*Final*

# *RANGE CONDITION ASSESSMENT (RCA) DECISION POINT 1 RECOMMENDATIONS REPORT*

## *Naval Base Ventura County (NBVC), California: Point Mugu, San Nicolas Island, and San Miguel Island*



***July 2009***

**Department of the Navy**
**Naval Facilities Engineering Command Southwest**

NAWCWD 2011-43

# FINAL RANGE CONDITION ASSESSMENT (RCA) DECISION POINT 1 RECOMMENDATIONS REPORT FOR NAVAL BASE VENTURA COUNTY (NBVC), CALIFORNIA: POINT MUGU, SAN NICOLAS ISLAND, AND SAN MIGUEL ISLAND

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## EXECUTIVE SUMMARY

This document is the Range Condition Assessment (RCA) of current and former land-based operational ranges of the Point Mugu Sea Range. The Point Mugu Sea Range is operated by the Naval Air Warfare Center Weapons Division (NAWCWD) and encompasses portions of Naval Base Ventura County (NBVC) California at Point Mugu, San Nicolas Island and San Miguel Island. The RCA will be used to support range planning and management decisions as part of the Range Sustainability Environmental Program Assessment (RSEPA). This document includes the Range Selection (Phase I) Review, Pre-Site Visit Information (Phase II) Review, On-Site Visit Information (Phase III) Review, including the Operational Range Site Model (ORSM) for munitions-related testing and training ranges, and the answers that are part of Decision Point 1 (DP1).

The following sections summarize the steps used to develop DP1 for Point Mugu, San Nicolas Island, and San Miguel Island, which together comprise the Point Mugu Sea Range.

### I. Range Selection (Phase I) Review

The RCA evaluates (1) potential for releases of munitions components to off-range areas, and (2) current regulatory status of ranges. The RCA recommends appropriate measures to (1) control the present environmental conditions, and (2) maintain regulatory compliance in support of range sustainability.

The Navy has operated Point Mugu Sea Range (PMSR) for more than 60 years with the purpose of providing a safe, operationally realistic, and thoroughly instrumented Sea Range testing and training environment. Onshore facilities associated with the Sea Range activities include active and historical facilities at Mugu and San Nicolas Island. San Miguel Island is no longer an active range site. However, it was historically used as a Navy range, and remains under Navy ownership.

The following areas of Point Mugu, San Nicolas Island, and San Miguel Island were selected for evaluation in this RCA:

**Point Mugu**: For the purposes of the RCA, the Point Mugu land-based operational range facilities assessed included the active and inactive launch facilities; Explosive Ordnance Disposal (EOD) range; and the "Combat Town" training area. The specific launch facilities are listed below:

- Main Launch Complex (Building 55) – consisting of eight launch stands for targets and other launches
- Bravo Launch Complex – consisting of two launch pads for portable-launched test missiles
- Charlie Launch Complex – consisting of three launch pads for rockets and test missiles
- Areas of interest – expended jet-assisted take off (JATO) booster (commonly known as "JATO bottles") drop zones, where appropriate

**San Nicolas Island**: The land surface of the entire island was assessed for the purposes of the RCA. Specific launch and munitions-related areas are listed below:

- Alpha Launch Complex – consisting of two active and three reserve launch pads for various stationary and portable-launched test missiles and targets
- Bravo Launch Complex – also known as Building 807 Launch Complex – consisting of three launch pads for Tomahawk and rolling airframe test missiles (RAM) and for targets
- Standoff land attack test missile (SLAM) target area

- Explosive Ordnance Disposal (EOD) ranges (former and current)

**San Miguel Island:** For the purposes of the RCA, all of San Miguel Island and Prince Island, a rock outcrop to the north of the main island were assessed.

## II. Pre-Site Visit Information (Phase II) Review

A team of Navy, civilian and TEC Inc. (TEC) personnel conducted the RCA Pre-Site Visit Information Collection (Phase II) in July and August 2006. During Phase II the team collected as much information as possible from Navy personnel familiar with the range operations as well as publicly available information on Point Mugu and San Nicolas Island. This information was used to plan the on-site visit and identify key information that would be needed to complete the RCA.

