

# **APPENDIX A**

## **MPPEH CERTIFICATION AND DOCUMENTATION**

for the

### **Remedial Investigation (RI)**

### **Former Conway Bombing and Gunnery Range (BGR)**

### **Horry County, South Carolina**

Prepared for:



U.S. Army Engineering and Support Center  
Attn: CEHNC-OE-DC (Ms. Chris Cochrane)  
4820 University Square  
Huntsville, Alabama 35816-1822

U.S. Army Corps of Engineers, Charleston District  
Attn: Mr. Shawn Boone  
69A Hagood Avenue  
Charleston, South Carolina 29403-0919

**Contract No. W912DY-04-D-0018**  
**Task Order: 0012**  
**Project No. I04SC002501**

Prepared by:



EOD Technology, Inc.  
2229 Old Highway 95  
Lenoir City, Tennessee 37771

**July 2012**

23. DATE RECEIVED	9/02/10	21. TOTAL CUBE	
22. RECEIVED BY		20. TOTAL WEIGHT	520 lbs
19. NO CONT	2	18. FY CONT	
17. ITEM NOMENCLATURE	Metal; Mixed		
16. PRODUCT CLASSIFICATION NOMENCLATURE			
Range Debris			
15. DOC DATE	9/22/10	14. LOC	15. SL
13. UNIT CUBE		12. UNIT WEIGHT	pounds
11. U/F	0	7. PRY RATE	8. TYPE CARGO
9. PS		6. MMPC	
4. MARK FOR		3. SHIP FROM	3. SHIP TO
		EOD Technology, Inc.	Allen Scrap Metal
		Conway RI/FS, Myrtle Beach, SC	3838 Danny Road Loris, SC
1. TOTAL PRICE	\$0.00	2. SHIP FROM	
DOLLARS		EOD Technology, Inc.	
10. QTY. RECD	0	11. U/F	0
9. PS		12. UNIT WEIGHT	pounds
8. TYPE CARGO		13. UNIT CUBE	
7. PRY RATE		14. LOC	
6. MMPC		15. SL	
5. DOC DATE	9/22/10	16. PRODUCT CLASSIFICATION NOMENCLATURE	
4. MARK FOR		17. ITEM NOMENCLATURE	
3. SHIP FROM		18. FY CONT	
EOD Technology, Inc.		19. NO CONT	2
Conway RI/FS, Myrtle Beach, SC		20. TOTAL WEIGHT	520 lbs
3838 Danny Road		21. TOTAL CUBE	
Loris, SC		22. RECEIVED BY	
		23. DATE RECEIVED	9/02/10
			2

Location: Conway, Horry Cty., SC  
 Contractor: EOD Technology, Inc.

Container / Seal Identification:

Conway RI/FS / EODT / 0001 / 250271  
 Conway RI/FS / EODT / 0002 / 250272

Certified by:

Tom Hinote, SUXOS  
 EODT Home Office (865)988-6063  
 Conway Field Office (256) 689-0353

Verified by:

Rick Shellenbarger, EODT-Quality Control

This certifies and verifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief, are inert and/or free of explosives or related materials.



**AEDA/RANGE RESIDUE INSPECTION, CERTIFICATION, AND CHAIN OF CUSTODY FORM**  
**120G**

Project Location: Conway RI/FS, Horry County, SC		Contract No: W912DY-04-0018		Task Order No.: 0012	Page 1 of 1
Line	Description	Source (e.g., Grid or Range) Identifier	Container/Serial Number	Container Type	Unit Wt./Vol.
1	Munitions Debris - Mixed Metals	Range XX, Strafing Range, Turret Range I, Turret Range II, Range III, Range IV, Range VII	0250271	55 Gal. Drum	520 lbs
2	Munitions Debris - Mixed Metals	Range XX, Strafing Range, Turret Range I, Turret Range II, Range III, Range IV, Range VII	0250272	55 Gal. Drum	file both.
3					
4					
5					
6					

**Inspector's certification:** This certifies that the AEDA residue, Range Residue, and/or Explosive Contaminated Property listed has been 100 % properly inspected and, to the best of our knowledge and belief, are free of explosive hazards.

Printed/typed name: Tom Hinote      Signature: *Tom Hinote*      Date: 9/2/2010

**Verifier certification:** This certifies that the AEDA residue, Range Residue and/or Explosive Contaminated Property listed has been 100 % properly inspected and to the best of our knowledge and belief, are free of explosive hazards.

Printed/typed name: Rick Shellenbarger      Signature: *[Signature]*      Date: 9/2/2010

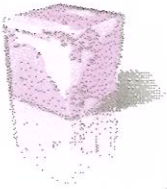
**Transporter(s)**

Transporter 1 acknowledgment of receipt of materials properly sealed/secured  
Printed/typed name: *N/A*      Signature: *[Signature]*      Date:

Transporter 2 acknowledgment of receipt of materials properly sealed/secured  
Printed/typed name:      Signature:      Date:

**Final Disposition**

Facility owner or operator: Certification of receipt of AEDA/Range Residue materials, except as noted above. Acknowledgment of receipt of materials properly sealed/secured.  
Printed/typed name: Danny Allen      Signature: *[Signature]*      Date: 9-2-10



# Allen's Scrap Metal LLC

## MEMORANDUM

To: Brian Woods, EOD Technology, Inc. (EODT), 2229 Old Highway 95, Lenoir City, TN 37771

From: Allen Scrap Metal, 3838 Danny Road, Loris, SC 29569

Date: September 2, 2010

Re: Disposition of scrap material received from EOD Technology, Inc. at Conway RI/FS in Horry County, South Carolina

This memorandum is provided in accordance with the contractual requirements between EODT and R. E. Goodson, LLC.

I affirm that the sealed containers of scrap received from **EODT on September 2, 2010** were received unopened, containers properly labeled and each with its unique identified and unbroken seal ensuring a continued chained of custody. After reviewing and concurring with all the provided supporting documentation, I sign for having received and agreeing with the provided documentation that the sealed containers contain no explosive hazards. Furthermore, the containers will not be sold, traded or otherwise given to another party until they are processed by crushing, shredding, or smelting (only identifiable by their basic content) prior to being released for resale. I further affirm that this will be done in a timely manner, not to exceed 30 days. Proof of final disposition (Non-Hazardous MD Inert/Demilitarization Certification/Verification) will be signed, dated and returned to the EODT at the following address: EOD Technology, Inc, 2229 Old Hwy 95, Lenoir City, TN 37771 (Attn: Brian Woods)

Name of Recycler: Allen Scrap Metal

Address: 3838 Danny Road

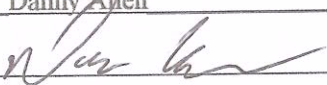
Phone: (843) 756-0687

Printed Name: Danny Allen

Signature: 

I confirm that the scrap was disposed in accordance with contract and DOD requirements as stated in above paragraph on this date 10/28/10.

Printed Name: Danny Allen

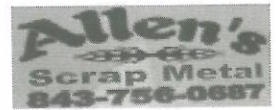
Signature:  Sign for destruction certification here.

Phone: 843 907-3279

Fax: 843 999-1234

# Allens Scrap Metal

3842 Danny Road  
Loris, SC 29569



*FOD Technologies*

2883  
Retail Vendor  
1010 Tenth St.  
Loris, SC 29524

September 02, 2010

Ticket# 16075  
Weight 520  
Total \$36.40

Driver:	Description:	Notes:
Truck#:	Container In:	
Other:	Container Out:	

## Retail Ticket - Number: 16075

<u>Commodity</u>	<u>Gross</u>	<u>Tare</u>	<u>Tare2</u>	<u>Deduct</u>	<u>Net UM</u>	<u>Price</u>	<u>Total</u>
Misc. Shred	8,740	8,220			520 P	0.0700	36.40
	8,740	8,220			520		36.40



September 24, 2010

Allen Scrap Metal  
3838 Danny Rd.  
Loris, SC 29569

RE: 1348 #'s Conway RI/FS/ EODT/ 0001/ 250271  
& Conway RI/FS/ EODT/ 0002/ 250272

This letter is to hereby certify that the 520 lbs of Range Debris hauled by Allen Scrap Metal to Commercial Metal Company in Lexington, SC have been destroyed in a 4000 HP automobile shredder.

CMC thanks you for your business and look forward in serving you in the near future.

A handwritten signature in black ink, appearing to read 'Michael Greenwood', is written above the typed name.

Michael Greenwood  
Manager - CMC Recycling-Florence  
Office: (843) 665-5865  
Cell: (803) 380-5321



September 24, 2010

Allen Scrap Metal  
3838 Danny Rd.  
Loris, SC 29569

RE: 1348 #'s Conway RI/FS/ EODT/ 0001/ 250271  
& Conway RI/FS/ EODT/ 0002/ 250272

This letter is to hereby certify that the 520 lbs of Range Debris hauled by Allen Scrap Metal to Commercial Metal Company in Lexington, SC have been destroyed and melted in a high arc furnace.

CMC thanks you for your business and look forward in serving you in the near future.

Michael Greenwood

Manager – CMC Recycling-Florence  
Office: (843) 665-5865  
Cell: (803) 360-5321

# **APPENDIX B**

## **ANALYTICAL RESULTS TABLES AND QUALITY ASSURANCE/QUALITY CONTROL EVALUATIONS**

for the

### **Remedial Investigation (RI) Former Conway Bombing and Gunnery Range (BGR) Horry County, South Carolina**

Prepared for:



U.S. Army Engineering and Support Center  
Attn: CEHNC-OE-DC (Ms. Chris Cochrane)  
4820 University Square  
Huntsville, Alabama 35816-1822

U.S. Army Corps of Engineers, Charleston District  
Attn: Mr. Shawn Boone  
69A Hagood Avenue  
Charleston, South Carolina 29403-0919

**Contract No. W912DY-04-D-0018**  
**Task Order: 0012**  
**Project No. I04SC002501**

Prepared by:



EOD Technology, Inc.  
2229 Old Highway 95  
Lenoir City, Tennessee 37771

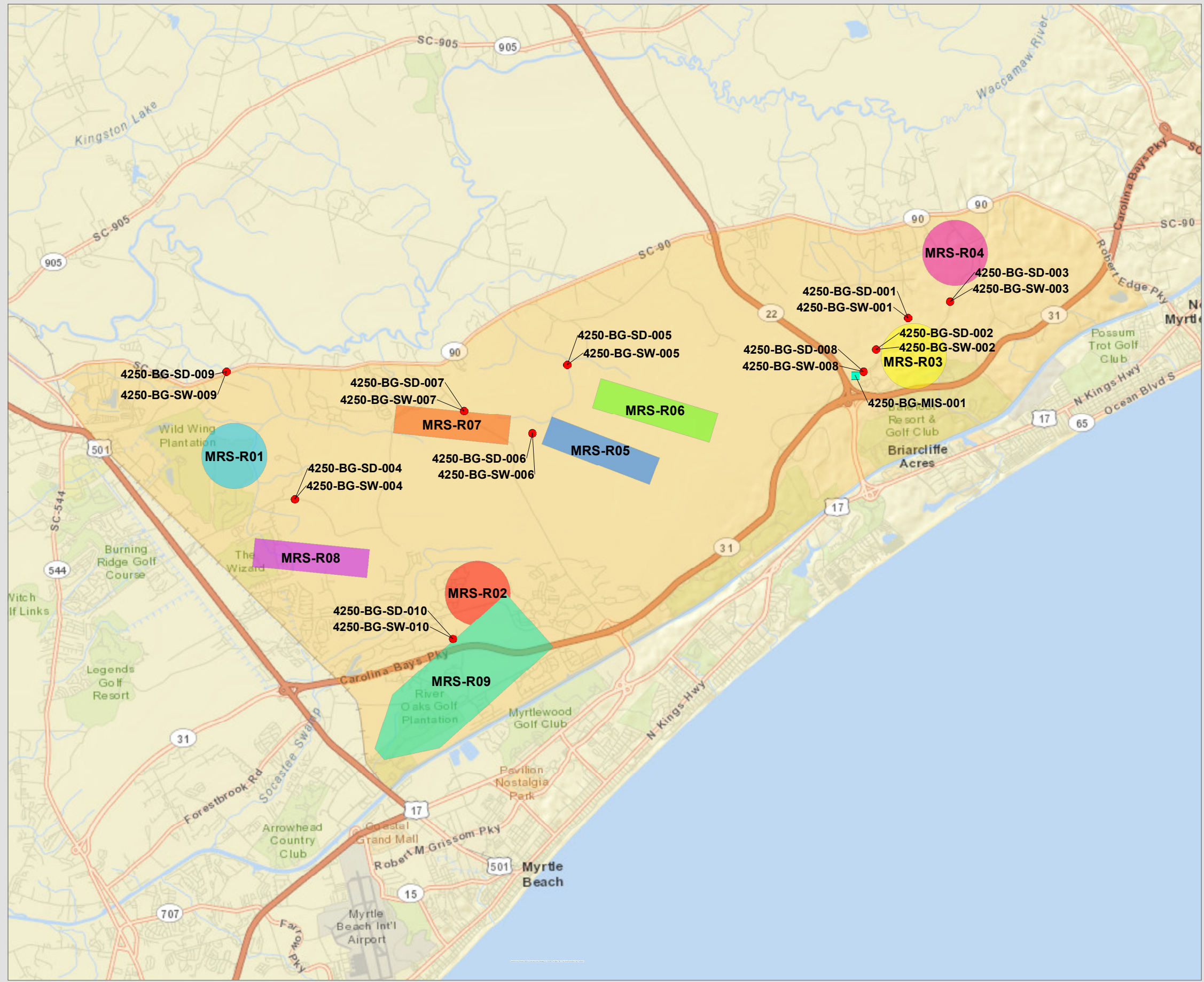
**July 2012**



**APPENDIX B**  
**ANALYTICAL RESULTS TABLE AND QUALITY**  
**ASSURANCE/QUALITY CONTROL EVALUATIONS**

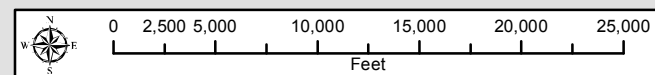
This Appendix presents Munitions Constituents (MC) sampling results for the Remedial Investigation (RI) performed at the Conway Bombing and Gunnery Range (BGR). The field sampling media included surface soil, surface water, and sediment; however, only surface soil results were utilized during the MC risk assessment. The Level IV third party validation summary report can be found on pages B-5 through B-19. The sample results are located on pages B-20 through B-30. The background sample results are on Table B-1 (Surface Soil), Table B-2 (Surface Water), and Table B-3 (Sediment). The explosive sample results are on Table B-4 (Surface Soil), Table B-5 (Surface Water) and Table B-6 (Sediment). The inorganic sample results are on Table B-7 (Surface Soil), Table B-8 (Surface Water), and Table B-9 (Sediment). The perchlorate sample results are on Table B-10 (Surface Water) and Table B-11 (Sediment). Figures showing the MC sampling locations for all media are located on Figures B-1 through Figure B-3. The background samples are on Figure B-1. The surface soil maps are on Figure B-2. The surface water and sediments were collocated and are on Figure B-3. The Level IV data validation report and electronic data deliverables can be found on the disk provided at the beginning of this report.

**Figure B-1  
Background Sample Locations  
Report for the Remedial Investigation  
at the Former Conway Bombing and Gunnery  
Horry County, South Carolina**



**Legend**

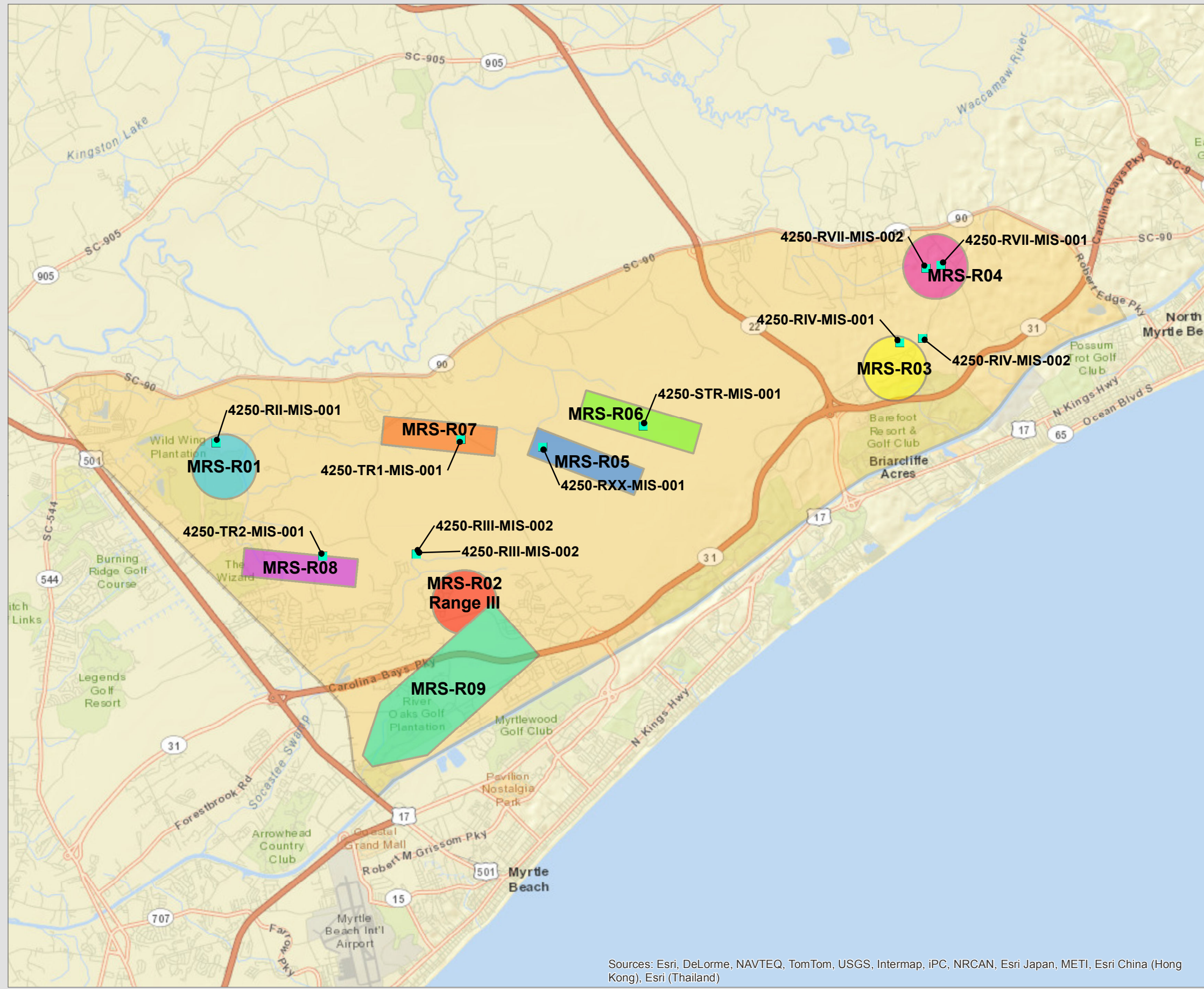
- MIS Background Sample Locations (100ft x 100ft Grids)
- Background Surface Water and Sediment Sample Locations
- MRS-R01 (Range II)
- MRS-R02 (Range III)
- MRS-R03 (Range IV)
- MRS-R04 (Range VII)
- MRS-R05 (Range XX)
- MRS-R06 (Strafing Range)
- MRS-R07 (Turret Range 1)
- MRS-R08 (Turret Range 2)
- MRS-R09 (MG/Rifle Range)
- Former Conway Bombing Range



Author: TKM	Date: 7/26/2012	HB# 44630	Path: L:\Conway\Maps\RIFS\RIFS Report\RI Report\Fig B-1 Conway_BG_SD_SW_Sampling.mxd
Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet Intl		Horry County, South Carolina	

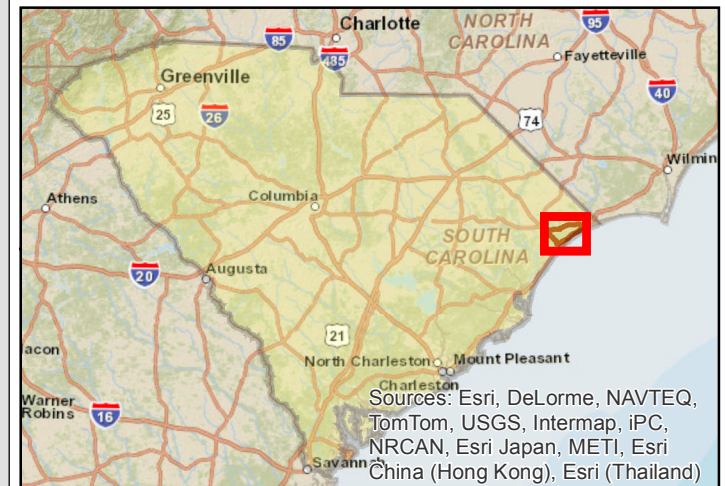
The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

