine mammal dolphin species commonly found within both coastal and offshore waters of Southern California (Carretta et al. 2010). However, there is no documented NMFS sighting data, or other anecdotal information currently available as to likely presence within the very near-shore, shallow waters associated with Silver Strand Training Complex boat lanes. These dolphin species include, in likely order of probable rare occurrence, the long-beaked common dolphin, Pacific white-sided dolphin, Risso's dolphin, and short-beaked common dolphin. None of these species are listed as threatened or endangered under the Endangered Species Act.

The Navy is including these four additional dolphin species in this analysis in the rare event of their movement through the Silver Strand Training Complex boat lanes. While DoN (2008b) has a more expanded species description, basic population biology information is provided below.

Long-Beaked Common Dolphin (*Delphinus capensis*), California Stock

Long-beaked common dolphins (Delphis capensis) are found year-round in the waters off California (Carretta et al 2000; Bearzi 2005; DoN 2009, 2010). The distribution and abundance of long-beaked common dolphins appears to be variable on interannual and seasonal time scales (Dohl et al. 1986; Heyning and Perrin 1994; Barlow 1995; Forney et al. 1995; Forney and Barlow 2007). As oceanographic conditions change, long-beaked common dolphins may move between Mexican and U.S. waters, and therefore a multi-year average abundance estimate is the most appropriate for management within the U.S. waters (Carretta et al. 2010). California waters represent the northern limit for this stock and animal's likely movement between U.S. and Mexican waters. No information on trends in abundance is available for this stock because of high interannual variability in line-transect abundance estimates (Carretta et al. 2010). Heyning and Perrin (1994) detected changes in the proportion of short-beaked to long-beaked common dolphins stranding along the California coast, with the short-beaked common dolphin stranding more frequently prior to the 1982-83 El Niño (which increased water temperatures off California),

and the long-beaked common dolphin more frequently observed for several years afterwards. Thus, it appears that both relative and absolute abundance of these species off California may change with varying oceanographic conditions (Carretta et al. 2010). Common dolphin distributions may be related to bathymetry (Hui 1979). Long-beaked common dolphins are usually found within 50 nautical miles (nm) (92.5 km) of shore with significantly more occurrence near canyons, escarpments, and slopes (Heyning and Perrin 1994; Barlow et al. 1997; Bearzi 2005, 2006). Group size ranges from less than a dozen to several thousand individuals (Barlow and Forney 2007; Barlow et al. 2010). Sparse information is available on the life history of long-beaked common dolphins, however, some information is provided for short-beaked common dolphins which may also apply to long-beaked dolphins. North Pacific short-beaked common dolphin females and males reach sexual maturity at roughly 8 and 10 years, respectively (Ferrero and Walker 1995). Peak calving season for common dolphins in the eastern North Pacific may be spring and early summer (Forney 1994). Barlow (2010) reported average group size for long-beaked common dolphins within a Southern California-specific stratum as 195 individuals from a 2008 survey along the US West Coast. The geometric mean abundance estimate in NMFS' annual stock assessment for the entire California stock of long-beaked common dolphins, based on two ship surveys conducted in 2005 and 2008, is 27,046 (CV=0.59) (Forney 2007; Barlow 2010; Carretta et al. 2010). Using a more stratified approach, Barlow et al. (2010) estimated abundance within a Southern California-specific strata of 16,480 (CV=0.41) long-beaked common dolphins based on analysis of pooled sighting data from 1991-2008.

Pacific White-sided Dolphin (*Lagenorhynchus obliquidens*), California/Oregon/ Washington Stock

While Pacific white-sided dolphins could potentially occur year-round in Southern California, surveys suggest a seasonal north-south movement of in the eastern North Pacific, with animals found primarily off California during the colder water months and shifting northward into Oregon and Washington as water temperatures increase during late spring and summer (Green et al. 1992, 1993; Forney 1994; Forney and Barlow 2007; Barlow 2010). Salvadeo et al. (2010) propose that increased global warming may increase a northward shift in Pacific white-sided dolphins. The Pacific white-sided dolphin is most common in waters over the continental shelf and slope, however, sighting records and captures in pelagic driftnets indicate that this species also occurs in oceanic waters well beyond the shelf and slope (Leatherwood et al. 1984; DoN 2009, 2010). Soldevilla et al. (2010a) reported the possibility of two distinct eco-types of Pacific white-sided dolphins occurring in Southern California based on passive acoustic detection of two distinct echolocation click patterns. No population trends have been observed in California or adjacent waters. Barlow (2010) reported average group size for Pacific white-sided dolphins within a Southern California-specific stratum as 17 from a 2008 survey along the US West Coast. The size of the entire California/Oregon/Washington Stock is estimated to be 26,930 (CV=0.28) individuals (Forney 2007, Barlow, 2010). Using a more stratified approach, Barlow et al. (2010) estimated abundance within a Southern California-specific strata of 1,914 (CV=0.39) Pacific white-sided dolphins based on analysis of pooled sighting data from 1991-2008.

