



## Headquarters Marine Corps

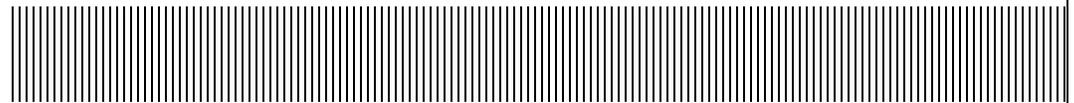
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**FINAL**

# Range Environmental Vulnerability Assessment

Marine Corps Mountain Warfare Training Center  
Bridgeport, California

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# Executive Summary

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The United States (U.S.) Marine Corps (Marine Corps) Range Environmental Vulnerability Assessment (REVA) program meets the requirements of the current Department of Defense Directive 4715.11 *Environmental and Explosives Safety Management on Operational Ranges within the United States* and Department of Defense Instruction 4715.14 *Operational Range Assessments*.

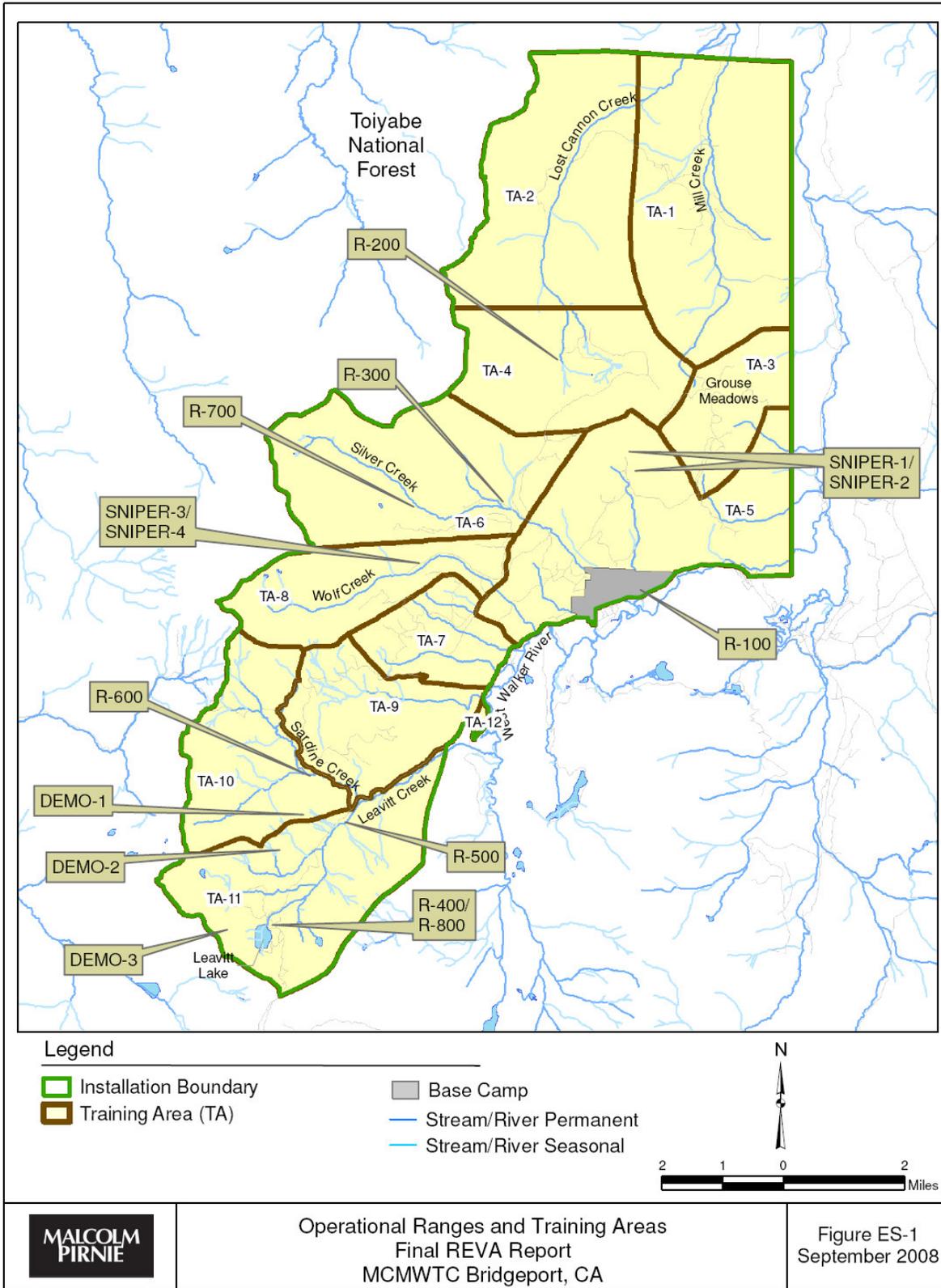
The purpose of REVA is to identify whether there is a release or substantial threat of a release of munitions constituents (MC) from the operational range or range complex areas to off-range areas. At other installations, this is accomplished through the use of fate and transport modeling and analysis of the indicator MC based upon site-specific environmental conditions at the operational ranges and training areas. However, live fire for operational ranges at Marine Corps Mountain Warfare Training Center (MCMWTC) Bridgeport, California, is primarily on small arms ranges (SARs); therefore, qualitative assessments were conducted to evaluate the potential for MC releases to off-range areas.

