

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental non-munitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

Munitions Response Site Name: Ammunition Demolition Activity Area (ADA) UXO Clearance (WEBCASS CRL# 41725.1119)

Component: U.S. Army

Installation/Property Name: Umatilla Chemical Depot (WEBCASS Installation 41725)

Location (City, County, State): Umatilla, Umatilla and Morrow Counties, OR

Site Name/Project Name (Project No.): ADA MRS/Post delineation (UMAD-148)

Date Information Entered/Updated: 10/14/2026

Point of Contact (Name/Phone): Geoffrey Carton (301-807-2704)

Project Phase (check only one):

☐ PA	☐ SI	☐ RI	☐ FS	☐ RD
☒ RA-C	☐ RIP	☐ RA-O	☐ RC	☐ LTM

Media Evaluated (check all that apply):

☐ Groundwater	☐ Sediment (human receptor)
☒ Surface soil	☐ Surface Water (ecological receptor)
☐ Sediment (ecological receptor)	☐ Surface Water (human receptor)

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM, or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type:

The Umatilla Chemical Depot (UMCD), formerly known as Umatilla Army Depot, was constructed in 1941 by the US Army for storage of conventional munitions. Between 1944 and 1955, the conventional munitions storage function at UMCD was expanded to include ammunition demolition, renovation, and maintenance. Testing, rework, burning, demolition and disassembly operations associated with conventional military munitions have been conducted over the years at UMCD. These activities occurred at the Ammunition Demolition Area (ADA) and led to the presence of munitions (2014, Terranear, pg 1-2).

From 1945 to 1992, the ADA was used by the Army to dispose of munitions by burning, detonation, dumping, and burial in various areas throughout the ADA. These activities resulted in the presence of munitions and explosives of concern (MEC) in various locations on the ADA (2010, USACE, pg 11).

Munitions present at the ADA during previous investigations include assorted fuzes, primers, boosters, rockets, mortars, grenades, mines, submunitions, bombs, small arms ammunition, and various other rounds ranging from 20 to 105 mm

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high explosive (HE), and 90 lb fragmentation bombs. Conventional munitions stored at UMCD were transferred to other installations following the installations inclusion in the 1988 BRAC Act. In 1962, the Army began storing chemical munitions at UMCD. However, no testing, manufacturing, or use of chemical munitions occurred at UMCD (2014, Terranear, pg 1-2).

The 1994 OU4 ROD addresses sites 41 (Chemical Agent Decontamination Solution Burial Area, 41725.1017) and 59 (Chemical Agent Decontamination Solution Disposal Areas, 41725.1046) which are within the boundary of the ADA. Page 27 states "The potential risks associated with exposure to soil contamination by future residents are within or below the acceptable carcinogenic risk range, non-carcinogenic hazard level, and action level for lead at sites ... 41 ... " and "if no response action is implemented at the following sites [list includes Sites 41 and 59], unacceptable human exposures to hazardous chemical substances in soil will not occur for future light industrial workers." The risks at these sites associated with reasonably anticipated future use are acceptable (1994, Army, pg 27).

During the 2014 RD/RA, all surface soil analytical results (RDX and TNT) sent to an offsite laboratory were less than the ROD and ESD cleanup levels. TNT results for two soil samples and one soil sample for DNT at blow in place locations exceeded the ROD and ESD cleanup levels (2015, Terranear, pgs 5-1, 5-3). Also, during this RD/RA, instrument aided surface detection was used to identify and remove metallic objects on the ground equal or larger than a 20 mm projectile across the 1,705 acres of the ADA (2015, Terranear, pg 1-4).

From 2017 to 2020, soil fines from ADA sift operations were analyzed for contaminants of concern. Approximately 37,592 tons of sifted fines soil contained COC (including 2,4-DNT, arsenic, and/or lead) concentrations exceeding the cleanup levels specified in the ROD/ESD. The COC-impacted soil was sampled for waste characterization (hazardous and non-hazardous) for disposal purposes. Of the 37,592 tons of COC-impacted soil, 20,914.32 tons was determined to be hazardous waste and was properly disposed off-site. Approximately 14,423 tons of the COC-impacted soil that was determined to be non-hazardous waste remained at the ADA in 2021 (2021, Bay West, pg 2-26).

Soil screen plant operations recovered 154,726 MEC/munitions from the ADA High Density Area and the Western Fence Area. Items recovered include fuzes and components, bombs (both practice and fragmentation), flares, grenades (hand and rifle), improved conventional munitions (M43A1), landmines, mortars, projectiles, rockets, propellant, and other various items (2021, Bay West, pg 2-19, Table 2-7).

