



EA Engineering, Science, and Technology, Inc.

## **FINAL OPERATIONAL RANGE ASSESSMENT PROGRAM REPORT FORT MCCOY, WISCONSIN**

To meet Department of Defense (DOD) requirements and support the United States (U.S.) Army's Sustainable Range Program, the Army is conducting assessments to determine whether a release or substantial threat of release of munitions constituents of concern (MCOC) from an operational range to an off-range area creates a potentially unacceptable risk to human health of the environment. The initial assessment – Phase I – was a qualitative evaluation of whether (a) a MCOC source existed on the operational range footprint, (b) there is a potential migration mechanism, and (c) human or sensitive ecological receptors are present. For the operational range footprints having a potentially complete source-receptor pathway, the Army conducted a Phase II, a quantitative assessment of potentially complete pathways of MCOC. This ORAP Phase II Report presents evaluation of source-receptor pathways at Fort McCoy, Wisconsin. EA Engineering, Science, and Technology, Inc. (EA) conducted this evaluation under contract W912DR-07-D-0042 to the U.S. Army Corps of Engineers (USACE)-Baltimore District.

Fort McCoy is located in portions of Monroe and Jackson counties, approximately 35 miles east of La Crosse, Wisconsin. The installation currently consists of 226 operational ranges, which encompass approximately 125,421 acres. Fort McCoy serves as a support installation, a ready and capable mobilization site, and is the Army's only facility focused on providing Total Force Warfighting Training. The installation currently serves as a Regional Training Center that annually supports the year-round training of more than 100,000 Active and Reserve Component U.S. military personnel from all branches of the armed forces.

In 2008, Fort McCoy's 226 operational ranges were evaluated under the Phase I Assessment. The ranges were evaluated based on three components: (1) whether they contained sources of potential MCOC, (2) the presence of MCOC migration pathways (surface water and/or groundwater) from operational ranges to off-range areas, and (3) the presence of off-range human and/or ecological receptors. The ranges were grouped based on these components and categorized as either "Unlikely" (MCOC are unlikely to migrate to off-range receptors at concentrations that pose an unacceptable risk), or "Inconclusive" (a determination could not be made based on readily available information).

The Phase I concluded that all three components may exist for 65 operational ranges and categorized them as Inconclusive for evaluation under the Phase II. The purpose of the Phase II was to determine whether MCOC are migrating off operational ranges, along surface water and groundwater pathways, at concentrations that pose an unacceptable risk to human health or the environment.

More than 90 percent of Fort McCoy's Inconclusive range areas are drained by the La Crosse River and Squaw Creek, which were the focus of the investigation. The initial Phase II multi-season field sampling was conducted within the Inconclusive range area's and their associated drainage areas during October 2010 and May 2011. However, in order to address issues associated with a lab closure, an improper well configuration, and elevated detections of metals within a latrine sink sample, a supplemental white phosphorus (WP) and groundwater investigation were conducted in June 2011.

During the initial Phase II investigation, a total of four rounds of surface water, three rounds of sediment, and two rounds of benthic macroinvertebrate samples were collected from four locations (two downstream and two background locations) in the two drainage areas. One round of groundwater samples was initially collected from three wells installed within the Cambrian Sandstone Aquifer. During the supplemental WP and groundwater investigation, an additional two rounds of surface water and sediment samples were collected from Fort McCoy's four locations, and one round of groundwater samples were collected from three wells installed within the Cambrian Sandstone Aquifer.

Samples of surface water, sediment, and groundwater were collected and analyzed for explosives, metals, and water quality parameters (pH, temperature, conductivity, oxidation-reduction potential [ORP], dissolved oxygen [DO]). Matrix-specific analytes included perchlorate, WP, and hardness in surface water; total organic carbon [TOC] and WP in sediment; and perchlorate in groundwater. Benthic macroinvertebrate populations were also sampled and habitats assessed during the ORAP Phase II investigation.

No explosives were detected in any surface water or sediment samples, perchlorate was detected in surface water at concentrations below screening levels, and with the exception of one detection of copper (likely attributed to filter contamination) in a duplicate sample at Squaw Creek, individual metal concentrations in surface water and sediment were all below screening levels. Additionally, benthic macroinvertebrate samples indicated similar conditions within downstream and background locations. The downstream benthic community in both subject streams did not indicate stress as a result of degraded water quality conditions.

No explosives or perchlorate were detected in any groundwater samples. Although concentrations of total lead and zinc were elevated in samples collected from a latrine faucet (GW-02) during the dry season, subsequent samples collected from the latrine sink and directly from the well confirmed that exceedances were most likely attributed to the latrine plumbing system and not MCOC-related.