This report presents the assessment results for the operational ranges and training areas (TAs) at MCMWTC Bridgeport. It is the first comprehensive report on MC associated with the operational ranges at MCMWTC Bridgeport and serves as the baseline of environmental conditions of the ranges.

MCMWTC Bridgeport maintains operational ranges (including SARs) as part of the cold weather orienteering, mobility, and survival training activities conducted at the installation. MCMWTC Bridgeport is located on approximately 53,000 acres in the Toiyabe National Forest in the eastern Sierra Nevada Mountains. The elevation of MCMWTC Bridgeport is 6,762 feet at Base Camp; elevations in the TAs rise to 11,459 feet. The installation is bounded on two sides by federal wilderness areas and is 11 miles northeast of Yosemite National Park. MCMWTC Bridgeport also includes cargo delivery and flight operations at the Sweetwater Flight Strip on U.S. Forest Service (USFS) land approximately 35 miles to the east in Nevada.

Current, as well as historical, uses of the operational ranges and TAs at MCMWTC Bridgeport were assessed under REVA. The TAs at MCMWTC Bridgeport include TA-1 through TA-12. Figure ES-1 identifies the TAs and the operational ranges located in each TA. Table ES-1 summarizes location and use information for the operational ranges and TAs.

Figure ES-1: Operational Ranges and TAs



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**Table ES-1: Range Summary**

TA Name	Fixed Range	Use	Size (acres) <sup>a</sup>	Notes / Action Items
TA-1		TA	6,930	
TA-2		TA	5,941	
TA-3 <sup>b</sup>		TA	1,617	
TA-4		TA	3,717	
	R-200	SAR		Summit Meadows Ambush Site with multiple firing points
	R-201 <sup>c</sup>	SAR		Historical munitions use, currently part of maneuver area
	R-202 <sup>c</sup>	SAR		Historical munitions use, currently part of maneuver area
TA-5		TA	6,560	
	R-100	SAR		Pistol, shotgun, and M16 range
	Sniper-1/Sniper-2	SAR		Aspen Bowl; each a single static firing point for snipers
TA-6		TA	5,447	
	R-300	SAR		Silver Creek Range with multiple firing points
	R-700	SAR		Shepherd's Cabin Range with multiple firing points
TA-7		TA	1,555	
TA-8		TA	2,791	
	Sniper-3/Sniper-4	SAR		Wolf Creek; each a single static firing point for snipers
TA-9		TA	2,729	
TA-10 <sup>e</sup>		TA	3,100	
	R-600	SAR		Sardine Biathlon Range with multiple firing points
	Demo-1	Demonstration area		Anti-personnel obstacle demonstration (snow avalanche)
TA-11 <sup>e</sup>		TA	4,830	
	Demo-2	Demonstration area		Anti-personnel obstacle demonstration (snow avalanche)
	Demo-3	Demonstration area		Anti-personnel obstacle demonstration (snow avalanche)
	R-400/R-800 <sup>f</sup>	SAR		Leavitt Lake Ambush Site and Live Fire and Maneuver
	R-500	SAR		Leavitt Mountain Leader Ambush Range with multiple firing points
TA-12	Climbing area	Climbing area	N/A	

**Total Operational Range Area**  
**45,217<sup>g</sup>**

<sup>a</sup> Total TA acreages are based on the 2003 Section 366 Report; however, acreages are not consistent with Interagency Agreement (IA) per MCMWTC Bridgeport and USFS liaison. Approximately 46,000 acres are included in the IA north of State Highway (Hwy) 108. The IA does not include TA-11 or portions of TA-10 located south of Hwy 108. As a result, acreages listed for individual TAs may be incorrect. Surface danger zones for individual ranges within TAs are found in the MCMWTC Range Regulations (2001).

<sup>b</sup> Grouse Meadows, located in TA-3, is noted to be a location where anti-personnel demonstrations (tree fall) or "demos" are performed; there is no formally recognized fixed physical location for this activity.

<sup>c</sup> Known ranges with historical use (R-201 and R-202) are noted in this table, though not the associated figure.

