



## Headquarters Marine Corps

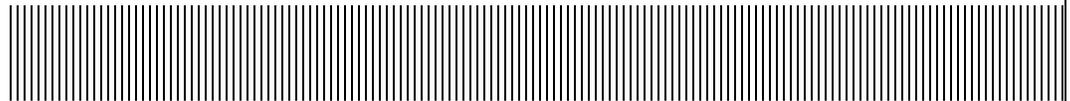
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**FINAL**

# Range Environmental Vulnerability Assessment

## Marine Corps Logistics Base Barstow

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# Executive Summary

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The Range Environmental Vulnerability Assessment (REVA) program is a proactive and comprehensive program designed to support the United States Marine Corps (Marine Corps) environmental range sustainment initiative. The Department of Defense (DoD) has issued several policy, guidance, and planning documents that drive and guide the need to assess operational ranges with respect to potential munitions constituents (MC) migration from operational ranges, including DoD Directive (DoDD) 3200.15 *Sustainment of Ranges and Operating Areas*, DoDD 4715.11 *Environmental and Explosives Safety Management on Operational Ranges Within the United States*, and specifically, DoD Instruction 4715.14 *Operational Range Assessments*.

Operational ranges across the Marine Corps are being assessed to identify areas and activities that are subject to possible impacts from external influences and to determine whether a release or substantial threat of a release of MC from an operational range to an off-range area creates an unacceptable risk to human health or the environment. This is accomplished through a baseline assessment of operational range areas, development of conceptual site models, and, where applicable, the use of fate and transport modeling / analysis of the REVA indicator MC based upon site-specific environmental conditions at the operational ranges. Indicator MC selected for the REVA program include trinitrotoluene (TNT), cyclotetramethylene tetranitramine (HMX), cyclotrimethylene trinitramine (RDX), and perchlorate.

For small arms ranges (SARs), REVA focuses on lead as the indicator MC because lead is the most prevalent (by weight) potentially hazardous constituent associated with small arms ammunition. Lead is geochemically specific regarding its mobility in the environment; modeling of lead requires site-specific geochemical data that are generally unavailable during a baseline assessment. Therefore, instead of modeling lead transport, operational SARs at the installations are qualitatively reviewed and assessed through the Small Arms Range Assessment Protocol (SARAP) to identify factors that influence the potential for lead migration. The SARAP was developed as a qualitative approach to identify and assess factors that influence the potential for lead to migrate from an operational range. These factors include the following:

- Range design and layout
- Physical and chemical characteristics of the area
- Past and present operation and maintenance practices

In addition, potential receptors and pathways are identified relative to the SAR being assessed. The potential for an identified receptor to be impacted by MC migration through an identified pathway is evaluated.

This report presents the assessment results for the operational ranges and training areas at Marine Corps Logistics Base (MCLB) Barstow, California. This report is the first comprehensive report on MC associated with the operational ranges at MCLB Barstow and serves as the baseline of environmental conditions of the operational ranges.

MCLB Barstow is located in the Mojave High Desert region of Southern California, approximately 3.5 miles east of the city of Barstow. The installation, subdivided into three units (Nebo Area, Yermo Annex, and the Rifle Range Complex), consists of approximately 6,166 acres. The mission of MCLB Barstow is to procure, maintain, store, and issue all classes of supplies and equipment and to repair and rebuild Marine Corps and other DoD-owned equipment. MCLB Barstow furnishes supplies for Marine Corps facilities worldwide and is a direct support provider for all installations.

Military training on operational ranges at MCLB Barstow consists solely of small arms training for weapon proficiency and requalification. MCLB Barstow uses three SARs for this training: the Rifle Range, Close Combat Pistol Range, and Pistol Range. A summary of the SAR assessment results are provided in Table ES-1. Because the SARs are located immediately adjacent to one another, the physical and environmental characteristics that factor into the SAR assessments are similar for all three ranges. The only differences in the ranges consist of operational aspects, such as the types of ammunition used, expenditure rates, direction of fire, and engineered controls established on the ranges. The SARs were characterized as minimal environmental concern based on the surface water and groundwater scores.

**Table ES-1: Summary of SAR Prioritizations**

Range Name	Surface Water Priority	Groundwater Priority
Rifle Range	Minimal	Minimal <sup>a</sup>
Close Combat Pistol Range	Minimal	Minimal <sup>a</sup>
Pistol Range	Minimal	Minimal <sup>a</sup>

<sup>a</sup>Original environmental concern evaluation priority was moderate; the priority was adjusted based on professional judgment.

Based on the following site conditions and existing range management practices, the moderate groundwater concern for each SAR was adjusted to minimal:

- Current and continued low use of small arms ammunition
- Regional and site-specific values of soil pH, indicating that lead is unlikely to be mobile at the site

- Lack of surface water and groundwater pathway/receptor interactions for human receptors
- Limited potential for surface water pathway/receptor interaction for ecological receptors (the desert tortoise).

To view the complete report, please go to <http://www.bam.usmc.mil/introduction.htm>