



Marine Corps Logistics Base (MCLB) Barstow Barstow, California

Range Environmental Vulnerability Assessment (REVA) Factsheet

September 2023

Background

Department of Defense (DoD) uses and manages operational ranges to support national security objectives and maintain the high state of operational readiness essential to its mission requirements.

DoD conducts non-regulatory, proactive, and comprehensive operational range assessments (ORAs) to support the long-term sustainability of these ranges while protecting human health and the environment.

The purpose of an ORA is to determine if there is a release or substantial threat of a release of munitions constituents (MC) from an operational range to an off-range area that exceeds an applicable regulatory standard or creates a potential unacceptable risk to human health or the environment.

The Range Environmental Vulnerability Assessment (REVA) Program is the U.S. Marine Corps (USMC) program implemented to meet the DoD ORA requirements.

ORA Findings (9/2023)

The Marine Corps Logistics Base (MCLB) Barstow 2023 Periodic Review (PR) concluded that the MC source-receptor pathways are incomplete for groundwater, surface water, and soil, indicating there is no known off-range migration of MC (lead, high explosives [HE], perchlorate) that presents a potential unacceptable risk to human or environmental health. Potential for off-range migration of MC is limited due to infrequent precipitation, high evaporation rates, and periodic lead removal from the berms. Receptor interaction is limited by distance to source areas. Groundwater supply wells at the Yermo Annex are cross-gradient and over 3 miles from the ranges, and desert tortoise critical habitat is upgradient of the ranges.

Next Steps

The operational ranges will be reassessed during the next REVA PR (5 years), or sooner if there are changes to site conditions or training.

Operational Ranges Overview

The primary mission of MCLB Barstow is to provide infrastructure and support services for USMC. The installation is in south-central California approximately mid-way between Los Angeles and Las Vegas. It is comprised of three noncontiguous areas: Nebo Annex (administration and housing), Yermo Annex (warehouses and storage), and the Rifle Range Complex (small arms ranges [SARs]). Training facilities are in the Rifle Range Complex and the Nebo Annex; however, live-fire is authorized only at the Rifle Range Complex.

MC source areas identified during 2023 PR (2017-2022) were three impact berms containing lead at the Rifle Range Complex. Perchlorate was not used at MCLB Barstow during the review period and high explosives (HE) were used on average only one time per year, thereby not creating an HE source for potential off-range migration.



Range Assessment Overview

Scope and Previous Assessment: The REVA 2023 PR evaluated munitions use at MCLB Barstow from 2 June 2017 to 30 September 2022. The previous REVA study concluded there was no immediate threat to off-range receptors due to MC migration from operational ranges.

Approach: REVA uses a conceptual site model (CSM) to inform decision making. A complete CSM pathway consists of an MC source (lead, HE, and/or perchlorate), transport mechanism of MC to an off-range exposure media, and receptor interaction with the off-range media. For this REVA PR, data were collected to update the previous CSM (2013–2017). This included reviewing operational ranges and any changes in range use, migration pathways, and off-range receptors.

Source: MC source areas are present in the impact berms of three SARs at the Rifle Range Complex. The very low use of HE at Range 7 does not create an MC source. Expenditures at MCLB Barstow are relatively low, and periodic lead mining reduces the MC source in the berms.

Transport Mechanisms: Surface runoff and infiltration of precipitation to groundwater are the viable MC transport mechanisms at MCLB Barstow. Stormwater runoff may transport MC through dissolution of lead into runoff or by carrying eroded soil from impact berms. There are no perennial surface waterbodies on the installation and no waterbodies used as targets or impact areas; therefore, surface water as a transport mechanism is an incomplete pathway.

Off-Range Receptors: Three water supply wells are set 400 feet below ground surface (BGS) in the Yermo Annex and are 3.5 miles crossgradient and across the Mojave River from the SARs. This pathway is considered incomplete due to the low MC source, limited groundwater recharge from precipitation, depth to groundwater, and distance and direction to wells. Human contact with soil or surface runoff would be incidental as there are only roads and railroads downgradient from the SARs prior to reaching the Mojave River, which is



dry most of the year.

The identified ecological receptor is the threatened Agassiz desert tortoise. Tortoise critical habitat is upgradient of the SAR impact berms; however, the tortoise has infrequently been observed on and near the SARs. The low MC source and very limited surface water reduces the potential for interaction with or impacts from MC.

Results: The CSM pathways were determined to be incomplete for MC migration to off-range receptors. This conclusion was reached for groundwater and surface runoff based on low annual precipitation (5 inches), primarily in the form of low-intensity storms, and high annual evaporation (84 inches), resulting in little water available for surface runoff or infiltration. While erosion potential and drainage of the soils are favorable for transport, the arid desert environment and neutral pH of surface water and soils are not conducive to leaching of lead from the impact berms. Low MC source, recurring lead removal actions, distances from MC sources to the range boundaries, and erosion control measures at the impact berms lessen the potential for off-range MC migration. Off-range MC migration via stormwater runoff from the SARs is further limited by engineering controls that direct runoff away from impact berms. Direct infiltration of precipitation to groundwater is limited by the depth of groundwater (approximately 175 feet BGS at the Rifle Range Complex).

Conclusion: The REVA 2023 Periodic Review for MCLB Barstow concludes there is no known MC off-range migration that creates an unacceptable risk to human health or the environment. The operational ranges will be reassessed during the next REVA Periodic Review.

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For more information on the DoD Operational Range Assessment Program, visit <http://www.denix.osd.mil/sri/home/>.