During RD/RA activities from 2022 to 2024, soils were analyzed for 13 munitions constituents (explosives and metals). There were no detections of contaminants of concern at the ADA at concentrations greater than those specified in the ROD and ESD or for residential end use (2025, Bay West, pgs 4-17).

Description of Pathways for Human and Ecological Receptors: The ADA MRS has a complete munitions exposure pathway, munitions are present in the surface and subsurface (2021, Bay West, pgs 2-6, 2-13).

Soil is a primary pathway of concern because of the presence of munitions in the subsurface of the ADA (2015, Terranear). No soil sampling results for the ADA during the -2022-2024 RD/RA had concentrations of munitions constituents (MC) greater than those specified in the ROD/ESD for residential end use or above background (2025, Bay West, Section 4.8). An evaluation of groundwater at several sites at the ADA confirmed that MC is not migrating to groundwater; the groundwater pathway is considered incomplete. It further states "Despite the presence of inorganic elements or compounds in the ground water beneath the ADA, there is no evidence that migration of contaminants in soil was, or in the future would be, responsible for ground water contamination" (1994, Army, pg 19). The 5th Five-year Review indicates that arsenic levels in the ADA are above MCLs and LUCs restricting groundwater use are in place (2023, Army, pg 41). There are no surface water bodies on the installation; all waters infiltrate into the desert soils before running off onto lower surrounding lands; therefore, the surface water/sediment pathway is considered incomplete (2024,

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USGS; 2023, Army, pgs 5, 41). There are no naturally occurring permanent wetlands on UMCD (2012 Army, Section 8.2.6).

Description of Receptors (Human and Ecological): The ADA is fenced and patrolled to prevent unauthorized access to the ADA. The only human receptors are workers who have access to the site. Workers could be exposed to subsurface munitions during activities that involve intrusive work.

There are no threatened or endangered species currently recorded on the UMCD grounds (2023, Army, pg 6). Any ecological receptor than can get past the fence can gain access to the site (e.g., burrowing under the fence, flying/jumping over the fence, exploiting weakness in the fence) and be exposed to subsurface MEC. No threatened and endangered species have been observed or documented within the ADA; however, there are threatened and endangered species within the area that could utilize the site. The Western burrowing owl, a federal species of concern, does use the ADA for nesting.

During RD/RA activities from 2022 to 2024, several metallic items were dug up from their original locations and moved by unknown wildlife (2025, Bay West, pg 4-19).

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with all the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Sensitive	- UXO that are considered most likely to function upon any interaction with exposed persons (e.g., submunitions, 40mm high-explosive [HE] grenades, white phosphorus [WP] munitions, high-explosive antitank [HEAT] munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions). - Hand grenades containing energetic filler. - Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard.	<u>30</u>
High explosive (used or damaged)	- UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." - DMM containing a high-explosive filler that have: - Been damaged by burning or detonation - Deteriorated to the point of instability.	<u>25</u>
Pyrotechnic (used or damaged)	- UXO containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades). - DMM containing a pyrotechnic filler other than white phosphorus (e.g., flares, signals, simulators, smoke grenades) that have: - Been damaged by burning or detonation - Deteriorated to the point of instability.	<u>20</u>
High explosive (unused)	- DMM containing a high-explosive filler that: - Have not been damaged by burning or detonation - Are not deteriorated to the point of instability.	<u>15</u>
Propellant	- UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). - DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: - Damaged by burning or detonation - Deteriorated to the point of instability.	<u>15</u>
Bulk secondary high explosives, pyrotechnics, or propellant	- DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). - DMM that are bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard.	<u>10</u>
Pyrotechnic (not used or damaged)	- DMM containing a pyrotechnic filler (i.e., red phosphorus), other than white phosphorus filler, that: - Have not been damaged by burning or detonation - Are not deteriorated to the point of instability.	10
Practice	- UXO that are practice munitions that are not associated with a sensitive fuze. - DMM that are practice munitions that are not associated with a sensitive fuze and that have not: - Been damaged by burning or detonation - Deteriorated to the point of instability.	<u>5</u>
Riot control	UXO or DMM containing a riot control agent filler (e.g., tear gas).	3
Small arms	Used munitions or DMM that are categorized as small arms ammunition. (Physical evidence or historical evidence that no other types of munitions [e.g., grenades, subcaliber training rockets, demolition charges] were used or are present on the MRS is required for selection of this category.)	2
Evidence of no munitions	Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0
MUNITIONS TYPE	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	<u>30</u>

DIRECTIONS: Document any MRS-specific data used in selecting the **Munitions Type** classifications in the space provided.

