



Military Munitions Response Program (Part 2)

December 2007



Military Munitions Response Site Prioritization Protocol (MRSPP)

USAEC MMRP Project Manager



Discussion Topics

- **Background Information**
- **Purpose and Use**
- **Structure and Scoring Factors**
- **Scoring Guidelines**



Before the Prioritization Protocol

- **Historically, sites with an explosive risk at FUDS sites were ranked with the Risk Assessment Code (RAC)**
- **MMRP was created under DERP. OSD adopted RAC for Active & BRAC MR sites as well**
- **RAC is a simple tool that evaluates munition items at sites and how they could come in contact with people**
- **No media analysis is needed for RAC**
- **RAC scores = 1 (highest risk), 2, 3, 4 & 5 (no explosive risk)**



Creation of MRSPP

- **Congress mandated a new prioritization tool be developed by DoD in consultation with stakeholders for use on all MMRP sites (FUDS, BRAC & Active Installations)**
- **Section 311 in the FY02 Defense Authorization Act, 13 Dec 01**
- **OSD work group created; interviews conducted; draft rule published; 100's of comments received**
- **Final rule published on 4 Oct 05**





How will it be used?

- **MRSP** is for the relative prioritization of all **MMRP** sites
- Can be completed using **SI** level data
- Updates required as additional data becomes available.
- **FY2008**: First results of the **MRSP** will be used to support future action decisions



MRSP is not a risk assessment tool

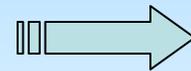


Protocol Structure

- The Protocol assigns a RELATIVE PRIORITY to each MMRP site (MRS)
- The Protocol is composed of 3 modules that separately evaluate each of the unique hazards at an MRS

–Explosive Hazard Evaluation (EHE):

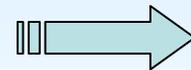
Addresses the explosive hazards from munitions and explosives of concern (MEC)



Explosive Reactivity

–Chemical Hazard Evaluation (CHE):

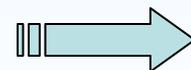
Addresses threats from chemical agents



Chemical Agents

–Health Hazard Evaluation (HHE):

Addresses acute & chronic human & ecological risks (MC and other contaminants)

