

## Section 2

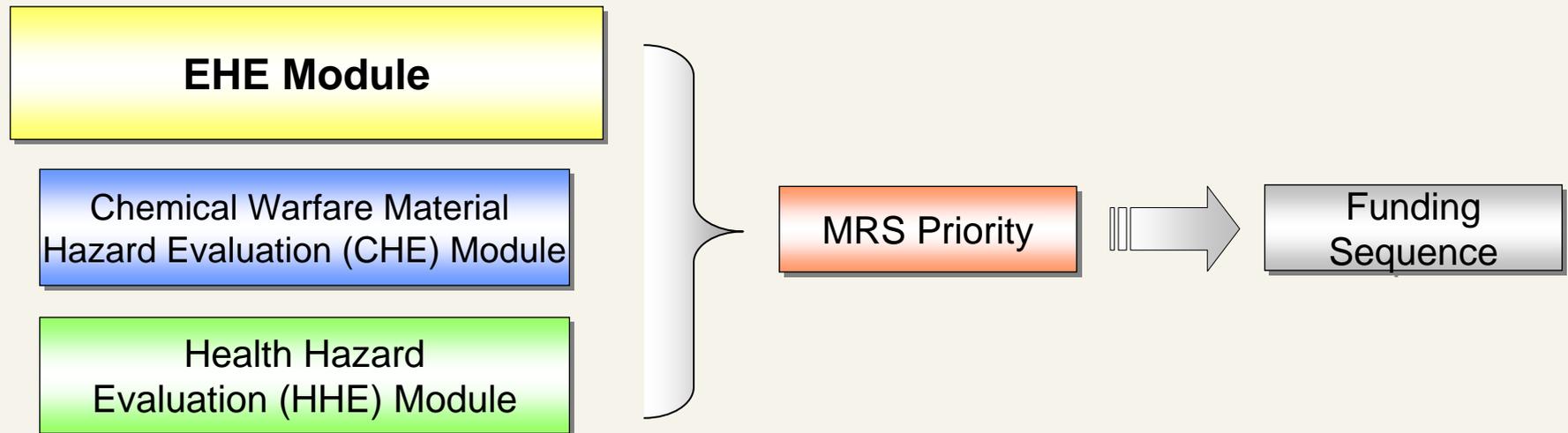
Explosives Hazard Evaluation (EHE)