Risso's Dolphin (*Grampus griseus*), California/Oregon/ Washington Stock

Off the U.S. West coast, Risso's dolphins are commonly seen on the shelf in the Southern California and in slope and offshore waters of California, Oregon and Washington (Soldevilla et al. 2010b, Carretta et al. 2010). Animals found off California during the colder water months are thought to shift northward into Oregon and Washington as water temperatures increase in late spring and summer (Green et al. 1992). The southern end of this population's range is not well documented, but previous surveys have shown a conspicuous 500 nm distributional gap between these animals and Risso's dolphins sighted south of Baja California and in the Gulf of California (Mangels and Gerrodette 1994). Thus this population appears distinct from animals found in the eastern tropical Pacific and the Gulf of California (Carretta et al. 2010). As oceanographic conditions vary, Risso's dolphins may spend time outside the U.S. Exclusive Economic Zone. Barlow (2010) reported average group size for Risso's dolphins within a Southern California-specific stratum as 23 from a 2008 survey along the US West Coast. The size of the California/Oregon/ Washington Stock is estimated to be 6,272 (CV=0.30) individuals (Forney 2007, Barlow, 2010; Carretta et al. 2010). Using a more stratified approach, Barlow et al. (2010) estimated abundance within a Southern California-specific strata of 3,974 (CV=0.39) Risso's dolphins based on analysis of pooled sighting data from 1991-2008.

Short-Beaked Common Dolphin (*Delphinus delphis*), California/Oregon/Washington Stock

Short-beaked common dolphins are the most abundant cetacean off California, and are widely distributed between the coast and at least 300 nmi distance from shore (Dohl et al. 1981; Forney et al. 1995; Barlow 2010; Carretta et al. 2010). Along the U.S. West Coast, portions of the short-beaked common dolphins' distribution overlap with that of the long-beaked common dolphin. The northward extent of short-beaked common dolphin distribution appears to vary interannually and with changing oceanographic conditions (Forney and Barlow 1998). Barlow (2010) reported average group size for short-beaked common dolphins within a Southern California-specific stratum as 122 from a 2008 survey along the US West Coast. The size of the California/Oregon/ Washington Stock is estimated to be 411,211 (CV=0.21) individuals (Carretta et al. 2010). Using a more stratified approach, Barlow et al. (2010) estimated abundance within a Southern California-specific strata of 152,000 (CV=0.17) Risso's dolphins based on analysis of pooled sighting data from 1991-2008.

5 HARASSMENT AUTHORIZATION REQUESTED

This Section remains unchanged as described in the Navy's Silver Strand Training Complex (SSTC) Incidental Harassment Authorization application through version 3 of December 28, 2010, with the following additions:

The Navy determined that its underwater detonation events at Silver Strand Training Complex (SSTC) may result in incidental takings of marine mammals by harassment.

Without consideration of mitigation measures, the modeling results from SSTC analysis predicts **812 potential pre-mitigation exposures** from underwater detonations and **986 potential pre-mitigation exposures** from ELCAS pile driving and removal per year that could be classified as Level B harassment as defined under the Marine Mammal Protection Act.

For underwater detonations, the models estimated 168 level B exposures to coastal bottlenose dolphins and 99 level B exposures to California sea lions. For species with less likely occurrence within SSTC, there were 52 Level B exposures to long-beaked common dolphins, 13 Level B exposures to Pacific white-sided dolphins, 32 exposures to Risso's Level B dolphins, and 448 Level B exposures to short-beaked common dolphin.

For ELCAS pile driving and pile removal, the calculations estimated 208 Level B exposures to coastal bottlenose dolphins, 122 Level B exposures to California sea lions, 12 Level B exposures to harbor seals, and 6 Level B exposures to gray whales. For species with less likely occurrence within SSTC, there were 54 Level B exposures to long-beaked common dolphins, 12 Level B exposures to Pacific white-sided dolphins, 30 exposures to Risso's Level B dolphins, and 542 Level B exposures to short-beaked common dolphin. It should be noted, however, that the short-beaked common dolphin, the species representing 55% of the total ELCAS exposure estimate is also the species least likely to be present given their generally more offshore distribution. Their inclusion in this exposure estimate is a conservative addition of a relatively rare species within SSTC.

Given Navy's current mitigation procedures presented in Section 11 which include monitoring of mitigation zones prior to detonation, and the increased likelihood that bottlenose dolphins, California sea lions, harbor seals, and gray whales can be readily detected, the potential for Level B exposures is minimized or eliminated. The Navy does not anticipate that actual harassment incidents will result from underwater detonations and ELCAS events within SSTC. However, to allow for scientific uncertainty regarding the exact mechanisms of the physical and behavioral effects, and as a conservative approach, the Navy is requesting authorization for take (Level B harassment) of 1,799 marine mammals per year at SSTC in this Incidental Harassment Authorization application.

The Navy is also requesting a few (e.g., two to five) Level B harassments for harbor seals during underwater detonations. The Navy's model estimated that this species would not be exposed during underwater detonation training events and the Navy does not anticipate Level B harassments. However, there remains a possibility (albeit remote) that the species may be present and undetected during training.

6 NUMBERS AND SPECIES EXPOSED

This Section remains unchanged as described in the Navy's Silver Strand Training Complex (SSTC) Incidental Harassment Authorization application through version 3 of December 28, 2010, with the following additions:

Estimated Marine Mammal Exposures From SSTC Underwater Detonations

For all underwater detonations, the Navy's impact model predicted:

- No marine mammal mortality to any species
- No Level A Injury to any species

For non-sequential (i.e., single detonation) training events, the Navy's impact model predicted the below exposures with the addition of four new species for this Addendum.

- 473 annual exposures that could result in Level B harassment (TTS)
    - 98 annual exposures to bottlenose dolphins
    - 55 annual California sea lion exposures
    - 0 annual exposures to gray whales
    - 0 annual exposures to harbor seals
    - 31 annual exposures to long-beaked common dolphins
    - 7 annual exposures to Pacific white-sided dolphins
    - 19 annual exposures to Risso's dolphins
    - 263 annual exposures to short-beaked common dolphins *

For sequential (Multiple Successive Explosive events) training events, the Navy's impact model predicted the below exposures with the addition of four new species for this Addendum.