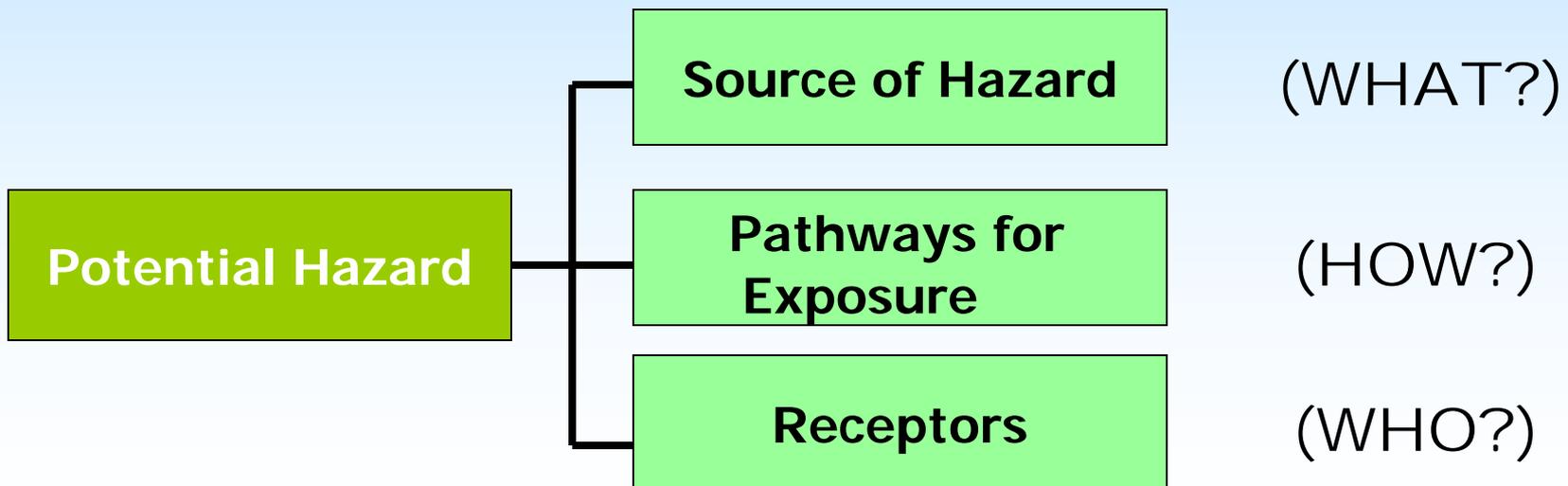


Media Contamination



Protocol Structure - Factors

- Each module (EHE, CHE & HHE) has a 3-axis structure (3 factors) used to determine the score
 - Hazard/Contaminant – What are the potential hazards?
 - Accessibility or Migration Pathway – How might the hazard be encountered?
 - Receptors – Who may be affected by the hazard?





Protocol Structure - Factors

- **Each module is scored separately**
- **Each module has 7 outcomes (A – G) and 3 “word scores”**
 - “A” is highest “G” is lowest
 - Evaluation pending; No longer required; No known or suspected hazard
- **Only score a module if items are known or suspected to be present**