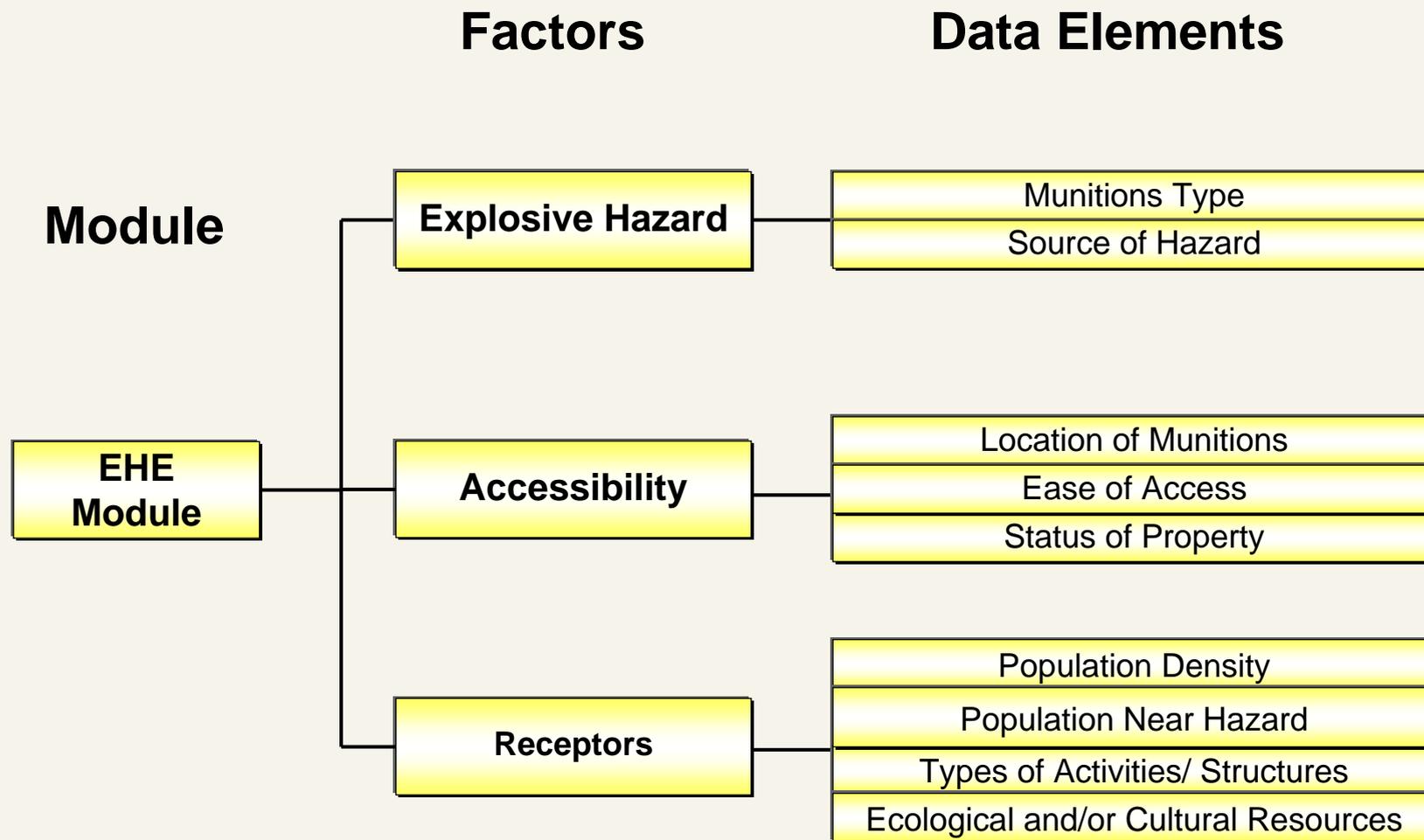
# EHE Module

- Provides a consistent DoD-wide approach for assigning a *relative* priority to munitions response sites (MRSs) where MEC are known or suspected to be present

## Protocol Structure



# Structure of the EHE Module



# EHE Module Scoring

- The data elements of the three factors contribute to the EHE Module Rating

<b>Explosive Hazard Factor</b>	<b>40 pts</b>
<b>Accessibility Factor</b>	<b>40 pts</b>
<b>Receptor Factor</b>	<b>20 pts</b>
<b>Maximum Total</b>	<b>100 pts</b>

- Based on the EHE Factor Value, the Module is assigned one of seven ratings (letters A – G)
- There are also three alternative outcomes when a letter rating is not appropriate –
  - ◆ Evaluation Pending
  - ◆ Prioritization No Longer Required
  - ◆ No Known or Suspected Hazard



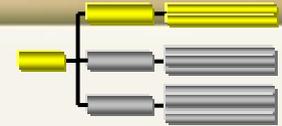
# EHE Module Scoring (cont)

- Each data element has a table associated with it
- Each data element table includes a list of classifications that reflect a range of potential MRS-specific conditions and their corresponding scores
- MRS-specific data is used to score each data element
- The largest single score becomes the overall score for the data element
- The sum of the data element scores in each factor becomes the total factor value



# EHE Explosive Hazard Factor

- Reflects munitions types that may still be present and assesses previous uses of MRS
- Comprised of two data elements
  - ◆ Munitions Type
  - ◆ Source of Hazard
- Constitutes 40% of the EHE Module numerical score



<b>Explosive Hazard Factor</b>	<b>40 pts</b>
<b>Accessibility Factor</b>	<b>40 pts</b>
<b>Receptor Factor</b>	<b>20 pts</b>
<b>Maximum Total</b>	<b>100 pts</b>

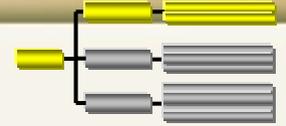
Munitions Type = ? out of 30 points

Source of Hazard = ? out of 10 points



# EHE Hazard Factor Data Element Classifications

- Each data element has multiple classifications and corresponding scores ranging from zero to the maximum value
- MRS-specific conditions are recorded by identifying all the appropriate classifications
- The data element score is the single highest classification score; classification scores are not additive



# Data Element Classifications

## Munitions Type (Max. 30)

▪ Sensitive	30
▪ High explosive (HE) (used or damaged)	25
▪ Pyrotechnic (used or damaged)	20
▪ HE (unused)	15
▪ Propellant	15
▪ Bulk HE, pyrotechnics, propellant	10
▪ Pyrotechnic (not used or damaged)	10
▪ Practice	5
▪ Riot control	3
▪ Small arms (only)	2
▪ Evidence of no munitions	0

## Source of Hazard (Max. 10)

▪ Former ranges	10
▪ Former munitions treatment, open burning/ open detonation (OB/OD) units	8
▪ Former practice munitions range	6
▪ Former maneuver area	5
▪ Former burial pits or other disposal area	5
▪ Former industrial operating facilities	4
▪ Former firing points	4
▪ Former missile or air defense artillery emplacements	2
▪ Former storage or transfer sites	2
▪ Former small arms range	1
▪ Evidence of no munitions	0



**Table 1**

**EHE Module: Munitions Type Data Element Table**

**DIRECTIONS:** Below are 11 classifications of munitions and their descriptions. Circle the score(s) that correspond with all munitions types found at the MRS.