- 339 annual exposures that could results in Level B harassment
    - 70 annual exposures to bottlenose dolphins
    - 44 annual exposures to California sea lions
    - 0 annual exposures to gray whales
    - 0 annual exposures to harbor seals
    - 21 annual exposures to long-beaked common dolphins
    - 5 annual exposures to Pacific white-sided dolphins
    - 14 annual exposures to Risso's dolphins
    - 185 annual exposures to short-beaked common dolphins *

(note: Given their normally much further offshore distribution in Southern California, short-beaked common dolphin the least likely to occur of all species considered in this analysis)*

ADDENDUM Table 6-1. SSTC modeled estimates of species exposed to underwater detonations without implementation of mitigation measures with inclusion of additional species.

Expected Species			**Annual Mammals Exposure (All Sources)**			
			Level B Behavior (Multiple Successive Explosive events only)	**Level B TTS**	**Level A Injury**	**Mortality**
			177 dB	**182 dB / 23 psi**	**205 dB / 13.0 psi-ms**	**30.5 psi-ms**
Cetaceans	Gray Whale	Warm	-	-	-	-
		Cold	0	0	0	0
	Coastal Bottlenose Dolphin	Warm	30	43	0	0
		Cold	40	55	0	0
Pinnipeds	California Sea Lion	Warm	4	4	0	0
		Cold	40	51	0	0
	Harbor Seal	Warm	0	0	0	0
		Cold	0	0	0	0
Total Annual Exposures (to expected species)			114	153	0	0
Unexpected Species			**Level B**		**Level A Injury**	**Mortality**
Cetaceans	Long-beaked common dolphin	Warm	14	21	0	0
		Cold	7	10	0	0
	Pacific white-sided dolphin	Warm	2	3	0	0
		Cold	3	4	0	0
	Risso's dolphin	Warm	3	4	0	0
		Cold	11	15	0	0
	Short-beaked common dolphin	Warm	123	177	0	0
		Cold	62	86	0	0
Total Annual Exposures (to unexpected species)			225	320	0	0
Grand Total All Exposures			339	473	0	0

Assessing ELCAS Pile Driving and Removal Impacts

Estimated Marine Mammal Exposures From ELCAS pile driving\removal

Based on the assessments, assumptions, and business rules conducted using the methodology discussed in the Navy's original Incidental Harassment Authorization application through version 3 of December 28, 2010, and addition of four rare, unexpected species, the revised estimate (Table ADDENDUM 6-2) is that ELCAS pile driving could result in:

- 0 Level A injury harassments to any marine mammal (190 and 180 dB RMS)
- 60 Level B harassments to expected species (40 bottlenose dolphins, 20 California sea lions); 80 harassments to unexpected species (80 short-beaked common dolphins *). Total Level B, therefore, is 60+80= 140

(note: Given their normally much further offshore distribution in Southern California, short-beaked common dolphin the least likely to occur of all species considered in this analysis)*

ELCAS Pile Removal

Based on the assessments, assumptions, and business rules conducted using the methodology discussed in the Navy's original Incidental Harassment Authorization application through version 3 of December 28, 2010, and addition of four rare, unexpected species, the revised estimate (Table 6-2) is that ELCAS pile removal could result in:

- 0 Level A injury harassments to any marine mammal (190 and 180 dB RMS)
- 288 Level B harassments to expected species (168 bottlenose dolphins, 102 California sea lions, 12 harbor seals, 6 gray whales); 558 harassments to unexpected species (54 long-beaked common dolphins, 12 Pacific white-side dolphins, 30 Risso's dolphins, 462 short-beaked common dolphins *). Total Level B, therefore, is 288+558= 846

(note: Given their normally much further offshore distribution in Southern California, short-beaked common dolphin the least likely to occur of all species considered in this analysis)*

ADDENDUM Table 6-2. Exposure estimates from ELCAS pile driving\removal prior to implementation of mitigation measures with inclusion of additional species.

Expected Species			**Annual Estimated Mammals Exposure**			
			Level B (Continuous)	**Level B (Impulse)**	**Level A (Cetaceans)**	**Level A (Pinnipeds)**
			120 dB RMS	**160 dB RMS**	**180 dB RMS**	**190 dB RMS**
Cetaceans	Gray Whale	Installation	Not applicable	0	0	0
		Removal	6	Not applicable	0	0
	Bottlenose Dolphin	Installation	Not applicable	40	0	0
		Removal	168	Not applicable	0	0
Pinnipeds	California Sea Lion	Installation	Not applicable	20	0	0
		Removal	102	Not applicable	0	0
	Harbor Seal	Installation	Not applicable	0	0	0
		Removal	12	Not applicable	0	0
Total Annual Exposures (to expected species)			288	60	0	0
Cetaceans	Long-beached common dolphin	Installation	Not applicable	0	0	0
		Removal	54	Not applicable	0	0
	Pacific white-sided dolphins	Installation	Not applicable	0	0	0
		Removal	12	Not applicable	0	0
	Risso's dolphin	Installation	Not applicable	0	0	0
		Removal	30	Not applicable	0	0
	Short-beaked common dolphin	Installation	Not applicable	80	0	0
		Removal	462	Not applicable	0	0
Total Annual Exposures (to unexpected species)			558	80	0	0
Grand Total All Exposures			846	140	0	0

7 IMPACTS TO MARINE MAMMAL SPECIES OR STOCKS

This Section remains unchanged as described in the Navy's Silver Strand Training Complex (SSTC) Incidental Harassment Authorization application through version 3 of December 28, 2010, with the following additions:

Overall, the conclusions in this analysis find that impacts to marine mammal species and stocks would be negligible, especially when mitigation measures outlined in Section 11 are implemented.