 - For example: If CWM is not a problem at a site, you don’t score the site using the CHE Module, that module gets a word score (no known or suspected CWM)
- **A site can be scored with 1, 2 or all 3 modules being completed**
- **Module scores are not additive, the highest module score becomes the site’s overall score (priority)**



Explosive Hazard Evaluation Module (EHE)



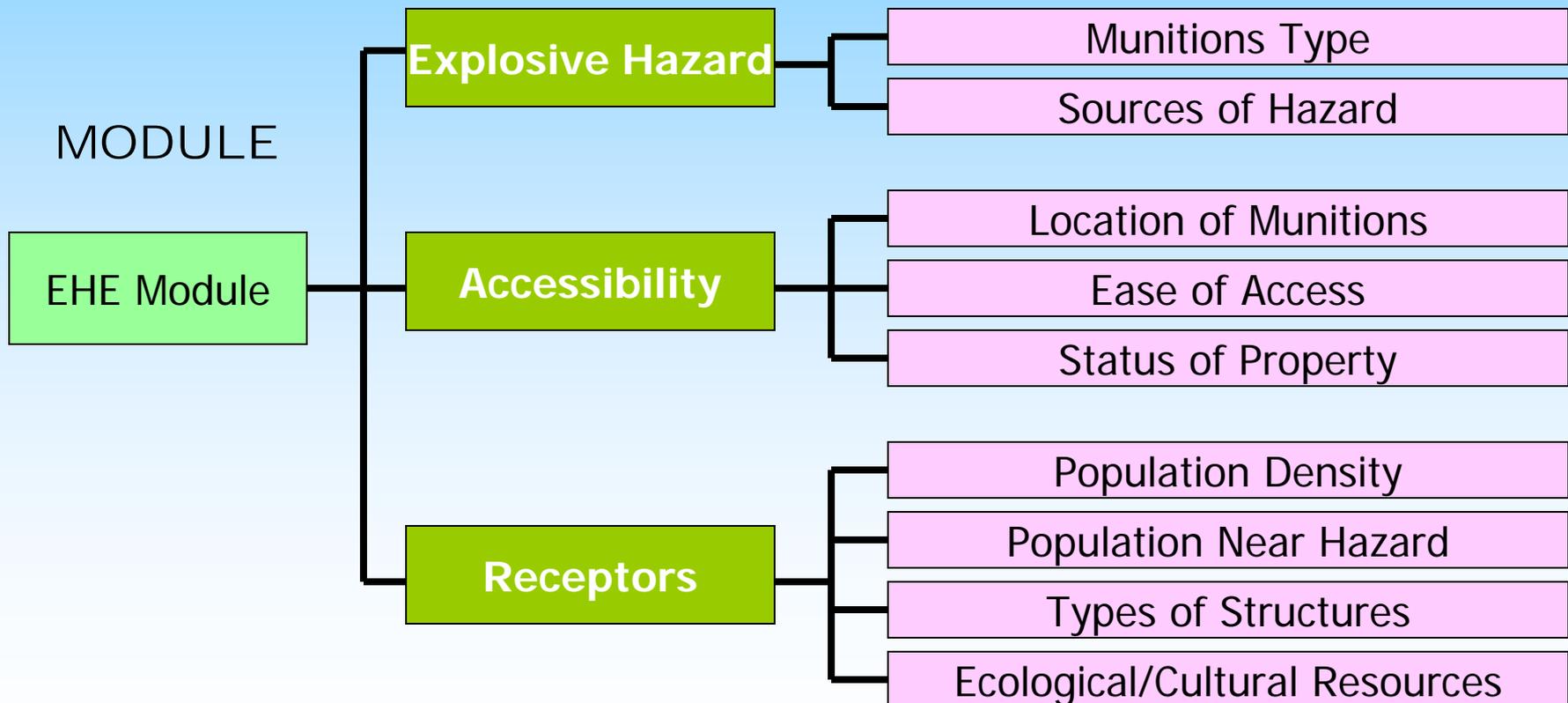
- Used to evaluate the explosive hazards associated with MEC:
 - UXO
 - DMM
 - MC at high enough concentrations to pose an explosive hazard
- Only used when an explosive hazard is known or suspected (to include small arms)