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

Classification	Description	Score
<b>Sensitive</b>	<ul style="list-style-type: none"> <li>All UXO that are considered 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].</li> <li>All hand grenades containing energetic filler.</li> <li>Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard.</li> </ul>	30
<b>High explosive (used or damaged)</b>	<ul style="list-style-type: none"> <li>All UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive."</li> <li>All DMM containing a high-explosive filler that have:                             <ul style="list-style-type: none"> <li>Been damaged by burning or detonation</li> <li>Deteriorated to the point of instability.</li> </ul> </li> </ul>	25
<b>Pyrotechnic (used or damaged)</b>	<ul style="list-style-type: none"> <li>All UXO containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades).</li> <li>All DMM containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades) that have:                             <ul style="list-style-type: none"> <li>Been damaged by burning or detonation</li> <li>Deteriorated to the point of instability.</li> </ul> </li> </ul>	20
<b>High explosive (unused)</b>	<ul style="list-style-type: none"> <li>All DMM containing a high explosive filler that:                             <ul style="list-style-type: none"> <li>Have not been damaged by burning or detonation</li> <li>Are not deteriorated to the point of instability.</li> </ul> </li> </ul>	15
<b>Propellant</b>	<ul style="list-style-type: none"> <li>All UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor).</li> <li>All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are:                             <ul style="list-style-type: none"> <li>Damaged by burning or detonation</li> <li>Deteriorated to the point of instability.</li> </ul> </li> </ul>	15
<b>Bulk secondary high explosives, pyrotechnics, or propellant</b>	<ul style="list-style-type: none"> <li>All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor), that are deteriorated.</li> <li>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.</li> </ul>	10
<b>Pyrotechnic (not used or damaged)</b>	<ul style="list-style-type: none"> <li>All DMM containing a pyrotechnic fillers (i.e., red phosphorous), other than white phosphorous filler, that:                             <ul style="list-style-type: none"> <li>Have not been damaged by burning or detonation</li> <li>Are not deteriorated to the point of instability.</li> </ul> </li> </ul>	10
<b>Practice</b>	<ul style="list-style-type: none"> <li>All UXO that are practice munitions that are not associated with a sensitive fuze.</li> <li>All DMM that are practice munitions that are not associated with a sensitive fuze and that have not:                             <ul style="list-style-type: none"> <li>Been damaged by burning or detonation</li> <li>Deteriorated to the point of instability.</li> </ul> </li> </ul>	5
<b>Riot control</b>	<ul style="list-style-type: none"> <li>All UXO or DMM containing a riot control agent filler (e.g., tear gas).</li> </ul>	3
<b>Small arms</b>	<ul style="list-style-type: none"> <li>All 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].</li> </ul>	2
<b>Evidence of no munitions</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>	0
<b>MUNITIONS TYPE</b>	<b>DIRECTIONS:</b> Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	

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

\_\_\_\_\_

\_\_\_\_\_

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**Classifications differentiate the categories of MEC, for example –**

**Sensitive munitions – Highest risk; considered likely to function upon interaction (30 points)**

**High explosive (unused) – Selected if investigation finds physical or historical evidence indicating DMM containing high explosive filler –**

- Have not been damaged by burning or detonation
- Are not deteriorated to the point of instability

**(15 points)**

**Evidence of No Munitions – Selected if investigation finds physical or historical evidence indicating no MEC present (0 points)**

**Table 2**

**EHE Module: Source of Hazard Data Element Table**

**DIRECTIONS:** Below are 11 classifications describing sources of explosive hazards. Circle the score(s) that correspond with all sources of explosive hazard found at the MRS.

**Note:** The terms *former range*, *practice munitions*, *small arms*, *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, associated buffer and safety zones, firing points, and live-fire maneuver areas.	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.	8
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.	5
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
<b>SOURCE OF HAZARD</b>	<b>DIRECTIONS:</b> Record <u>the single highest score</u> from above in the box to the right (maximum score = 10).	

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

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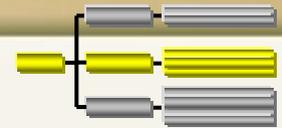
**Classifications differentiate sources of hazards, for example –**

**Former ranges - Supported live-fire training pose the greatest potential hazard and receive the highest score (10 points)**

**Former storage or transfer point - Selected if investigation finds physical or historical evidence of a location where munitions were stored or handled for transfer between different modes of transportation ( 2 points)**

**Evidence of no munitions - Can be selected only if investigation finds physical or historical evidence indicating no MEC present and receive the lowest score (0 points)**

# Accessibility Factor



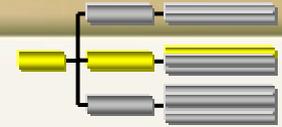
- Focuses on the potential to encounter MEC
- Comprised of three data elements
  - ◆ Location of Munitions – assesses the potential of munitions to be present, likelihood for direct contact, and potential for MEC to be on or brought to the surface by dynamic conditions
  - ◆ Ease of Access – evaluates means for a receptor to encounter MEC based on extent of controls preventing access or entry to the MRS
  - ◆ Status of Property – differentiates between MRSs that DoD controls and MRSs that DoD does not control
- Constitutes 40% of the EHE Module numerical score

<b>Explosive Hazard Factor</b>	<b>40 pts</b>
<b>Accessibility Factor</b>	<b>40 pts</b>
<b>Receptor Factor</b>	<b>20 pts</b>
<b>Maximum Total</b>	<b>100 pts</b>