The predicted annual exposures from impact analysis conducted for this Incidental Harassment Authorization include:

- No Level A injury or mortality to gray whales, the coastal stock of bottle nose dolphins, California sea lions, or harbor seals from SSTC underwater detonations and ELCAS training events; for unexpected species, no Level A injury or mortality to long-beaked common dolphins, Pacific white-sided dolphins, Risso's dolphins, or short-beaked common dolphins.
- 267 Level B exposures to bottlenose dolphins (168) and California sea lions (99) from underwater detonations; for unexpected species, 52 exposures to long-beaked common dolphins, 13 to Pacific white-sided dolphins, 32 to Risso's dolphins, and 448 short-beaked common dolphins.
- 348 Level B exposures to bottlenose dolphins (208), California sea lions (122), harbor seals (12), and gray whales (6) from ELCAS pile driving and removal; for unexpected species, 54 Level B exposures to long-beaked common dolphins, 12 to Pacific white-sided dolphins, 30 to Risso's dolphins, and 542 short-beaked common dolphins.

Unexpected Species

Long-beaked common dolphins- There were no predicted mortality or Level A injury for long-beaked common dolphins. Modeling predicted there would be 52 potential Level B exposures from underwater explosions and 54 Level B exposures from ELCAS pile driving and removal. Of all the relatively rare species within SSTC, the long-beaked common dolphin is the most possible given its more near-shore coastal distribution (Bearzi, 2005, Carretta et al. 2010). Given high travel mode, low site fidelity to areas without significant bathymetric relief such as the low slope sandy bottom under the SSTC boat lanes (Hui 1979, Heyning and Perrin 1994, Bearzi, 2005, 2006), there is a high likelihood that pre-detonation mitigation would detect long-beaked common dolphins and therefore reduce exposures such that potential effects would be minimal.

Pacific white-side dolphins- There were no predicted mortality or Level A injury for Pacific white-sided dolphins. Modeling predicted there would be 13 potential Level B exposures from underwater explosions and 12 Level B exposures from ELCAS pile driving and removal. As discussed in Section 4, there is limited empirical data available to confirm Pacific white-sided species occurrence in the near shore water adjacent to the SSTC boat lanes. Movement of Pacific white-side dolphins into the SSTC boat lanes would likely be rare to very infrequent and limited in duration. There would be a high likelihood that pre-detonation mitigation would detect Pacific white-sided dolphins, if present at all, and therefore reduce exposures such that potential effects would be minimal.

Risso's dolphins- There were no predicted mortality or Level A injury for Risso's dolphins. Modeling predicted there would be potential 32 Level B exposures from underwater explosions and 30 Level B exposures from ELCAS pile driving and removal. As discussed in Section 4, there is limited empirical data available to confirm Risso's species occurrence in the near shore water adjacent to the SSTC boat lanes. More Risso's sighting occur further offshore (DoN 2009, Barlow 2010, Carretta et al. 2010, DoN 2010a). Movement of Risso's dolphins into the SSTC boat lanes would likely be rare to very infrequent and limited in duration. There would be a high likelihood that pre-detonation mitigation would detect Risso's dolphins, if present at all, and therefore reduce exposures such that potential effects would be minimal.

Short-beaked common dolphins- There were no predicted mortality or Level A injury for short-beaked common dolphins. Modeling predicted there would be potential 448 Level B exposures from underwater explosions and 542 Level B exposures from ELCAS pile driving and removal. As discussed in Section 4, there is limited empirical data available to confirm short-beaked common species occurrence in the near shore water adjacent to the SSTC boat lanes. More short-beaked common sighting occur further offshore (Bearzi 2005, DoN 2009, Barlow 2010, Carretta et al. 2010, DoN 2010a). Movement of short-beaked common dolphins into the SSTC boat lanes would likely be rare to very infrequent and limited in duration. There would be a high likelihood that pre-detonation mitigation would detect short-beaked common dolphins, if present at all, and therefore reduce exposures such that potential effects would be minimal.

8 IMPACT ON SUBSISTENCE USE

This Section remains unchanged as described in the Navy's Silver Strand Training Complex (SSTC) Incidental Harassment Authorization application through version 3 of December 28, 2010.

9 IMPACTS TO THE MARINE MAMMAL HABITAT AND THE LIKELIHOOD OF RESTORATION

This Section remains unchanged as described in the Navy's Silver Strand Training Complex (SSTC) Incidental Harassment Authorization application through version 3 of December 28, 2010.

10 IMPACTS TO MARINE MAMMALS FROM LOSS OR MODIFICATION OF HABITAT

This Section remains unchanged as described in the Navy's Silver Strand Training Complex (SSTC) Incidental Harassment Authorization application through version 3 of December 28, 2010.