Munitions recovered at the ADA include flares (M52A1, M55A2, M21A1, M48), assorted fuzes, boosters, rockets (warheads for 2.75in MK1, MK5, M151, M156 (WP), 3.5in M28 (HEAT), M30 (WP); 3.5in motor, 3.5in Rocket M30), 81mm mortars (M43A1, M56, M57 (WP), M374A1), hand grenades (MK2, T13, M15 (WP)), rifle grenades (M406, M31, M9A1), mines (M1A1, M2, M3), submunitions (M43A1), M83 bomblets, bombs (both practice and fragmentation), small arms ammunition, and various other rounds ranging from 20 millimeter (mm) to 105 mm high explosives (HE, HC, WP).

Table 1

EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Circle the scores that correspond with all the munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
	and 90 lb. HE Frag bombs (2021, Bay West, Tables 2-2, 2-3, 2-7). The additional items recovered during the 2022-2024 RD/RA confirmed similar munitions are still present (2025, Bay West, Tables 4-2 and 4-3). Some of the over 150,000 munitions recovered at the ADA are kickouts from demolition operations and remained undamaged from burning or detonation.	
	Hand grenades, submunitions (M43A1), M83 bomblet, WP-filled, and HEAT munitions are sensitive.	

Table 2

EHE Module: Source of Hazard Data Element Table

DIRECTIONS: Below are 11 classifications describing sources of explosive hazards. Circle the scores that correspond with all the sources of explosive hazards known or suspected to be present at the MRS.

Note: The terms *former range*, *practice munitions*, *small arms range*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Former range	♦ The MRS is a former military range where munitions (including practice munitions with sensitive fuzes) have been used. Such areas include impact or target areas and associated buffer and safety zones.	10
Former munitions treatment (i.e., OB/OD) unit	♦ The MRS is a location where UXO or DMM (e.g., munitions, bulk explosives, bulk pyrotechnic, or bulk propellants) were burned or detonated for the purpose of treatment prior to disposal.	<u>8</u>
Former practice munitions range	♦ The MRS is a former military range on which only practice munitions without sensitive fuzes were used.	6
Former maneuver area	♦ The MRS is a former maneuver area where no munitions other than flares, simulators, smokes, and blanks were used. There must be evidence that no other munitions were used at the location to place an MRS into this category.	5
Former burial pit or other disposal area	♦ The MRS is a location where DMM were buried or disposed of (e.g., disposed of into a water body) without prior thermal treatment.	<u>5</u>
Former industrial operating facilities	♦ The MRS is a location that is a former munitions maintenance, manufacturing, or demilitarization facility.	4
Former firing points	♦ The MRS is a firing point, where the firing point is delineated as an MRS separate from the rest of a former military range.	4
Former missile or air defense artillery emplacements	♦ The MRS is a former missile defense or air defense artillery (ADA) emplacement not associated with a military range.	2
Former storage or transfer points	♦ The MRS is a location where munitions were stored or handled for transfer between different modes of transportation (e.g., rail to truck, truck to weapon system).	2
Former small arms range	♦ The MRS is a former military range where only small arms ammunition was used. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present to place an MRS into this category.)	1
Evidence of no munitions	♦ Following investigation of the MRS, there is physical evidence that no UXO or DMM are present, or there is historical evidence indicating that no UXO or DMM are present.	0
SOURCE OF HAZARD	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 10).	<u>8</u>

DIRECTIONS: Document any MRS-specific data used in selecting the **Source of Hazard** classifications in the space provided.

Testing, rework, burning, demolitions, and disassembly operations associated with conventional military munitions have been at the ADA. Digital geophysical mapping identified numerous possible burial features in the ADA (2015, Terranear, pgs ES-1, 2-1). In the southern ADA, the Oregon National Guard has several active ranges where training is conducted.

Table 3

EHE Module: Location of Munitions Data Element Table

DIRECTIONS: Below are eight classifications of munitions locations and their descriptions. Circle the scores that correspond with all the locations where munitions are known or suspected to be present at the MRS.