**Figure B-2**  
**Multi Increment Sampling Locations**  
**Report for the Remedial Investigation**  
**at the Former Conway Bombing and Gunnery**  
**Horry County, South Carolina**

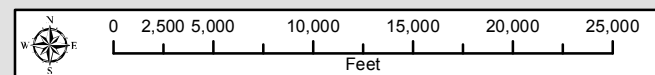


**Legend**

- MIS Locations (100ft x100ft Grids) (RI/FS)
- ASR Supplement**
- Range Name**
- MRS-R01 (Range II)
  - MRS-R02 (Range III)
  - MRS-R03 (Range IV)
  - MRS-R04 (Range VII)
  - MRS-R05 (Range XX)
  - MRS-R06 (Strafing Range)
  - MRS-R07 (Turret Range 1)
  - MRS-R08 (Turret Range 2)
  - MRS-R09 (MG/Rifle Range)
  - Former Conway Bombing Range



Sources: Esri, DeLorme, NAVTEQ, TomTom, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand)

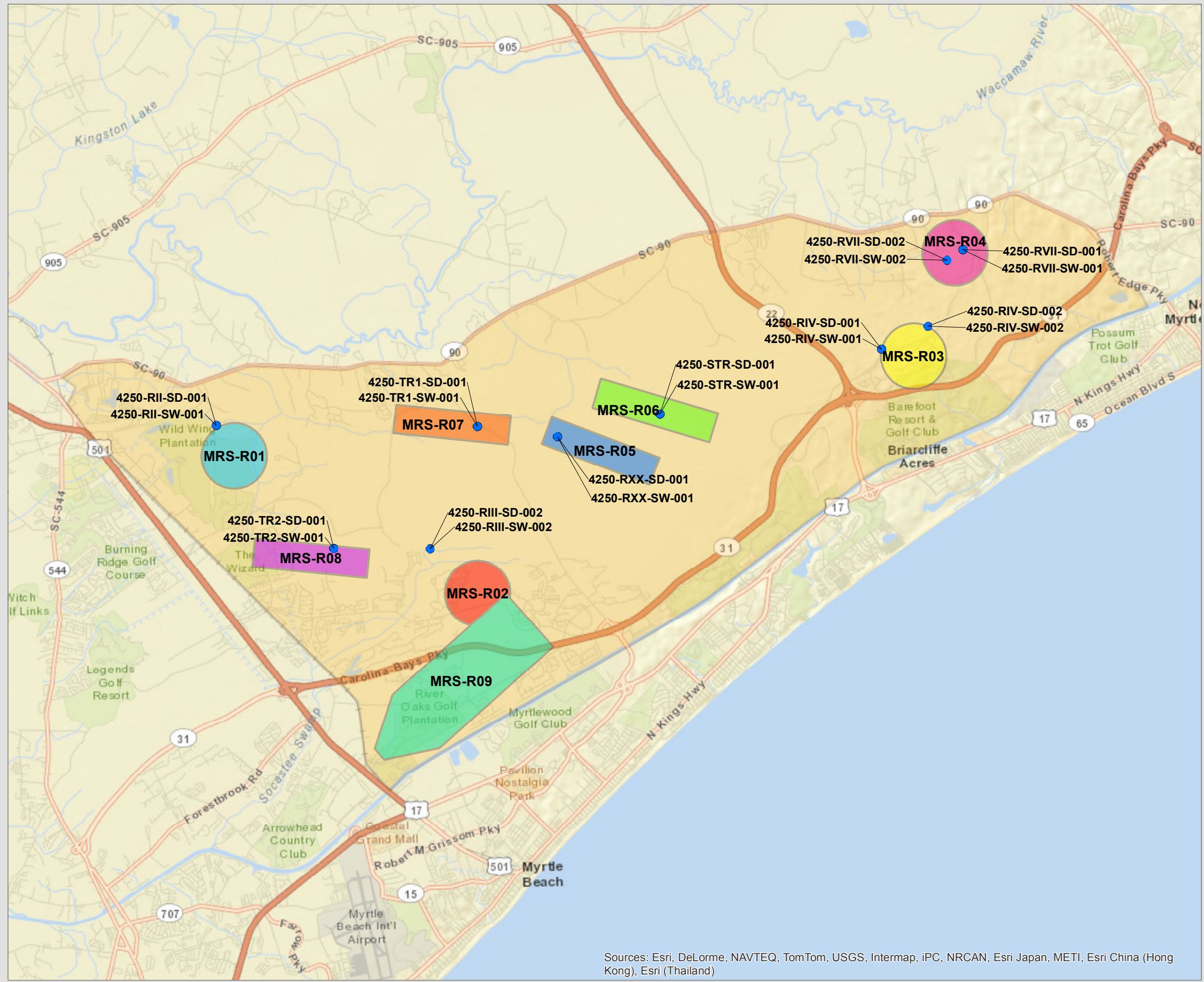


Author: TKM	Date: 7/26/2012	HB# 44630	Path: L:\Conway\Maps\RIFS\RIFS Report\RI Report\Fig B-2 Conway_MIS_Sampling.mxd
Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet Intl		Horry County, South Carolina	



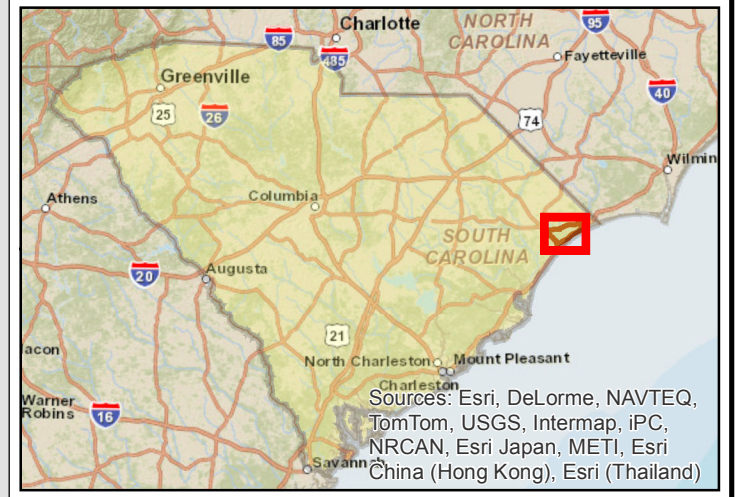
The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

**Figure B-3**  
**Surface Water and Sediment Sample Locations**  
**Report for the Remedial Investigation**  
**at the Former Conway Bombing and Gunnery**  
**Horry County, South Carolina**

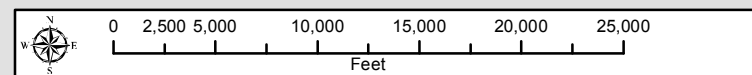


**Legend**

- Surface Water and Sediment Sample Locations
- MRS-R01 (Range II)
- MRS-R02 (Range III)
- MRS-R03 (Range IV)
- MRS-R04 (Range VII)
- MRS-R05 (Range XX)
- MRS-R06 (Strafing Range)
- MRS-R07 (Turret Range 1)
- MRS-R08 (Turret Range 2)
- MRS-R09 (MG/Rifle Range)
- Former Conway Bombing Range



Sources: Esri, DeLorme, NAVTEQ, TomTom, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand)



Author: TKM	Date: 7/30/2012	HB# 44630	Path: L:\Conway\Maps\RIFS\RIFS Report\RI Report\Fig B-3 Conway_SD_SW_Sampling.mxd
Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet Intl		Horry County, South Carolina	



The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.



## **DATA VALIDATION SUMMARY REPORT**

**Conway  
Bombing and Gunnery Range**

**Conway, South Carolina**

**Prepared for EOD Technology**

**By**

**DataChek**



**January 11, 2011  
Updated March 29, 2011**

**TABLE OF CONTENTS**

**1.0** Introduction ..... 1

**2.0** Procedures ..... 1

**3.0** Summary of Data Validation ..... 4

**4.0** Analysis-Specific Data Validation Summaries ..... 4

    4.1 Perchlorate by SW846 6850/6860 ..... 4

        4.1.1 Surface water..... 4

        4.1.2 Soils..... 5

    4.2 Explosives by SW846 8330/8321 ..... 6

        4.2.1 Surface water..... 6

        4.2.2 Soils..... 7

        4.2.3 Composites..... 8

    4.3 Metals by SW846 6010B/7471A ..... 9

        4.3.1 Metals (Sb,Cu,Pb) by SW846 6010B ..... 9

            4.3.1.1 Surface water..... 9

            4.3.1.2 Soils..... 9

            4.3.1.3 Composites..... 10

        4.3.2 Metals (Ba,Cd,Pb,Zn,Hg) by SW846 6010B ..... 10

            4.3.2.1 Surface water..... 10

            4.3.2.2 Soils..... 11

            4.3.2.3 Composites..... 11

        4.3.3 Metals (Ba,Cd,Cu,Hg,Pb,Sb,Zn) by SW846 6010B ..... 12

            4.3.3.1 Surface water..... 12

            4.3.3.2 Soils..... 12

            4.3.3.3 Composites..... 13

**5.0** References ..... 13

**TABLES**

Table 1. Data Validation Qualifiers ..... 2

Table 2. Data Validation Reason Codes..... 3

**Data Validation Summary Report  
Site Investigation  
Conway Bombing/Gunnery Range  
Conway, South Carolina**

**1.0 Introduction**

The data validation of 199 soil, surface water, and composite samples from the Conway Bombing/Gunnery Range was completed in January 2011. Level IV data validation, which includes the review of all raw data elements, was performed on 100% of the environmental samples collected during the site sampling activities. All the samples have the following label: Stage\_4\_Validation\_Manual (S4VM). GEL Labs, Charleston, SC, produced the analytical data. The chemical parameters for which the samples were analyzed are identified below:

Parameter (Method)
<b>GEL Labs</b>
Explosives by SW846 8330 and 8321
Metals by SW846 6010B/7471A
Perchlorate by SW846 6850/6860

The total number of samples and sample delivery groups (SDG) varied according to analysis type as indicated below.

Analysis Type	Media Type	Number of Samples/ Number of SDGs
Perchlorate	Soils	17/8
	Surface Water	17/8
Explosives	Soils	23/7
	Surface Water	17/7
	Composites	30/6
Metals (Sb,Cu,Pb)	Soils	5/3
	Surface Water	5/3
	Composites	6/2
Metals (Ba,Cd,Pb, Zn,Hg)	Soils	19/6
	Surface Water	10/5
	Composites	26/7
Metals (Sb,Ba,Cd,Cu,Pb,Zn,Hg)	Soils	11/5
	Surface Water	9/5
	Composites	4/2

Six of the perchlorate were resampled in February 2011, (3 water and 3 soil) due to an oversight by the laboratory that resulted in the samples being analyzed well beyond the QC holding time. The analyses were validated in March 2011.

**2.0 Procedures**

The sample data were validated following the logic identified in *The CLP National Functional Guidelines for Organic Data Review (June 2008)* and *The Contract Laboratory Program (CLP) Data Validation Functional Guidelines for Evaluating Inorganic Analyses (October, 2004)* and the *DoD Perchlorate Handbook (August 2007)*. For the explosive compounds, the validation was based on the method requirements and technical judgment, following the logic of the CLP validation guidelines.



The data validation qualifiers (Table 1) applied by the reviewer were recorded in a column adjacent and to the right of the laboratory results. A data validation reason code was also added to each of the reviewer's qualifiers to provide the user with a means to identify which results were qualified and the reason for the qualifiers (Table 2). The data were labeled Stage\_4\_Validation\_Manual (S4VM) according to *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use (January, 2009)*.

**Table 1: Validation Qualifiers**

<b>Qualifier</b>	<b>Definition</b>
<b>U</b>	Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit.
<b>B</b>	Indicates that the analyte was found in the associated method blank as well as the sample at above the QC level. Sample results were qualified in accordance with the CLP guidelines for contamination found in the blanks.
<b>J</b>	The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed. For inorganics a minus (-) or plus (+) is assigned to the qualifier to denote low or high bias, respectively.
<b>R</b>	The reported sample results are rejected due to the following: <ol style="list-style-type: none"> <li>1. Severe deficiencies in the supporting quality control data.</li> <li>2. Anomalies noted in the sampling and/or analysis process that could affect the validity of the reported data.</li> <li>3. The presence or absence of the constituent cannot be verified based on the data provided.</li> <li>4. To indicate not to use a particular result in the event of a reanalysis.</li> </ol>
<b>UJ</b>	The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the "non-detect" may be inaccurate or imprecise. The non-detect result should be estimated.

**Table 2: Data Validation Reason Codes**

<b>Reason Code</b>	<b>Definition</b>
01	Sample received outside of 4+/-2 degrees Celsius
01A	Improper sample preservation
02	Holding time exceeded
02A	Extraction
02B	Analysis
03	Instrument performance – outside criteria
03A	BFB
03B	DFTPP
03C	DDT and/or Endrin % breakdown exceeds criteria
03D	Retention time windows
03E	Resolution
04	Initial calibration results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	Correlation coefficient >0.995
05	Continuing calibration results outside specified criteria
05A	Compound mean RRF QC criteria not met
05B	Compound % D QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	TB
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated method blank or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09	Post digestion spike outside criteria (GFAA)
10	Internal standards outside specified control limits
10A	Recovery
10B	Retention time
11	Laboratory control sample recoveries outside specified limits
11A	Recovery
11B	% RPD (if run in duplicate)
12	Interference check standard
13	Serial dilution
14	Tentatively identified compounds
15	Quantification
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18	Percent difference between original and second column exceeds QC criteria
19	Professional judgment was used to qualify the data
20	Pesticide clean-up checks

Reason Code	Definition
21	Target compound identification
22	Radiological calibration
23	Radiological quantification
24	Reported result and/or lab qualifier revised to reflect validation findings

### 3.0 Summary of Data Validation Findings

This data validation report reflects the data validation findings for samples associated with the Conway Bombing/Gunnery Range. The validated data set consisted of 75 soil, 58 surface water and 66 composite samples (199 total) and was validated at Level IV. Overall the data was of excellent quality, and all measurements of the project quality control (QC) objectives (precision, accuracy, representativeness, comparability and completeness) were met. Each of these measures and specific data qualifications are discussed below.

*Precision:* Precision is a measure of the agreement between duplicate sample measurements of the same quantity and is reflected in the relative percent difference (RPD) between spikes and the RPD for the field duplicate analysis. The precision for all the analysis types and media is 98.9%.

*Accuracy:* Accuracy is measured by the results from the recovery of known amounts of compounds or elements from laboratory control samples (LCS), matrix spikes (MS), and surrogate recoveries. The overall measure of accuracy for the Conway Bombing/Gunnery Range was calculated by comparing the number of spike recoveries that exceeded the laboratory limits by the total number of LCS, MS and surrogate spikes. The accuracy calculation for all the analysis types and media is 98.9%

*Representativeness:* The measures of representativeness – sample handling, analytical blank analysis, field blanks – were met for all sites. Designated analytical protocols were followed. Holding times were met for all analyses. Overall, no major problems were identified resulting from analytical failure.

*Comparability:* All data were analyzed using appropriate approved methods of analysis. All data results were reported correctly and in standard units

*Completeness:* Completeness is the amount of valid data compared to the planned amount and is expressed as a percent of the usable data points divided by the total number of analytes for each parameter analyzed. Out of 1556 data points, none were rejected resulting in 100% completeness.

Several sample results for the organic compounds and inorganic elements were assigned “J” qualifiers by the laboratory, which is standard practice for these methods, because they were quantified between the method detection limit (MDL) and the contract reporting detection limit (CRDL). Due to the uncertainty associated with this region of quantification, the “J” qualifiers assigned by the laboratory to the organic and inorganic results were retained by the data validator to indicate an estimated quantity.

Data validation summaries, which function as worksheets for the validation task, are included for each parameter in each data package. The following section highlights the key findings of the data validation for each analysis.

## 4.0 Analysis-Specific Data Validation Summaries

### 4.1. Perchlorate by SW846-6850/6860

#### 4.1.1. Surface Water:

Overall, the data for the surface water samples are of good quality and are usable as qualified. In SDG 259608 the 2 surface water samples had the same number on the C-O-C and both were listed as “normal”

samples. The reviewer did not treat one of the samples as a field duplicate since the sampling time was 6 minutes apart. The 4250-RIV-SW-001-002 field duplicate (SDG 259044) sample was mislabeled as 4250-RIV-SW-001-MS/MSD by the laboratory. The sample and sampling time were correctly listed on the C-O-C. The reviewer changed the Form I to reflect the numbering on the C-O-C. Seventeen surface water samples were analyzed for perchlorate, and the data were reviewed for the following:

***Holding Times/Sample Condition.*** Technical holding time criteria were met for all samples. All samples were received in acceptable condition.

***Initial and Continuing Calibration.*** The CCV and CCV recoveries were within the QC limits and no qualifiers were needed.

***Blanks.*** No contamination was noted in the associated method blanks, so no qualifiers were required.

***Matrix Spike/Matrix Spike Duplicates/Duplicate.*** The MSD recoveries for SDGs 259054, 259044 and 259442 were above the QC limit. However, the MS recovery and the LCS recovery were acceptable, so no qualifiers were needed. Also, all sample results were non-detects.

***Laboratory Control Sample (LCS).*** No qualifiers were required since all LCS recoveries were within the QC limits.

***Internal Standards.*** The internal standard area recovery counts and the elution retention times were acceptable.

***Field Duplicates.*** All field duplicate results were within the QC limits.

***Quantification.*** All results were acceptable as qualified.

#### ***4.1.2. Soils:***

Overall, the soils data are of good quality and are usable as qualified. In SDG 259608 the 2 soil samples had the same number on the C-O-C and both were listed as “normal” samples. The reviewer did not treat one of the samples as a field duplicate since the sampling time was 15 minutes apart. The 4250-RIV-SD-001-002 field duplicate sample (SDG 259044) was mislabeled as 4250-RIV-SD-001-MS/MSD by the laboratory. The sample and sampling time were correctly listed on the C-O-C. The reviewer changed the Form I to reflect the numbering on the C-O-C. Seventeen soil samples were analyzed for perchlorate and the data were reviewed for the following:

***Holding Times/Sample Condition.*** Technical holding time criteria were met for all samples. All samples were received in acceptable condition.

***Initial and Continuing Calibration.*** The CCV and CCV recoveries were within the QC limits and no qualifiers were needed.

***Blanks.*** No contamination was noted in the associated method blanks, so no qualifiers were required.

***Matrix Spike/Matrix Spike Duplicates/Duplicate.*** The MS/MSD recoveries were acceptable, so no qualifiers were needed.

***Laboratory Control Sample (LCS).*** No qualifiers were required since all LCS recoveries were within the QC limits.

**Internal Standards.** The internal standard area recovery counts and the elution retention times were acceptable.

**Field Duplicates.** All field duplicate results were within the QC limits.

**Quantification.** All results were acceptable as qualified.

**4.2 Explosives by SW846 8330/8321**

**4.2.1 Surface Water**

Overall, the data for the surface water samples are of good quality and are usable as qualified. The 4250-RIV-SW-001-002 field duplicate (SDG 259044) sample was mislabeled as 4250-RIV-SW-001-MS/MSD by the laboratory. The sample and sampling time were correctly listed on the C-O-C. The reviewer changed the Form I to reflect the numbering on the C-O-C. Seventeen surface water samples were analyzed for explosive compounds, and the data were reviewed for the following:

**Method/Holding Time/Sample Condition.** The analysis requested by the client was performed for all the samples. Samples were extracted and analyzed within the holding times and all containers were received in the appropriate condition.

**Initial and Continuing Calibration.** All initial calibration (ICAL) calculations for relative response factors were correct. None of the relative standard deviations (RSDs) were outside the QC limits. No qualifiers were added to the results. Some CCV percent recoveries were below the QC limit and were qualified as "UJ" in the following:

<i>SDG</i>	<i>Samples Affected</i>	<i>Compounds</i>	<i>Bias</i>	<i>Qualifier</i>
259044	4250-RIV--SW-001, 4250-RIV-SW-001-002, 4250-RIV--SW-002	nitroglycerin	low	UJ
259054	4250-RVII-SW-001, 4250-RVII-SW-002	HMX, nitroglycerin, PETN	low	UJ
259578	4250-STR-SW-001, 4250-STR-SW-001FD, 4250-RII-SW-001, 4250-RII-SW-001FD	nitroglycerin, tetryl	low	UJ
259608	4250-RXX-SW-001, 4250-TR1-SW-001	nitroglycerin, tetryl	low	UJ
259442	4250-RIII-SW-001, 4250-RIII-SW-001-002	nitroglycerin,	low	UJ
259443	4250-TR2-SW-001	nitroglycerin	low	UJ
	4250-TR2-SW-001FD	nitroglycerin,HMX,RDX, 1,3,5-trinitrobenzene, 4-amino-2,6-dinitrotoluene	low	UJ

**Blanks.** A number of calibration blanks had contaminants present. All samples were nondetects for those compounds and no qualifiers were required.