11 MEANS OF EFFECTING THE LEAST PRACTICABLE ADVERSE IMPACTS – MITIGATION MEASURES

This Section remains unchanged as described in the Navy's Silver Strand Training Complex (SSTC) Incidental Harassment Authorization application through version 3 of December 28, 2010, with the following additions:

The underwater zones of influences (ZOI) effectively represent a modeled mitigation zone that would be established around each detonation point to prevent Level B harassment to marine mammals. While the ZOIs vary between the different types of underwater detonation training, the Navy is proposing to establish an expanded **700 yard** mitigation zone for all positive control (RFD) underwater detonations conducted on the oceanside of the SSTC, a 1,000-1,500 yard mitigation zone around all TDFD underwater detonations conducted on the oceanside of the SSTC, and a 60 yards mitigation zone around SWAG training events conducted on the oceanside and Bayside of SSTC. This large a mitigation zone is not necessary for any underwater detonations other than the Marine Mammal System operations based strictly on modeled ZOI plus additional safety zone (see Table 6-3), and is proposed as a conservative (i.e., over protective) measure. SWAGs have smaller, more directional charges and subsequent a small ZOI, so a smaller mitigation zone of 60 yards is proposed.

There are three broad sets of training events for which the Navy proposes additional mitigation. These events are:

- Very shallow water (VSW, <24 feet) underwater detonation mitigation
  With a 700 yard mitigation zone for positive control (i.e., RFD) events, and 1,000 to 1,500 yard mitigation zone for timed-delayed (i.e., TDFD) events depending on charge weight and delay time. The positive control mitigation zone is based on the maximum range of on-set TTS as predicted by the iso-velocity analysis of empirically measured very shallow water detonations <20 lbs NEW plus an additional conservative (i.e., over-protective) buffer that brings the final zone to 700 yards. The timed-delay mitigation zone derivation is described below.
- Shallow water (>24 feet) underwater detonation mitigation
  With a 700 yard mitigation zone for positive control (i.e., RFD) events, and 1,000 to 1,500 yard mitigation zone for timed-delayed (i.e., TDFD) events depending on charge weight and delay time. The positive control mitigation zone is based on the maximum range to NMFS' injury criteria predicted using the Navy's REFMS model plus an additional buffer that brings the final zone to 700 yards for RFD events. The timed-delay mitigation zone derivation is described below. Mitigation zone for much smaller SWAG detonations is 60 yards.
- ELCAS pile driving and removal mitigation
  (mitigation measures remain as indicated in the original SSTC Incidental Harassment Authorization application through version 3 of December 28, 2010)

Derivation Of Timed Delayed Mitigation Zones

To increase the effectiveness of the shallow water mitigation zone when using time-delayed detonations (i.e., TDFD), an additional buffer zone is added to the existing Navy modeled zone of influence (ZOI) for a particular charge weight.

In essence, this should allow sighting of marine mammals outside of a final mitigation zone swimming into the zone prior to starting a timed-delay detonation.

Final TDFD mitigation zones are determined in a three step process:

1) A swim speed and time factor is generated from 5-10 minutes. Onto each range, another 200 yds is added as a still additional buffer to account for varying individual swim speed;

2) The just calculated swim speed-time-buffer range is added to SSTC specific model results showing range to the applicable NMFS injury criteria;

3) Finally, the Navy rounds the step 2 ranges to appropriate mitigation ranges more likely to be practical in the field.

1) Swim Speed Estimation

Using an average swim speed of 3 knots (102 yd/min) as representative of all dolphin species, the approximate distance an animal would travel within a given time-delay period between 5-10 minutes can be estimated (Table 11-1).

To account for differences between species or faster swimming by individuals within a species, the Navy and NMFS also agreed to add still another 200 yds to the original 3 knot derived ranges. Table 11-1 shows both the initial 3 knot range plus the additional 200 yard buffer.

ADDENDUM Table 11-1. Potential Distance Traveled Based on Swim Speed and Length of Time-Delay and Additional 200 Yard Buffer.

Type	Swim Speed	Time-delay	Potential Distance Traveled	Potential Distance Traveled With Additional 200 Yds Buffer
Dolphin	102 yards per minute	5 min	510 yards	710 yards
		6 min	612 yards	812 yards
		7 min	714 yards	914 yards
		8 min	816 yards	1,016 yards
		9 min	918 yards	1,118 yards
		10 min	1,020 yards	1,220 yards

2) ZOI and swim speed-time-buffer addition

Based on acoustic propagation modeling and anticipated zones of influences (ZOI) to NMFS injury criteria (13.0 psi-msec) by training event type and charge weight, potential dolphin travel distances by time at 3 knots plus buffer can be added to event specific ZOI to produce a matrix of charge weight, selected delay time, and applicable buffer zone (Table 11-3).

As long as animals are not observed within a given time-delayed mitigation zone before the time-delay detonation is set, then the animals would be unlikely to swim into the injury zone from outside the zone within the time-delay window

ADDENDUM Table 11-2. Revised Radius For Timed-delayed Firing Devices Based On Charge Size, Length Of Time Delay, And Additional Buffer From Table11-1.

(Table Caveat: these are not the Navy's final mitigation zones which are shown in Table 11-3. This table is provided to show the initial math applicable to each charge weight and time combination)

Charge Weight (NEW) *	Navy Modeled ZOI to injury (13.0 psi-msec)	Time (in minutes)					
		5 min	6 min	7 min	8 min	9 min	10 min
5 lb	80 yards	80+710= 790 yards	80+812= 892 yards	80+914= 994 yards	80+1,016= 1,096 yards	80+1,118= 1,198 yards	80+1,220= 1,300 yards
10 lb	160 yards	160+710= 870 yards	160+812= 972 yards	160+914= 1,074 yards	160+1,016= 1,176 yards	160+1,118= 1,278 yards	160+1,220= 1,380 yards
15-29 lb **	360 yards	360+710= 1,070 yards	360+812= 1,172 yards	360+914= 1,274 yards	360+1,016= 1,376 yards	360+1,118= 1,478 yards	360+1,220= 1,580 yards

* for charge weights lower than those shown here, the next highest charge weight will be used
**Modeled ZOI are variable due not only to NEW, but also to event categories (see Table 2-1 in SSTC original IHA) and how the charge is placed and detonated in the water column in likely training scenarios. Under these considerations, 15, 20 and 29 lb NEW have a maximum injury ZOI of 360 yds which is used in this table.