**Location of Munitions = ? out of 25 points**  
**Ease of Access = ? out of 10 points**  
**Status of Property = ? out of 5 points**



# Accessibility Factor – Location of Munitions



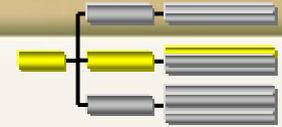
- Evaluates three conditions that best represent the potential for encountering munitions
  - ◆ *Confirmed or suspected* presence of munitions based on *physical* or *historical* evidence
  - ◆ Likelihood for direct contact with MEC based on location (*surface* or *subsurface*)
  - ◆ Potential for MEC to be brought to the surface by dynamic site conditions (*active, stable, or constraint*)



*Investigators finding physical evidence of munitions*



# Accessibility Factor – Location of Munitions (cont)



## ■ Physical or historical evidence of munitions

### ◆ Physical evidence means –

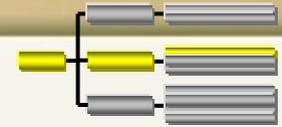
- Recorded observations from on-site investigations, such as finding intact UXO or DMM, or munitions debris (e.g., fragments, penetrators, projectiles, shell casings, links, fins)
- The results of field or laboratory sampling and analysis procedures
- The results of geophysical investigations

### ◆ Historical evidence means –

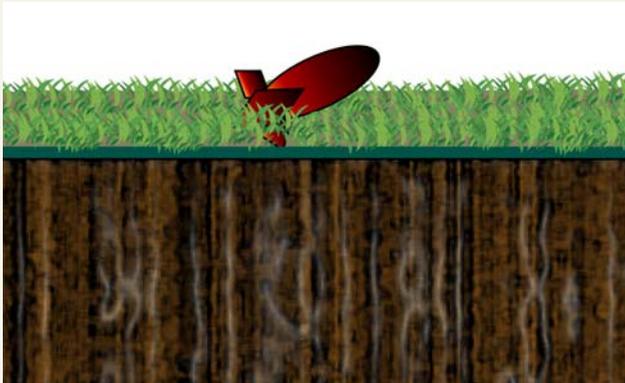
- Written documents or records
- Documented interviews of persons with knowledge of site conditions
- Other types of verified information



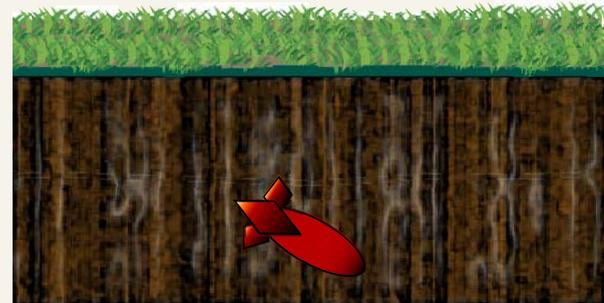
# Accessibility Factor – Location of Munitions (cont)



- Likelihood for direct contact with MEC based on surface proximity
  - ◆ On the Surface
    - Entirely or partially exposed above the ground surface
    - Entirely or partially exposed above the surface of a water body
  - ◆ In the Subsurface
    - Entirely beneath the ground surface
    - Submerged in a water body



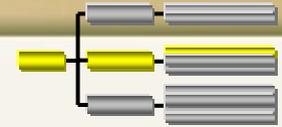
Surface



Subsurface



# Accessibility Factor – Location of Munitions (cont)



- Potential for MEC to be brought to the surface by dynamic site conditions for access by, or impact to, receptors
  - ◆ Active
    - Naturally occurring geological conditions are likely to expose subsurface UXO or DMM (e.g., drought, flooding, frost heave)
    - Ongoing intrusive activities are likely to expose subsurface UXO or DMM (e.g., plowing, construction, dredging)
  - ◆ Stable
    - No known naturally occurring geological conditions are likely to expose subsurface UXO or DMM
    - No ongoing intrusive activities are likely to exposure subsurface UXO or DMM
  - ◆ Physical constraints prevent contact with UXO or DMM (e.g., pavement, water depth >120 feet)



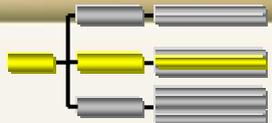
# Location of Munitions

## Location of Munitions (Max. 25)

- Confirmed Surface 25
- Confirmed Subsurface, *active* 20
- Confirmed Subsurface, *stable* 15
- Suspected (*physical evidence*) 10
- Suspected (*historical evidence*) 5
- Subsurface, *physical constraint* 2
- Small arms (*regardless of loc.*) 1
- Evidence of no munitions 0