<sup>d</sup> C4 is composed of 96% Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), a REVA indicator MC. Source: MCMWTC Range Regulations (2001), Section 4009, Demolitions, Booby Traps, and Pyrotechnics.

<sup>e</sup> TA-11 and portions of TA-10 south of Hwy 108 are used by MCMWTC Bridgeport through an annual special use permit from the USFS for winter use only.

<sup>f</sup> Ranges R-400 and R-800 are located adjacent to Leavitt Lake. It is also noted that a biathlon course used by MCMWTC Bridgeport is in this area. Very limited munitions use, involving firing small arms into the southern side of the bowl surrounding Leavitt Lake is associated with this course. The area is not formally recognized in the MCMWTC Range Regulations (2001).

<sup>g</sup> The total area is presented as shown in the 366 Report and is correct for the total area covered north of Hwy 108. It is also noted that an additional 7,000 acres south of Hwy 108 are used under annual permit from the USFS, including portions of TA-10 and all of TA-11. There are also 480 acres in Nevada at Sweetwater Strip, but no ordnance use or delivery occurs there. The sum of these three areas used by MCMWTC Bridgeport is approximately 53,000 acres (IA area, Special Use area, and Sweetwater Strip).



Twelve operational SARs were identified within the TAs (USMC, 2001):

- R-100
- R-200
- R-300
- R-400/R-800
- R-500
- R-600
- R-700
- Sniper-1/Sniper-2
- Sniper-3/Sniper-4

The typical REVA assessment includes a screening model for octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine, trinitrotoluene, RDX, and perchlorate, while the SARs are evaluated qualitatively for lead. Live fire for operational ranges at MCMWTC Bridgeport is primarily on SARs. Therefore, only qualitative assessments for SARs, using the SAR Assessment Protocol (Appendix A), were conducted for MCMWTC Bridgeport operational ranges.

The SARs are qualitatively reviewed and assessed to identify factors that influence the potential for lead migration, including:

- design and layout,
- physical and chemical characteristics of the area, and
- current and past operation and maintenance practices.

In addition, potential receptors and pathways have been identified relative to the SARs being assessed. The results of the SAR Assessments suggest minimal to moderate environmental concern evaluation rankings, which do not require further action. Preliminary work conducted in 1997 by the U.S. Army Corps of Engineers on the only fixed pistol range at MCMWTC Bridgeport, R-100, did not find lead to be migrating off range at that location. Table ES-2 identifies the results of the SAR Assessments for MCMWTC Bridgeport.

The four demonstration ranges at MCMWTC Bridgeport are not considered areas of concern for small arms use or other MC. In addition, severe restrictions on the use of tracers, pyrotechnics, and non-small-arms munitions are in place to promote public and fire safety. A limited amount of smoke grenades and illumination devices is also issued for use at MCMWTC Bridgeport; some of these munitions contain the indicator MC. However, the devices do not represent a source of lead, as installation personnel stated that expended devices and duds are recovered immediately after exercises to alleviate explosive safety concerns. There is the potential that some MC may be released to the environment when the items are expended. However, with the limited sporadic use of these munitions and the fact that the majority of the MC are consumed when the items are expended, the potential for MC loading to be present at levels that may have the potential to result in an off-range release is considered negligible.

Two former range areas were identified as other than operational ranges and, therefore, excluded from REVA because they are addressed under the Military Munitions Response Program. The Sweetwater Flight Strip in Nevada was also screened from REVA modeling or SAR Assessment because personnel interviews and document reviews during the REVA site visit indicated that no munitions are or have been used at that facility.

**Table ES-2: Summary of SAR Assessment Results**

Range Number/Name	Surface Water Environmental Concern	Groundwater Environmental Concern
R-100	Minimal to moderate	Minimal to moderate
R-200	Minimal to moderate	Moderate
R-300	Minimal to moderate	Moderate
R-400/R-800	Moderate	Moderate
R-500	Minimal to moderate	Minimal to moderate
R-600	Minimal to moderate	Minimal to moderate
R-700	Minimal to moderate	Moderate
Sniper-1/Sniper-2	Minimal <sup>a</sup>	Minimal <sup>b</sup>
Sniper-3/Sniper-4	Minimal <sup>b</sup>	Minimal <sup>b</sup>

<sup>a</sup> Original protocol environmental concern evaluation ranking was minimal to moderate; the ranking was adjusted based on professional judgment.

<sup>b</sup> Original protocol environmental concern evaluation ranking was moderate; the ranking was adjusted based on professional judgment.

To view the complete report, please go to:  
<http://www.mwtc.usmc.mil/RangeControl/REVA%20Bridgeport%20FINAL%20September%202008.pdf>