3) Navy FINAL TDFD detonation mitigation zones

Finally, to create a better marine mammal risk mitigation regime that is likely to achieve better success through more practical execution, Navy divided the span of training events (as derived in Table 11-2) into those requiring at 1,000 yard buffer zone (with 2 boats mitigation), and those requiring greater than a 1,400 yard buffer zone (3 boats mitigation, or 2 boats and 1 helicopter).

Table 11-3 shows the Navy's final mitigation zones and application for SSTC TDFD underwater detonations. This required in most cases rounding (most upward) the calculated ranges from Table 11-2 to the appropriate range category (1,000, 1,400, 1,500 yds).

These new mitigation zones and survey protocol are supportable from an operational perspective and will result in minimal risk of marine mammal injury or mortalities. The zones and the number of boats/helicopters used will allow for a thorough survey of the area in the weather conditions and sea states typically experienced during a training event.

ADDENDUM Table 11-3. Navy's New Mitigation Zone Radius For TDFDs within SSTC based on size of charge and length of time-delay.

		Time Delay					
		5 min	6 min	7 min	8 min	9 min	10 min
Charge Size * (lb NEW)	5 lb	1,000 yards	1,000 yards	1,000 yards	1,000 yards	1,400 yards	1,400 yards
	10 lb	1,000 yards	1,000 yards	1,000 yards	1,400 yards	1,400 yards	1,400 yards
	15-29 lb	1,000 yards	1,400 yards	1,400 yards	1,400 yards	1,500 yards	1,500 yards

* For charge weights lower than those shown here, the next highest charge weight will be used (ex. 3.5 NEW charge would use the 5 lb mitigation range).

Navy mitigation applied:

1,000 yd = minimum of 2 observation boats

1,400/1,500 yd = minimum of 3 observation boats or 2 boats and 1 helicopter

Mitigation for Underwater Detonations in Very Shallow Water (<24 Feet)

Mitigation Measures For VSW Underwater Detonations Using Positive Control

1. Underwater detonations using positive control (remote firing devices) will only be conducted during daylight.
2. Easily visible anchored floats will be positioned on **700 yard radius** of a roughly semi-circular zone (the shoreward half being bounded by shoreline and immediate off-shore water) around the detonation location for small explosive exercises at the SSTC. These mark the outer limits of the mitigation zone. (An initial 400 yard radius is the zone of influence (TTS or 23 psi) for VSW as determined from empirical measurements as discussed in Section 6.3.6 plus an additional buffer to make the final mitigation zone 700 yards)
3. For each VSW underwater detonation event, a safety-boat with a minimum of one observer is launched **30 or more minutes prior** to detonation and moves through the area around the detonation site. The task of the safety observer is to exclude humans from coming into the area and to augment a shore observer's visual search of the mitigation zone for marine mammals. The safety-boat observer is in constant radio communication with the exercise coordinator and shore observer discussed below.
4. A shore-based observer will also be deployed for VSW detonations in addition to boat based observers. The shore observer will indicate that the area is clear of marine mammals after 10 or more minutes of continuous observation with no marine mammals having been seen in the mitigation zone or moving toward it.
5. At least **10 minutes prior** to the planned initiation of the detonation event-sequence, the shore observer, on an elevated on-shore position, begins a continuous visual search with binoculars of the mitigation zone. At this time, the safety-boat observer informs the shore observer if any marine mammal has been seen in the zone and, together, both search the surface within and beyond the mitigation zone for marine mammals (and other protected species such as sea turtles).
6. The observers (boat and shore based) will indicate that the area is not clear any time a marine mammal is sighted in the mitigation zone or moving toward it and, subsequently, indicate that the area is clear of marine mammals when the animal is out and moving away and no other marine mammals have been sited.
7. Initiation of the detonation sequence will only began on final receipt of an indication from the shore observer that the area is clear of marine mammals and will be postponed on receipt of an indication from that any observer that the area is not clear of marine mammals.
8. Following the detonation, visual monitoring of the mitigation zone continues **for 30 minutes** for the appearance of any marine mammal in the zone. Any marine mammal appearing in the area will be observed for signs of possible injury.
9. Any marine mammal observed after an VSW underwater detonation either injured or exhibiting signs of distress will be reported via operational change of command to Navy environmental representatives from U.S. Pacific Fleet, Environmental Office, San Diego Detachment. Using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex, the Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animals status.

Mitigation Measures For VSW Underwater Detonations Using Time-Delay (TDFD Only)

1. Underwater detonations using timed delay devices will only be conducted during daylight.
2. Time-delays longer than 10 minutes will not be used. The initiation of the device will not start until the mitigation area below is clear for a full **30 minutes** prior to initiation of the timer.
3. A mitigation zone will be established around each underwater detonation location as indicated in the **Table 11-3 (1,000 or 1,500 yards)** based on charge weight and length of time-delay used.
4. VSW ranges 1,000 yds:

   • For each VSW underwater detonation event with a mitigation zone of 1,000 yds, a safety-boat with a minimum of one observer is launched 30 or more minutes prior to detonation and moves through the area around the detonation site at the seaward edge of the mitigation zone. The task of the boat is to exclude humans from coming into the area and to augment a shore observer's visual search of the mitigation zone for marine mammals. The safety-boat observer is in constant radio communication with the exercise coordinator and shore observer discussed below. To the best extent practical, boats will try to maintain a 10 knot search speed.