Note: The terms *confirmed*, *surface*, *subsurface*, *small arms ammunition*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	- Physical evidence indicates that there are UXO or DMM on the surface of the MRS. - Historical evidence (i.e., a confirmed report such as an explosive ordnance disposal [EOD], police, or fire department report that an incident or accident that involved UXO or DMM occurred) indicates there are UXO or DMM on the surface of the MRS.	<u>25</u>
Confirmed subsurface, active	- Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS, and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM. - Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena (e.g., drought, flooding, erosion, frost heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.	<u>20</u>
Confirmed subsurface, stable	- Physical evidence indicates the presence of UXO or DMM in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed. - Historical evidence indicates that UXO or DMM are located in the subsurface of the MRS and the geological conditions at the MRS are not likely to cause UXO or DMM to be exposed, in the future, by naturally occurring phenomena, or intrusive activities at the MRS are not likely to cause UXO or DMM to be exposed.	15
Suspected (physical evidence)	There is physical evidence (e.g., munitions debris such as fragments, penetrators, projectiles, shell casings, links, fins), other than the documented presence of UXO or DMM, indicating that UXO or DMM may be present at the MRS.	<u>10</u>
Suspected (historical evidence)	There is historical evidence indicating that UXO or DMM may be present at the MRS.	<u>5</u>
Subsurface, physical constraint	There is physical or historical evidence indicating that UXO or DMM may be present in the subsurface, but there is a physical constraint (e.g., pavement, water depth over 120 feet) preventing direct access to the UXO or DMM.	2
Small arms (regardless of location)	The presence of small arms ammunition is confirmed or suspected, regardless of other factors such as geological stability. (There must be evidence that no other types of munitions [e.g., grenades] were used or are present at the MRS to place an MRS into this category.)	1
Evidence of no munitions	Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0
LOCATION OF MUNITIONS	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 25).	<u>25</u>

DIRECTIONS: Document any MRS-specific data used in selecting the *Location of Munitions* classifications in the space provided.

Evidence from previous investigations indicates there are munitions on the surface and in the subsurface of the ADA. Any change on the surface could expose munitions. The 2022-2024 RD/RA did not address MEC in all areas of the ADA; therefore, subsurface UXO hazards still exist (2025, Bay West, pg 6-1). Over 3,000 tons of metallic debris including MD was removed from the ADA (2021, Bay West, pg 2-23). During RD/RA activities at the ADA from 2022 to 2024, several metallic items were dug up from their original locations and moved by unknown wildlife (2025, Bay West, pg 4-19). This indicates that munitions can be brought to the surface by wildlife. In addition, freeze thaw cycles can bring munitions to the surface.

Table 4

EHE Module: Ease of Access Data Element Table

DIRECTIONS: Below are four classifications of barrier types that can surround an MRS and their descriptions. The barrier type is directly related to the ease of public access to the MRS. Circle the score that corresponds with the ease of access to the MRS.

Note: The term *barrier* is defined in Appendix C of the Primer.

Classification	Description	Score
No barrier	♦ There is no barrier preventing access to any part of the MRS (i.e., all parts of the MRS are accessible).	10
Barrier to MRS access is incomplete	♦ There is a barrier preventing access to parts of the MRS, but not the entire MRS.	8
Barrier to MRS access is complete but not monitored	♦ There is a barrier preventing access to all parts of the MRS, but there is no surveillance (e.g., by a guard) to ensure that the barrier is effectively preventing access to all parts of the MRS.	5
Barrier to MRS access is complete and monitored	♦ There is a barrier preventing access to all parts of the MRS, and there is active, continual surveillance (e.g., by a guard, video monitoring) to ensure that the barrier is effectively preventing access to all parts of the MRS.	<u>0</u>
EASE OF ACCESS	DIRECTIONS: Record the single highest score from above in the box to the right (maximum score = 10).	<u>0</u>

DIRECTIONS: Document any MRS-specific data used in selecting the ***Ease of Access*** classification in the space provided.

There is a fence around the entire ADA boundary that is regularly monitored by the installation guards. The fence around the installation boundary is controlled by guards and access is granted at specific access points (2010, USACE, Attachment 2). Between 2017 and 2020, wind-blown soil that accumulated against the inside and outside of the designated section of the western fence line of the ADA was removed down to the original ground surface level. Following the removal action activities at the western fence area, a new 7-ft security chain link fence topped with 3-strand Class 3 barbwire was installed along the western ADA boundary (2021, Bay West, pg 1-15). During the 2022-2024 RA, wind-blown soil was again removed from the west fence area, as well as the north fence area, and a new perimeter fence was installed (2025, Bay West, pg 4-8).

Table 5

EHE Module: Status of Property Data Element Table

DIRECTIONS: Below are three classifications of the status of a property within the Department of Defense (DoD) and their descriptions. Circle the score that corresponds with the status of property at the MRS.

