

### 13 When will sampling, if any, take place at an installation?

If the modeling shows a potential for a modeled munitions constituents to migrate off range at concentrations that exceed a conservative, predetermined trigger value, surface water and/or groundwater at an appropriate off-range location will be considered for sampling. Sampling results will be used to determine what further actions, if any, are necessary to reduce or eliminate the potential for munitions constituents to migrate from an operational range.

### 14 What is considered an off-range release?

An off-range release is defined for purposes of this program as any munitions constituent that has been detected in surface water, sediment and/or groundwater at concentrations exceeding the DoD Range and Munitions Use Subcommittee Screening Values.

### 15 How are public stakeholders involved in the REVA program?

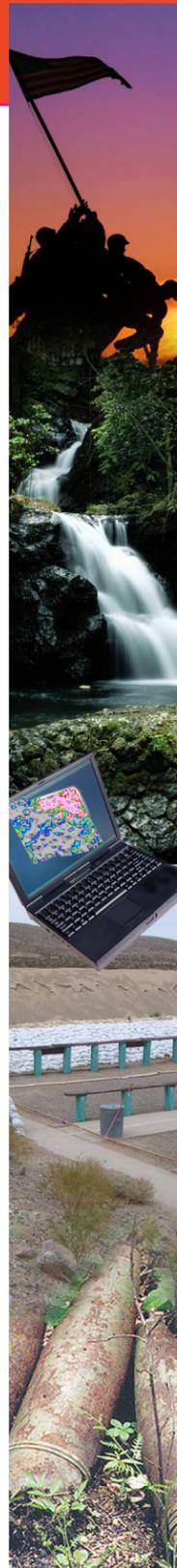
In accordance with DoD guidance as outlined in DoD Instruction 4715.14, the final results of the REVA assessments will be made available to regulatory agencies and the public. Regulators are provided a 60 day review period prior to finalizing the document. All findings are posted on the installations specific website and an executive summary is posted on DENIX (<https://www.denix.osd.mil/sri/Policy/Reports.cfm>).

### 16 Does this mean that my drinking water might be contaminated by munitions constituents?

No, it does not. REVA is a program to better understand potential long-term impacts of Marine Corps use of its operational ranges. The Marine Corps is proactively assessing the potential for munitions constituents from military munitions use to move off range and for those chemicals to impact human health or the environment. The Marine Corps uses current, as well as historical, data to assist in determining the likelihood that this could happen. At any point in the REVA process, if it is determined that a release of munitions constituents has occurred that potentially impacts human health and/or the environment, an immediate notification will be made to the appropriate regulatory agency (as required by DoD Instruction 4715.14). Working with that agency, the Marine Corps will determine the appropriate response to protect human health and the environment.

### 17 Who can be contacted for more information?

For questions regarding the REVA program, please contact Ms. Jennifer Wilber, Headquarters Marine Corps REVA Program Manager, at [jennifer.wilber@usmc.mil](mailto:jennifer.wilber@usmc.mil). 1-571-256-2810



## REVA - Frequently Asked Questions (FAQs)

### Questions...

- 1 What is a Range Environmental Vulnerability Assessment (REVA)?
- 2 What types of military ranges are being assessed?
- 3 Why are operational range assessments being conducted?
- 4 What regulations govern these assessments?
- 5 What installations are subject to the program?
- 6 What is the schedule for completing the REVA program?
- 7 What munitions constituents are being evaluated?
- 8 What is "munitions constituents loading"?
- 9 What "receptors" are being evaluated?
- 10 How does the REVA assess off-range migration of munitions constituents?
- 11 What models are being used for the REVA?
- 12 What are REVA Trigger Values?
- 13 When will sampling, if any, take place at an installation?
- 14 What is considered an off-range release?
- 15 How are public stakeholders involved in the REVA program?
- 16 Does this mean that my drinking water might be contaminated by munition constituents?
- 17 Who can be contacted for more information?



## Answers...

### 1 What is a Range Environmental Vulnerability Assessment (REVA)?

REVA is a key component of the Marine Corps Sustainable Range Program. REVA is a non-regulatory, proactive, and comprehensive approach for environmental sustainability for Marine Corps operational ranges. The purposes of REVA are to:

- Provide a snapshot of the current environmental conditions of operational ranges across the Marine Corps;
  - Perform a detailed assessment of potential munitions constituent migration from operational ranges;
  - Assist installation and range managers in formulating strategies for long-term range sustainment; and
  - Provide early identification of potential environmental issues.
- The munitions constituents include 2,4,6-trinitrotoluene (TNT), 1,3,5-trinitro-1,3,5-triazine or Royal Demolition Explosive (RDX), High Melting Explosive (HMX), perchlorate or lead

### 2 What types of military ranges are being assessed?

An operational range is defined in Title 10 of the United States Code Section 101(d)(3)(A) and (B) as “a range that is under the jurisdiction, custody, or control of the Secretary of Defense and that is used for range activities or, although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities.” Types of range areas assessed under REVA include target/impact areas, firing points, small arms ranges and other training and maneuver areas using military munitions. Areas that are excluded from the assessment include indoor ranges, recreational use ranges, ranges no longer used for operational purposes, and ranges covered by a Resource Conservation Recovery Act Subpart X permit.

### 3 Why are operational range assessments being conducted?

In an effort to better understand the long-term impacts of the use of its training lands, the Department of Defense (DoD) proactively implemented DoD Instruction 4715.14 Operational Range Assessments. This DoD Instruction established requirements for the military services to conduct assessments on all operational ranges in the United States. The Marine Corps has implemented the REVA program to improve its environmental stewardship program, to meet the requirements of the DoD Instruction, and to address environmental concerns proactively so that they do not lead to training restrictions.