**Surrogate Recoveries.** Each sample is spiked with 3,4-dinitrotoluene as a surrogate to determine the laboratory's ability to recover nitroaromatic compounds. All surrogate recoveries were within limits except for the samples listed below. If the surrogate recovery is below the QC limit then the sample results were probably biased low and were qualified "UJ".

<i>SDG</i>	<i>Samples Affected</i>	<i>Bias</i>	<i>Qualifier</i>
259608	4250-RXX-SW-001, 4250-TR1-SW-001	low	UJ
259442	4250-RIII-SW-001, 4250-RIII-SW-001-002	low	UJ

**Matrix Spike/Matrix Spike Duplicates (MS/MSD).** A number of MS/MSD recoveries were outside the limits but the LCS was within limits, so no qualifiers were required. No action is taken on MS/MSD data alone. The EPA guidelines for organic compounds provide that the data reviewer may use informed professional judgment to use the MS/MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. The reviewer concluded that since all other criteria were met, no qualification was required because it would have been based only on the MS/MSD results.

**Laboratory Control Sample (LCS).** In SDGs 259578 and 259608 the LCS for o-nitrotoluene was above the QC limit. The associated LCSD recovery and other QC criteria were met and all sample results were nondetects, so no qualifiers were required. 2,4-dinitrotoluene also was above the QC limit. The associated LCSD recovery and other QC criteria were met and all sample results were nondetects, so no qualifiers were required.

**Field Duplicates.** The RPDs calculated for the field duplicates were within the QC limits and qualifiers were not required.

**Quantification.** All results were acceptable as qualified.

#### 4.2.2 Soils

Overall, the data for the soils samples are of good quality and are usable as qualified. The 4250-RIV-SD-001-002 field duplicate (SDG 259044) sample was mislabeled as 4250-RIV-SD-001-MS/MSD by the laboratory. The sample and sampling time were correctly listed on the C-O-C. The reviewer changed the Form I to reflect the numbering on the C-O-C. Twenty-three soil samples were analyzed for explosive compounds, and the data were reviewed for the following:

**Method/Holding Time/Sample Condition.** The analysis requested by the client was performed for all the samples. Samples were extracted and analyzed within the holding times and all containers were received in the appropriate condition

**Initial and Continuing Calibration.** All initial calibration (ICAL) calculations for relative response factors were correct. None of the relative standard deviations (RSDs) were outside the QC limits. No qualifiers were added to the results. The ICV recoveries for 2,4-dinitrotoluene (9/20@15:02) in SDG 259578 and tetryl (9/29@7:49) in SDG 259741 exceeded the QC limit. Since all sample results were nondetects no qualifiers were needed. Some of the CCV percent recoveries were below the QC limit and were qualified as “UJ/J” in the following:

<i>SDG</i>	<i>Samples Affected</i>	<i>Compounds</i>	<i>Bias</i>	<i>Qualifier</i>
259044	4250-RIV--SD-001, 4250-RIV-SD-001-002, 4250-RIV--SD-002	nitroglycerin	low	UJ
259054	4250-RVII-SD-001, 4250-RVII-SD-002	nitroglycerin	low	UJ
259442	4250-RIII-SD-001, 4250-RIII-SD-001-002	nitroglycerin, HMX, 2,4,6-trinitrotoluene	low	UJ
259443	4250-TR2-SD-001	HMX	low	UJ
	4250-TR2-SD-001FD	nitroglycerin	low	UJ

**Blanks.** A number of calibration blanks had contaminants present. All samples were nondetects for those compounds and no qualifiers were required.

**Surrogate Recoveries.** Each sample is spiked with 3,4-dinitrotoluene as a surrogate to determine the laboratory's ability to recover nitroaromatic compounds. All surrogate recoveries were within limits except for the samples listed below.

**Matrix Spike/Matrix Spike Duplicates (MS/MSD).** A number of MS/MSD recoveries were outside the limits but the LCS was within limits, so no qualifiers were required. No action is taken on MS/MSD data alone. The EPA guidelines for organic compounds provide that the data reviewer may use informed professional judgment to use the MS/MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. The reviewer concluded that since all other criteria were met, no qualification was required because it would have been based only on the MS/MSD results.

**Laboratory Control Sample (LCS).** 2,4-dinitrotoluene had a high LCS recovery for the LCS/LCSD associated with SDGs 259578 and 259741. The LCSD and the MS/MSD were within the limits and no qualifiers were required.

**Field Duplicates.** Relative percent differences between the reported compound concentrations in the field duplicate sample and the original sample were acceptable. No qualifiers were added to the results.

**Quantification.** Results were acceptable as qualified.

#### **4.2.3 Composites**

Overall, the data for the composite samples are of good quality and are usable as qualified. Thirty composite samples were analyzed for explosive compounds, and the data were reviewed for the following:

**Method/Holding Time/Sample Condition.** The analysis requested by the client was performed for all the samples. Samples were extracted and analyzed within the holding times and all containers were received in the appropriate condition.

**Initial and Continuing Calibration.** All initial calibration (ICAL) calculations for relative response factors were correct. None of the relative standard deviations (RSDs) were outside the QC limits. No qualifiers were added to the results. All the CCVs, were within the QC limits.

**Blanks.** A number of calibration blanks had contaminants present. The sample results were all nondetects for those compounds and no qualifiers were required.

**Surrogate Recoveries.** All surrogate recoveries were within limits.

**Matrix Spike/Matrix Spike Duplicates (MS/MSD).** A number of MS/MSD recoveries (SDGs 259262) were outside the limits but the LCS was acceptable, so no qualifiers were required. No action is taken on MS/MSD data alone. The EPA guidelines for organic compounds provide that the data reviewer may use informed professional judgment to use the MS/MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. The reviewer concluded that since all other criteria were met, no qualification was required because it would have been based only on the MS/MSD results.

**Laboratory Control Sample (LCS).** The LCS recoveries for nitrobenzene in SDGs 259329 and 259439 were below the QC limit (50-150%) and the six samples in SDG259329 and the six in 259439 had that compound qualified as "UJ".

**Field Duplicates.** Relative percent differences between the reported compound concentrations in the field duplicate sample and the original sample were acceptable and no qualifiers were required.

**Quantification.** Results were acceptable as qualified.

#### **4.3. Metals by SW846 6010B, 7470A**

##### **4.3.1 Metals (Sb,Cu,Pb) by SW846 6010B, 7470A**

###### **4.3.1.1. Surface Water:**

Overall, the data for the five surface water samples are of good quality and are usable as reported.

**Holding Times/Sample Condition.** Technical holding time criteria were met for all samples. All samples were received in acceptable condition.

**Initial and Continuing Calibration.** The CCV and CCV recoveries were within the QC limits and no qualifiers were needed.

**Interference Check Samples.** The recoveries were within the QC limits and qualifiers were not added.

**Blanks.** No contamination was noted in the associated method blanks, so no qualifiers were required.

**Matrix Spike/Matrix Spike Duplicates/Duplicate.** The MS/MSD recoveries were acceptable, no qualifiers were needed.

**Laboratory Control Sample (LCS).** No qualifiers were required since all LCS recoveries were within the QC limits.

**Serial Dilution.** The serial dilutions were less than 50X the LOQ so no qualifiers were needed.

**Field Duplicates.** All field duplicate results were within the QC limits.

**Quantification.** All results were acceptable as reported.

###### **4.3.1.2. Soils:**

Overall, the data for the 5 soil samples are of good quality and are usable as qualified.

**Holding Times/Sample Condition.** Technical holding time criteria were met for all samples. All samples were received in acceptable condition.

**Initial and Continuing Calibration.** The CCV and CCV recoveries were within the QC limits and no qualifiers were needed.

**Interference Check Samples.** The recoveries were within the QC limits and qualifiers were not added.

**Blanks.** A number of calibration blanks had contaminants present. All samples were nondetects for those compounds and no qualifiers were required.

**Matrix Spike/Matrix Spike Duplicates/Duplicate.** The MS/MSD recoveries were acceptable, no qualifiers were needed.

**Laboratory Control Sample (LCS).** No qualifiers were required since all LCS recoveries were within the QC limits.

**Serial Dilution.** The serial dilutions were less than 50X the LOQ so no qualifiers were needed.



**Field Duplicates.** All field duplicate results were within the QC limits except for Pb in samples 4250-STR-SD-001 and 4250-STR-SD-001FD (SDG 259578). Lead in those two samples was qualified as “J”.

**Quantification.** All results were acceptable as qualified.

#### **4.3.1.3 Composites**

Overall, the data for the 6 composite samples are of good quality and are usable as reported.

**Holding Times/Sample Condition.** Technical holding time criteria were met for all samples. All samples were received in acceptable condition.

**Initial and Continuing Calibration.** The CCV and CCV recoveries were within the QC limits and no qualifiers were needed.

**Interference Check Samples.** The recoveries were within the QC limits and qualifiers were not added.

**Blanks.** No contamination was noted in the associated method blanks, so no qualifiers were required.

**Matrix Spike/Matrix Spike Duplicates/Duplicate.** The MS/MSD recoveries were acceptable, no qualifiers were needed.

**Laboratory Control Sample (LCS).** No qualifiers were required since all LCS recoveries were within the QC limits.

**Serial Dilution.** The serial dilutions were less than 50X the LOQ so no qualifiers were needed.

**Field Duplicates.** All field duplicate results were within the QC limits.

**Quantification.** All results were acceptable as qualified.

#### **4.3.2 Metals (Ba,Cd,Pb,Zn,Hg) by SW846 6010B, 7470A**

##### **4.3.2.1. Surface Water:**

Overall, the data for the 10 surface water samples are of good quality and are usable as qualified.

**Holding Times/Sample Condition.** Technical holding time criteria were met for all samples. All samples were received in acceptable condition.

**Initial and Continuing Calibration.** The CCV and CCV recoveries were within the QC limits and no qualifiers were needed.

**Interference Check Samples.** The recoveries were within the QC limits and qualifiers were not added.

**Blanks.** Zinc was noted in the prep blank associated with (SDG 259054) at a level <LOQ. Sample 4250-RVII-SW-002 also had a result for Zn that was <LOQ and based on the prep blank the result was qualified as “U”.

**Matrix Spike/Matrix Spike Duplicates/Duplicate.** The MS/MSD recoveries were acceptable, no qualifiers were needed.

**Laboratory Control Sample (LCS).** No qualifiers were required since all LCS recoveries were within the QC limits.

**Serial Dilution.** The serial dilutions were less than 50X the LOQ so no qualifiers were needed.

**Field Duplicates.** Barium had a high RPD for the 4250-RIV-SW-001/4250-RIV-SW-001-002 field duplicate pair (SDG259044) and was qualified as “J” in those samples. Zinc had a high RPD for the 4250-RII-SW-001/4250-RII-SW-001FD field duplicate pair (SDG259578) and was qualified as “J” in those samples.

**Quantification.** All results were acceptable as qualified.

#### **4.3.2.2. Soils:**

Overall, the data for the 19 soil samples are of good quality and are usable as qualified.

**Holding Times/Sample Condition.** Technical holding time criteria were met for all samples. All samples were received in acceptable condition.

**Initial and Continuing Calibration.** The CCV and CCV recoveries were within the QC limits and no qualifiers were needed.

**Interference Check Samples.** The recoveries were within the QC limits and qualifiers were not added.

**Blanks.** No contamination was noted in the associated method blanks, so no qualifiers were required.

**Matrix Spike/Matrix Spike Duplicates/Duplicate.** The MS/MSD recoveries were acceptable, no qualifiers were needed.

**Laboratory Control Sample (LCS).** No qualifiers were required since all LCS recoveries were within the QC limits.

**Serial Dilution.** The serial dilutions were less than 50X the LOQ so no qualifiers were needed.

**Field Duplicates.** All field duplicate results were within the QC limits except for Pb in samples 4250-RIII-SD-001 and 4250-RIII-SD-001-002 (SDG 259442). Lead in those two samples was qualified as “J”. Barium and Pb had high RPDs for the 4250-RII-SD-001/4250-RII-SD-001FD field duplicate pair (SDG259578) and were qualified as “J” in those samples.

**Quantification.** All results were acceptable as qualified.

#### **4.3.2.3 Composites**

Overall, the data for the 23 composite samples are of good quality and are usable as reported.

**Holding Times/Sample Condition.** Technical holding time criteria were met for all samples. All samples were received in acceptable condition.

**Initial and Continuing Calibration.** The CCV and CCV recoveries were within the QC limits and no qualifiers were needed.

**Interference Check Samples.** The recoveries were within the QC limits and qualifiers were not added.

**Blanks.** A number of calibration blanks had contaminants present. All samples were nondetects for those compounds and no qualifiers were required.

**Matrix Spike/Matrix Spike Duplicates/Duplicate.** Zinc had high MS/MSD recoveries in SDG 259260. All sample results were nondetects so no qualifiers were required. In addition, Pb had a low MS recovery but the MSD and LCS recoveries were acceptable so no qualifiers were needed.

**Laboratory Control Sample (LCS).** No qualifiers were required since all LCS recoveries were within the QC limits.

**Serial Dilution.** The serial dilutions were less than 50X the LOQ so no qualifiers were needed.

**Field Duplicates.** All field duplicate results were within the QC limits.

**Quantification.** All results were acceptable as reported.

#### **4.3.3. Metals (Sb,Cu,Pb,Ba,Cd, Zn,Hg) by SW846 6010B, 7470A**

##### **4.3.3.1. Surface Water:**

Overall, the data for the eleven surface water samples are of good quality and are usable as reported.

**Holding Times/Sample Condition.** Technical holding time criteria were met for all samples. All samples were received in acceptable condition.

**Initial and Continuing Calibration.** The CCV and CCV recoveries were within the QC limits and no qualifiers were needed.

**Interference Check Samples.** The recoveries were within the QC limits and qualifiers were not added.

**Blanks.** No contamination was noted in the associated method blanks, so no qualifiers were required.

**Matrix Spike/Matrix Spike Duplicates/Duplicate.** The MS/MSD recoveries were acceptable, no qualifiers were needed.

**Laboratory Control Sample (LCS).** No qualifiers were required since all LCS recoveries were within the QC limits.

**Serial Dilution.** The serial dilutions were less than 50X the LOQ so no qualifiers were needed.

**Field Duplicates.** All field duplicate results were within the QC limits.

**Quantification.** All results were acceptable as reported.

##### **4.3.3.2. Soils:**

Overall, the data for the 9 soil samples are of good quality and are usable as reported.

**Holding Times/Sample Condition.** Technical holding time criteria were met for all samples. All samples were received in acceptable condition.

**Initial and Continuing Calibration.** The CCV and CCV recoveries were within the QC limits and no qualifiers were needed.

**Interference Check Samples.** The recoveries were within the QC limits and qualifiers were not added.

**Blanks.** No contamination was noted in the associated method blanks, so no qualifiers were required.

**Matrix Spike/Matrix Spike Duplicates/Duplicate.** The MS/MSD recoveries were acceptable, no qualifiers were needed.

**Laboratory Control Sample (LCS).** No qualifiers were required since all LCS recoveries were within the QC limits.

**Serial Dilution.** The serial dilutions were less than 50X the LOQ so no qualifiers were needed.

**Field Duplicates.** All field duplicate results were within the QC limits.

**Quantification.** All results were acceptable as reported.

#### **4.3.3.3. Composites**

Overall, the data for the 4 composite samples are of good quality and are usable as reported.

**Holding Times/Sample Condition.** Technical holding time criteria were met for all samples. All samples were received in acceptable condition.

**Initial and Continuing Calibration.** The CCV and CCV recoveries were within the QC limits and no qualifiers were needed.

**Interference Check Samples.** The recoveries were within the QC limits and qualifiers were not added.

**Blanks.** No contamination was noted in the associated method blanks, so no qualifiers were required.

**Matrix Spike/Matrix Spike Duplicates/Duplicate.** The MS/MSD recoveries were acceptable, no qualifiers were needed.

**Laboratory Control Sample (LCS).** No qualifiers were required since all LCS recoveries were within the QC limits.

**Serial Dilution.** The serial dilutions were less than 50X the LOQ so no qualifiers were needed.

**Field Duplicates.** All field duplicate results were within the QC limits.

**Quantification.** All results were acceptable as reported.

## **5.0 References**

EPA (U.S. Environmental Protection Agency), June 2008. OWSER 9240.1-48 *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA-540-R-08-01)*.

EPA (U.S. Environmental Protection Agency), October, 2004. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (EPA-540-R-04-004)*.

EPA (U.S. Environmental Protection Agency), January 2009. OSWER 9200-1-85. *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. (EPA-540/R-08-005)*.

Department of Defense, August 2007. *DoD Perchlorate Handbook*. The Department of Defense Environmental Data Quality Workgroup. Appendix G-Selecting Analytical Methods and Services.



## **DATA TABLES**



**TABLE B-1: MIS SURFACE SOIL (BACKGROUND)**

		Antimony 7440-36-0		Barium 7440-39-3		Cadmium 7440-43-9		Copper 7440-50-8		Lead 7439-92-1		Mercury 7439-97-6		Zinc 7440-66-6	
SampleNumber	Sample Date/Time	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
4250-BGMIS-001	8/26/2011 11:00	0.652	U	6.88		0.1980	U	0.552	J	1.96	J	0.00671	J	3.29	
4250-BGMIS-001	8/26/2011 11:35	0.620	U	7.48		0.0948	J	0.552	J	1.71	J	0.00774	J	3.19	
4250-BGMIS-001	8/26/2011 12:05	0.636	U	7.08		0.0971	J	0.422	J	1.25	J	0.00718	J	2.90	

J: Estimated Value; M: Manually integrated compound; U: Undetected at the Limit of Detection; UJ: Undetected, the Limit of Detection is Estimated

**TABLE B-2: SURFACE WATER (BACKGROUND)**

SampleNumber	Sample Date/Time	Antimony 7440-36-0		Barium 7440-39-3		Cadmium 7440-43-9		Copper 7440-50-8		Lead 7439-92-1		Mercury 7439-97-6		Zinc 7440-66-6	
		Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
4250-BGSW-001	8/13/2010 13:33	6	U	22.5		2	U	3.1	J	6.6	U	0.132	U	13.4	
4250-BGSW-002	8/13/2010 14:08	6	U	6.71		2	U	6	U	6.6	U	0.132	U	7.33	J
4250-BGSW-003	8/17/2010 10:00	6	U	20		2	U	6	U	6.6	U	0.132	U	6.6	U
4250-BGSW-004	8/23/2010 14:50	6	U	1.61	J	2	U	6	U	6.6	U	0.132	U	6.6	U
4250-BGSW-005	8/25/2010 16:25	6	U	6.76		2	U	6	U	6.6	U	0.132	U	17.8	
4250-BGSW-006	8/25/2010 11:10	6	U	4.95	J	2	U	6	U	6.6	U	0.132	U	6.1	J
4250-BGSW-007	8/25/2010 13:55	6	U	8.38		2	U	6	U	6.6	U	0.132	U	6.6	U
4250-BGSW-008	8/26/2010 12:30	6	U	15.2		2	U	6	U	6.6	U	0.132	U	4.68	J
4250-BGSW-009	8/26/2010 13:00	6	U	18		2	U	6	U	6.6	U	0.132	U	3.39	J
4250-BGSW-010	8/26/2010 14:00	6	U	29.2		2	U	265		6.6	U	0.132	U	17.7	

J: Estimated Value; M: Manually integrated compound; U: Undetected at the Limit of Detection; UJ: Undetected, the Limit of Detection is Estimated

**TABLE B-3: SEDIMENT (BACKGROUND)**

SampleNumber	Sample Date/Time	Antimony 7440-36-0		Barium 7440-39-3		Cadmium 7440-43-9		Copper 7440-50-8		Lead 7439-92-1		Mercury 7439-97-6		Zinc 7440-66-6	
		Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
4250-BGSD-001	8/13/2010 13:35	4.75	U	8.73		1.44	U	4.32	U	5.18	J	0.0627	U	4.75	U
4250-BGSD-002	8/13/2010 14:10	0.864	U	1.14		0.262	U	0.785	U	1.99		0.0107	U	0.864	U
4250-BGSD-003	8/17/2010 10:10	3.68	U	26.4		1.12	U	5.85		14.9		0.0325	J	18.7	J
4250-BGSD-004	8/23/2010 14:55	0.815	U	0.247	U	0.247	U	0.741	U	0.618	U	0.00938	U	0.815	U
4250-BGSD-005	8/25/2010 16:35	0.824	U	7.25		0.25	U	0.749	U	3.76		0.0208		2.71	
4250-BGSD-006	8/25/2010 11:15	0.825	U	2.46		0.25	U	0.907	J	1.47		0.0116	J	1.58	
4250-BGSD-007	8/25/2010 14:05	2.03	U	9.09		0.615	U	1.85	U	6.11		0.048		3.46	
4250-BGSD-008	8/26/2010 12:35	0.92	U	12.4		0.279	U	0.819	J	5		0.0443		2.24	
4250-BGSD-009	8/26/2010 13:05	1.92	U	19.1		0.582	U	7.95		11.4		0.0637		28.3	
4250-BGSD-010	8/26/2010 14:08	0.818	U	2.91		0.248		3.03		1.86	U	0.0161		1.76	