Classification	Description	Score
Non-DoD control	♦ The MRS is at a location that is no longer owned by, leased to, or otherwise possessed or used by DoD. Examples are privately owned land or water bodies; land or water bodies owned or controlled by state, tribal, or local governments; and land or water bodies managed by other federal agencies. ♦ The MRS is at a location that is owned by DoD, but that DoD has leased to another entity and for which DoD does not control access 24 hours per day.	5
Scheduled for transfer from DoD control	♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD, and DoD plans to transfer that land or water body to the control of another entity (e.g., a state, tribal, or local government; a private party; another federal agency) within 3 years from the date the Protocol is applied.	3
DoD control	♦ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by DoD. With respect to property that is leased or otherwise possessed, DoD must control access to the MRS 24 hours per day, every day of the calendar year.	<u>0</u>
STATUS OF PROPERTY	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	<u>0</u>

DIRECTIONS: Document any MRS-specific data used in selecting the *Status of Property* classification in the space provided.

The ADA is on Umatilla Chemical Depot, which is owned by DoD (2010, USACE, Attachment 2). The ADA occupies approximately 1,735 acres within the 7,500 acres licensed to the Oregon Army National Guard as the Rees Training Center (2025, Bay West, pg 2-1).

Table 6

EHE Module: Population Density Data Element Table

DIRECTIONS: Below are three classifications for population density and their descriptions. Determine the population density per square mile that most closely corresponds with the population of the MRS, including the area within a two-mile radius of the MRS's perimeter. Circle the most appropriate score.

Note: Use the U.S. Census Bureau tract data available to capture the highest population density within a two-mile radius of the perimeter of the MRS.

Classification	Description	Score
> 500 persons per square mile	♦ There are more than 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	<u>5</u>
100–500 persons per square mile	♦ There are 100 to 500 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	3
< 100 persons per square mile	♦ There are fewer than 100 persons per square mile in the U.S. Census Bureau tract in which the MRS is located.	1
POPULATION DENSITY	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	<u>5</u>

DIRECTIONS: Document any MRS-specific data used in selecting the **Population Density** classification in the space provided.

Irrigon, OR lies less than two miles from the boundary of the ADA. As of 2020, Irrigon has a population of 2,011 people and a land area of 1.3 square miles, for a population density of approximately 1,547 people/sq mile. (2020, U.S. Census Bureau, https://data.census.gov/profile/Irrigon_city,_Oregon?q=160XX00US4136500).

Table 7

EHE Module: Population Near Hazard Data Element Table

DIRECTIONS: Below are six classifications describing the number of inhabited structures near the MRS. The number of inhabited buildings relates to the potential population near the MRS. Determine the number of inhabited structures within two miles of the MRS boundary and circle the score that corresponds with the number of inhabited structures.

Note: The term *inhabited structures* is defined in Appendix C of the Primer.

Classification	Description	Score
26 or more inhabited structures	♦ There are 26 or more inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	<u>5</u>
16 to 25 inhabited structures	♦ There are 16 to 25 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	4
11 to 15 inhabited structures	♦ There are 11 to 15 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	3
6 to 10 inhabited structures	♦ There are 6 to 10 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	2
1 to 5 inhabited structures	♦ There are 1 to 5 inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	1
0 inhabited structures	♦ There are no inhabited structures located up to 2 miles from the boundary of the MRS, within the boundary of the MRS, or both.	0
POPULATION NEAR HAZARD	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	<u>5</u>

DIRECTIONS: Document any MRS-specific data used in selecting the **Population Near Hazard** classification in the space provided.

There are more than 26 inhabited structures within two miles of the boundary of the ADA. The determination was made by laying a two-mile line from the ADA boundary on a Google Earth image and counting the structures. There is an area with numerous structures north/northwest of the ADA containing more than 26 structures (2025, Google Earth, <https://earth.google.com/web/search/Irrigon,+OR/@45.860743,-119.47371911,159.84983067a,18196.33200675d,35y,360h,0t,0r>).

Table 8

EHE Module: Types of Activities/Structures Data Element Table

DIRECTIONS: Below are five classifications of activities and/or inhabited structures and their descriptions. Review the types of activities that occur and/or structures that are present within two miles of the MRS and circle the scores that correspond with **all** the activities/structure classifications at the MRS.

Note: The term *inhabited structure* is defined in Appendix C of the Primer.