EHE Module

3 FACTORS

9 DATA ELEMENTS





EHE Module

- **The data elements of the 3 factors contribute to the EHE**

Rating:

Explosive Hazard	40 points
Accessibility Factor	40 points
Receptor Factor	20 points
Maximum Total	100 points

- **9 Data element scores – various scores**
 - Munitions Type: 30 points, Population Density: 5 points
- **Data element scores are added to give Factor scores**
- **EHE score – sum of all Factors (total possible = 100)**
- **Seven EHE final scores (A – G)**

[Tables 1-10.doc](#)



Chemical Hazard Evaluation Module (CHE)

- Used to evaluate the chemical hazards associated with the physiological effects of CWM
- Only used when CWM is known or suspected
- CWM can be –
 - UXO
 - DMM
 - Chemical agent in other than munitions configuration (bulk containers, media)

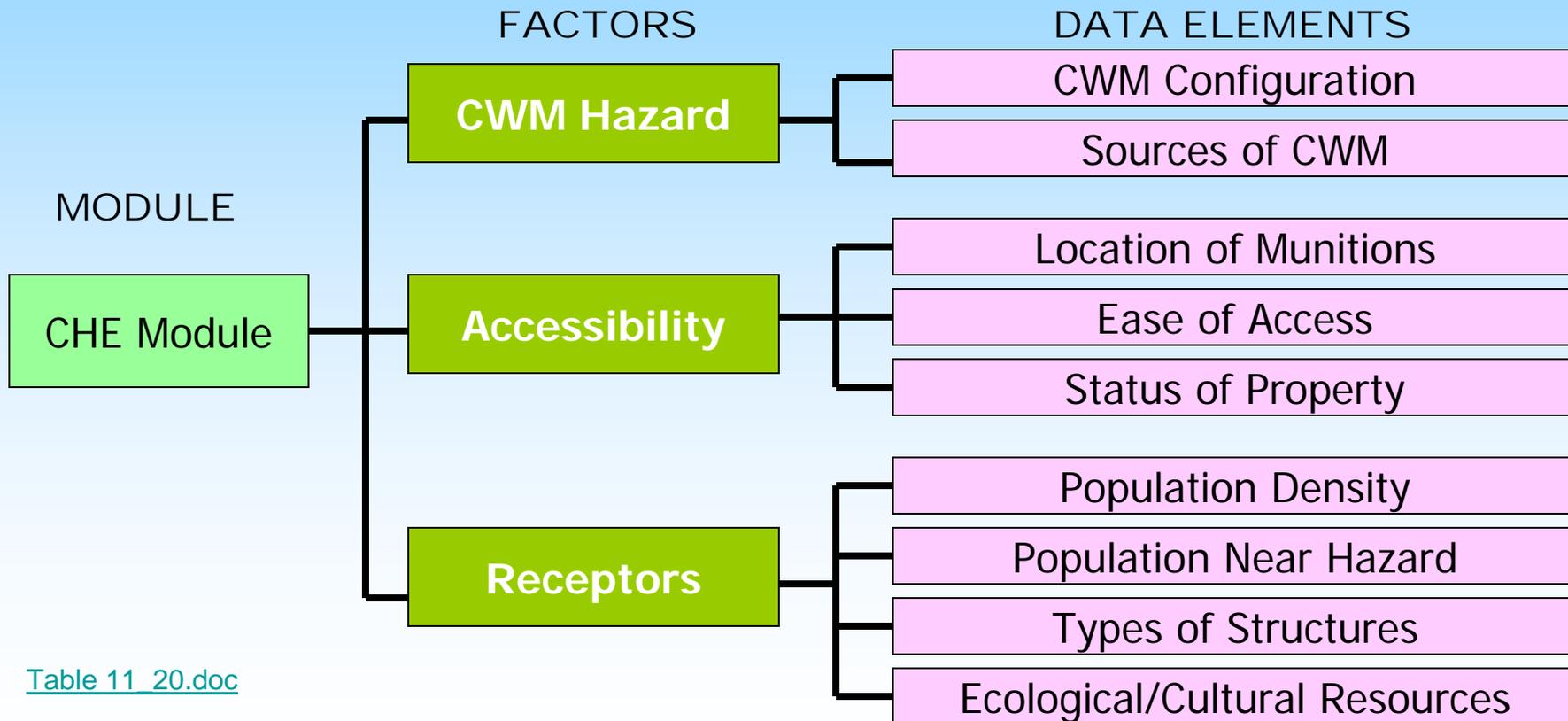


CWM sites are adjusted up in the ratings due to the potential for severe hazards.



CHE Module

- Very similar to the EHE in format
- Only CWM Hazard data elements are different



[Table 11_20.doc](#)

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: <ul style="list-style-type: none"> ♦ 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	<ul style="list-style-type: none"> ♦ 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	<ul style="list-style-type: none"> ♦ 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: <ul style="list-style-type: none"> ♦ Nonexplosively configured CWM/DMM either damaged or undamaged ♦ Bulk CWM (e.g., ton container). 	15
CAIS K941 and CAIS K942	<ul style="list-style-type: none"> ♦ 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)	<ul style="list-style-type: none"> ♦ CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS. 	10
Evidence of no CWM	<ul style="list-style-type: none"> ♦ 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. 	0
CWM CONFIGURATION	DIRECTIONS: Record <u>the single highest score</u> from above in the box to the right (maximum score = 30).	0

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

According to the Final HRR, the research uncovered no documentation relating to CWM activities at the Test Area.

Tables 12-19 are intentionally omitted according to Active-Army Guidance

Table 20
Determining the CHE Module Rating

	Source	Score	Value	
<p>DIRECTIONS:</p> <ol style="list-style-type: none"> 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. <p>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.</p>	CWM Hazard Factor Data Elements			
	CWM Configuration	Table 11		
	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			
	No Known or Suspected CWM Hazard			
CHE MODULE RATING				



CHE Module

- **The data elements of the 3 factors contribute to the CHE**

Rating:

CWM Hazard	40 points
Accessibility Factor	40 points
Receptor Factor	20 points
Maximum Total	100 points

- **9 Data element scores – various scores**
 - CWM Source: 10 points, Ease of Access: 10 points
- **Data element scores are added to give Factor scores**
- **CHE score – sum of all Factors (total possible = 100)**
- **Seven CHE final scores (A – G)**
 - **The final CHE score is automatically adjusted up one unit higher than the EHE and HHE because of the potential for severe hazard.**