## III. On-Site Visit Information (Phase III) Review

### Site Visit

A team of Navy, civilian and TEC personnel conducted the on-site visit in December 2006 and February 2007. During the visits to Point Mugu and San Nicolas Island, the team interviewed key personnel responsible for range and environmental operations and collected range and environmental information, specifically related to munitions operations. Overall, the operation of the land-based operational facilities at Point Mugu and San Nicolas Island are in compliance with applicable environmental regulations. The following sustainability issues were identified at the operational range facilities:

***Point Mugu***

- A range management plan addressing long-term sustainable range management objectives per the requirements of DoD Directive 4715.11, Environmental and Explosives Safety Management of Department of Defense Active and Inactive Ranges with the United States is programmed for FY 2009. However, Point Mugu would not have such a plan in place until completion of the plan programmed for FY 2009.
- Point Mugu has an asbestos management program but does not have an Asbestos Management Plan that documents roles and responsibilities for the tasks and recordkeeping associated with the various aspects of the program.
- Point Mugu is not in full compliance with the requirements of Code of Federal Regulations Title 36 Part 79 (36 CFR 79) – Curation of Federally Owned and Administered Archaeological Collections – because the repository for artifacts recovered from Point Mugu does not meet all of the regulatory criteria for the physical conditions in which federally owned collections must be stored. However, the artifacts are kept in a secure and appropriate climate-controlled location; these aspects fulfill the majority of the federal criteria. NOVs have not been issued for insufficient compliance with these regulations. Therefore, further steps are not recommended to attain a higher level of compliance.

***San Nicolas Island***

- A range management plan addressing long-term sustainable range management objectives per the requirements of DoD Directive 4715.11, Environmental and Explosives Safety Management of Department of Defense Active and Inactive Ranges with the United States is programmed for FY 2009. However, San Nicolas Island would not have such a plan in place until completion of the plan programmed for FY 2009.
- San Nicolas Island has an asbestos management program but does not have an Asbestos Management Plan that documents roles and responsibilities for the tasks and recordkeeping associated with the various aspects of the program.
- San Nicolas Island is not in full compliance with federal regulations 36 CFR 79 – Curation of Federally Owned and Administered Archaeological Collections – requirements because the repository for artifacts recovered from San Nicolas Island does not meet the all of the regulatory criteria for the physical conditions in which federally owned collections must be stored. However, the artifacts are kept in a secure and appropriate climate-controlled location; these aspects fulfill the majority of the federal criteria. NOVs have not been issued for insufficient compliance with these regulations. Further steps are not recommended to attain a higher level of compliance.
- Currently, expended (i.e., no longer active) test missile components recovered from on-going stand off land attack (SLAM) missile testing are examined to determine whether active explosive components remain, and then the inactive components are disposed off the island as scrap metal, via a contractor. There is no written standard operating procedure (SOP) or guidance, and it is unclear how these efforts are being tracked through the required demilitarization documentation.
- San Nicolas Island does not have an Integrated Cultural Resources Management Plan, as required by DoD Instruction 4715.3 (1996).
- Significant cleanup of debris and abandoned facilities from past operations has been conducted under the IR Program. However, the IR program does not address aircraft, target and test missile wreckage. These are properly addressed under the Operational Range Clearance (ORC) program, and remain in place at the time of this RCA. The IR program determined that rusted 55-gallon containers remaining in various canyons are empty and removed some of them. A former fuel testing pad on the south side of the island, and a former site identified with a radioactive hazard symbol on a 1962 map of San Nicolas Island were not evaluated under the IR program. Remaining debris/historical facilities are sparse and do not represent significant quantities of material.
- MQM-8 Vandal (Vandal) target wreckage includes minor rocket motor assembly components that emit low levels of radioactivity from magnesium-thorium, an alloy commonly used in aerospace applications. The small amount of thorium associated with the Vandal target debris is not likely to affect human receptors, have an adverse impact on the environment or to represent a potential for off-range migration of constituents.
- An ordnance sweep of the EOD range has not been conducted from 2001 through 2006. Although the ordnance sweep is not current, it does conform to DoD Instruction No. 3200.16, which indicates that the frequency and degree of range clearance may vary considering among

other factors, previous range clearance, past, current, and anticipated use, and the types of military ammunition used (DoD 2005).

- Perchlorate was detected historically in drinking water samples from Windmill and Zitnic Springs on the northwestern portion of the island, which were disconnected from the water supply system in 2006. There are no human receptors and the California MCL established in 2007 is not applicable. The concentrations of perchlorate detected historically and under the RCA in samples from Windmill and Zitnic Springs are below the DoD current level of concern for managing perchlorate (24 ppb) (DoD 2006) and are several orders of magnitude below the DoD Range and Munitions Use Subcommittee (RMUS) 9,300 ppb ecological freshwater and marine surface water screening values.