Classification	Description	Score
Residential, educational, commercial, or subsistence	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with any of the following purposes: residential, educational, child care, critical assets (e.g., hospitals, fire and rescue, police stations, dams), hotels, commercial, shopping centers, playgrounds, community gathering areas, religious sites, or sites used for subsistence hunting, fishing, and gathering.	<u>5</u>
Parks and recreational areas	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with parks, nature preserves, or other recreational uses.	4
Agricultural, forestry	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with agriculture or forestry.	<u>3</u>
Industrial or warehousing	Activities are conducted, or inhabited structures are located up to two miles from the MRS's boundary or within the MRS's boundary, that are associated with industrial activities or warehousing.	2
No known or recurring activities	There are no known or recurring activities occurring up to two miles from the MRS's boundary or within the MRS's boundary.	1
TYPES OF ACTIVITIES/STRUCTURES	DIRECTIONS: Record the single highest score from above in the box to the right (maximum score = 5).	<u>5</u>

DIRECTIONS: Document any MRS-specific data used in selecting the **Types of Activities/Structures** classifications in the space provided.

The Irrigon Elementary School and residences are within a two-mile radius of the ADA (2025, Google Earth, <https://earth.google.com/web/search/Irrigon,+OR/@45.860743,-119.47371911,159.84983067a,18196.33200675d,35y,360h,0t,0r>). There are agricultural areas to the south and west of the site boundary (2025, Bay West, pg 6-1; 2025, Google Earth, <https://earth.google.com/web/search/Irrigon,+OR/@45.860743,-119.47371911,159.84983067a,18196.33200675d,35y,360h,0t,0r>). No parks or recreational areas were identified within two miles of the ADA.

Table 9

EHE Module: Ecological and/or Cultural Resources Data Element Table

DIRECTIONS: Below are four classifications of ecological and/or cultural resources and their descriptions. Review the types of resources present and circle the score that corresponds with the ecological and/or cultural resources present on the MRS.

Note: The terms *ecological resources* and *cultural resources* are defined in Appendix C of the Primer.

Classification	Description	Score
Ecological and cultural resources present	♦ There are both ecological and cultural resources present on the MRS.	5
Ecological resources present	♦ There are ecological resources present on the MRS.	3
Cultural resources present	♦ There are cultural resources present on the MRS.	3
No ecological or cultural resources present	♦ There are no ecological resources or cultural resources present on the MRS.	<u>0</u>
ECOLOGICAL AND/OR CULTURAL RESOURCES	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	<u>0</u>

DIRECTIONS: Document any MRS-specific data used in selecting the *Ecological and/or Cultural Resources* classification in the space provided.

No threatened or endangered species have been observed or documented at the adjacent ADA; however, there are threatened or endangered species in the general area that could use the site. The Western Burrowing Owl, a federal species of concern, uses the ADA for nesting (2015, Terranear, pg 2-6). _____

There are no naturally occurring permanent wetlands on UMCD (2012 Army, Section 8.2.6). _____

No cultural, historical or archeological resources have been reported or identified within the ADA. Additionally, due to the amount of disturbance associated with the munitions demolition activities conducted at the ADA, it is highly unlikely that the integrity of any such resources that may have existed prior to utilization of the ADA is still intact (2014, Terranear, pg 7-2). _____

Table 10
Determining the EHE Module Rating

	Source	Score	Value
DIRECTIONS: 1. From Tables 1–9, record the data element scores in the Score boxes to the right. 2. Add the Score boxes for each of the three factors and record this number in the Value boxes to the right. 3. Add the three Value boxes and record this number in the EHE Module Total box below. 4. Circle the appropriate range for the EHE Module Total below. 5. Circle the EHE Module Rating that corresponds to the range selected and record this value in the EHE Module Rating box found at the bottom of the table. Note: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.	Explosive Hazard Factor Data Elements		
	Munitions Type	Table 1	<u>30</u>
	Source of Hazard	Table 2	<u>8</u>
			<u>38</u>
	Accessibility Factor Data Elements		
	Location of Munitions	Table 3	<u>25</u>
	Ease of Access	Table 4	<u>0</u>
	Status of Property	Table 5	<u>0</u>
			<u>25</u>
	Receptor Factor Data Elements		
	Population Density	Table 6	<u>5</u>
	Population Near Hazard	Table 7	<u>5</u>
	Types of Activities/Structures	Table 8	<u>5</u>
	Ecological and/or Cultural Resources	Table 9	<u>0</u>
			<u>15</u>
	EHE MODULE TOTAL		<u>78</u>
	EHE Module Total	EHE Module Rating	
	92 to 100	A	
	82 to 91	B	
	71 to 81	<u>C</u>	
	60 to 70	D	
	48 to 59	E	
	38 to 47	F	
	less than 38	G	
	Alternative Module Ratings	Evaluation Pending	
		No Longer Required	
		No Known or Suspected Explosive Hazard	
	EHE MODULE RATING		<u>C</u>