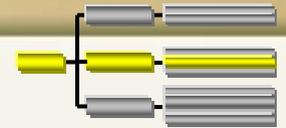


# Accessibility Factor – Ease of Access

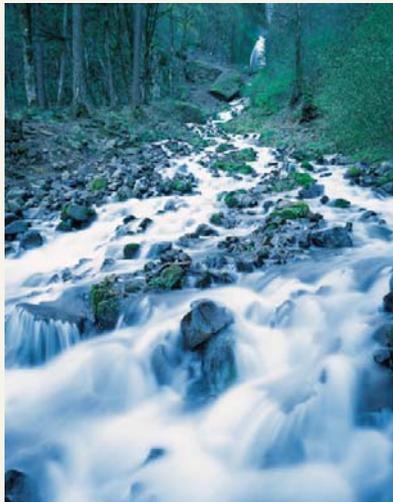
- Focuses on the extent barriers prevent access or entry to the MRS 
- ◆ No barrier – all parts of the MRS are accessible; receives the highest score (10 points)
- ◆ Incomplete barrier – prevents access to some parts of MRS (8 points)
- ◆ Barrier is complete but not monitored – prevents access to all parts of the MRS, but there is no monitoring of the barrier (5 points)
- ◆ Barrier is complete and monitored – prevents 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; receives the lowest score (0 points)



# Accessibility Factor – Ease of Access (cont)



- Natural obstacles and man-made controls are considered barriers



*Natural obstacles include difficult terrain, dense vegetation, and deep or fast-moving water*

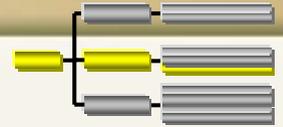


*Man-made barriers such as a fence*



# Accessibility Factor – Status of Property

- Three classifications differentiate MRSs under DoD control from those not under DoD control –
  - ◆ Non-DoD control – the MRS is on land or in water that is no longer owned by, leased to, or otherwise possessed or used by DoD (includes all Indian lands); receives the highest score (5 points)
  - ◆ Scheduled for transfer from DoD control – property transferring from DoD control within three years (3 points)
  - ◆ 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; receives the lowest score (0 points)



# Accessibility Factor Data Element Classifications

## Ease of Access (Max. 10)

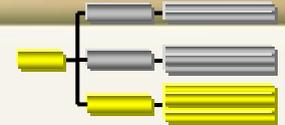
- No barrier 10
- Barrier is incomplete 8
- Barrier is complete, but not monitored 5
- Barrier is complete and monitored 0

## Status of Property (Max. 5)

- Non-DoD control 5
- Scheduled for transfer from DoD Control 3
- DoD control 0



# Receptor Factor



- Focuses on human and ecological populations that may be impacted by presence of MEC
- Comprised of four data elements
  - ◆ Population Density
  - ◆ Population Near Hazard
  - ◆ Types of Activities and/or Structures
  - ◆ Ecological and/or Cultural Resources
- Constitutes 20% of the EHE Module numerical score

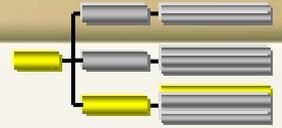
<b>Explosive Hazard Factor</b>	<b>40 pts</b>
<b>Accessibility Factor</b>	<b>40 pts</b>
<b>Receptor Factor</b>	<b>20 pts</b>
<b>Maximum Total</b>	<b>100 pts</b>

Population Density = ? of 5 points  
 Population Near Hazard = ? of 5 points  
 Types of Activities/Structures = ? of 5 points  
 Ecological and/or Cultural Resources = ? of 5 points



# Receptor Factor – Population Density

- Based on the number of people per square mile in the county where an MRS is located, per US Census data
  - ◆ More than 500 persons per square mile (5 points)
  - ◆ 100 - 500 persons per square mile (3 points)
  - ◆ Fewer than 100 persons per square mile (1 point)
- If an MRS is located –
  - ◆ In more than one county, the largest population value among the counties will be used
  - ◆ Within or borders city limits or cities are reported separately from their counties, population density of the city should be used instead of county data



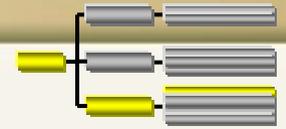
>500 people

<100 people

500-100 people



# Receptor Factor – Population Density



US Census population data *surrounding* an MRS

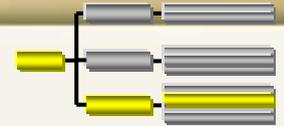
<100 people

500-100 people

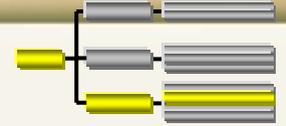


# Receptors Factor – Population Near Hazard

- Addresses the number of inhabited structures on the MRS and within *two miles* of its boundary. Example classifications include –
  - ◆ Within the boundary of the MRS and extending two miles outward from the boundary of the MRS there are 26 or more inhabited structures; receives highest classification score (5 points)
  - ◆ Within the boundary of the MRS and extending two miles outward from the boundary of the MRS there are no inhabited structures; receives lowest classification score (0 points)
- Inhabited structures are permanent or temporary structures, other than munitions-related structures, routinely occupied by one or more persons for any portion of a day
- Considers transient as well as permanent populations



# Receptors Factor – Population Near Hazard

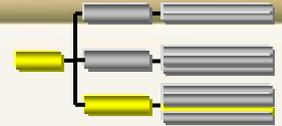


*Two-mile boundary example*



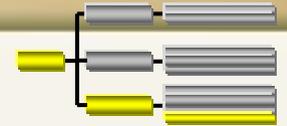
# Receptor Factor – Types of Activities/Structures