***San Miguel Island***

Per NAVAIR guidance site work for the RCA was not required at San Miguel Island. The only remaining operational Navy component at San Miguel Island is a solar-powered weather station that represents no sustainability issues. To obtain information about San Miguel Island, TEC interviewed National Park Service (NPS) personnel familiar with environmental aspects of NPS activities on the island, current and historic Navy activities, and with the previous environmental investigations conducted at San Miguel Island by the Navy.

No compliance or sustainability issues were identified for San Miguel Island.

**Operational Range Site Model (ORSM)**

The ORSM is a summary of the operational, environmental, cultural, and land use information used to evaluate the potential for the off-range release of MCs and the potential for exposure to off range receptors. This initial ORSM was prepared as part of the RCA Phase III component of RSEPA. Critical information for Point Mugu and San Nicolas Island is discussed below.

***Point Mugu***

**Range Boundary:** The geographic range boundary for Point Mugu is the restricted air space boundary overlapping a portion of Point Mugu. Within the range boundary, the RCA study area boundary encompasses the area from the center of the airfield southward to the coastline.

**Operational Component:** Military operations at Point Mugu consist of missile and target launches, aircraft training exercises, telemetry, radar, and EOD range clearance. In regard to range activity, Point Mugu is a research, development, test and evaluation (RDT&E) range where operations occur with far less frequency than at weapons firing ranges where operations occur on a daily basis. On average nine AQM-74 target craft launched annually from Point Mugu use JATO bottles that contain perchlorates. A yearly average of 120 BQM-74 target launches, which use nitroglycerin/nitrocellulose propellant, also takes place. Both types of JATO bottles, after expending 99 percent of their propellant load in flight, fall into Mugu Lagoon and the wetlands southwest of the Main Launch Complex and are recovered annually. EOD range clearance operations involve the use of less than 50 pounds (lbs) per year of explosives containing C-4, PETN and RDX.

**Environmental Component:** Mugu Lagoon is a large, shallow estuary that occupies the southern third of Point Mugu and encompasses 350 acres of open water and tidal flats. Many of the operational range facilities are located adjacent to either the lagoon or the coast of the Pacific Ocean. Circulation within Mugu Lagoon is primarily driven by tidal action that moves water from the ocean outlet in the southeastern portion of Point Mugu to the inner channels of the lagoon and back out again. Mugu Lagoon

also receives fresh water input from several sources including Calleguas Creek in the east near the lagoon mouth, and Oxnard Drainage Ditch No. 3 which flows into the lagoon's western branch. Point Mugu contains habitats for threatened, endangered, and sensitive species.

**Cultural Component:** One active and two inactive launch facility buildings have been determined to be eligible for inclusion in the National Register of Historic Places (NRHP). An early 20th century fishing compound is located on the sandspit on the southern end of Mugu Lagoon, south of the range facilities.

**Land Use Component:** Human access to the operational range areas is limited to authorized military and contractor personnel. For safety purposes, onshore and offshore areas are cleared during launch activities. Some civilian areas near the range boundary are used for recreational activities: fishing, bird watching and duck hunting.

**Predictive Modeling:** Predictive modeling is not recommended for Point Mugu. There are no human receptors as Mugu Lagoon is not used as a source of drinking water. Water quality calculations show that surface water concentrations of perchlorate associated with expended JATO bottles that land in Mugu Lagoon are lower than the current DoD level of concern for managing perchlorate (24 ppb) and several orders of magnitude below the 9,300 ppb ecological marine surface water screening value developed by the DoD Range and Munitions Use Subcommittee (RMUS). The initial ORSM indicates that freshwater inflow and tidal flushing in the lagoon would serve to attenuate nitroglycerin concentrations to levels below the RMUS screening value (138 ppb) and nitrocellulose to less than 1,000 ppm, a concentration found to have no effect on several aquatic species (Defense Technical Information Center [DTIC] 2008).

***San Nicolas Island***

**Range Boundary:** The range boundary for San Nicolas Island is the restricted air space boundary that surrounds the island. The RCA study boundary for the San Nicolas Island is the island coastline.

**Operational Component:** Located on the line that separates the inner and outer sections of the Sea Range, San Nicolas Island is a tracking and communications site for missile testing that takes place on the Sea Range around the island. The island is instrumented with tracking and communications equipment necessary to support long-range weapons testing and fleet training. San Nicolas Island also supports the Sea Range in simulating shipboard launches of missiles and targets. The western portion of the island contains launch facilities and a target area for test SLAM missiles, which is the only active impact area on the island. As an RDT&E range where range operations occur with far less frequency than at weapons firing ranges where there are multiple impacts to land-based targets on a daily basis, there have been relatively few SLAM test missile impacts in the target area. Impact debris is recovered immediately following each SLAM missile test. Since the SLAM testing began in 1998, only there have been only 114 SLAM test missile impacts in the target area. Throughout 34 years of target launch activities at San Nicolas Island, JATO bottles with nitroglycerin/nitrocellulose propellant have always been used, and approximately 100 JATO bottles have landed at the edge of the mesa southwest of the Alpha Launch Complex after expending 99 percent of their propellant load in flight. An expended JATO bottle cleanup program is expected to be completed in 2009.