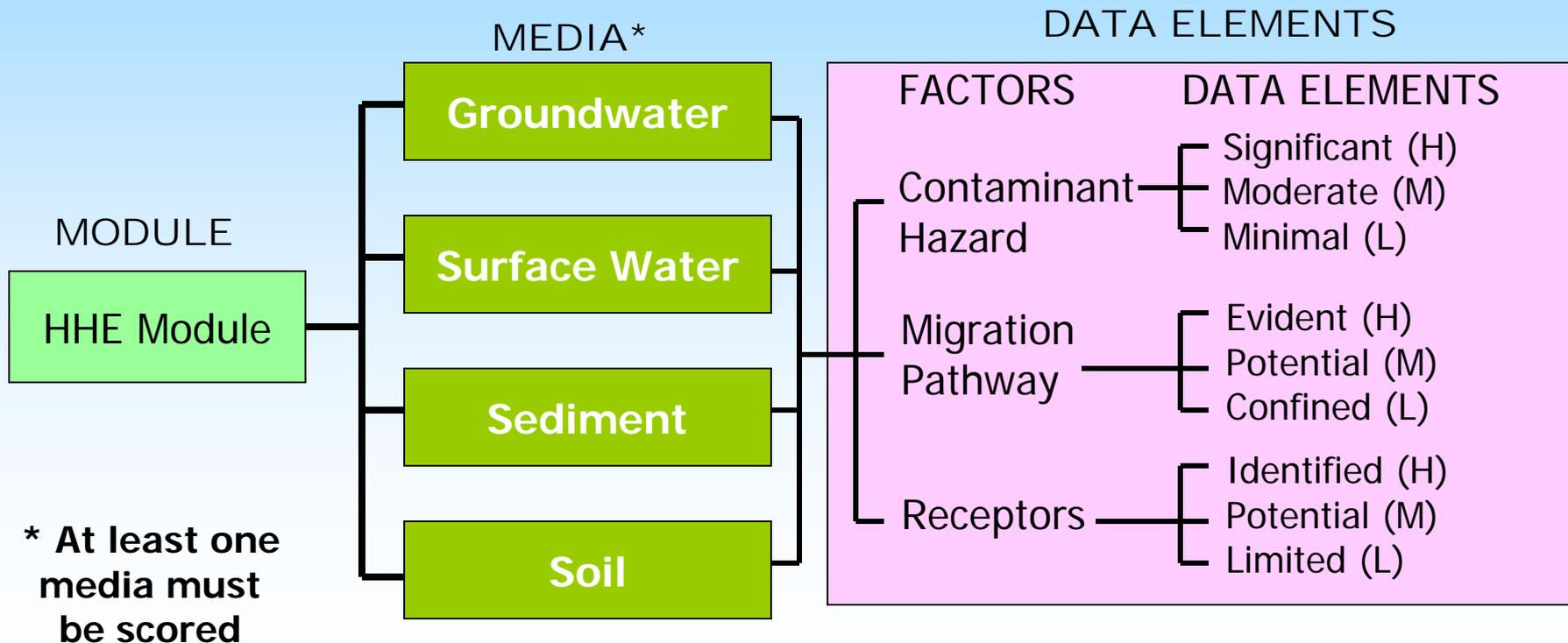
Health Hazard Evaluation Module (HHE)

- The HHE module addresses potential health and environmental effects of MC and other chemical contaminants released to the environment
- HHE used for: MC (not explosive concentrations) and incidental, non munitions-related contaminants
- This module is based on IRP's Relative Risk Site Evaluation (RRSE)
- Difference is number of outcomes (IR = 3, MR = 7)



HHE Module (cont.)

- Data elements are different from EHE or CHE
- Data element scores are letters, not numbers (L / M / H)
- Element scores are 3 letter combos (HHM, MLL, HML, etc)

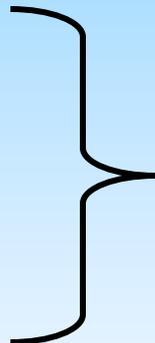




HHE Module

- Values for the 3 evaluation factors are grouped into 3-letter combinations

Contaminant Hazard	Significant (H) Moderate (M) Minimal (L)
Migration Pathway	Evident (H) Potential (M) Confined (L)
Receptor	Identified (H) Potential (M) Limited (L)



HHE Module Ratings	
Combination	Rating
HHH	A
HHM	B
HHL	
HMM	C
HML	
MMM	D
HLL	
MML	E
MLL	F
LLL	G

Order letters highest to lowest (H's first, M's second & L's third) to determine Rating

[Table 21_28.doc](#)

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
	(See Table 27)		
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

X

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
	(See Table 27)		
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

X

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
	(See Table 27)		
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 (Human Endpoint) MC Hazard

X

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
	(See Table 27)		
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 (Ecological Endpoint) MC Hazard

X

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
	(See Table 27)		
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 X

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
	(See Table 27)		
CHF Scale	CHF Value	Sum the Ratios	19.70
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).	H

No Known or Suspected Surface Soil MC Hazard



Table 27 (Soil)

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

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.