J: Estimated Value; M: Manually integrated compound; U: Undetected at the Limit of Detection; UJ: Undetected, the Limit of Detection is Estimated





**TABLE B-5: SURFACE WATER (EXPLOSIVES)**

SampleNumber	Sample Date/Time	1,3,5-Trinitrobenzene 99-35-4		1,3-Dinitrobenzene 99-65-0		2-Nitrotoluene 88-72-2		2,4,6-Trinitrotoluene 118-96-7		2,4-Dinitrotoluene 121-14-2		2,6-Dinitrotoluene 606-20-2		2-Amino-4,6-dinitrotoluene 35572-78-2		3-Nitrotoluene 99-08-1		4-Nitrotoluene 99-99-0		4-Amino-2,6-dinitrotoluene 19406-51-0		Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) 2691-41-0		Nitrobenzene 98-95-3		Nitroglycerin 55-63-0		Pentaerythritol Tetranitrate (PETN) 78-11-5		Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX) 121-82-4		Methyl-2,4,6-Trinitrophenylamine (Tetryl) 479-45-8	
		Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
<b>Range III</b>																																	
4250-RIII-SW-002	8/26/2010 9:05	0.156	U	0.130	U	0.260	U	0.130	U	0.156	U	0.130	U	0.130	U	0.260	U	0.338	U	0.130	U	0.169	U	0.130	U	0.519	UJ	1.04	U	0.130	U	0.325	U
<b>Range II</b>																																	
4250-RII-SW-001	8/24/2010 11:20	0.156	U	0.130	U	0.260	U	0.130	U	0.156	U	0.130	U	0.130	U	0.260	U	0.338	U	0.130	U	0.169	U	0.130	U	0.519	UJ	1.04	U	0.130	U	0.325	UJ
<b>Range IV</b>																																	
4250-RIV-SW-001	8/16/2010 9:45	0.156	U	0.130	U	0.260	U	0.130	U	0.156	U	0.130	U	0.130	U	0.260	U	0.338	U	0.130	U	0.169	U	0.130	U	0.519	UJ	1.04	U	0.130	U	0.325	U
4250-RIV-SW-002	8/16/2010 13:12	0.156	U	0.130	U	0.260	U	0.130	U	0.156	U	0.130	U	0.130	U	0.260	U	0.338	U	0.130	U	0.169	U	0.130	U	0.519	UJ	1.04	U	0.130	U	0.325	U
<b>Range VII</b>																																	
4250-RVII-SW-001	8/17/2010 10:30	0.169	UJ	0.141	UJ	0.282	UJ	0.141	UJ	0.169	UJ	0.141	UJ	0.141	UJ	0.282	UJ	0.366	UJ	0.141	UJ	0.183	UJ	0.141	UJ	0.563	UJ	1.13	UJ	0.141	UJ	0.352	UJ
4250-RVII-SW-002	8/17/2010 11:00	0.156	U	0.130	U	0.260	U	0.130	U	0.156	U	0.130	U	0.130	U	0.260	U	0.338	U	0.130	U	0.169	UJ	0.130	U	0.519	UJ	1.04	UJ	0.130	U	0.325	U
<b>Range XX</b>																																	
4250-RXX-SW-001	8/25/2010 10:26	0.156	UJ	0.130	UJ	0.260	UJ	0.130	UJ	0.156	UJ	0.130	UJ	0.130	UJ	0.260	UJ	0.338	UJ	0.130	UJ	0.169	UJ	0.130	UJ	0.519	UJ	1.04	UJ	0.130	UJ	0.325	UJ
<b>Stafing Range</b>																																	
4250-STR-SW-001	8/24/2010 15:32	0.162	U	0.135	U	0.270	U	0.135	U	0.162	U	0.135	U	0.135	U	0.270	U	0.351	U	0.135	U	0.176	U	0.135	U	0.541	UJ	1.08	U	0.135	U	0.338	UJ
<b>Turret Range 1</b>																																	
4250-TR1-SW-001	8/25/2010 13:30	0.156	UJ	0.130	UJ	0.260	UJ	0.130	UJ	0.156	UJ	0.130	UJ	0.130	UJ	0.260	UJ	0.338	UJ	0.130	UJ	0.169	UJ	0.130	UJ	0.519	UJ	1.04	UJ	0.130	UJ	0.325	UJ
<b>Turret Range 2</b>																																	
4250-TR2-SW-001	8/23/2010 14:00	0.156	U	0.130	U	0.260	U	0.130	U	0.156	U	0.130	U	0.130	U	0.260	U	0.338	U	0.130	U	0.169	U	0.130	U	0.519	UJ	1.04	U	0.130	U	0.325	U

J: Estimated Value; M: Manually integrated compound; U: Undetected at the Limit of Detection; UJ: Undetected, the Limit of Detection is Estimated

**TABLE B-6: SEDIMENT (EXPLOSIVES)**

Sample Number	Sample Date/Time	1,3,5-Trinitrobenzene 99-35-4		1,3-Dinitrobenzene 99-65-0		2-Nitrotoluene 88-72-2		2,4,6-Trinitrotoluene 118-96-7		2,4-Dinitrotoluene 121-14-2		2,6-Dinitrotoluene 606-20-2		2-Amino-4,6-dinitrotoluene 35572-78-2		3-Nitrotoluene 99-08-1		4-Nitrotoluene 99-99-0		4-Amino-2,6-dinitrotoluene 19406-51-0		Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) 2691-41-0		Nitrobenzene 98-95-3		Nitroglycerin 55-63-0		Pentaerythritol Tetramitate (PETN) 78-11-5		Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX) 121-82-4		Methyl-2,4,6-Trinitrophenylnitramine (Tetryl) 479-45-8	
		Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
<b>Range III</b>																																	
4250-RIII-SD-002	8/26/2010 9:15	0.2	U	0.3	U	0.2	U	0.2	UJ	0.2	U	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.3	UJ	0.3	U	0.5	U	1.46	U	0.2	U	0.2	U
<b>Range II</b>																																	
4250-RII-SD-001	8/24/2010 11:33	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.3	U	0.3	U	0.5	U	1.46	U	0.2	U	0.2	U
<b>Range IV</b>																																	
4250-RIV-SD-001	8/16/2010 10:40	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.3	U	0.3	U	0.5	UJ	1.46	U	0.2	U	0.2	U
4250-RIV-SD-002	8/16/2010 13:12	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.3	U	0.3	U	0.5	UJ	1.46	U	0.2	U	0.2	U
<b>Range VII</b>																																	
4250-RVII-SD-001	8/17/2010 10:43	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.3	U	0.3	U	0.5	UJ	1.46	U	0.2	U	0.2	U
4250-RVII-SD-002	8/17/2010 11:07	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.3	U	0.3	U	0.5	UJ	1.46	U	0.2	U	0.2	U
<b>Range XX</b>																																	
4250-RXX-SD-001	8/25/2010 10:54	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.3	U	0.3	U	0.5	U	1.46	U	0.2	U	0.2	U
<b>Stafing Range</b>																																	
4250-STR-SD-001	8/24/2010 15:47	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.3	U	0.3	U	0.5	U	1.46	U	0.2	U	0.2	U
<b>Turret Range 1</b>																																	
4250-TR1-SD-001	8/25/2010 13:39	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.3	U	0.3	U	0.5	U	1.46	U	0.2	U	0.2	U
<b>Turret Range 2</b>																																	
4250-TR2-SD-001	8/23/2010 14:15	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.2	U	0.3	U	0.2	U	0.2	U	0.2	U	0.3	UJ	0.3	U	0.5	U	1.46	U	0.2	U	0.2	U

J: Estimated Value; M: Manually integrated compound; U: Undetected at the Limit of Detection; UJ: Undetected, the Limit of Detection is Estimated

TABLE B-7: MIS SURFACE SOIL (METALS)															
SampleNumber	Sample Date/Time	Antimony 7440-36-0		Barium 7440-39-3		Cadmium 7440-43-9		Copper 7440-50-8		Lead 7439-92-1		Mercury 7439-97-6		Zinc 7440-66-6	
		Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
<b>Range III</b>															
4250-RIII-MIS-002	8/26/2010 8:00	N/A		11.2		0.195	U	N/A		4.31		0.0131		1.31	
4250-RIII-MIS-002a	8/26/2010 8:34	N/A		11.7		0.192	U	N/A		4.9		0.0146		1.36	
4250-RIII-MIS-002b	8/26/2010 8:46	N/A		16		0.194	U	N/A		5.88		0.0158		1.65	
<b>Range II</b>															
4250-RII-MIS-001	8/24/2010 9:00	N/A		7.17		0.198	U	N/A		4		0.0284	U	3.31	
4250-RII-MIS-001a	8/24/2010 9:45	N/A		8.88		0.2	U	N/A		4.88		0.0252		3.46	
4250-RII-MIS-001b	8/24/2010 10:30	N/A		5.8		0.189	U	N/A		3.51		0.0206		2.1	
<b>Range IV</b>															
4250-RIV-MIS-001	8/20/2010 8:00	N/A		1.89		0.19	U	N/A		1.99		0.0057	J	0.856	J
4250-RIV-MIS-001a	8/20/2010 8:45	N/A		1.34		0.188	U	N/A		1.51		0.00438	J	0.522	J
4250-RIV-MIS-001b	8/20/2010 9:30	N/A		2.16		0.197	U	N/A		1.96		0.00789	U	0.62	J
4250-RIV-MIS-002	8/20/2010 10:30	N/A		1.99		0.18	U	N/A		2.64		0.0167		1.93	
4250-RIV-MIS-002a	8/20/2010 11:15	N/A		2.61		0.197	U	N/A		3.11		0.00541	J	2.36	
4250-RIV-MIS-002b	8/20/2010 12:00	N/A		2.71		0.189	U	N/A		3.32		0.00404	J	2.32	
<b>Range VII</b>															
4250-RVII-MIS-001	8/18/2010 12:00	N/A		14.3		0.2	U	N/A		6.46		0.0502		13.7	
4250-RVII-MIS-001a	8/18/2010 12:45	N/A		8.63		0.195	U	N/A		5.65		0.0491		4.58	
4250-RVII-MIS-001b	8/18/2010 13:30	N/A		15.7		0.199	U	N/A		10.8		0.0488		6.54	
4250-RVII-MIS-002	8/19/2010 10:00	N/A		18.1		0.199	U	N/A		11.3		0.0181		3.69	
4250-RVII-MIS-002a	8/19/2010 10:45	N/A		14.6		0.199	U	N/A		10.2		0.0207		4.86	
4250-RVII-MIS-002b	8/19/2010 11:30	N/A		14.3		0.195	U	N/A		7.75		0.0204		5.81	
<b>Range XX</b>															
4250-RXX-MIS-001	8/25/2010 8:00	N/A		4.83		0.188	U	N/A		3.45		0.019		5.97	
4250-RXX-MIS-001a	8/25/2010 8:45	N/A		4.46		0.18	U	N/A		2.74		0.0183		5.65	
4250-RXX-MIS-001b	8/25/2010 9:30	N/A		4.22		0.196	U	N/A		2.65		0.0185		5.39	
<b>Staffing Range</b>															
4250-STR-MIS-001	8/24/2010 13:30	2.2		N/A		N/A		4.74		7.08		N/A		N/A	
4250-STR-MIS-001a	8/24/2010 14:15	1.19		N/A		N/A		5.45		11.6		N/A		N/A	
4250-STR-MIS-001b	8/24/2010 15:00	1.32		N/A		N/A		9.1		20.9		N/A		N/A	
<b>Turret Range 1</b>															
4250-TR1-MIS-001	8/25/2010 11:25	0.353	J	N/A		N/A		2.87		3.58		N/A		N/A	
4250-TR1-MIS-001a	8/25/2010 12:05	0.356	J	N/A		N/A		0.7	J	3.09		N/A		N/A	
4250-TR1-MIS-001b	8/25/2010 12:45	0.657	U	N/A		N/A		0.417	J	2.38		N/A		N/A	
<b>Turret Range 2</b>															
4250-TR2-MIS-001	8/23/2010 11:10	0.655	U	N/A		N/A		0.653	J	1.5		N/A		N/A	
4250-TR2-MIS-001a	8/23/2010 12:00	0.629	U	N/A		N/A		0.488	J	1.39		N/A		N/A	
4250-TR2-MIS-001b	8/23/2010 12:45	0.647	U	N/A		N/A		0.588	U	1.29		N/A		N/A	

J: Estimated Value; M: Manually integrated compound; U: Undetected at the Limit of Detection; UJ: Undetected, the Limit of Detection is Estimated

**TABLE B-8: SURFACE WATER (METALS)**

		Antimony 7440-36-0		Barium 7440-39-3		Cadmium 7440-43-9		Copper 7440-50-8		Lead 7439-92-1		Mercury 7439-97-6		Zinc 7440-66-6	
SampleNumber	Sample Date/Time	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
<b>Range III</b>															
4250-RIII-SW-002	8/26/2010 9:05	N/A		5.86		2	U	N/A		6.6	U	0.132	U	5.69	J
<b>Range II</b>															
4250-RII-SW-001	8/24/2010 11:20	N/A		9.35		2	U	N/A		6.6	U	0.132	U	7.02	J
<b>Range IV</b>															
4250-RIV-SW-001	8/16/2010 9:45	N/A		2.57	J	2	U	N/A		6.6	U	0.132	U	6.6	U
4250-RIV-SW-002	8/16/2010 13:12	N/A		2.12	J	2	U	N/A		6.6	U	0.132	U	6.6	U
<b>Range VII</b>															
4250-RVII-SW-001	8/17/2010 10:30	N/A		33.2		2	U	N/A		6.6	U	0.132	U	6.6	U
4250-RVII-SW-002	8/17/2010 11:00	N/A		8.8		2	U	N/A		6.6	U	0.132	U	6.8	J
<b>Range XX</b>															
4250-RXX-SW-001	8/25/2010 10:20	N/A		6.49		2	U	N/A		6.6	U	0.132	U	37.7	
<b>Stafing Range</b>															
4250-STR-SW-001	8/24/2010 15:32	6	U	N/A		N/A		6	U	6.6	U	N/A		N/A	
<b>Turret Range 1</b>															
4250-TR1-SW-001	8/25/2010 13:30	6	U	N/A		N/A		6	U	6.6	U	N/A		N/A	
<b>Turret Range 2</b>															
4250-TR2-SW-001	8/23/2010 14:00	6	U	N/A		N/A		6	U	6.6	U	N/A		N/A	

J: Estimated Value; M: Manually integrated compound; U: Undetected at the Limit of Detection; UJ: Undetected, the Limit of Detection is Estimated

**TABLE B-9: SEDIMENT (METALS)**

		Antimony 7440-36-0		Barium 7440-39-3		Cadmium 7440-43-9		Copper 7440-50-8		Lead 7439-92-1		Mercury 7439-97-6		Zinc 7440-66-6	
SampleNumber	Sample Date/Time	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
<b>Range III</b>															
4250-RIII-SD-002	8/26/2010 9:15	N/A		1.4		0.231	U	N/A		1.45		0.0105	U	0.761	U
<b>Range II</b>															
4250-RII-SD-001	8/24/2010 11:33	N/A		2.56	J	0.367		N/A		1.95	J	0.0146	U	4.51	
<b>Range IV</b>															
4250-RIV-SD-001	8/16/2010 10:40	N/A		3.18		0.277	U	N/A		2.27		0.0148	J	2.08	
4250-RIV-SD-002	8/16/2010 13:32	N/A		0.807		0.248	U	N/A		0.857	J	0.01	U	0.817	U
<b>Range VII</b>															
4250-RVII-SD-001	8/17/2010 10:37	N/A		20.1		0.192	J	N/A		11.7		0.027		5.75	
4250-RVII-SD-002	8/17/2010 11:07	N/A		18.1		0.171	J	N/A		11.2		0.0181		16.1	
<b>Range XX</b>															
4250-RXX-SD-001	8/25/2010 10:39	N/A		4.99		0.259	U	N/A		10.2		0.0177		12.4	
<b>Stafing Range</b>															
4250-STR-SD-001	8/24/2010 15:47	1.02	U	N/A		N/A		0.926	U	7.57	J	N/A		N/A	
<b>Turret Range 1</b>															
4250-TR1-SD-001	8/25/2010 13:55	0.899	U	N/A		N/A		0.817	U	4		N/A		N/A	
<b>Turret Range 2</b>															
4250-TR2-SD-001	8/23/2010 14:15	0.821	U	N/A		N/A		0.747	U	0.622	U	N/A		N/A	

J: Estimated Value; M: Manually integrated compound; U: Undetected at the Limit of Detection; UJ: Undetected, the Limit of Detection is Estimated



<b>TABLE B-10: SURFACE WATER (PERCHLORATE)</b>			
		<b>Perchlorate 14797-73-0</b>	
<b>SampleNumber</b>	<b>Sample Date/Time</b>	<b>Result</b>	<b>Qual</b>
<i><b>Range III</b></i>			
4250-RIII-SW-002	8/26/2010 9:05	0.1	U
<i><b>Range II</b></i>			
4250-RII-SW-001	8/24/2010 11:20	0.1	U
<i><b>Range IV</b></i>			
4250-RIV-SW-001	8/16/2010 9:45	0.466	
4250-RIV-SW-002	8/16/2010 13:12	0.1	U
<i><b>Range VII</b></i>			
4250-RVII-SW-001	8/17/2010 10:30	0.1	U
4250-RVII-SW-002	8/17/2010 11:00	0.0512	J
<i><b>Range XX</b></i>			
4250-RXX-SW-001	8/25/2010 10:20	0.1	U
<i><b>Staffing Range</b></i>			
4250-STR-SW-001	2/15/2011 12:34	0.1	U
<i><b>Turret Range 1</b></i>			
4250-TR1-SW-001	2/15/2011 11:45	0.1	U
<i><b>Turret Range 2</b></i>			
4250-TR2-SW-001	8/23/2010 14:00	0.1	U
J: Estimated Value; M: Manually integrated compound; U: Undetected at the Limit of Detection; UJ: Undetected, the Limit of Detection is Estimated			



<b>TABLE B-11: SEDIMENT (PERCHLORATE)</b>			
		<b>Perchlorate 14797-73-0</b>	
<b>SampleNumber</b>	<b>Sample Date/Time</b>	<b>Result</b>	<b>Qual</b>
<i><b>Range III</b></i>			
4250-RIII-SD-002	8/26/2010 9:15	0.00134	U
<i><b>Range II</b></i>			
4250-RII-SD-001	8/24/2010 11:33	0.00188	U
<i><b>Range IV</b></i>			
4250-RIV-SD-001	8/16/2010 10:40	0.00146	U
4250-RIV-SD-002	8/16/2010 13:32	0.00131	U
<i><b>Range VII</b></i>			
4250-RVII-SD-001	8/17/2010 10:37	0.00162	U
4250-RVII-SD-002	8/17/2010 11:07	0.00174	U
<i><b>Range XX</b></i>			
4250-RXX-SD-001	8/25/2010 10:39	0.00133	U
<i><b>Stafing Range</b></i>			
4250-STR-SD-001	2/15/2011 12:38	0.00139	U
<i><b>Turret Range 1</b></i>			
4250-TR1-SD-001	2/15/2011 11:50	0.00147	U
<i><b>Turret Range 2</b></i>			
4250-TR2-SD-001	8/23/2010 14:15	0.00132	U
J: Estimated Value; M: Manually integrated compound; U: Undetected at the Limit of Detection; UJ: Undetected, the Limit of Detection is Estimated			





**ELECTRONIC DATA DELIVERABLE (EDD)**

The EDD can be found on the disk at the beginning of this report.



## **STUDENT'S T UCL SPREADSHEETS**

These spreadsheets can be found on the disk at the beginning of this report.