- Assesses the nature of the population near hazard.  
Example classifications include –
  - ◆ Within the MRS and extending two miles outward from the boundary of the MRS there are residential, educational, commercial, or subsistence activities conducted; (5 points)
  - ◆ Within the MRS and extending two miles outward from the boundary of the MRS there are no known or recurring activities; (1 point)
- Addresses –
  - ◆ Extent, type, and intrusiveness of activities
  - ◆ Likelihood of people congregating on-site and within a two-mile radius
  - ◆ Accounts for transient and permanent populations



# Receptors Factor – Ecological or Cultural Resources

- Considers threatened/endangered species, critical habitats, historical sites, cultural items, American Indian and Alaska Native sacred sites, and other similar resources on the MRS. Example classifications include –
  - ◆ Ecological and cultural resources are both present on the MRS; receives highest classification score (5 points)
  - ◆ No ecological or cultural resources are present on the MRS; receives lowest classification score (0 points)
- Focuses only on resources found on the MRS, not those outside the boundary



*Desert Tortoise*



*Petroglyph*



*Red-Cockaded  
Woodpecker*



# EHE Module Receptor Factor Data Element Classifications

## Population Density (People/Sq Mile, Max. 5)

- > 500 5
- 100 - 500 3
- < 100 1

## Population Near Hazard (Max. 5)

- 26 or more inhabited structures 5
- 16 to 25 4
- 11 to 15 3
- 6 to 10 2
- 1 to 5 1
- 0 0

## Types of Activities/ Structures (Max. 5)

- Residential, educational, subsistence, etc. 5
- Recreation (hiking, hunting, etc.) 4
- Agriculture or forestry 3
- Industrial, warehousing 2
- No known or recurring activities 1

## Ecological and/or Cultural Resources (Max. 5)

- Ecological/Cultural 5
- Ecological 3
- Cultural 3
- None 0



# Determining EHE Module Rating

- Table 10 is used to determine the EHE Module Rating
- The data element scores recorded on Table 10 are summed together to calculate the EHE overall value
- The Module Rating corresponds to a letter rating found on the bottom of Table 10
- An MRS can also receive one of three alternative module ratings –
  - ◆ Evaluation Pending
  - ◆ No Longer Required
  - ◆ No Known or Suspected Explosive Hazard
- The EHE Module Rating will be used to determine the MRS's relative priority based on known or suspected explosive hazards



# Determining EHE Module Rating (cont)

- Alternative ratings defined –
  - ◆ Evaluation Pending – There are known or suspected MEC but sufficient information is not available to populate the nine data elements of the EHE module
  - ◆ No Longer Required – The MRS no longer requires an assigned priority because –
    - DoD has conducted a response
    - DoD has achieved all DoD objectives set out in the decision document for the MRS
    - No further action, except for long-term management and recurring reviews, is required
  - ◆ No Known or Suspected Explosive Hazard – The MRS does not require evaluation under the EHE module



**Table 10**

**Determining the EHE Module Rating**

**DIRECTIONS:**

- From Tables 1-9, 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 **EHE Module Total** box below.
- Circle the appropriate range for the **EHE Module Total** below.
- 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.

	Source	Score	Value
<b>Explosive Hazard Factor Data Elements</b>			
Munitions Type	Table 1	30	40
Source of Hazard	Table 2	10	
<b>Accessibility Factor Data Elements</b>			
Location of Munitions	Table 3	25	33
Ease of Access	Table 4	05	
Status of Property	Table 5	03	
<b>Receptors Factor Data Elements</b>			
Population Density	Table 6	01	13
Population Near Hazard	Table 7	02	
Types of Activities/ Structures	Table 8	05	
Ecological and /or Cultural Resources	Table 9	05	
<b>EHE MODULE TOTAL</b>			86
<b>EHE Module Total</b>	<b>EHE Module Rating</b>		
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		
	No Known or Suspected Explosive Hazard		
<b>EHE MODULE RATING</b>	B		

Enter the Explosive Hazard data element scores

Enter the Accessibility Factor data element scores

Enter the Receptor Factor data element scores

Add the three factor values

Select the Module Rating that corresponds with the module value calculated above

Record the Module Rating in the EHE Module Rating box

# Camp Swampy Fictitious Example

- Former Camp Swampy is located about four miles from the Gulf of Mexico. The Swampy River flows through the Camp and discharges into the Gulf. The river is frequently used for recreational purposes
- The MRS is located on the eastern portion of the former Camp Swampy. The MRS is a state wildlife refuge containing three endangered species. The MRS is partially fenced and unmonitored
- The western half of Camp Swampy was sold to Swampy Inc. in 1993 and is surrounded by an electric fence
- The northern half of the Camp Swampy MRS contains 12 unused buildings, but a town with 600 houses and a population density of 125 people per square mile is only 1 mile away



# Camp Swampy Fictitious Example

- Munitions of all types were stored at Camp Swampy
- The OB/OD site was primarily used to detonate white phosphorus munitions and 8 inch artillery projectiles containing high explosives, and to burn unserviceable propellants
- A confirmed incident report indicates munitions were found on the surface near the former OB/OD



*Exposed white phosphorous*

**What is the EHE Module Rating for Camp Swampy?**



# EHE

Fill in the worksheet for the EHE module



# Table 1

## EHE Module: Munitions Type Data Element Table

**DIRECTIONS:** Below are 11 classifications of munitions and their descriptions. Circle the score(s) that correspond with all munitions types found at the MRS.