Table 11

CHE Module: CWM Configuration Data Element Table

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Circle the scores that correspond with **all** the CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
CWM, that are either UXO, or explosively configured damaged DMM	The CWM known or suspected of being present at the MRS are: ♦ CWM that are UXO (i.e., CWM/UXO) ♦ Explosively configured CWM that are DMM (i.e., CWM/DMM) that have been damaged.	30
CWM mixed with UXO	♦ The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO.	25
CWM, explosive configuration that are undamaged DMM	♦ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20
CWM/DMM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS are: ♦ Nonexplosively configured CWM/DMM either damaged or undamaged ♦ Bulk CWM (e.g., ton container).	15
CAIS K941 and CAIS K942	♦ The CWM/DMM known or suspected of being present at the MRS are CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11.	12
CAIS (chemical agent identification sets)	♦ CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10
Evidence of no CWM	♦ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	<u>0</u>
CWM CONFIGURATION	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	<u>0</u>

DIRECTIONS: Document any MRS-specific data used in selecting the **CWM Configuration** classifications in the space provided.

While the Army stored chemical munitions at UMCD, testing, manufacturing and use never occurred on site. Therefore, no CWM is known or suspected of being used at the ADA (2015, Terranear, ES-1). The last of UMCDs CWM was destroyed in 2012 and the disposal facility was successfully closed (2021, Bay West, pg 1-1). MRSP Tables 12-19 are omitted in accordance with Army guidance.

Tables 12-19 are omitted
in accordance with Army Guidance

Table 20
Determining the CHE Module Rating

				Source	Score	Value	
DIRECTIONS: - From Tables 11–19, record the data element scores in the Score boxes to the right. - Add the Score boxes for each of the three factors and record this number in the Value boxes to the right. - Add the three Value boxes and record this number in the CHE Module Total box below. - Circle the appropriate range for the CHE Module Total below. - Circle the CHE Module Rating that corresponds to the range selected and record this value in the CHE Module Rating box found at the bottom of the table. Note: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.	CWM Hazard Factor Data Elements						
	CWM Configuration	Table 11	<u>0</u>				
	Sources of CWM	Table 12					
	Accessibility Factor Data Elements						
	Location of CWM	Table 13					
	Ease of Access	Table 14					
	Status of Property	Table 15					
	Receptor Factor Data Elements						
	Population Density	Table 16					
	Population Near Hazard	Table 17					
	Types of Activities/Structures	Table 18					
	Ecological and/or Cultural Resources	Table 19					
	CHE MODULE TOTAL						
	CHE Module Total			CHE Module Rating			
	92 to 100			A			
	82 to 91			B			
	71 to 81			C			
	60 to 70			D			
	48 to 59			E			
38 to 47			F				
less than 38			G				
Alternative Module Ratings			Evaluation Pending				
			No Longer Required				
			<u>No Known or Suspected CWM Hazard</u>				
CHE MODULE RATING			<u>No Known or Suspected CWM Hazard</u>				

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional groundwater contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Groundwater MC Hazard



Media not evaluated.

An evaluation of groundwater at several sites at the ADA confirmed that MC is not migrating to groundwater; the groundwater pathway is considered incomplete (1994, Army, pg 19). The 5th Five-year Review indicates that land use controls restricting groundwater use are in place (2023, Army, pg 41).

Table 22

HHE Module: Surface Water – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		
Migratory Pathway Factor DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.			
Classification	Description	Value	
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H	
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M	
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L	
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).		
Receptor Factor DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.			
Classification	Description	Value	
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H	
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M	
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L	
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).		
No Known or Suspected Surface Water (Human Endpoint) MC Hazard			☐

Media not evaluated.

There are no surface water bodies on the installation; all waters infiltrate into the desert soils before running off onto lower surrounding lands; therefore, the surface water pathway is considered incomplete (2024, USGS; 2023, Army, pgs 5, 41). Surface water drainage channels throughout the area are poorly developed due to the high permeability of the soil, low precipitation, and recent formation of the landscape (2025, Bay West, pg 2-5). Therefore, the surface water pathway is considered incomplete.

Table 23

HHE Module: Sediment – Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	CHF Value	Sum The Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		

CONTAMINANT HAZARD FACTOR **DIRECTIONS:** Record the CHF Value from above in the box to the right maximum value = H).

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Human Endpoint) MC Hazard



Media not evaluated.