# **APPENDIX C**

## **INSTITUTIONAL ANALYSIS AND INSTITUTIONAL ANALYSIS REPORT**

for the

### **Remedial Investigation (RI) Former Conway Bombing and Gunnery Range (BGR) Horry County, South Carolina**

Prepared for:



U.S. Army Engineering and Support Center  
Attn: CEHNC-OE-DC (Ms. Chris Cochrane)  
4820 University Square  
Huntsville, Alabama 35816-1822

U.S. Army Corps of Engineers, Charleston District  
Attn: Mr. Shawn Boone  
69A Hagood Avenue  
Charleston, South Carolina 29403-0919

**Contract No. W912DY-04-D-0018**  
**Task Order: 0012**  
**Project No. I04SC002501**

Prepared by:



EOD Technology, Inc.  
2229 Old Highway 95  
Lenoir City, Tennessee 37771

**July 2012**

**TABLE C-1: INSTITUTIONAL ANALYSIS**

Agencies	Horry County						Private
	USACE	US EPA	SCDHEC	District Schools	Assessor's Office	Planning Department	Myrtle Beach National Company
Origin of Institution	USACE was established in 1775 under the Continental Congress for military and civil works missions	The US EPA was established in 1970 by the White House and Congress to protect human health and the environment	State of South Carolina	State of South Carolina Education Agency	Local Government	Local Government	Private Business
Basis of Authority	Defense Environmental Restoration Program (DERP) [USC.Section 270 et seq] Executive Order 12580	CERLA CFR, Title 40: "Protection of the Environment," Chapter I, Parts 1-799 --Environmental Protection Agency	Title 44 Health Chapter 56 SC Hazardous Waste Management Act Article 1 General Provisions and Chapter 61 Department of Health and Environmental Control Statutory Authority: 1976 Code Sections 1-23-10, 1-23-110, 1-23-120(D), 6-19-40, 13-7-10, 13-7-40, 13-7-45 et seq., 13-7-110 et seq., 20-1-350, 20-3-230, 38-25-20, 39-23-40, 40-25-30(9), 44-1-20, 44-1-140, 44-5-120, 44-7-130, 44-7-250, 44-7-260(A), 44-7-430, 44-7-500 through 44-7-590, 44-29-40, 44-41-70(b), 44-53-280(a), 44-53-950, 44-55-10 to 44-55-60, 44-56-30, 44-61-30, 44-63-20, 44-69-10 et seq., 44-87-10, 44-96-80, 44-96-290, 44-96-300, 44-96-320, 44-96-340, 44-96-360, 44-96-380, 44-96-400, 44-96-450, 44-96-460, 48-1-10 et seq., 48-1-30 through 48-1-60 et seq., 48-2-10, 59-111-580)	Horry County District operates the public schools in Horry County.	State Law	State and Local law	Limited to its own facilities.
Authority Limits	Implementing response actions for release of hazardous substances from each facility that is, or was under the jurisdiction of the US DoD in accordance with DERP and consistent with the CERLA	Protection of human health and the environment	Within the entire state	Within the school districts.	Taxing power	Making laws, rules and policy.	Limited to its own facilities.
How Much Control is Exercised?	USACE has minimal control relative to implementing, maintaining, monitoring, or enforcing institutional controls on privately owned property	Control is a function of the Administrative Orders issued	State Equivalent of EPA	Not Applicable	Control over existing code regulations.	Not Applicable	Not Applicable
Enforcement Authority	Not related to institutional controls	Yes, under four Administrative Orders issued by EPA to the National Guard Bureau and South Carolina Army National Guard	Administers EPA RCRA/non-RCRA programs in South Carolina. Enforcement arm can issue binding orders/judgments	Make policies, taxing power, purchase property, condemn lands, make contracts, and sell bonds	Purchase property and make contracts.	Make laws, rules and policies.	Limited to its own facilities.
Sunset Provisions	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Geographic Jurisdiction	USACE is organized geographically into 8 divisions in the U.S. and 41 subordinate districts throughout the U.S., Asia, and Europe. The districts oversee project offices throughout the world. Divisions and districts are defined by watershed boundaries, not by states. The Five Points OLF falls within the jurisdiction of Fort Worth District of the USACE.	EPA Region 4 with oversight jurisdiction. South Carolina State Program Unit in EPA's office leads and supports environment under existing environmental laws.	State of South Carolina	Within the school districts.	Within Horry County	Within Horry County	Limited to its own facilities.
Public Safety Function	Mission statement of the OE Mandatory Center Expertise (MCX) and design Center "to safely eliminate or reduce risks from ordnance, explosives, and recovered chemical warfare materiel at current or FUDS."	EPA regulates other federal agencies, state, and local governments and Indian tribes. It develops and enforces regulations to protect human health and environment under existing environmental laws.	Not Applicable. Site Inspectors and Emergency Response capability only.	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Land Use Controls	Not an agency mission for private property, although they can perform real estate services for the military and civil works activities of the Army and Air Force, and other federal agencies as requested.	Provides regulatory oversight of the cleanup of ordnance and explosives (OE)	Not Applicable	Limited to its own facilities.	Assess all real proerty in county for ad valorem taxes.	The development masterplan was in a state of active rezoning, permitting, and construction, it was essential that Horry County Planning and Zoning officials revise the county comprehensive plan and zoning to reflect knowledge associated with the bombing range target, safety and surrounding zones.	Limited to its own facilities.
Financial Capability	DERA for environmental restoration activities at non-NPL sites, such as Five Points OLF. DSMOA to fund states in identifying, prioritizing, investigating, and remediating FUDS in their states.	DERA for environmental restoration activities at non-National Priorities List (NPL) sites, such as Five Points OLF.	Yes, funded for project	No	No	No	No
Mission	USACE is a major Army command that provides engineering, design, and construction management services to FUDS	To protect human health and the environment by administering federal laws and regulations	"We promote and protect the health of the public and the environment."	"To ensure that every student is fully prepared to be a successful contributor in a rapidly changing global society by aggressively pursuing personalized, achievement-based, student-centered teaching and learning."	"Providing a community environment in which citizens and visitors of Horry County can enjoy the highest quality of life."	"Providing a community environment in which citizens and visitors of Horry County can enjoy the highest quality of life."	Not Applicable
Desire to participate in Institutional Control Program	USACE has the resolve to implement institutional controls as evidenced by this Engineering Evaluation/ Cost Analysis (EE/CA) and related activities.	The US EPA has delegated it oversight authority to the SCDHEC.	Yes, committed to partnering with all participating agencies.	Participation would require approval of printed materials by the Horry County Curriculum Office and Legal Department.	The department is supportive of proposed institutional controls, and would be willing to include Fact Sheets with tax bills, if funding available.	The department is willing to implement a new planning, zoning land use and public outreach plan.	Confirmed their interest and involvement in assisting with any alternatives agreed upon.
Constraints to Institutional Effectiveness	Has responsibility, but not local authority, for implementing, maintaining, monitoring and enforcing institutional controls.	Has responsibility, but not local authority, for implementing, maintaining, monitoring and enforcing institutional controls at Conway Bombing and Gunnery Range.	Has authority to enforce applicable laws, regulations, and standards, and to seek injunctive relief.	Participation would require approval of printed materials by the Horry County Curriculum Office and Legal Department.	Participation would require approval of printed materials by the Horry County Office and Legal Department.	Participation would require approval of printed materials by the Horry County Office and Legal Department.	Constrained to their own facility.
Ability to Partner with other Agencies			Yes, committed to partnering with all participating agencies. Funding for implementing Federal actions will come through a DSMOA arrangement.	Yes	Yes, all public agencies.	Yes, all public agencies.	Yes
Point of Contact			Susan Byrd	Joe Burch	Rendel Mincey	Janet Carter	Thomas Hale
				Coordinator of Planning	Tax Assessor	Director of Planning	President

# **APPENDIX D**

## **DECLARATION OF RESTRICTIVE COVENANTS**

for the

### **Remedial Investigation (RI) Former Conway Bombing and Gunnery Range (BGR) Horry County, South Carolina**

Prepared for:



U.S. Army Engineering and Support Center  
Attn: CEHNC-OE-DC (Ms. Chris Cochrane)  
4820 University Square  
Huntsville, Alabama 35816-1822

U.S. Army Corps of Engineers, Charleston District  
Attn: Mr. Shawn Boone  
69A Hagood Avenue  
Charleston, South Carolina 29403-0919

**Contract No. W912DY-04-D-0018**  
**Task Order: 0012**  
**Project No. I04SC002501**

Prepared by:



EOD Technology, Inc.  
2229 Old Highway 95  
Lenoir City, Tennessee 37771

**July 2012**

FILED  
HORRY COUNTY

97 JUL -1 PM 3:48

STATE OF SOUTH CAROLINA  
COUNTY OF HORRY

R.M.C.

DECLARATION OF RESTRICTIVE  
COVENANTS

THIS DECLARATION OF RESTRICTIVE COVENANTS is made this the  
.27th day of June, 1997, by International Paper Realty  
Corporation, a Delaware corporation, hereinafter referred to as the  
"Declarant".

RECITALS

WHEREAS, Declarant is the owner of certain real property  
located in Horry County, South Carolina, more particularly  
described as:

All that piece, parcel or tract of land, consisting of  
approximately 420.747 acres ±, in the County of Horry, State of  
south Carolina, and more particularly described and delineated as  
the "Open Space - Animal Corridor (Socastee Swamp)"; the "200'  
Corridor"; and the "35' Buffer Easement"; on a survey entitled  
"Survey of Animal Corridor, Carolina Forest" dated the 14th day of  
March, 1997, and prepared for International Paper Realty  
Corporation by Survey Technology, Inc., and recorded on the 1st.  
day of July, 1997, in Plat Book 148 at Page 219, in the  
Office of the RMC for Horry County, and which is by reference  
incorporated herein as part of this description.

HORRY COUNTY ASSESSOR  
NEW PARCEL 163-00-01-065  
SPLIT FROM 164-00-01-001  
Map Blk Parcel

and hereinafter referred to as the "Property", and,

WHEREAS, in consideration of the issuance of the Department of  
the Army Permit Number 96-1X-341, dated March 31, 1997, hereinafter  
called the "Permit" to the Declarant by the U. S. Army Corps of  
Engineers, Charleston District, hereinafter referred to as the  
"Corps" (including any successor agency to said Corps), and the  
Certification issued by the South Carolina Department of Health and  
Environmental Control, Division of Water Quality, Bureau of Water  
and Coastal Resource Management ("DHEC" to include any successor  
agency) issued by letter dated March 6, 1997, referencing P/N 96-  
1X-341-C (the "Certification"), and for the protection or  
enhancement of the Property's wetlands, scenic, conservation,  
resource, environmental, or other values, and for other good and  
valuable consideration, the receipt and sufficiency of which is  
hereby acknowledged, Declarant has agreed to place certain  
restrictive covenants on the Property, in order that the Property  
shall remain substantially in its natural condition forever, as  
provided herein.

158-00-01-005

BOOK 1955 PAGE 029

NOW THEREFORE, Declarant hereby declares that the Property shall be held, transferred, conveyed, leased, occupied or otherwise disposed of and used subject to the following restrictive covenants, which shall run with the land and be binding on all of Declarant's heirs, successors, assigns, lessees, or other occupiers and users:

1. Declarant (including all heirs, successors, assigns, lessees, or other occupiers and users of Declarant) is and shall be prohibited from the following: filling, draining, flooding, dredging, impounding, clearing, burning, cutting, or destroying vegetation; cultivating, excavating, erecting, constructing, or otherwise doing any work on the Property; introducing exotic species into the Property; and from changing the grade or elevation, impairing the flow or circulation of waters, reducing the reach of waters, and any other discharge or activity requiring a permit under clean water or water pollution control laws and regulations, as amended. No hunting, trapping, or other endeavor engaged in for the killing, pursuit, or capture of animals, (excluding fishing and extraordinary animal control measures taken under authority of the State, County, or Federal Governments, for the protection, welfare, and safety of the public), shall be conducted on the property.

The following are expressly excepted from this paragraph:

(a) construction, maintenance and use of stormwater management swales and drainage pipes and ditches to outfall stormwater to the "Open Space - Animal Corridor (Socastee Swamp)" through the "35' Buffer Easement" as described on the survey referenced above. The specific areas for construction in the "35' Buffer Easement" cannot be identified at the present time; and

(b) cumulatively very small impacts associated with fishing, and similar recreational activities, consistent with the continuing natural condition of the Property.

2. After recording, these restrictive covenants may be altered by modification of the Permit pursuant to applicable Corps regulations and policy, provided all agencies that certified the Permit concur with the modification, and subject to consultation with other resource agencies as appropriate. Such modifications become a part of these restrictive covenants. Declarant may request to exchange or trade property in entirety that is not encumbered by conservation easements or covenants for the Property herein, provided such substitute property is of equivalent functions and values as the Property herein, and is placed under equivalent conservation restrictions.

3. Any permit application, or request for certification or modification, which may affect the Property, made to any governmental entity with authority over wetlands or other waters of the United States, shall expressly reference and include a copy of these covenants.

4. - It is expressly understood and agreed that these restrictive covenants do not grant or convey to members of the general public any rights of ownership, entry, or use of the Property. These restrictive covenants are created solely for the protection of the Property, wetlands, and associated values, and Declarant reserves the ownership of the fee simple estate and all rights appertaining thereto, including without limitation the rights to exclude others and to use the Property for all purposes not consistent with these restrictive covenants.

5. The Corps, DHEC, and their authorized agents shall have the right to enter and go upon the lands of the Declarant to inspect the Property and take actions necessary to verify compliance with these restrictive covenants.

6. The Declarant grants to the Corps, the U. S. Department of Justice, and/or DHEC, a discretionary right to enforce these restrictive covenants in a judicial action against any person or other entity violating or attempting to violate these restrictive covenants; provided, however, that no violation of these restrictive covenants shall result in a forfeiture or reversion of title. In any enforcement action, an enforcing agency shall be entitled to a complete restoration for any violation, as well as any other judicial remedy. An enforcing agency shall also be entitled to costs and attorney fees in any enforcement action in which it obtains relief. Nothing herein shall limit the right of the Corps to modify, suspend, or revoke the Permit.

7. Declarant shall include the following warning on all deeds, mortgages, plats, or any other legal instruments used to convey any interest in the Property:

**WARNING:** this Property Subject to Declaration of Restrictive Covenants Recorded in Deed Book 1955 at Page 29, in the RMC for Horry County.



8. The perimeter of the Property shall at all times be plainly marked by permanent signs saying, "Protected Natural Area", or by an equivalent, permanent marking system.

9. A plat depicting the boundaries of the Property subject to these restrictive covenants shall be recorded in the RMC Office or Clerk of Court Office for each county in which the Property is situated prior to the recording of these restrictive covenants. The Plat is recorded on the 1st day of July, 1997, in Plat Book 148, at Page 219 in the RMC for Horry County.

10. Should any separable part of these restrictive covenants be determined to be contrary to law, the remainder shall continue in full force and effect.

IN WITNESS WHEREOF, the Declarant has duly executed this Declaration of Restrictive Covenants the date written above.

SIGNED, SEALED AND DELIVERED )  
 )  
IN THE PRESENCE OF )

Maurice Calandro  
Allen Gordin

DECLARANT:  
INTERNATIONAL PAPER REALTY  
CORPORATION

By: [Signature] (SEAL)  
L. H. Ronnie, Sr.  
Its: President

Attest:  
By: [Signature] (SEAL)  
John J. McEwan  
Its: Assistant Secretary

PROBATE

STATE OF New Jersey )  
COUNTY OF Bergen )

PERSONALLY appeared before me Maurice Calandro and made oath that S he saw the within-named Declarant by L.H. Kinnis, Jr. its President, and by John J. McEwen, its Assistant Secretary, attesting the same, sign, seal and as his/her/its act and deed, deliver the within-written Declaration of Restrictive Covenants for the uses and purposes therein mentioned and that S he with the other witness named above witnessed the execution thereof.

Maurice Calandro

SWORN to before me this the 9 day of August, 1997.

Colette J. Borell  
Notary Public

My commission expires: \_\_\_\_\_  
COLETTE J BORELL  
Notary Public, State of New Jersey  
My Commission Expires November 14, 1998



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# **APPENDIX E**

## **CONCEPTUAL SITE MODELS**

for the

### **Remedial Investigation (RI)**

### **Former Conway Bombing and Gunnery Range (BGR)**

### **Horry County, South Carolina**

Prepared for:



U.S. Army Engineering and Support Center  
Attn: CEHNC-OE-DC (Ms. Chris Cochrane)  
4820 University Square  
Huntsville, Alabama 35816-1822

U.S. Army Corps of Engineers, Charleston District  
Attn: Mr. Shawn Boone  
69A Hagood Avenue  
Charleston, South Carolina 29403-0919

**Contract No. W912DY-04-D-0018**  
**Task Order: 0012**  
**Project No. I04SC002501**

Prepared by:



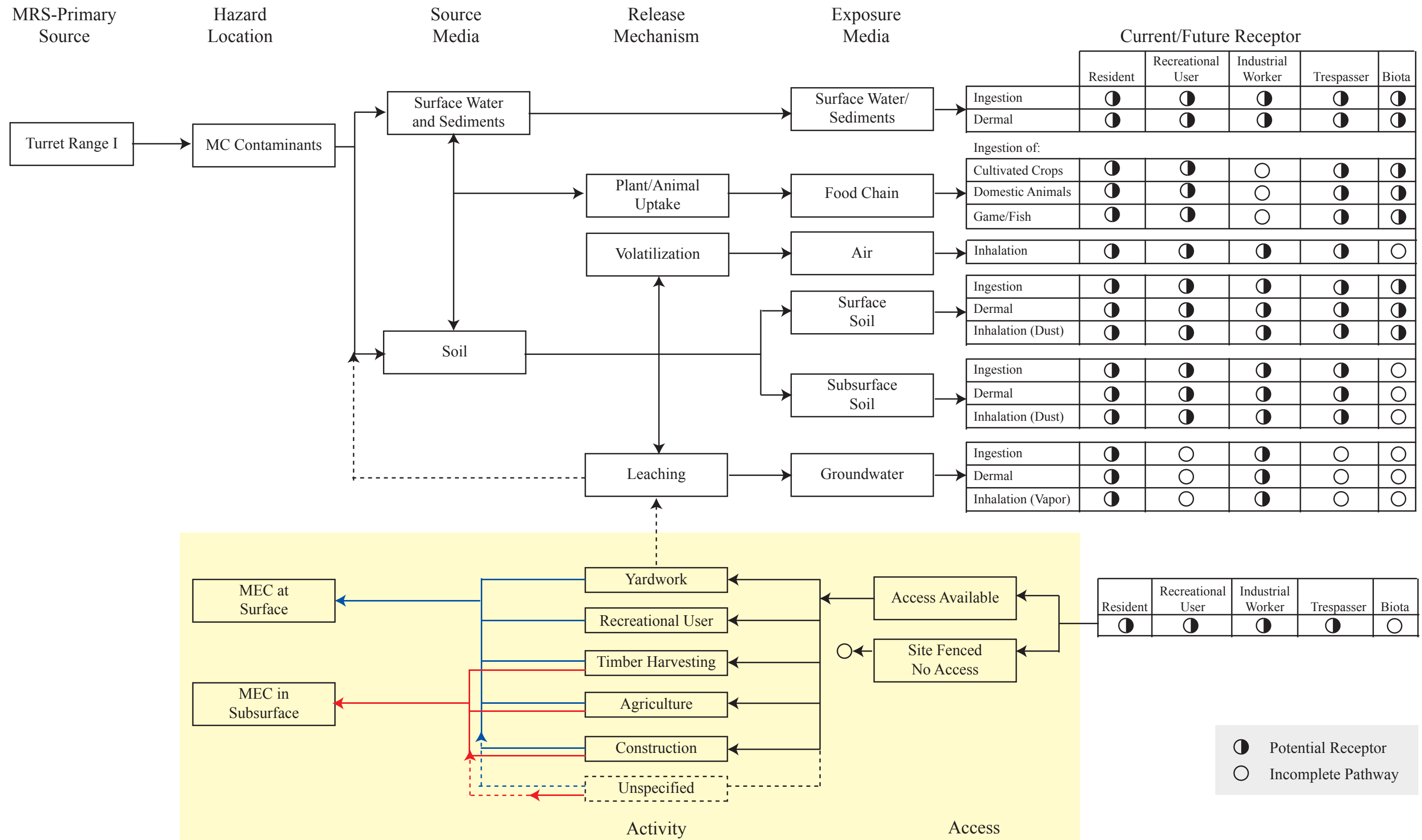
EOD Technology, Inc.  
2229 Old Highway 95  
Lenoir City, Tennessee 37771