There is an airfield near the southeastern edge of San Nicolas Island's central mesa. The landing area consists of one 10,000-foot (3,050-meters) concrete and asphalt runway. The airfield can accommodate aircraft up to the size and weight of C-5 aircraft.

EOD personnel formerly conducted range clearance operations on the western end of the island, at an area approximately one square mile in size, located northwest of the Alpha Launch Complex. The former EOD range was designated IR Program Site 18, then removed from further evaluation under the IR Program

because the IR site boundaries include the active launch facilities. Perchlorate has been identified as a contaminant in the soils in the former EOD range and in water samples from Zitnic Springs (formerly used as a source of drinking water), which is located on the northwestern coastline. The former EOD range lies in the estimated recharge zone for Zitnic Springs. Small amounts of water from the Zitnic Springs aquifer emerge from bedrock fractures at the coastline.

**Environmental Component:** Surface water at San Nicolas Island consists of springs and one perennial stream (Tule Creek) in the northwestern quadrant of the island. Due to the small, irregular amount of rainfall the island receives surface runoff is not a significant source of surface water. However, surface runoff is a source of groundwater recharge. San Nicolas Island has a limited capacity for groundwater storage, due to the consolidated marine sediments that comprise the majority of the island. Groundwater at San Nicolas Island occurs where sands form reservoirs in bedrock depressions, primarily in association with windblown sands in the northwestern portion of the island. The springs at San Nicolas Island are considered groundwater under the direct influence of surface water.

San Nicolas Island contains habitats for threatened, endangered, and sensitive species.

**Cultural Component:** Twelve prehistoric archaeological sites at San Nicolas Island are considered eligible for inclusion on the NRHP. The entire island is in the process of being designated as the San Nicolas Island Historic District, which would result in about one-third of the sites being determined eligible for protection and preservation. About one-third will be determined ineligible, and about one-third will remain in an unclassified status until some level of excavation is conducted at those sites. The island also includes one Cold War Era structure considered to be eligible for inclusion in the National Register of Historic Places.

**Land Use Component:** Human access to San Nicolas Island is limited to authorized military and contractor personnel. Onshore and offshore areas are cleared during launch activities. There is no public access within the boundaries of the operational range.

**Predictive Modeling:** Predictive modeling is not recommended for San Nicolas Island. RCA screening samples were collected in March 2008 at four spring seep sample points along the coast and a fifth at Windmill Springs, an inland location. Perchlorate was detected at concentrations of 16 ppb in the sample from the Zitnic Springs seep, 11 ppb in the sample from the Windmill Springs headwaters, and 0.4 ppb in a sample from a coastal seep approximately 0.5 mile west of Zitnic Springs. No perchlorate was detected in the samples from two other coastal locations sampled. The perchlorate concentrations detected in the March 2008 RCA screening samples from the Zitnic Springs seep and at the Windmill Springs headwaters are within the range of perchlorate concentrations historically detected at those locations in samples taken through 2006, when both springs were disconnected from the drinking water system. The California drinking water MCL established in 2007 does not apply as the springs are no longer used as sources of drinking water. All historical and 2008 detections of perchlorate in samples from Windmill and Zitnic Springs are below the DoD current level of concern for managing perchlorate (24 ppb) (DoD 2006) and are several orders of magnitude below the RMUS 9,300 ppb ecological freshwater and marine surface water screening values.

### *San Miguel Island*

The range boundary for San Miguel Island is airspace Warning Area 289N that surrounds the island. The RCA study boundary for San Miguel Island includes San Miguel Island and Prince Island, a rock outcrop north of the main island. However, ORSM was not conducted for San Miguel Island because there are no current Navy range operations. San Miguel Island is now a part of Channel Islands National Park and has

been managed by the NPS since 1980. The only remaining active Navy component, a solar-powered weather station, does not present a potential for contamination and is not a sustainability issue. San Miguel Island contains remnants of historical Navy and Marine Corps facilities and ranges. To evaluate environmental conditions associated with the former Navy range activities, the Navy conducted a Site Inspection (SI) under the IR program. No further action was recommended for any of the eight IR sites, and the sites were closed. There are no compliance or sustainability issues for San Miguel Island.