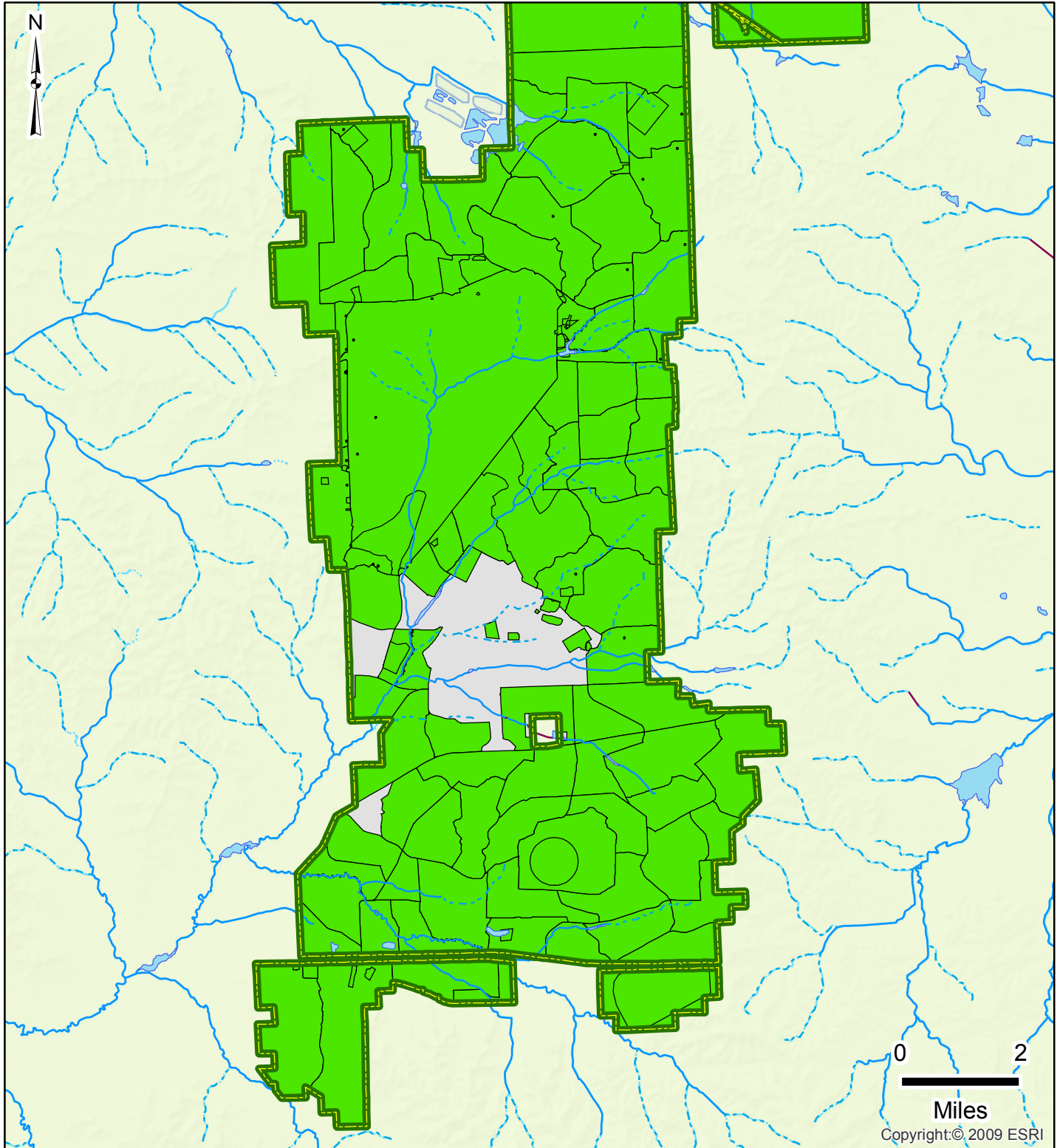
The results of Fort McCoy's Phase II show that MCOC from the operational ranges are not migrating at levels that pose an unacceptable risk to off-range human and or ecological receptors. Therefore, the Inconclusive ranges should be re-categorized as Unlikely and the operational ranges at Fort McCoy should be placed into a periodic review program under the ORAP (**Figure 1**).



Operational Range Assessment Program  
 Final Denix Report  
 Fort McCoy, Wisconsin



**Figure 1**  
**Phase II Conclusions**



- |                          |                   |                     |
|--------------------------|-------------------|---------------------|
| <b>Installation Data</b> | <b>Range Data</b> | <b>Hydrology</b>    |
| Installation Boundary    | Unlikely          | River/Stream        |
|                          |                   | Intermittent Stream |

Data Sources: ARID-GEO 2006  
 ESRI Streetmap 2006

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