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

Classification	Description	Score
Sensitive	<ul style="list-style-type: none"> <li>All UXO that are considered 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).</li> <li>All hand grenades containing energetic filler.</li> <li>Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard.</li> </ul>	30
High explosive (used or damaged)	<ul style="list-style-type: none"> <li>All UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive."</li> <li>All DMM containing a high-explosive filler that have:                             <ul style="list-style-type: none"> <li>Been damaged by burning or detonation</li> <li>Deteriorated to the point of instability.</li> </ul> </li> </ul>	25
Pyrotechnic (used or damaged)	<ul style="list-style-type: none"> <li>All UXO containing pyrotechnic fillers other than white phosphorus (e.g., flares, signals, simulators, smoke grenades).</li> <li>All DMM containing pyrotechnic fillers other than white phosphorus (e.g., flares, signals, simulators, smoke grenades) that have:                             <ul style="list-style-type: none"> <li>Been damaged by burning or detonation</li> <li>Deteriorated to the point of instability.</li> </ul> </li> </ul>	20
High explosive (unused)	<ul style="list-style-type: none"> <li>All DMM containing a high explosive filler that:                             <ul style="list-style-type: none"> <li>Have not been damaged by burning or detonation</li> <li>Are not deteriorated to the point of instability.</li> </ul> </li> </ul>	15
Propellant	<ul style="list-style-type: none"> <li>All UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor).</li> <li>All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are:                             <ul style="list-style-type: none"> <li>Damaged by burning or detonation</li> <li>Deteriorated to the point of instability.</li> </ul> </li> </ul>	15
Bulk secondary high explosives, pyrotechnics, or propellant	<ul style="list-style-type: none"> <li>All DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor), that are deteriorated.</li> <li>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.</li> </ul>	10
Pyrotechnic (not used or damaged)	<ul style="list-style-type: none"> <li>All DMM containing a pyrotechnic fillers (i.e., red phosphorus), other than white phosphorus filler, that:                             <ul style="list-style-type: none"> <li>Have not been damaged by burning or detonation</li> <li>Are not deteriorated to the point of instability.</li> </ul> </li> </ul>	10
Practice	<ul style="list-style-type: none"> <li>All UXO that are practice munitions that are not associated with a sensitive fuze.</li> <li>All DMM that are practice munitions that are not associated with a sensitive fuze and that have not:                             <ul style="list-style-type: none"> <li>Been damaged by burning or detonation</li> <li>Deteriorated to the point of instability.</li> </ul> </li> </ul>	5
Riot control	<ul style="list-style-type: none"> <li>All UXO or DMM containing a riot control agent filler (e.g., tear gas).</li> </ul>	3
Small arms	<ul style="list-style-type: none"> <li>All 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].</li> </ul>	2
Evidence of no munitions	<ul style="list-style-type: none"> <li>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.</li> </ul>	0
MUNITIONS TYPE	<b>DIRECTIONS:</b> Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	<b>30</b>

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

**White phosphorus munitions and projectiles containing high explosives**

## Table 2

### EHE Module: Source of Hazard Data Element Table

**DIRECTIONS:** Below are 11 classifications describing sources of explosive hazards. Circle the score(s) that correspond with all sources of explosive hazard found at the MRS.

**Note:** The terms former range, practice munitions, small arms, 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, associated buffer and safety zones, firing points, and live-fire maneuver areas.	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.	8
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.	5
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
<b>SOURCE OF HAZARD</b>	<b>DIRECTIONS:</b> Record the single highest score from above in the box to the right (maximum score = 10).	<b>8</b>

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

There is an OB/OD site on the property. Munitions were formerly stored at Camp Swampy.

**Table 3****EHE Module: Location of Munitions Data Element Table**

**DIRECTIONS:** Below are eight classifications of munitions locations and their descriptions. Circle the score(s) that correspond with all locations where munitions are located or suspected of being found at the MRS.