**July 2012**

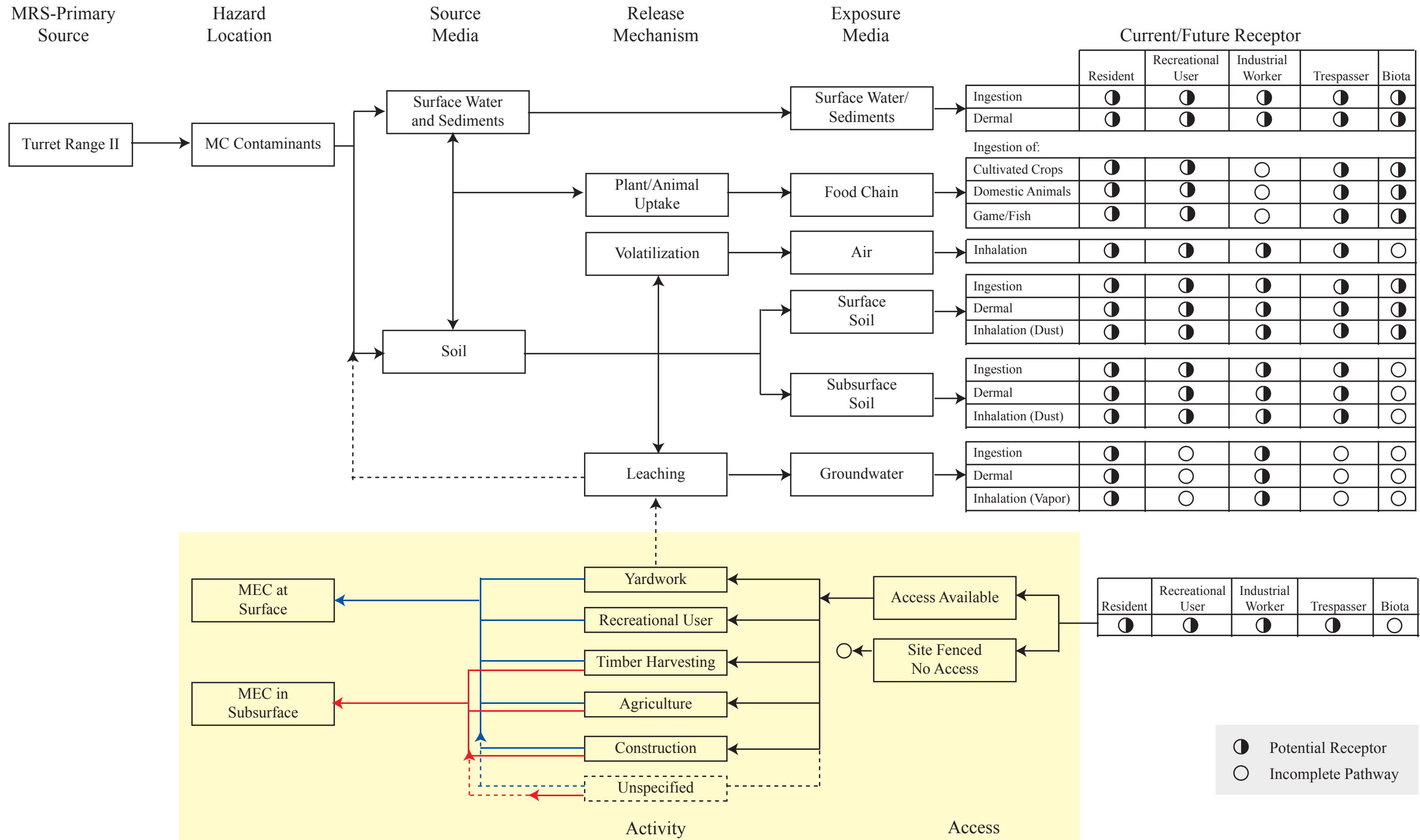


## **PRELIMINARY CONCEPTUAL SITE MODELS**

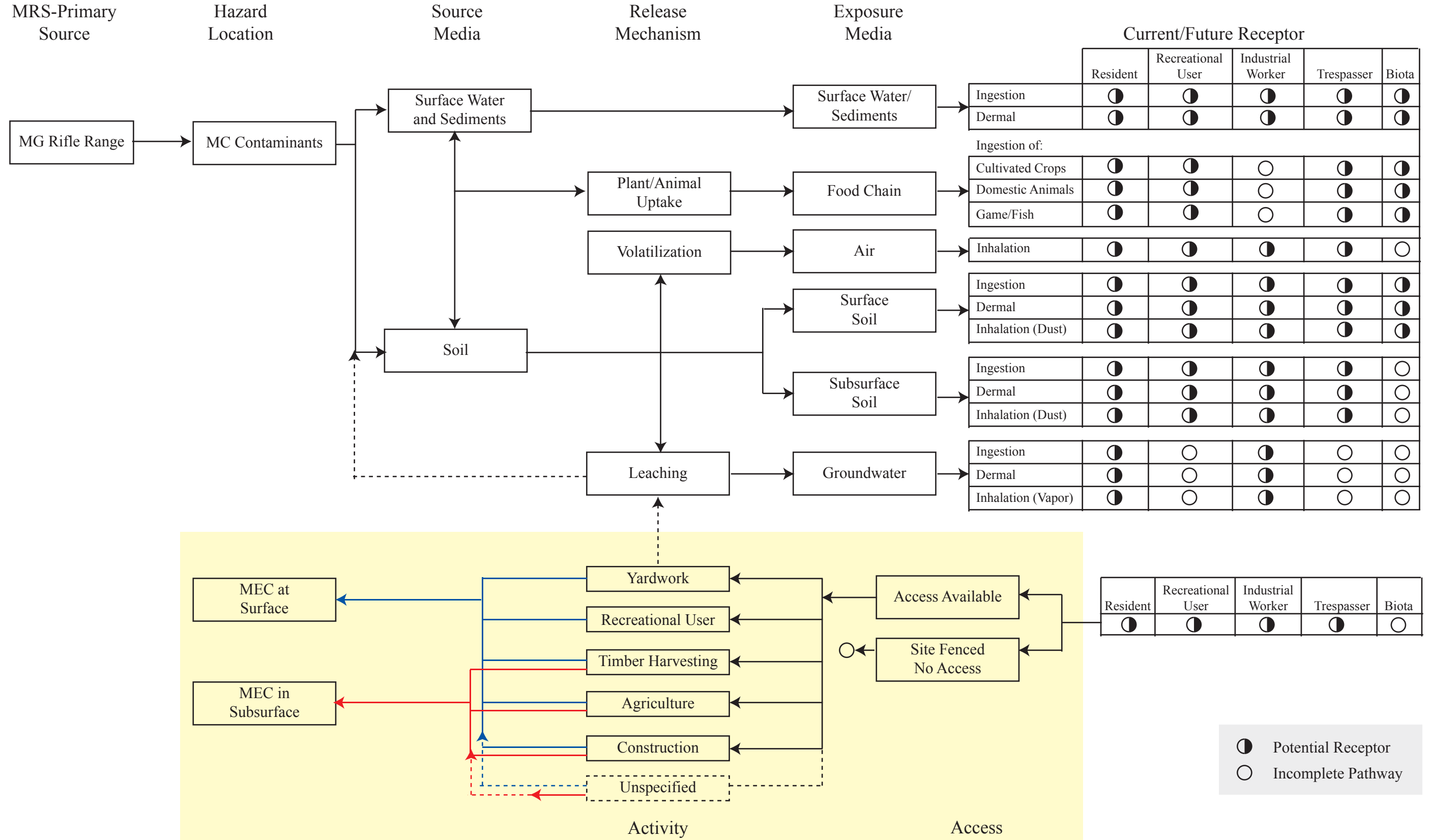
TURRET RANGE I PRELIMINARY CONCEPTUAL SITE EXPOSURE MODEL



TURRET RANGE II PRELIMINARY CONCEPTUAL SITE EXPOSURE MODEL

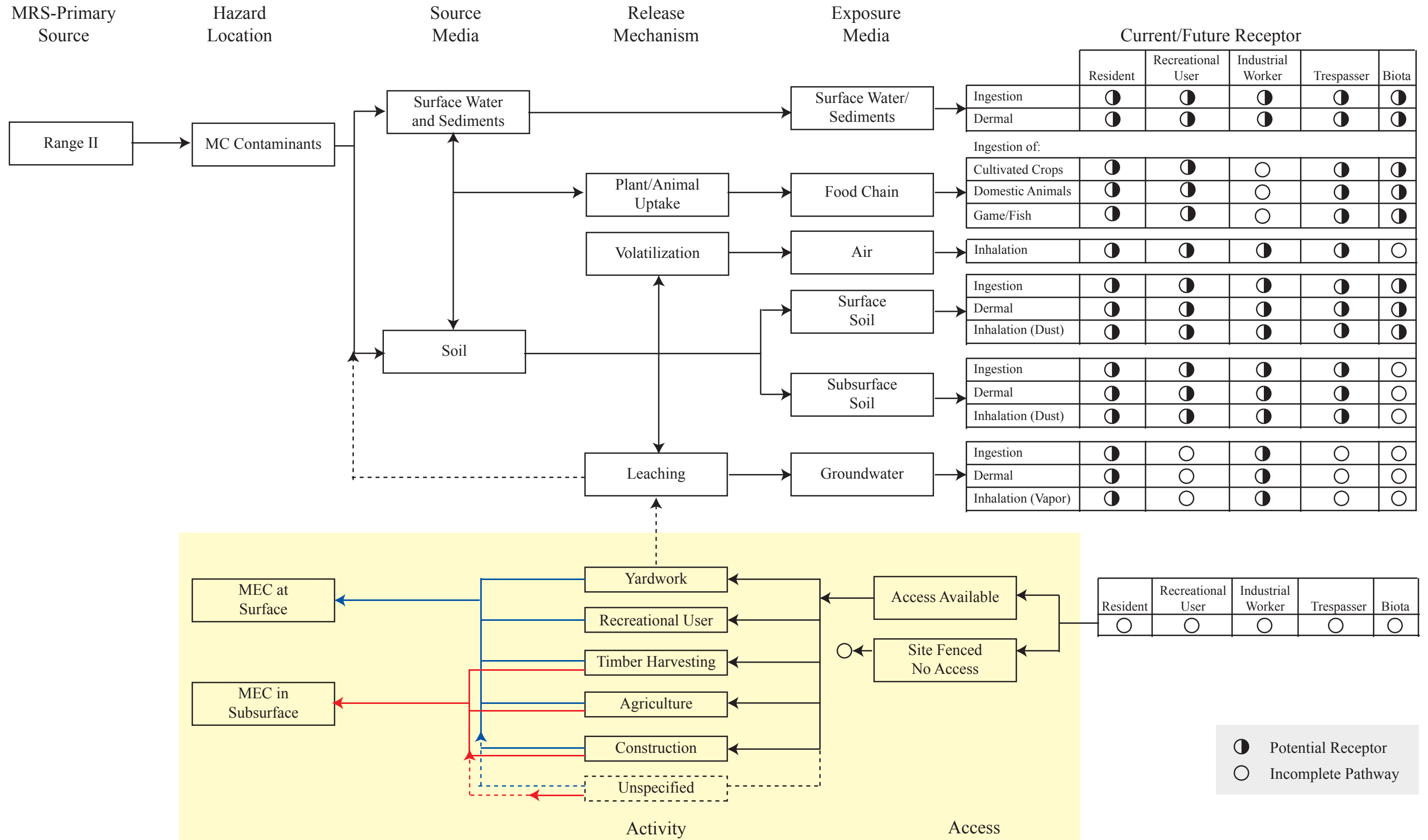


### MG RIFLE RANGE PRELIMINARY CONCEPTUAL SITE EXPOSURE MODEL



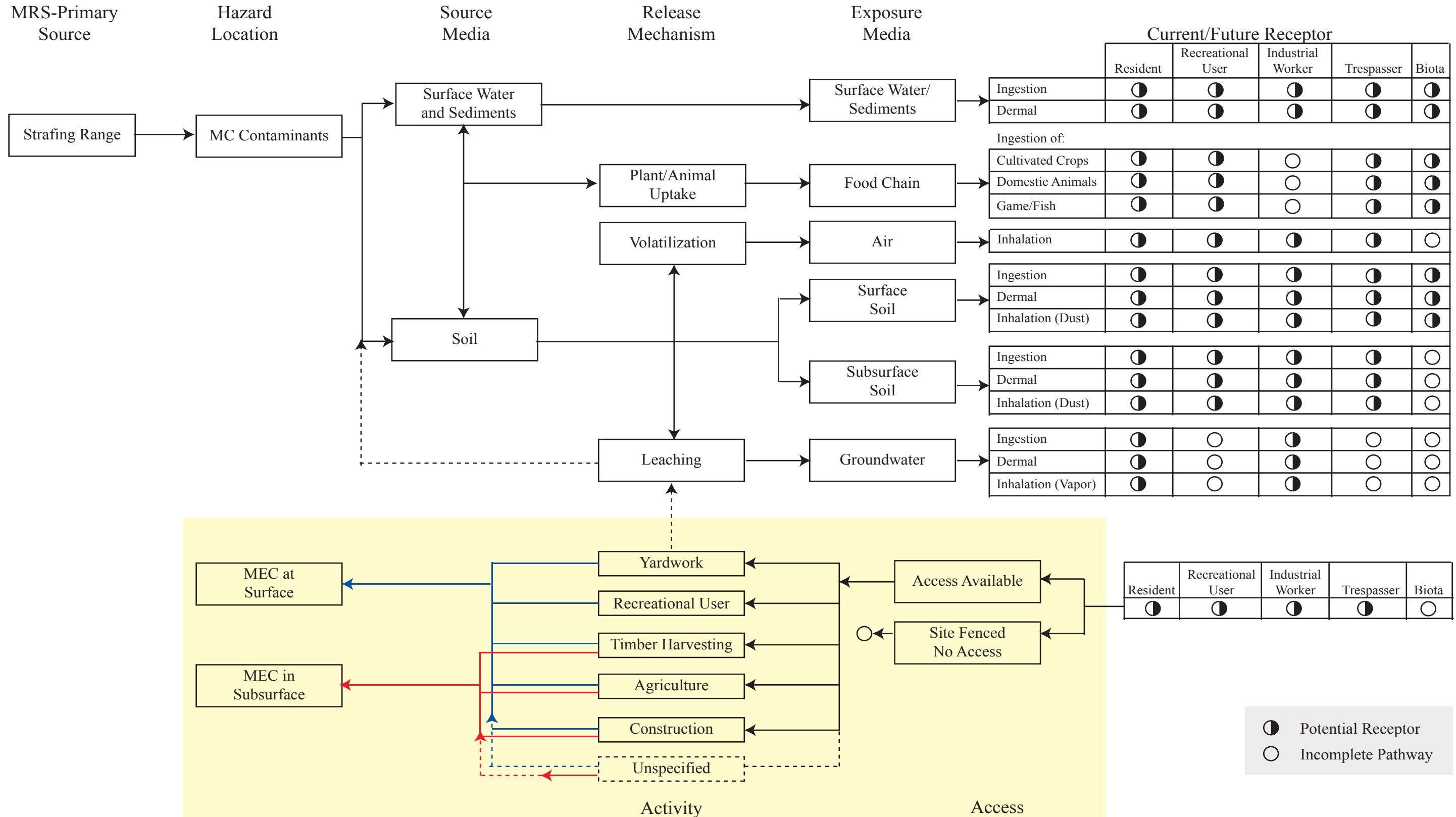


RANGE II PRELIMINARY CONCEPTUAL SITE EXPOSURE MODEL

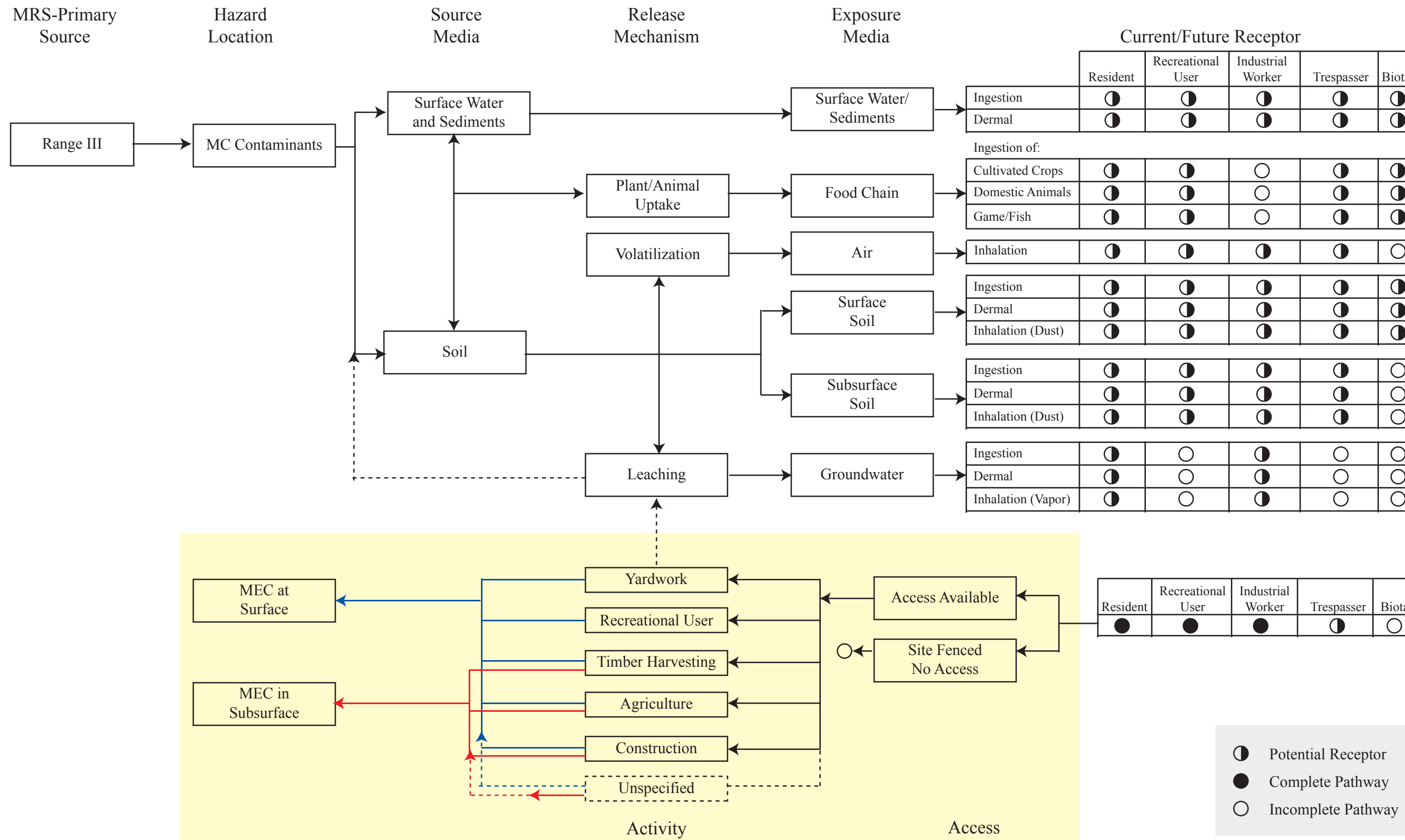


● Potential Receptor  
○ Incomplete Pathway

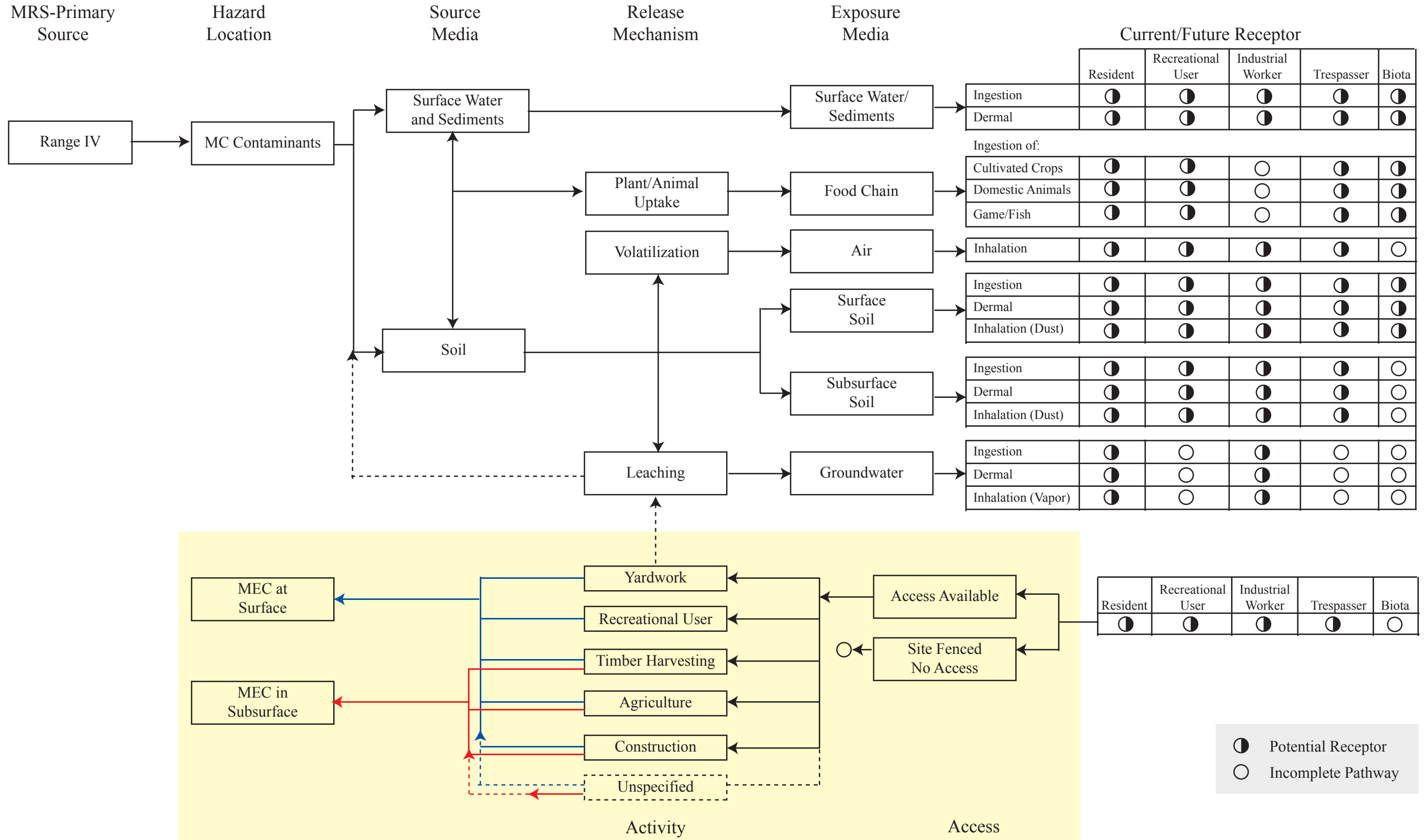
STRAFING RANGE PRELIMINARY CONCEPTUAL SITE EXPOSURE MODEL



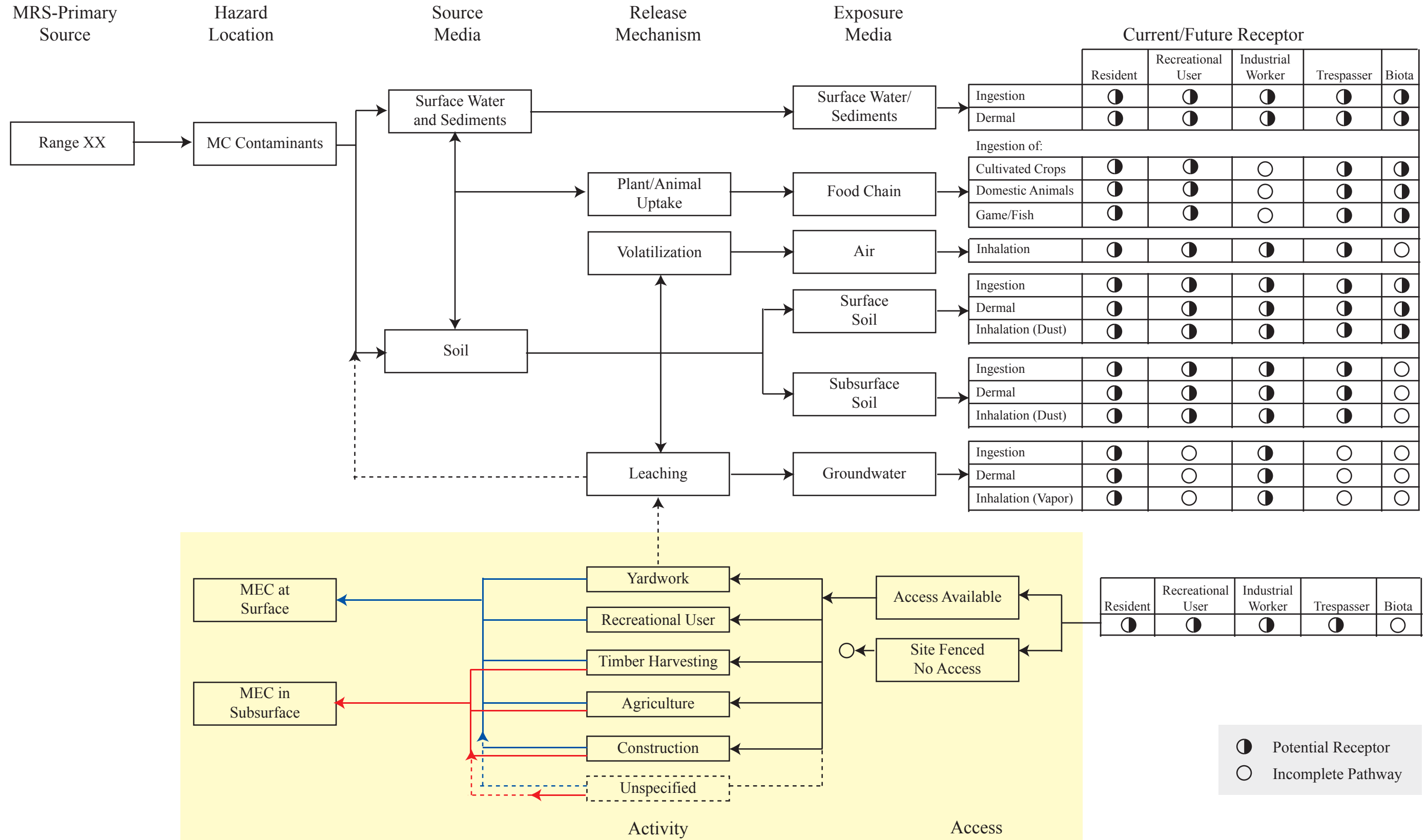
### RANGE III PRELIMINARY CONCEPTUAL SITE EXPOSURE MODEL



RANGE IV PRELIMINARY CONCEPTUAL SITE EXPOSURE MODEL

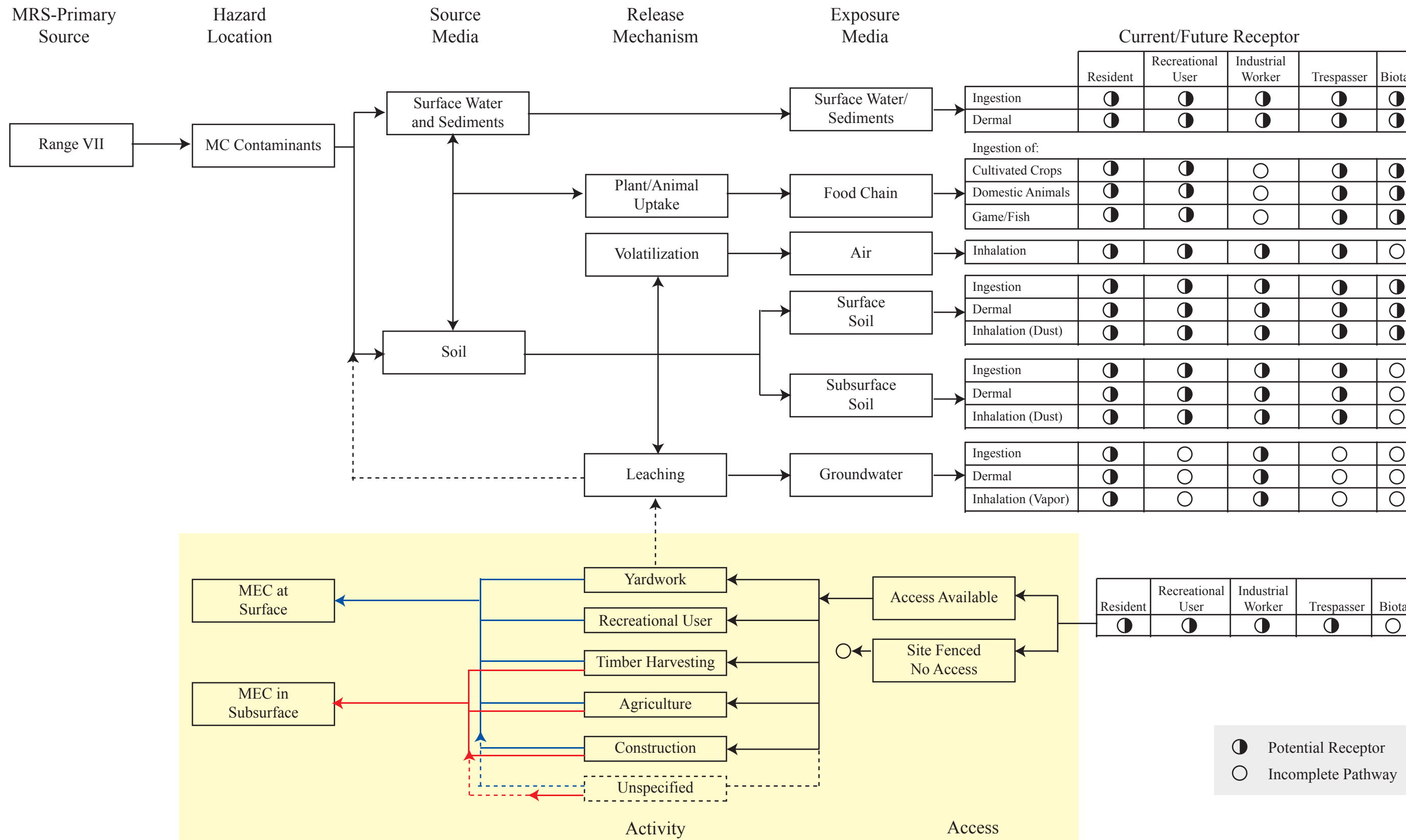


RANGE XX PRELIMINARY CONCEPTUAL SITE EXPOSURE MODEL



● Potential Receptor  
○ Incomplete Pathway

### RANGE VII PRELIMINARY CONCEPTUAL SITE EXPOSURE MODEL

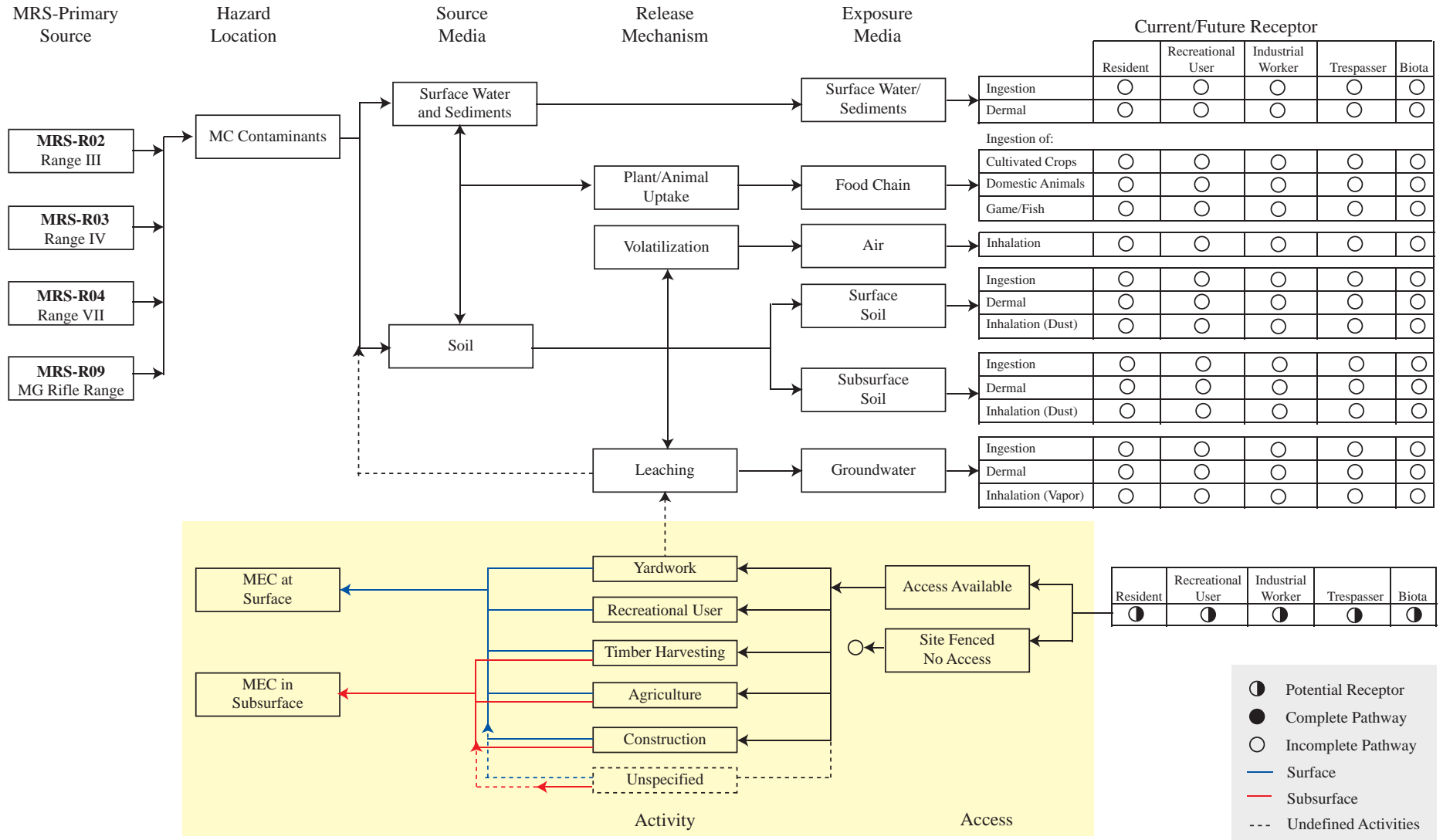


● Potential Receptor  
○ Incomplete Pathway



## **REVISED CONCEPTUAL SITE MODELS**

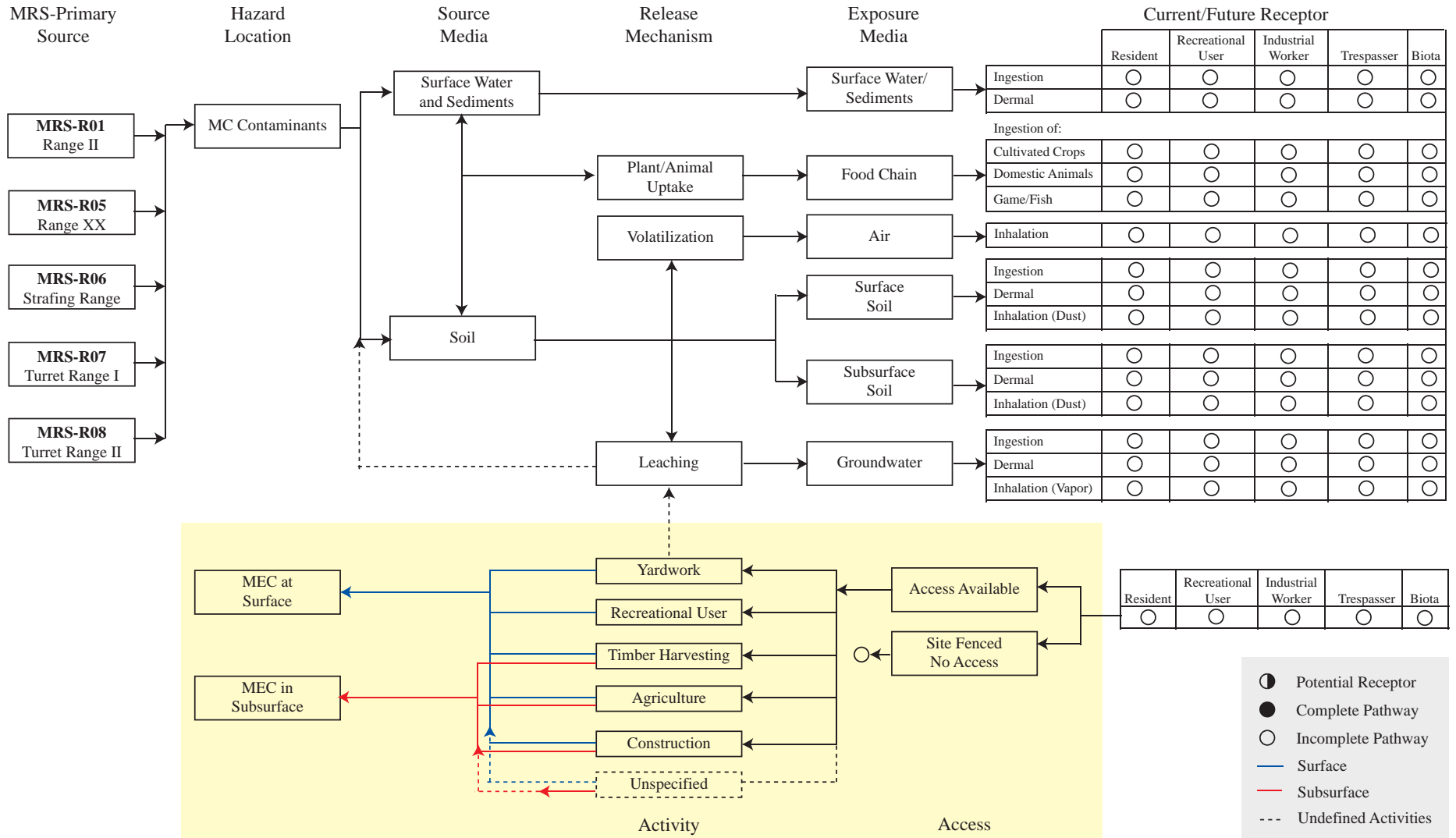
**REVISED CONCEPTUAL SITE MODEL FOR MRS-R02, R03, R04, R09**



Note: Munitions Constituents at MRS R09 have not been conclusively shown to be absent, but are considered unlikely based on the range use and results from adjacent ranges.



### REVISED CONCEPTUAL SITE MODEL FOR MRS-R01, R05, R06, R07, R08



# **APPENDIX F**

## **SITE SPECIFIC MUNITIONS**

for the

### **Remedial Investigation (RI)**

### **Former Conway Bombing and Gunnery Range (BGR)**

### **Horry County, South Carolina**

Prepared for:



U.S. Army Engineering and Support Center  
Attn: CEHNC-OE-DC (Ms. Chris Cochrane)  
4820 University Square  
Huntsville, Alabama 35816-1822

U.S. Army Corps of Engineers, Charleston District  
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**Contract No. W912DY-04-D-0018**  
**Task Order: 0012**  
**Project No. I04SC002501**

Prepared by:



EOD Technology, Inc.  
2229 Old Highway 95  
Lenoir City, Tennessee 37771