There are no surface water bodies on the installation; all waters infiltrate into the desert soils before running off onto lower surrounding lands; therefore, the sediment pathway is considered incomplete (2024, USGS; 2023, Army, pgs 5, 41). Surface water drainage channels throughout the area are poorly developed due to the high permeability of the soil, low precipitation, and recent formation of the landscape (2025, Bay West, pg 2-5). No sediment is known to exist at the ADA.

Table 24

HHE Module: Surface Water – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the surface water, select the box at the bottom of the table.

Contaminant	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record the CHF Value from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	

No Known or Suspected Surface Water (Ecological Endpoint) MC Hazard



Media not evaluated.

There are no surface water bodies on the installation; all waters infiltrate into the desert soils before running off onto lower surrounding lands; therefore, the surface water pathway is considered incomplete (2024, USGS; 2023, Army, pgs 5, 41). Surface water drainage channels throughout the area are poorly developed due to the high permeability of the soil, low precipitation, and recent formation of the landscape (2025, Bay West, pg 2-5).

Table 25

HHE Module: Sediment – Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with ecological endpoints present in the sediment, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
CHF Scale	CHF Value	Sum the Ratios	
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	

No Known or Suspected Sediment (Ecological Endpoint) MC Hazard



Media not evaluated.

There are no surface water bodies on the installation; all waters infiltrate into the desert soils before running off onto lower surrounding lands; therefore, the surface water/sediment pathway is considered incomplete (2024, USGS; 2023, Army, pgs 5, 41). Surface water drainage channels throughout the area are poorly developed due to the high permeability of the soil, low precipitation, and recent formation of the landscape (2025, Bay West, pg 2-5). No sediment is known to exist at the ADA.

Table 26

HHE Module: Surface Soil Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface soil contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratio
1,3,5-Trinitrobenzene	0.24	2,200	0.0001
2,4,6-Trinitrotoluene	4.6	36	0.128
2,4-Dinitrotoluene	2.3	120	0.019
RDX	0.61	230	0.002
Antimony	20	31	0.645
CHF Scale	CHF Value	Sum the Ratios	5.5
CHF > 100	H (High)	$CHF = \sum \frac{[\text{Maximum Concentration of Contaminant}]}{[\text{Comparison Value for Contaminant}]}$	
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		
CONTAMINANT HAZARD FACTOR	DIRECTIONS: Record <u>the CHF Value</u> from above in the box to the right (maximum value = H).		M

Migratory Pathway Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to the presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	M

Receptor Factor

DIRECTIONS: Circle the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	DIRECTIONS: Record <u>the single highest value</u> from above in the box to the right (maximum value = H).	M

No Known or Suspected Surface Soil MC Hazard



Soils were analyzed for 13 contaminants of concern (explosives and metals) (2025, Bay West, pgs 4-16, 4-17). Much of the contaminated surface soil has been removed as part of the various RD/RA activities. Remediation to address remaining contaminated soil is ongoing. The National Guard is using uncontaminated surface areas in training.

HHE Module: Supplemental Contaminant Hazard Factor Table

DIRECTIONS: Only use this table if there are more than five contaminants in any given medium present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B of the Primer) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

[illegible]

Table 28
Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard, Migration Pathway, and Receptor Factors** for the media (from Tables 21–26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the **HHE Ratings** provided below, determine each media's rating (A–G) and record the letter in the corresponding **Media Rating** box below.

Media (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value		Three-Letter Combination (Hs-Ms-Ls)		Media Rating (A-G)
Groundwater (Table 21)							Media not evaluated
Surface Water/Human Endpoint (Table 22)							Media not evaluated
Sediment/Human Endpoint (Table 23)							Media not evaluated
Surface Water/Ecological Endpoint (Table 24)							Media not evaluated
Sediment/Ecological Endpoint (Table 25)							Media not evaluated
Surface Soil (Table 26)	M	M	M		MMM		D

DIRECTIONS (cont.):

4. Select the single highest Media Rating (A is highest; G is lowest) and enter the letter in the **HHE Module Rating** box.

Note:

An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

HHE MODULE RATING

D

HHE Ratings (for reference only)

Combination	Rating
HHH	A
HHM	B
HHL	C
HMM	
HML	
MMM	<u>D</u>
HLL	E
MML	
MLL	
LLL	F
	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected MC Hazard

Table 29

MRS Priority

DIRECTIONS: In the chart below, circle the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Circle the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS Priority is the single highest priority; record this relative priority in the **MRS Priority or Alternative MRS Rating** at the bottom of the table.

Note: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
B	3	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		<u>No Known or Suspected CWM Hazard</u>		No Known or Suspected MC Hazard	
MRS PRIORITY or ALTERNATIVE MRS RATING				4	

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