### 4 What regulations govern these assessments?

Currently, there are no federal state regulations that require these operational range assessments. However, the DoD is taking a proactive approach and has implemented DoD Directive 4715.11 Environmental and Explosives Safety Management on Operational Ranges within the United States and DoD Instruction 4715.14 Operational Range Assessments to ensure that range operations are not harming or creating an unacceptable risk to human health and/or the environment. DoD Directive 4715.11 requires Marine Corps installations to maintain an inventory of their operational ranges and to evaluate the environmental impact of munitions use. DoD Instruction 4715.14 establishes the policy to assess the environmental impacts of military munitions use.

### 5 What installations are subject to the program?

REVAs will be conducted at all Marine Corps installations in the United States that have operational ranges:

Marine Corps Air Station Cherry Point, North Carolina  
 Marine Corps Base Camp Lejeune, North Carolina  
 Marine Corps Base Camp Pendleton, California  
 Marine Corps Recruit Depot Parris Island, South Carolina  
 Marine Corps Air Station Beaufort, South Carolina  
 Marine Corps Air-Ground Combat Center Twentynine Palms, California  
 Marine Corps Base Quantico, Virginia  
 Marine Corps Mountain Warfare Training Center Bridgeport, California  
 Marine Corps Air Station Yuma / Chocolate Mountains and Barry Goldwater Range, Arizona  
 Marine Corps Logistics Base Barstow, California  
 Marine Corps Logistics Base Albany, Georgia  
 Marine Corps Air Station Miramar, California

### 6 What is the schedule for completing the REVA program?

The REVA Baseline Assessments were completed in 2009. The REVA 5-Year Review assessments began 2010 and will be completed in FY14. The assessments will be conducted every 5 years.

### 7 What munitions constituents are being evaluated?

For the purposes of the REVA program, indicator munitions constituents specifically identified for assessment include TNT, RDX, HMX, perchlorate, and lead. These munitions constituents are considered to be indicator constituents because numerous studies conducted on military installations on the frequency of occurrence of specific munitions constituents in soil and groundwater have shown that TNT or RDX have been detected in a high percentage of analyzed samples. Studies have also shown that RDX and perchlorate are mobile within the environment and have the highest potential to migrate off range. TNT, RDX, and HMX do not degrade rapidly and persist in the environment for long periods of time. Lead is a commonly identified metal associated with small arms ammunition used by the military.

### 8 What is “munitions constituents loading”?

“Munitions constituents loading” is the term used in the REVA program to describe the amount and types of munitions constituents potentially deposited onto the operational ranges as a result of military munitions training activities. The amount and types of munitions constituents fired onto the operational ranges must be estimated for use in computer models that assess the potential for munitions constituents to migrate off range at detectable concentrations. Where available, expenditure data will be used. See also Question #10.

### 9 What “receptors” are being evaluated?

REVA evaluates both human and ecological receptors that could be exposed to munitions constituents if the constituents migrate off range. The identification of potential human and ecological receptors at an installation is an important step in the REVA process.

### 10 How does the REVA assess off-range migration of munitions constituents?

Off-range areas include those areas outside the boundaries of an operational range or operational range complex. Off-range areas can be outside an installation boundary or on installation property but outside of an operational range (e.g., cantonment area). The REVA process uses computer models to assess the potential for munitions constituents to migrate off range to potential receptors through groundwater surface water and sediment pathways. Data for the modeling effort are collected from existing reports and databases; site-specific information is used whenever it is available. The REVA process uses reasonable and conservative assumptions when selecting inputs to the models. Modeling results are used to evaluate if further action might be necessary, including best management practices or field sampling.

Small arms ranges are considered separately from other operational ranges. The REVA process uses a Small Arms Range Assessment Protocol specifically designed to assess the potential for lead to migrate off range. Various factors related to lead release, dissolution, and transport are considered. The assessment process involves scoring a small arms range for each factor, then summing the scores to rank the range as having a low, moderate, or high potential for off-range migration of lead and receptor exposure.

The REVA team along with the installation carefully review these modeling efforts and small arms range assessments. All investigation results are documented upon completion.

### 11 What models being used for the REVA?

The computer models used for the REVA are a series of software programs. To assess groundwater, the REVA uses unsaturated and saturated zone models to evaluate the area above the groundwater table (i.e., the unsaturated zone) and below the groundwater table (i.e., the saturated zone). A one-dimensional groundwater screening-level model (i.e., VS2DT1) is used to simulate contaminants leaching from the ground surface (i.e., downward movement) through the unsaturated zone. A separate model (Biochlor) is used to simulate horizontal movement of the contaminant in the saturated zone toward the range boundary.

A series of linked calculations are used to estimate munitions constituents' concentrations in surface water runoff from operational ranges. Annual surface water runoff from the site is estimated from precipitation data and land characteristics, and the revised universal soil loss equation is used to estimate soil erosion. A multimedia partitioning model (CalTOX) is used to estimate the distribution of loaded munitions constituents among different environmental media, such as shallow soil, deep soil, and surface water. Simple mixing calculations are used to estimate the reduction in munitions constituents' concentrations expected from the edge of the loading area to downstream locations. More complex surface water transport models are available, if warranted on a case-by-case basis.

All models used in the REVA program are publicly available and approved by the United States Environmental Protection Agency.

### 12 What are REVA Trigger Values?

REVA Trigger Values are screening level values to which modeling results are compared to determine whether additional actions are needed. The REVA Trigger Values are based on the median value of compiled method detection limits (MDLs) from various laboratories. The EPA defines an MDL as “the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero.” Detection above an MDL simply indicates that the constituent is present in a sample analyzed by the laboratory not that there is an immediate health concern.