Note: Do not add ratios from different media.

Media	Contaminant	Maximum Concentration (mg/kg)	Comparison Value	Ratio	
Soil	Aluminum	10300	710	15.51	
	Antimony	-	15	0.00	
	Arsenic	13.1	240	0.05	
	Barium	168	2800	0.06	
	Beryllium	1.16	38	0.03	
	Cadmium	21	52	0.40	
	Calcium				
	Chromium	36.3	23000	0.00	
	Cobalt	3.21	3800	0.00	
	Copper	41.1	400	0.10	
	Iron	70000	70000	1.00	
	Lead	26.3	500	0.05	
	Magnesium				
	Manganese	793	250	3.17	
	Nickel	5.96	830	0.01	
	Potassium				
	Selenium	0.83	310	0.00	
	Silver		95	0.00	
	Sodium				
	Thallium				
	Vanadium	72.4	290	0.25	
	Zinc	41.3	800	0.05	
	Mercury	-			
	1,3,5-Trinitrobenzene	-	2000	0.00	
	1,3-Dinitrobenzene	-	6.3	0.00	
	2,4,6-Trinitrotoluene	-	17	0.00	
	2,4-Dinitrotoluene	-	0.0024	0.00	
	2,6-Dinitrotoluene	-	6.9	0.00	
	2-Amino-4,6-Dinitrotoluene	-			
	4-Amino-2,6-Dinitrotoluene	-			
	HMX	-	200	0.00	
	m-Nitrotoluene	-	270	0.00	
	Nitrobenzene	-	30	0.00	
	o-Nitrotoluene	-	280	0.00	
p-Nitrotoluene	-	5.6	0.00		
RDX	-	25	0.00		
Tetryl	-	37	0.00		

Total: 19.70

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)					
Surface Water/Human Endpoint (Table 22)					
Sediment/Human Endpoint (Table 23)					
Surface Water/Ecological Endpoint (Table 24)					
Sediment/Ecological Endpoint (Table 25)					
Surface Soil (Table 26)	M	M	H	HMM	C

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

HHE Ratings (for reference only)

Combination	Rating
HHH	A
HHM	B
HHL	C
HMM	
HML	D
MMM	
HLL	E
MML	
MLL	F
LLL	G

Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected MC Hazard



Determining a Site's Priority

- One, two or all three modules can be used to score a site
- MRS priority is based on the module with the highest hazard score
- MR Sites are assigned one of 8 numerical scores or one of 3 non-numerical outputs:
 - No longer required (site is at RC)
 - Evaluation pending (more data needed)
 - No known or suspected hazard (no contamination)



Prioritization Determination Table

		CHE Rating	Priority		
EHE Rating	Priority	A	1	HHE Rating	Priority
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 Hazard		No Known or Suspected Hazard		No Known or Suspected Hazard	

[Table 29.doc](#)

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		No Known or Suspected CWM Hazard		No Known or Suspected MC Hazard	
MRS PRIORITY or ALTERNATIVE MRS RATING				3	



Guidelines

- **Provide rationale to support scoring**
 - Why criteria was selected.
 - Descriptions should be specific and succinct.
- **Provide details**
 - Munitions data
 - Other known/available site specific information
- **Don't include data that does not exceed screening criteria (HHE)**
- **MRSP priority must be consistent with Site Recommendation:**
 - An MRS being recommended for NFA should NOT have a numeric MRSP score



MMRP Additional Requirements and QA Panel

Tim Rodeffer
AEC MMRP Project Manager



Discussion Topics

- **Additional MRSPF requirements**
- **Active Army MRSPF Process**
- **MRSPF Notification Requirements**
- **Quality Assurance Panel**