   • A shore-based observer will also be deployed for VSW detonations in addition to boat based observers. At least 10 minutes prior to the planned initiation of the detonation event-sequence, the shore observer, on an elevated on-shore position, begins a continuous visual search with binoculars of the mitigation zone. At this time, the safety-boat observer informs the shore observer if any marine mammal has been seen in the zone and, together, both search the surface within and beyond the mitigation zone for marine mammals (and other protected species such as sea turtles). The shore observer will indicate that the area is clear of marine mammals after 10 or more minutes of continuous observation with no marine mammals having been seen in the mitigation zone or moving toward it.

5. VSW ranges ≥ 1,400:

   • A minimum of 2 boats and 1 shore-based observer will be used to survey for marine mammals (and other marine species such as diving birds and protected species such as sea turtles) at mitigation ranges ≥ 1,400 yards.

   • When conducting the surveys within a mitigation zone >1,400 yds, boats will position themselves near the mid-point of the mitigation zone radius (but always outside the detonation plume radius/human safety zone) and travel in a semi-circular pattern around the detonation location surveying both the inner (toward detonation site) and outer (away from detonation site) areas. When using 2 boats, each boat will be positioned on opposite sides of the detonation location, separated by 180 degrees. If using more than 2 boats, each boat will be positioned equidistant from one another (120 degrees separation for 3 boats, 90 degrees separation for 4 boats, etc.). If available, aerial visual survey support from Navy helicopters can be utilized, so long as to not jeopardize safety of flight. Helicopters will travel in a circular pattern around the detonation location.

6. A mitigation zone will be surveyed from **30 minutes prior to the detonation and for 30 minutes after the detonation**.

7. Other personnel besides boat observers can also maintain situational awareness on the presence of marine mammals within the mitigation zone to the best extent practical given dive safety considerations.

   Divers placing the charges on mines will observe the immediate underwater area around a detonation site for marine mammals (and other marine species such as diving birds and sea turtles) and report sightings to surface observers.

8. If a marine mammal is sighted within an established mitigation zone or moving towards it, underwater detonation events will be suspended until the marine mammal has voluntarily left the area and the area is clear of marine mammals for at least **30 minutes**.

9. Other personnel besides boat observers can also maintain situational awareness on the presence of marine mammals within the mitigation zone to the best extent practical given dive safety considerations. Divers placing the charges on mines will observe the immediate underwater area around a detonation site for marine mammals (and other marine species such as diving birds and sea turtles) and report sightings to surface observers.

10. If a marine mammal is sighted within an established mitigation zone or moving towards it, underwater detonation events will be suspended until the marine mammal has voluntarily left the area and the area is clear of marine mammals for at least **30 minutes**.

11. Immediately following the detonation, visual monitoring for affected marine mammals (and other species such as birds and sea turtles) within the mitigation zone will continue for **30 minutes.**

12. Any marine mammal or sea turtle observed after an underwater detonation either injured or exhibiting signs of distress will be reported to via Navy operational chain of command to Navy environmental representatives from U.S. Pacific Fleet, Environmental Office, San Diego Detachment. Using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex, the Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animals status.

Mitigation for Underwater Detonations in Shallow Water (>24 Feet)

Mitigation Measures For Underwater Detonations <u>Using Positive Control</u>
(Except SWAG and Timed Detonations)

1. Underwater detonations using positive control devices will only be conducted during daylight.
2. A mitigation zone of **700 yards** will be established around each underwater detonation point.
3. A minimum of two boats, including but not limited to small zodiacs and 7-m Rigid Hulled Inflatable Boats (RHIB) will be deployed. One boat will act as an observer platform, while the other boat is typically the diver support boat.
4. Two observers with binoculars on one small craft\boat will survey the detonation area and the mitigation zone for marine mammals from at least **30 minutes prior** to commencement of the scheduled explosive event and until at least **30 minutes after** detonation.
5. In addition to the dedicated observers, all divers and boat operators engaged in detonation events can potentially monitor the area immediately surrounding the point of detonation for marine mammals (and other protected species such as sea turtles).
6. If a marine mammal is sighted within the **700 yard** mitigation zone or moving towards it, underwater detonation events will be suspended until the marine mammal has voluntarily left the area and the area is clear of marine mammals **for at least 30 minutes**.
7. Immediately following the detonation, visual monitoring for marine mammals within the mitigation zone will continue for **30 minutes**. Any marine mammal observed after an underwater detonation either injured or exhibiting signs of distress will be reported to via Navy operational chain of command to Navy environmental representatives from U.S. Pacific Fleet, Environmental Office, San Diego Detachment. Using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex, the Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animals status.

Mitigation Measures For Underwater Detonations Using Time-Delay (TDFD Detonations Only)

1. Underwater detonations using timed delay devices will only be conducted during daylight.
2. Time-delays longer than 10 minutes will not be used. The initiation of the device will not start until the mitigation area below is clear for a full **30 minutes prior** to initiation of the timer.
3. A mitigation zone will be established around each underwater detonation location as indicated in Table 11-3 based on charge weight and length of time-delay used. When conducting the surveys within a mitigation zone (either 1,000 or ≥1,400 yds), boats will position themselves near the mid-point of the mitigation zone radius (but always outside the detonation plume radius/human safety zone) and travel in a circular pattern around the detonation location surveying both the inner (toward detonation site) and outer (away from detonation site) areas.
4. Shallow water TDFD detonations 1,000 yds:

   • A minimum of 2 boats will be used to survey for marine mammals (and other marine species such as diving birds and protected species such as sea turtles) at mitigation ranges of 1,000 yds.