## IV. Decision Point 1 Outcome

### Are Further Steps Required to Maintain Compliance?

Records review and interviews with environmental compliance managers and range personnel indicate that installation environmental programs are in compliance with federal environmental and state regulatory requirements. No further steps are required to maintain environmental compliance of the Point Mugu and San Nicolas Island operational range areas. However some program areas have been identified that could be reviewed to ensure adherence to U.S. Navy range management and range residue demilitarization documentation requirements. Recommendations are provided below.

### Recommendations/Protective Measures

#### *Point Mugu*

Overall, training and range operations at Point Mugu are in compliance with applicable environmental programs. No recommendations or protective measures are necessary to maintain compliance with federal and state regulations.

The following measures are suggested to ensure that the operational range facilities at Point Mugu adhere to Navy/DoD guidance and policy:

- A Range Management Plan – as required by DoD Directive 4715.11, which includes long-term sustainable range management objectives – should be prepared using the allocated FY 2009 funding.
- The Asbestos Management Program currently in place should be maintained. To document roles, responsibilities, and procedures associated with this program, an Asbestos Management Plan may be prepared and updated as needed to retain currency.

#### *San Nicolas Island*

Overall, training and range operations at San Nicolas Island are in compliance with applicable environmental programs. No recommendations or protective measures are necessary to maintain compliance with federal and state regulations.

The following measures are suggested to ensure that San Nicolas Island adheres to Navy/DoD guidance and policy:

- Continued monitoring of the coastal seeps and Windmill Springs headwaters as part of the 5-year RSEPA review program is recommended.
- A Range Management Plan – as required by DoD Directive 4715.11, which includes long-term sustainable range management objectives – should be prepared using the allocated FY 2009 funding in order to adhere to Navy regulations.

- The asbestos management program currently in place should be maintained. To document roles, responsibilities, and procedures associated with this program, an Asbestos Management Plan may be prepared and updated as needed to retain currency.
- Demilitarization documentation and record keeping procedures for SLAM test missile debris shipped for offsite disposal from San Nicolas Island should be reviewed and updated per the most current Navy guidance.
- Funding should be allocated for the preparation of an ICRMP for San Nicolas Island.
- A plan and program should be developed and implemented to remove range debris, including aircraft, target and test missile debris as well the remaining 55-gallon containers not removed by the IR program. Cleanup of the debris should be conducted under the Operational Range Clearance (ORC) program. The abandoned fuels testing pad on the south side of the island former and the site identified with a radioactive hazard symbol on a 1962 map of San Nicolas Island should also be evaluated under an ORC.
- If removed from San Nicolas Island MQM-8 Vandal target wreckage should be evaluated to determine the need for disposal as hazardous waste. Radioactive components should be properly disposed at an appropriately-permitted facility.
- Ordnance sweeps at San Nicolas Island should be performed on an as needed basis depending upon previous clearance operations; past, current and anticipated use; and types and quantities of munitions used in accordance with DoD Instruction 3200.16.

***San Miguel Island***

- No recommendations or protective measures are needed for San Miguel Island.

**Is Further Analysis Required to Assess Risk of Potential Off-Range Release?**

***Point Mugu***

The calculated residual surface water perchlorate concentrations (13.40 ppb for large drone targets, 3.90 ppb for small drone targets, and 0.30 ppb one-year long-term concentration) are below the current DoD level of concern for managing perchlorate (24 ppb). The calculated perchlorate concentrations are also several orders of magnitude below the RMUS 9,300 ppb ecological marine surface water screening value. Evaluation of the ORSM therefore indicates that perchlorate in surface water is not likely to present a threat to the environment or a potential for off-range release of munitions constituents. No further analysis is needed for Point Mugu.

***San Nicolas Island***

The small volume of water from the Zitnic Springs coastal cliff seeps represents an offshore migration of constituents. However, the turnover of seawater due to tidal amplitude, seawater brought to the coastal spring seep zone by longshore currents, and turbulent action in the surf zone would attenuate the highest detected perchlorate concentration (20 ppb, detected historically) to 0.2 ppb within a few feet of the cliff seep zone. Therefore, the seeps are not likely to represent a threat to the environment or non-human receptors, or a potential for off-range release. No further analysis is needed for San Nicolas Island.

***San Miguel Island***

There is no potential source of contamination identified at San Miguel Island, therefore, there is no potential for off-range release, and no further analysis is needed.