Additional Requirements

- **The Army will use MRSPP and other factors to determine MRS funding sequence:**
 - **Regulatory or stakeholder concerns**
 - **Cultural or social factors**
 - **Economic factors, redevelopment**
 - **Land use**
- **Services will conduct QA reviews**
- **Services will report annually to DoD**
- **MRSPP scores recalculated as appropriate**



Active Army MRSPP Process

- **Scoring sites during Site Inspection process.**
- **MRSPP scores included as Appendix in the SI Report.**
- **On schedule to complete all SIs & MRSPP scores by end of FY10.**



MRSPF Notification Requirements

Protocol
requires



1. Notification to stakeholders seeking their involvement in prioritization
2. Publish an announcement in local paper requesting information pertinent to prioritization or sequencing decisions of the MRS



MRSPF Notification Requirements

- **ACSIM Memo sent out to installations detailing requirements.**
- **Installations tasked to complete both the lead agency notification letter and public announcement requirements.**
- **Example letters and public announcements language provided as enclosures to ODEP memo.**



MRSPF Notification Requirements

- **Installations can tailor the language based on their specific requirements.**
- **Notification letter to be sent to lead regulatory agency and copy all other applicable stakeholders**



MRSPP Notification Requirements

- **Requirements should be discussed with Stakeholders during the SI Technical Project Planning (TPP) Meetings.**
- **If requested, a meeting can be conducted to allow participation in the scoring process.**
- **Stakeholders will have the opportunity to review and comment on the draft MRSPP scores included as an Appendix to the Draft SI Report.**
- **Scores will be final within the Final SI Report (effective 2nd quarter FY08).**



Army MRSPP QA Panel

- **Established in accordance with Protocol**
- **Comprised of Active Army, BRAC, and FUDS representatives. DASA(ESOH) – Chair**
- **Objectives - Panel reviews priorities to ensure consistency and that decisions are representative of site conditions**



Army MRSPP QA Panel

- QA Panel initially met in October 2007.
- Reviewed MRSs that have met the protocol reporting requirements (public notice and lead reg. agency notification)
- MRSs reviewed:
 - 22 *Active Army*
 - 2 *BRAC*
 - 5 *FUDS*



Army MRSPP QA Panel

Scores reviewed

Installation	MRSs
Ft. Knox	2
Charles Melvin Price Support Center	3
Red River AD	5
Cornhusker	1
Ft. Riley	4
Longhorn AAP	3
Blossom Point Research Facility	4



Army MRSPP QA Panel

Active Army Results

- **11 scores approved**
- **8 scores disapproved (priority change)**
- **3 scores pending (unresolved issues)**



Army MRSPP QA Panel

What happens when the QA Panel disapproves a score?

- **MRSPP score sheets updated by AEC and sent back to installation with explanation of why score disapproved and how it was corrected**
- **Installations to ensure that stakeholders (federal agencies, state regulatory agencies, RABS, etc.) are afforded the opportunity to comment on these changes prior to the QA Panel finalizing the scores**



Army MRSPP QA Panel

What happens when the QA Panel approves a score?

- **AEDB-R modified in FY07 to accommodate the MRSPP sub-scores & final score, as well as all score sheets**
- **Scores will be added to AEDB-R as they are finalized.**



Questions / Comments



Other Things You Might Want to Know About in MMRP

USAEC MMRP Project Manager



MMRP Guidebook for US Army Active Installations

- Provides general guidance on MMRP
 - Drivers and authorizations
 - CERCLA process
 - What's the same as IRP, what's different
 - MRSP requirements
 - Stakeholder involvement
- Companion to DERP Management Guidance for Active Installations, Nov 2004
- Draft-Final Guidance being prepared by AEC Cleanup Division
- Anticipate Final Guide in 2008



