

Supporting Information

Quantifying the Risks of Unexploded Ordnance at Closed Military Bases

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This supporting information provides maps of the construction activities planned at Fort Ord Site OE-53 (see main paper) and an analysis of the explosion risks for areas of Site OE-53 where buildings will be constructed. The main paper provides an analysis of explosion risks for areas where paving activities are planned.

Maps of Planned Construction Activities

Figure S1 shows a map of the locations where buildings and paved areas will be constructed for the planned Monterey Peninsula College Emergency Vehicle Operations Center (EVOC). The dark-shaded areas are buildings, while the gray-shaded areas will be paved for activities such as vehicular training. Only a portion of the EVOC overlaps with Site OE-53. Figure S2 shows this portion. In total, Site OE-53 contains four buildings and four major paved areas planned for the EVOC. The buildings are the (1) driver simulation center, (2) multi-purpose facility, (3) vehicle support facility, and (4) fuel station. The paved portions are the (1) motorcycle training area, (2) skid pad, (3) slow-speed maneuver and accident avoidance training area, and (4) parking lot.

Risk Assessment for Areas Where Buildings Will Be Constructed

While several very large buildings are planned for the EVOC (Figure S2), the buildings planned for construction on Site OE-53 are relatively small. The total footprint of these buildings is approximately 1,630 m², as compared to approximately 165,200 m² for the paved areas. As a consequence, the explosion risks to construction workers due to the

need to excavate foundations for the buildings are lower than the risks for the paved areas.

Table S1 shows the risks of one or more explosions occurring due to excavation of building foundations. Results are shown for all three different assumptions about the sensitivity of UXO to detonation upon being struck with a backhoe: high sensitivity, corresponding to the subjective probabilities of the pessimistic expert; average sensitivity, corresponding to the uniform (0, 1) distribution; and low sensitivity, corresponding to the subjective probabilities of the optimistic expert. Results are also shown for different excavation depths. As shown, regardless of the assumed sensitivity of the UXO to explosion, as long as any excavation is planned, the risks exceed 10^{-4} and thus in all likelihood would not meet current regulatory requirements for occupational safety.

TABLE S1 Estimated Risk of One or More Detonations of UXO Occurring in Areas of Site OE-53 where Buildings Will Be Constructed						
Assumed Sensitivity of UXO to Explosion	Depth of Excavation					
	Surface	6 inches	1 foot	2 feet	3 feet	4 feet
Low (optimist view)	0	4.4×10^{-4}	4.9×10^{-4}	4.9×10^{-4}	5.3×10^{-4}	7.1×10^{-4}
Medium (average of expert views)	0	1.4×10^{-2}	1.6×10^{-2}	1.6×10^{-2}	2.0×10^{-2}	2.2×10^{-2}
High (pessimist view)	0	2.4×10^{-2}	3.0×10^{-2}	3.1×10^{-2}	3.7×10^{-2}	4.4×10^{-2}

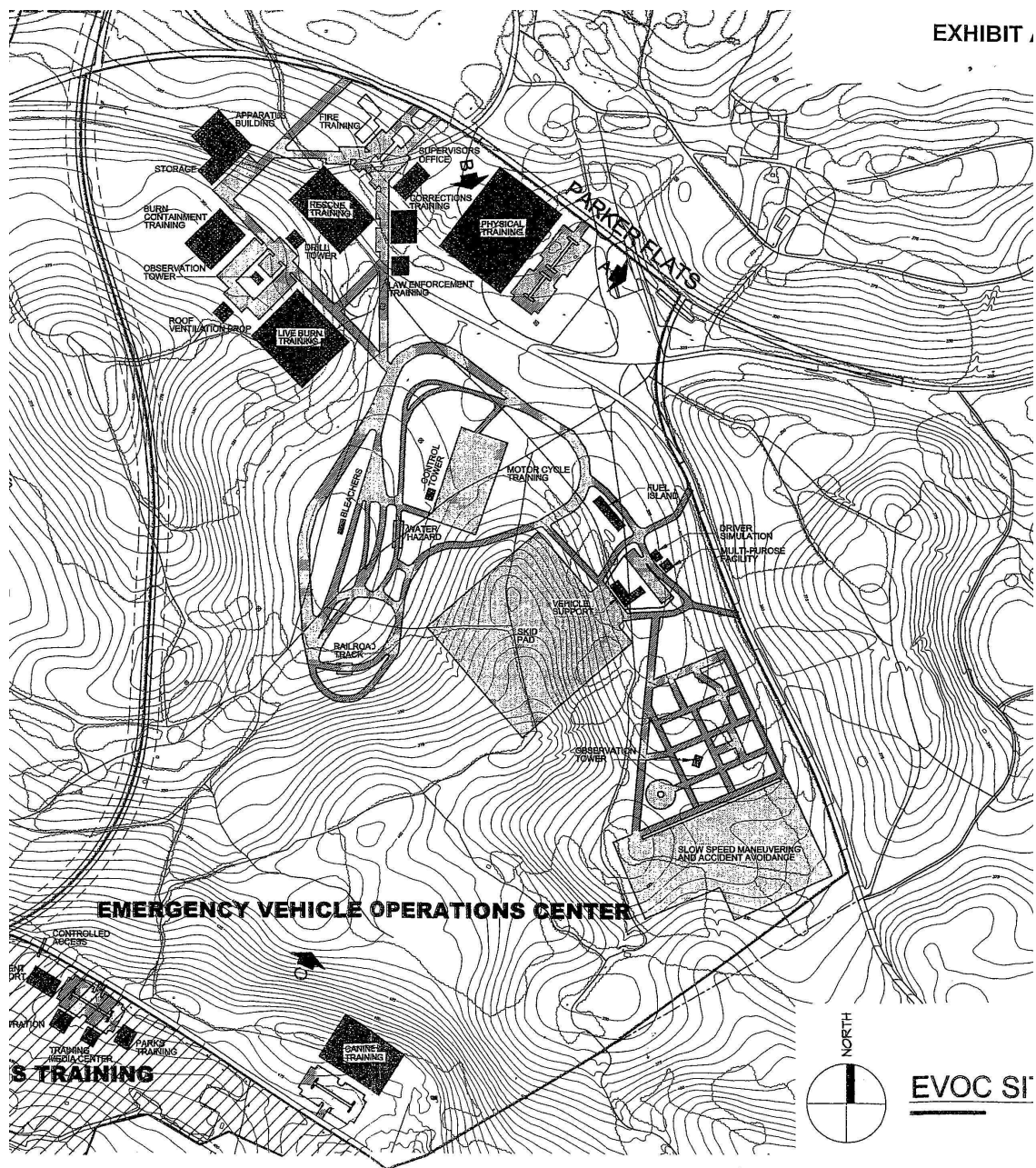


FIGURE S1 Plan for Monterey Peninsula College Emergency Vehicle Operations Center, to be constructed at Fort Ord Site OE-53.

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

FIGURE S2 Emergency Vehicle Operations Center plan overlain on map of selected munitions response sites (each labeled as “MRS”) at Fort Ord. The case study focuses on elements of the plan within site MRS-53 (i.e., OE-53), shown within the bright blue, irregularly shaped boundary within the larger square. Note that all the major buildings are outside of OE-53 (and other OE sites) but that other, smaller buildings and several vehicle parking, fueling, testing, and maneuver areas are within OE-53. The risk assessment includes all major developments within this blue boundary.