**Notes:** The terms *surface*, *subsurface*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Score
Confirmed surface	<ul style="list-style-type: none"> <li>Physical evidence indicates that there are UXO or DMM on the surface of the MRS.</li> <li>Historical evidence (e.g., a confirmed incident report or accident report) indicates there are UXO or DMM on the surface of the MRS.</li> </ul>	25
Confirmed subsurface, active	<ul style="list-style-type: none"> <li>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, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.</li> <li>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, heat heave, tidal action), or intrusive activities (e.g., plowing, construction, dredging) at the MRS are likely to expose UXO or DMM.</li> </ul>	20
Confirmed subsurface, stable	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>	15
Suspected (physical evidence)	<ul style="list-style-type: none"> <li>There is physical evidence (e.g., munitions debris, such 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.</li> </ul>	10
Suspected (historical evidence)	<ul style="list-style-type: none"> <li>There is historical evidence indicating that UXO or DMM may be present at the MRS.</li> </ul>	5
Subsurface, physical constraint	<ul style="list-style-type: none"> <li>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.</li> </ul>	2
Small arms (regardless of location)	<ul style="list-style-type: none"> <li>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].</li> </ul>	1
Evidence of no munitions	<ul style="list-style-type: none"> <li>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.</li> </ul>	0
LOCATION OF MUNITIONS	<b>DIRECTIONS:</b> Record the single highest score from above in the box to the right (maximum score = 25).	<b>25</b>

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

**A confirmed incident report indicates munitions were found on the surface near the OB/OD site.**

**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 any explosive materiel. 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.	0
<b>EASE OF ACCESS</b>	<b>DIRECTIONS:</b> Record the single highest score from above in the box to the right (maximum score = 10).	<b>8</b>

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

**The MRS is partially unfenced and unmonitored.**

**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 (the Department) 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 the Department. 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.	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 the Department, and the Department 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 rule is applied.	3
DoD control	+ The MRS is on land or is a water body that is owned, leased, or otherwise possessed by the Department. With respect to property that is leased or otherwise possessed, the Department must control access to the MRS 24 hours per day, every day of the calendar year.	0
<b>STATUS OF PROPERTY</b>	<b>DIRECTIONS:</b> Record the single highest score from above in the box to the right (maximum score = 5).	<b>5</b>

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

\_\_\_\_\_

\_\_\_\_\_

**The MRS is located on a wildlife refuge owned**

**by the State.**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Table 6

### EHE Module: Population Density Data Element Table

**DIRECTIONS:** Below are three classifications of population density and their descriptions. Determine the population density per square mile in the vicinity of the MRS and circle the score that corresponds with the associated population density.

**Note:** If an MRS is located in more than one county, use the largest population density value among the counties. If the MRS is within or borders a city or town, use the population density for the city or town, rather than that of the county.

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

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

**The town has a population density of 125 persons per square mile.**

### 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 population near the hazard. Determine the number of Inhabited structures within two miles of the MRS boundary and circle the score that corresponds with the associated population near the hazard.

**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.	5
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
<b>POPULATION NEAR HAZARD</b>	<b>DIRECTIONS:</b> Record <u>the single highest score</u> from above in the box to the right (maximum score = 5).	<b>5</b>

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

**The town, located less than one mile from the MRS, has 600 houses.**

**Table 8**

**EHE Module: Types of Activities/Structures Data Element Table**

**DIRECTIONS:** Below are five classifications of activities and/or inhabited structures near the hazard 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 score(s) 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.	5
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.	3
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
<b>TYPES OF ACTIVITIES&amp;STRUCTURES</b>	<b>DIRECTIONS:</b> Record the single highest score from above in the box to the right (maximum score = 5).	<b>5</b>

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

**There is a residential area less than two miles away.  
The MRS is located on a state wildlife refuge with  
Swampy Inc across the river.**

**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 resource classifications at 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.	0
<b>ECOLOGICAL AND/OR CULTURAL RESOURCES</b>	<b>DIRECTIONS:</b> Record the single highest score from above in the box to the right (maximum score = 5).	<b>3</b>

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

**Three endangered species exist on the MRS**

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# EHE Module Rating

**Table 10**  
Determining the EHE Module Rating

**DIRECTIONS:**

- From Tables 1-9, 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 **EHE Module Total** box below.
- Circle the appropriate range for the **EHE Module Total** below.
- 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.

	Source	Score	Value
<b>Explosive Hazard Factor Data Elements</b>			
Munitions Type	Table 1	30	38
Source of Hazard	Table 2	08	
<b>Accessibility Factor Data Elements</b>			
Location of Munitions	Table 3	25	38
Ease of Access	Table 4	08	
Status of Property	Table 5	05	
<b>Receptors Factor Data Elements</b>			
Population Density	Table 6	03	16
Population Near Hazard	Table 7	05	
Types of Activities/ Structures	Table 8	05	
Ecological and /or Cultural Resources	Table 9	03	
<b>EHE MODULE TOTAL</b>			92
<b>EHE Module Total</b>	<b>EHE Module Rating</b>		
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		
	No Known or Suspected Explosive Hazard		
<b>EHE MODULE RATING</b>	<b>A</b>		

White phosphorous munitions  
OB/OD pits

Incident report at OB/OD pits  
Fence is incomplete  
Non-DoD Controlled

Population Density= 100-500 p/sq mi  
Nearby town >26 inhabited structures  
Residential area <2 miles away  
Ecological Resources – 3 Endangered species

Add the data element scores recorded above

Select the Module Rating that corresponds with the module value calculated above

Record the Module Rating in the EHE Module Rating box