MMRP RI/FS Guidance

- **Being developed for all Army Sites (Active, FUDS, BRAC) – Initiated Sep 06**
 - **Addresses MEC and MC**
 - **General guidance for conducting investigations for on-post and off-post MR Sites**
 - **RI approach is to investigate sufficiently to determine risk based on current and reasonably anticipated future land use (DQOs)**
 - **Responses based on current and reasonably anticipated future land use; focus on remedies based on risk and anticipated future land use**
 - **Includes a potential list of remedy alternatives including LUCs**



MMRP RI/FS Guidance

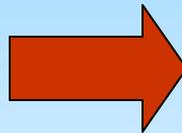
- **Continued:**
 - **“What is an unacceptable risk?”**
 - **Remedies at MR sites on post (under Army control) may be suited to engineering controls and LUCs**
 - **Active remedies for off-post MRSs likely.**
 - **Final Guidance not expected until late 2008**



RI/FS General Approach

Assess what you know

- Determine reasonably anticipated future land use
- Evaluate existing data
- Evaluate initial response alternatives
- Assess LUCS alternative



Determine what you need to know

- Determine your data needs based on land use and working with stakeholders define DQOs.
- Potential data needs: munition types, location & density, pathways & receptors, cost, etc.
- Generally, collect only the data needed to support decisions

**Get agreement
from Project Team**

**Characterization/cleanup of
the entire MRS may not be
necessary (i.e., LUCs)**



EPA's Handbook on the Management of Munitions Response Actions (Interim Final)

- **For regulators, public, and DoD.**
- **Provides EPA guidance on the management of munitions response actions under CERLCA and RCRA**

http://epa.gov/fedfac/pdf/mra_hbook_5_05.pdf

- ✓ Types of Munitions (explosives, fuses)
- ✓ Detection and munitions response technologies
- ✓ Planning site characterization
- ✓ Designing response strategies
- ✓ LUCS
- ✓ Safety Requirements (DDESB)



Draft Munitions and Explosives of Concern Hazard Assessment (MEC HA)

- EPA's attempt to fulfill the NCP requirement to complete a "risk assessment" for MEC items
- Developed by EPA with input from Federal Agencies, States, Tribal organizations, and DoD (OSD)
- Assesses explosive hazards (MEC) to human receptors at MRSs.
- Similar in nature to the MRSP, but does not address MC or ecological hazards.
- Expands on MRSP by assessing the potential effects of a remedial alternative on the potential explosive hazard at a MRS



Draft MEC-HA

- **Does not address water ranges**
- **Does not address chemical agents**
- **Completed at end of RI**
- **Active remedies preferred over LUCs**
- **Supports response alternatives**
- **Draft Guidance available**



Explosive Safety Management

- **DDESB – DoD’s principle executive representative and advisor on explosive safety management**
 - Performs programmatic reviews & installation level surveys
 - Provides advice & guidance on explosive and chemical agent issues
- **DoD Directive No. 6055.9 (Aug 05)**
 - DoD’s Ammunition & Explosives Safety Standard
 - Established requirements that must be performed prior to initiating munition response activities (i.e., safety plans and siting submissions)
 - Removal depths are determined by an evaluation of site-specific data and risk



Explosive Safety Management

- An Explosive Safety Submittal (ESS) or Chemical Safety Submittal (CSS) is required for munition responses that involve intentional physical contact (intrusive activities) with MEC or CA regardless of configuration
- Provides safety specifications for the execution of the selected investigation or response





Explosive Safety Management

ESS/CSS

- **Required prior to initiating the activity**
- **DDESB reviews and approves**
- **Review process can be long, 4-6 months unless project is TCRA**
- **Extra deliverable, extra project costs, adds time to project schedule**



Explosive Safety Management



**Digging this hole
requires an ESS**



Explosive Safety Management

- **ESS/CSS Exclusions:**
 - Operational ranges
 - Emergency responses
 - Small arms ranges
 - “Anomaly avoidance” investigations, to include escort support by UXO qualified personnel required for drilling and sampling



Construction & MEC

- **Many MR sites have been redeveloped:**
 - Recreation - Golf courses, ball fields
 - Housing (military or private)
 - Industrial/commercial facilities
- **If no UXO or DMM has been previously reported, does this mean there is no MEC at the site? NO!**
- **If construction has occurred on your MR Site, it may still require investigation**



Questions / Comments