**July 2012**

## APPENDIX F SITE SPECIFIC MUNITIONS

### M41 20 LB FRAGMENTATION BOMB

#### **Description:**

The 20-lb Fragmentation Bomb A-M41A1 is constructed of spirally wound wire and cast-steel nose and tail pieces. A seamless steel inner tube is threaded to the nose and tail piece to form the base for the spiral-wound wire. The fin assembly is made of four rectangular sheet-steel vanes welded to a one inch diameter pipe. The threaded end of the pipe is secured to the base filling plug. The nose section of the bomb is threaded to receive an impact fuze. The 20-lb Fragmentation Bomb AN-M41AI is used in the 100-lb Fragmentation Bomb Cluster AN-M1 A1 and in the 500-11) Fragmentation Bomb Clusters **M26** and **M26A2**. At the center of gravity, a U-shaped eyebolt of steel is welded to the bomb case for horizontal suspension; an eyebolt is welded to the tail for vertical suspension. Approximately 13 percent of the complete weight, of Fragmentation Bomb **AN-M41AI** is explosive filler, Amatol 50/50 or TNT. A yellow colored head and base identify the high explosive filler of the 20-lb Fragmentation Bomb **A-N-M41AI**. Identifying nomenclature is stenciled in black on the bomb body. The bomb body windings are painted olive drab.

#### **Differences Between Bombs AN-M41 and AN-M41 A1:**

Bomb AN-M41, the earlier model, differs from AN-M41A1 in length. A change in construction added a 1/8 inch shoulder to the nose of the bomb; this change in design alone constitutes the “**AI**” modification. Fragmentation Bomb AN-M41 is issued only in cluster form.

#### **Physical Characteristics:**

Weight of assembled fuzed bomb:

Loaded with Amatol **19.7 lbs**

**50/50**

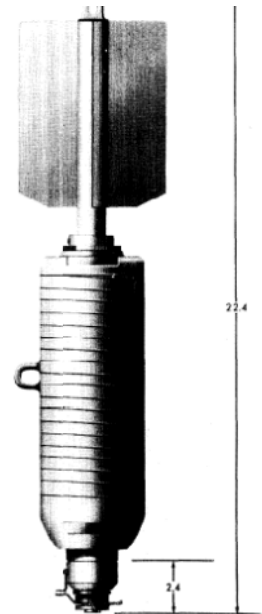
Loaded with TNT- - **19.8 lbs**

Weight of explosive:

AM 50/50----- 2.57 lbs

TNT----- -\_\_--\_ 2.7 lbs

Reference OP 1280



**M38 100 LB PRACTICE BOMB**

**Description:**

This bomb simulates a G.P. bomb of the same size. The spotting charge is assembled in a sleeve at the base of the bomb, within the fin box. Authorized spotting charges are M1A1, M3, and M4.