   • When using 2 boats, each boat will be positioned on opposite sides of the detonation location, separated by 180 degrees.

   • Two observers in each of the boats will conduct continuous visual survey of the mitigation zone for the entire duration of a training event.

   • To the best extent practical, boats will try to maintain a 10 knot search speed. This search speed was added to ensure adequate coverage of the buffer zone during observation periods. While weather conditions and sea states may require slower speeds in some instances, 10 knots is a prudent, safe, and executable speed that will allow for adequate surveillance. For a 1,000 yd radius buffer zone a boat travelling at 10 knots and 500 yds away from the detonation point would circle the detonation point 3.22 times during a 30 minute survey period. By using 2 boats, 6.44 circles around the detonation point would be completed in a 30 minute span.

5. Shallow water TDFD detonations ≥1,400 yds:

   • When using 3 (or more) boats, each boat will be positioned equidistant from one another (120 degrees separation for 3 boats, 90 degrees separation for 4 boats, etc.).

   • For a 1,400 yd radius mitigation zone, a 10 knot speed results in 2.3 circles for each of the three boats, or nearly 7 circles around the detonation point over a 30 minute span

   • If available, aerial visual survey support from Navy helicopters can be utilized, so long as to not jeopardize safety of flight.

   • Helicopters, if available, can be used in lieu of one of the boat requirements. Navy helicopter pilots are trained to conduct searches for relatively small objects in the water, such as a missing person. A helicopter search pattern is dictated by standard Navy protocols and accounts for multiple variables, such as the size and shape of the search area, size of the object being searched for, and local environmental conditions, among others.

6. A mitigation zone will be surveyed from **30 minutes prior** to the detonation and for 30 minutes after the detonation.
7. Other personnel besides boat observers can also maintain situational awareness on the presence of marine mammals within the mitigation zone to the best extent practical given dive safety considerations.

   Divers placing the charges on mines will observe the immediate underwater area around a detonation site for marine mammals (and other marine species such as diving birds and sea turtles) and report sightings to surface observers.
8. If a marine mammal is sighted within an established mitigation zone or moving towards it, underwater detonation events will be suspended until the marine mammal has voluntarily left the area and the area is clear of marine mammals **for at least 30 minutes**.
9. Immediately following the detonation, visual monitoring for affected marine mammals (and other species such as birds and sea turtles) within the mitigation zone will continue **for 30 minutes**.
10. Any marine mammal or sea turtle observed after an underwater detonation either injured or exhibiting signs of distress will be reported to via Navy operational chain of command to Navy environmental representatives from U.S. Pacific Fleet, Environmental Office, San Diego Detachment or Pearl Harbor. Using Marine Mammal Stranding protocols and communication trees established for the Southern California and Hawaii Range Complexes, the Navy will report these events to the Stranding Coordinator of NMFS' Southwest or Pacific Islands Regional Office. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animals status.

Mitigation Measures For Underwater SWAG Detonations (SWAG Only)

A modified set of mitigation measures would be implemented for SWAG detonations, which involve much smaller charges of 0.03 lbs NEW.

1. Underwater detonations using SWAG will only be conducted during daylight.

2. A mitigation zone of **60 yards** will be established around each SWAG detonation site.

3. A minimum of two boats, including but not limited to small zodiacs and 7-m Rigid Hulled Inflatable Boats (RHIB) will be deployed. One boat will act as an observer platform, while the other boat is typically the diver support boat.

4. Two observers with binoculars on one small craft\boat will survey the detonation area and the mitigation zone for marine mammals (and other protected species such as sea turtles) from at least **10 minutes prior** to commencement of the scheduled explosive event and until at least **10 minutes after detonation**.

5. In addition to the dedicated observers, all divers and boat operators engaged in detonation events can potentially monitor the area immediately surrounding the point of detonation for marine mammals.

6. Divers and personnel in support boats would monitor for marine mammals out to the 60 yard mitigation zone for 10 minutes prior to any detonation.

7. After the detonation, visual monitoring for marine mammals would continue for **10 minutes**. Any marine mammal observed after an underwater detonation either injured or exhibiting signs of distress will be reported to via Navy operational chain of command to Navy environmental representatives from U.S. Pacific Fleet, Environmental Office, San Diego Detachment. Using Marine Mammal Stranding communication trees and contact procedures established for the Southern California Range Complex, the Navy will report these events to the Stranding Coordinator of NMFS' Southwest Regional Office. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established SSTC beach feature), species description (if known), and indication of the animals status.

12 MINIMIZATION OF ADVERSE EFFECTS ON SUBSISTENCE USE

This Section remains unchanged as described in the Navy's Silver Strand Training Complex (SSTC) Incidental Harassment Authorization application through version 3 of December 28, 2010.

13 MONITORING AND REPORTING MEASURES

This Section remains unchanged as described in the Navy's Silver Strand Training Complex (SSTC) Incidental Harassment Authorization application through version 3 of December 28, 2010.

14 RESEARCH

This Section remains unchanged as described in the Navy's Silver Strand Training Complex (SSTC) Incidental Harassment Authorization application through version 3 of December 28, 2010.

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