**Physical Characteristics:**

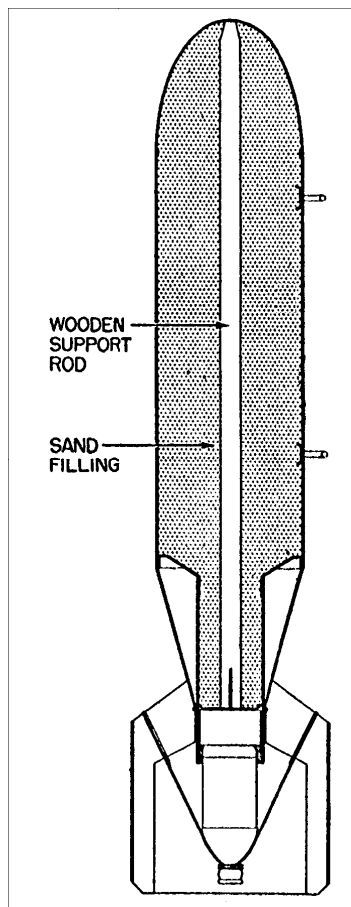
100-pound M38A2

Over-all length, inches 47.5

Diameter, inches 8.13

Weight, empty, pounds 15.7

Weight, sand-loaded and spotting charge, pounds 100



**M54 4 LB INCENDIARY BOMB**

**Description:**

The bomb body is a steel cylinder having a hexagonal nose plug. The fuze is installed in the tail plug assembly. There are three vent holes below the primer cap assembly, to assist in initial burning. There is a hexagonal hollow steel-metal tail.

**Physical Characteristics:**

4-pound Incendiary AN-M54 Series

AN-M54

Over-all length, inches 21.35

Body length, inches 13.6

Body diameter, inches 1.69

Tail length, inches 10.0

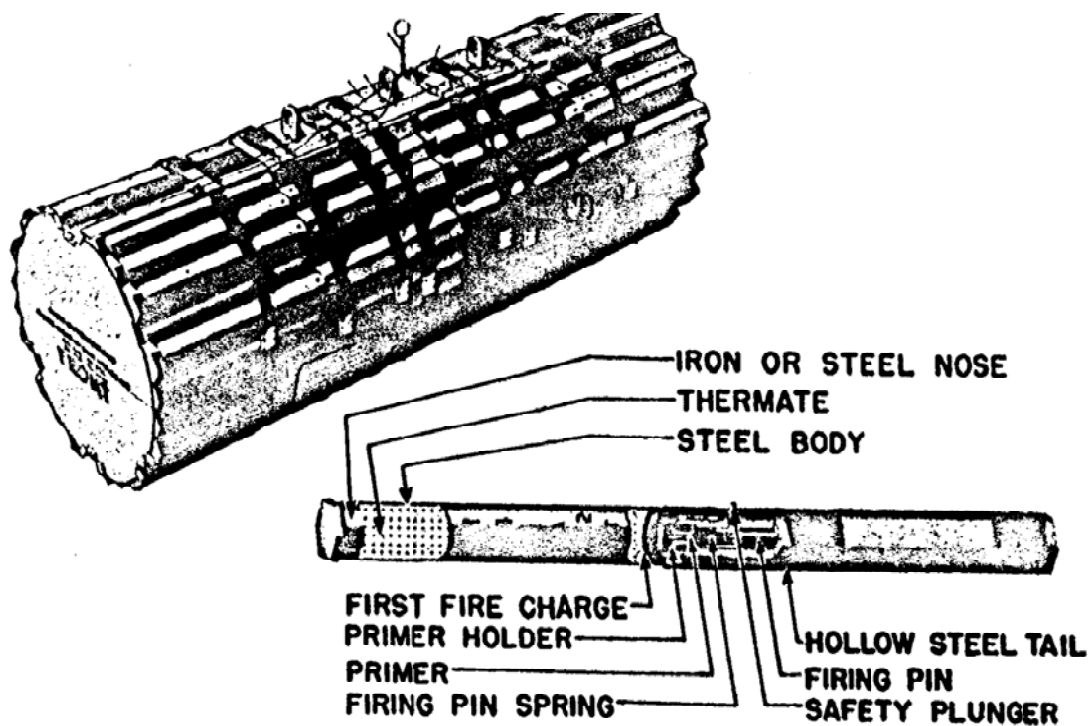
Tail width, inches 1.69

Filling Thermate

Weight of filling, pounds 1.6

Total weight, pounds 4.0

Charge/weight ratio 40 percent



## **M69 6 LB INCENDIARY BOMB**

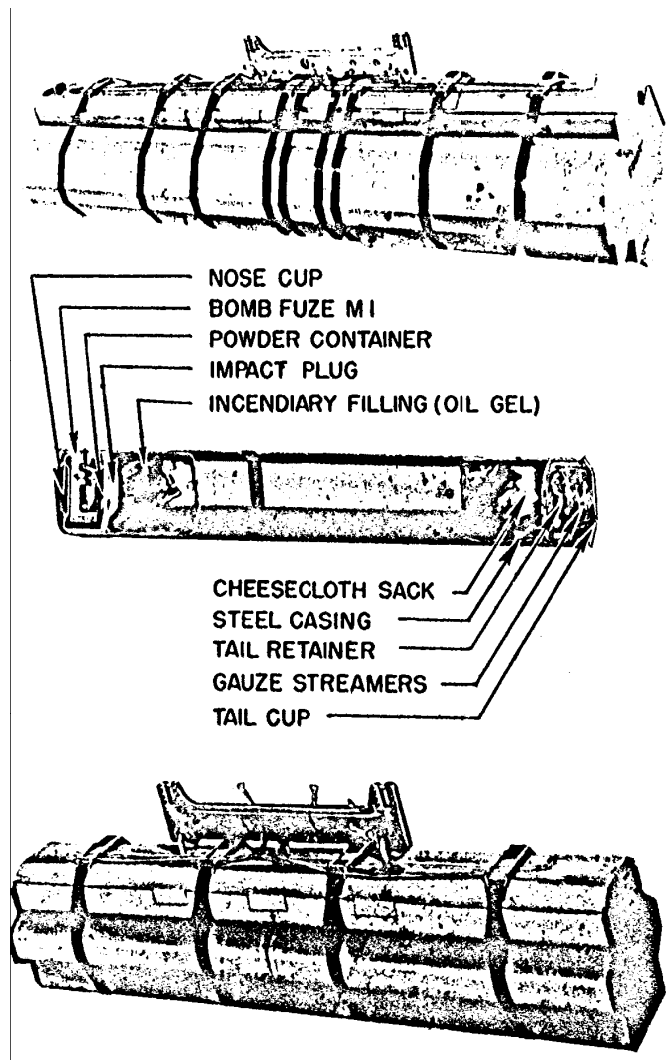
### **Description:**

**General:** The Nose Fuze M1 Figure 323 is screwed into the side of the nose of the Bomb AN-M69. When assembled, the two arrows on the top of the fuze case must be parallel to the longitudinal centerline and point aft. This is necessary in order that the fuze will fire on nose impact. The fuze consists of five main parts; namely, a die-cast aluminum fuze base, a striker of the same material, a primer cap, a lead-coated spitter fuse (60 percent black powder - 40 percent collodion) and a booster charge consisting of 1.2 grams of black powder. The booster cup is a transparent nitro-cellulose composition. The entire fuze assembly is contained in a cover of steel tubing. A safety plunger prevents the striker from detonating the primer cap while the bomb is clustered.

**Operation:** Upon release from the cluster, the spring-operated fuze safety plunger in each bomb moves outward, thereby arming the fuze. Upon impact, the momentum of the striker carries it forward and causes the striker pin to detonate the primer cap, which, in turn, ignites the lead-coated spitter fuse. The latter requires from three to five seconds to burn. The spitter fuse ignites the booster charge of black powder contained in a celluloid cup in the end of the fuze case. This ignites the igniter-ejector charge of black powder and oiled magnesium powder in the nose cup of the bomb.

### **Physical Characteristics:**

Bombs 6-pound Incendiary AN-M69  
Functioning 3 to 5 seconds delay after impact  
Armed condition Safety plunger is out  
Fuzes used with None  
Arming time Instantaneous  
Body diameter, inches 1.125  
Over-all length, inches 2.5  
Material Die-cast aluminum and steel



**M57 250 LB BOMB**

**Physical Characteristics:**

250-Pound G.P. AN-M57

Over-all length, inches: 45.4

Body length, inches: 36.0

Body diameter, inches: 10.9

Wall thickness, inch: 0.27

Tail length, inches: 12.1

Tail width, inches: 14.9

Tail weight, pounds: 6.0

Filling: 50/50 TNT

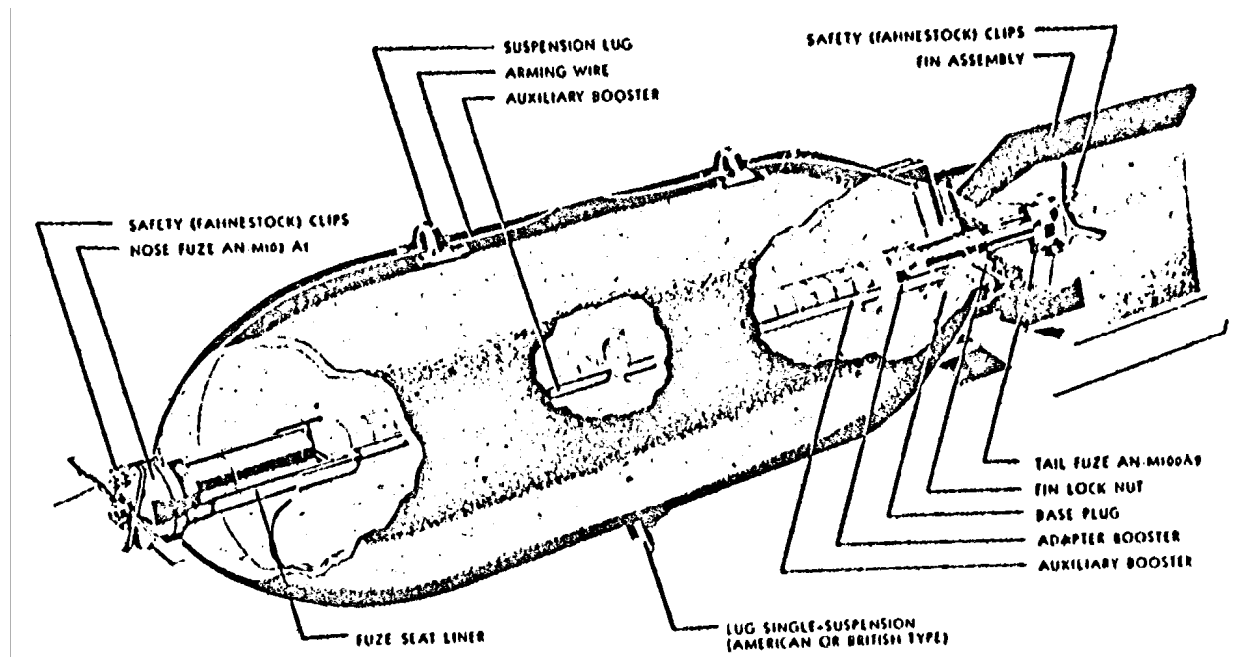
Amatol

Weight of filling: 123.7# 129.0#

Total weight, : 255.9# 260.0#

Charge/weight ratio: 48.0 percent 50.0 percent

Fuzing: Directions applicable to these bombs are the same as for the 100-pound G.P. Bomb AN-30.



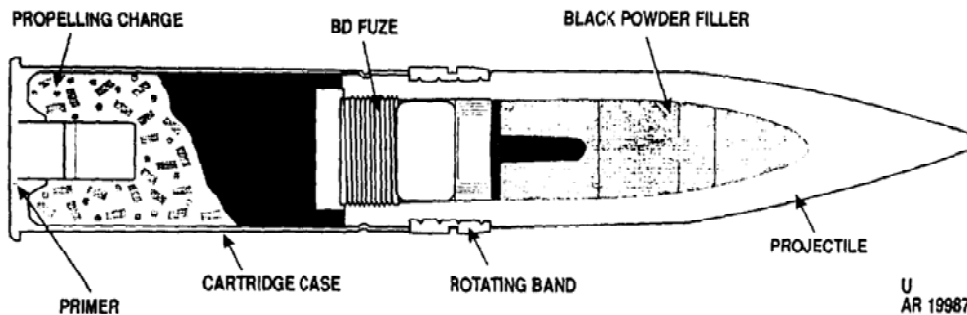
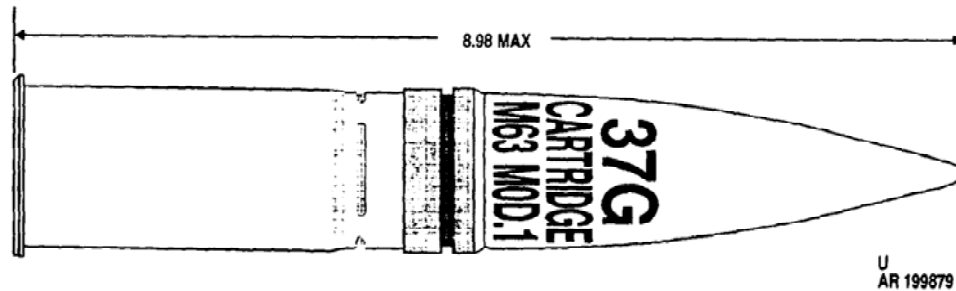
**M63 37mm PROJECTILE**

**Description:**

The cartridge consists of a black powderfilled steel projectile crimped to a steel cartridge case and fitted with a base-detonating practice fuze. A rotating band encircles the projectile near the base. The cartridge case is loosely filled with propellant and is fitted with a percussion primer.

**Functioning:**

When the weapon is fired, the firing pin strikes the primer to ignite the propelling charge. The rotating band engages the barrel rifling to impart spin to the projectile and prevent escape of pressure past the projectile. Rapidly expanding gases from the burning propellant drive the projectile through the barrel with the velocity required to reach the target. Upon impact, the base-detonating fuze ignites the black powder filler in the projectile, simulating the detonation of a service projectile.







**MK 2 1-POUNDER**

**I-Pounder Common Mk 2 Mods 0 and 1**

Guns used in.....	1-pdr./40
Over-all length, inches.....	3.56
Diameter of base, inches.....	1.441
Distance base to band, inch.....	0.829
Width of band, inch.....	0.731
Diameter at bourrelet, inches.....	1.445
Filling .....	Black powder
Weight of filling, pound.....	0.026
Weight of loaded projectile, pounds... .	1.088
Charge/weight ratio .....	2.07 %
Cartridge Case .....	Mk 2
Primer .....	Mk 10 Mod 9
Tracer .....	Integral
Fuzes.....	Base—Mk 8 Mod 4 (B.I.F.)

This ammunition is used in coast guard guns. Their bursting charge is black powder and TNT, or black powder alone. This should be kept in mind when unscrewing the fuze, as some of the powder may have fallen down into the threads and the friction would cause detonation.

The Primer Mk 10 Mod 8 may be used for saluting charges only.

Base Fuzes Mk 2 Mod 9 and Mk 8 Mod 5, without tracers, may be used, but the Mk 8 Mod 4 is the preferred assembly.

This round may be issued B.L. & P. for target practice.

## High Velocity Aircraft Rocket

### Description:

Type: Air-to-surface rocket

Used by: United States Military

Produced: 1944-1955

Weight: 140 pounds (64 kg)

Warhead Weight: 45 pounds (20 kg)

Engine: Solid-fuel rocket

Operational Range: 3 miles (4.8 km)

Speed: 950 miles per hour (1,530 km/h)

Length: 6 feet (1.8 m)

Diameter: 5 inches (130 mm)

Warhead: High-explosive



"Holy Moses" HVARs mounted on a [TBF Avenger](#)

# **APPENDIX G**

## **FIELD RECORDS**

for the

### **Remedial Investigation (RI)**

### **Former Conway Bombing and Gunnery Range (BGR)**

### **Horry County, South Carolina**

Prepared for:



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**Contract No. W912DY-04-D-0018**  
**Task Order: 0012**  
**Project No. I04SC002501**

Prepared by:



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**July 2012**



## **SUXOS LOG**



**EODT SUXOS Daily Log  
Conway RI / FS, Myrtle Beach, SC**

Date	Time	Event
7/19/10	0600-1630	Start of Remedial Investigation/Feasibility Study (RI/FS) for Conway Bombing and Gunnery Range (BGM), Horry County, South Carolina. Brian Woods, EODT Project Manager (PM), Thomas Hinote, SUXOS, Eugene Mikell, temporary UXOSO/QC on site to commence site set-up. IAW section 3.5.1, EODT has commenced pre-mobilization processes for the Conway site to facilitate immediate productivity prior to the arrival of the main work force. Coordinating with local service providers and agencies to ensure the availability of resources that may be needed. Note that this project is sharing field office and equipment storage space with an ongoing EODT project in Myrtle Beach, SC (Goodson project). Forty foot conex box arrived and located at the Goodson site.
7/20/10	0600-1645	Mustered the above personnel. Continued site set-up and coordination with local service providers. John Clark, EODT Surveyor is sharing duties between the Goodson project and this project. John Clark and Eugene Mikell have started to reconnoiter the planned work sites and BGM's identified in the WP to determine access. As expected, some areas will require landowner approval to access.
7/21/10	0600-1645	Mustered the crew. Met with Christian Anderson and John Hurst, land surveyors, with DDC Engineers. Conducted daily tailgate safety briefing and planned operations discussed. Plans are to continue site logistics and for Clark and Mikell to escort DDC surveyors to determine necessary control points for surveying. While laying-in survey points, the crew has determined which areas (BGR's) are easier to access and which have less vegetation than others.
7/22/10	0600-1700	Mustered the crew. Rick Shellenbarger, UXOSO/QC and Scott Solomon, UXOT1 arrived on site. In addition, John Cook, USACE PM, and Greg Parsons, USACE OESS, and the contracted S & P Brush cutters on site. Conducted daily safety tailgate briefing and planned operations for the day discussed. Conducted initial site-specific and APP/SSHP training for what crew is currently on site. Continuing site set-up and local service provider coordination to support the RI/FS. In the afternoon we conducted a drive by at all those sites that we can access using full size vehicles. At the same time, we confirmed radio and/or phone communications with the field office. Greg Parsons and John Cook depart in the afternoon. Greg informs us that we won't have a USACE OESS on site until the week after next (August 5 <sup>th</sup> ).
7/23/10	0600-1800	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. Plans are to commence brush cutting in conjunction with surveying. Crew commenced brush cutting in Range XX. This particular range area is relatively clear of heavy brush and thick trees. Weather today is extremely hot and humid with heat indexes exceeding 110 degrees in the afternoon. Today we reached a heat index of 100 degrees at approximately 1000. Due to the travel distances, locations and time required to set-up operations, the decision was made to extend today's



**EODT SUXOS Daily Log  
Conway RI / FS, Myrtle Beach, SC**

Date	Time	Event
		brush cutting efforts beyond normal working hours. Brush cutters were able to complete Ranges XX and the Straffing Range. Both of these ranges were in an area that is relatively free of heavy brush. At the end of the day, the John Deere Gator broke-down and required towing by the brush cutters. The Gator was returned to Hertz Rental for repairs.
7/26/10	0600-1700	Mustered the crew. Jim Vance (UXOT3/Team Leader), John Bonczek (UXOT2), Bill Sebrell (UXOT2), Sandon Hill (UXOT1) arrived on site. Daily tailgate safety briefing and planned operations discussed. Plans are to conduct initial site-training for those newly arrived personnel. At the same time, we will: continue brush cutting and surveying in advance of the remedial investigation; and, continue to coordinate with local agencies for required field support. 1100: Completed initial site training for the WP, APP/SSHP and PPE. Conducted a follow-on drive-by tour of those ranges accessible by a full size vehicle. 1245: Received call from UXOSO/QC (in the field) that the crew is on hold while police search for a convicted felon who has made his way into our area. Apparently, this individual had just robbed a local store and was attempting to elude the local police who were in pursuit. He decided to bolt into the woods right adjacent to our work site. Once the police arrived, we were all recalled to the rally point and placed in a holding pattern until released by the crew. The crew was finally released at 1600 and returned to the field office at approximately 1645. Lost approximately four (4) hours of production time due to this incident.
7/27/10	0600-1630	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. Finalized site-specific training and administrative check-in for all assigned personnel. All but John Bonczek qualified on the Schonstedt at the test strip, and certified on the Whites, at the function test site (see UXOQC records for specifics). John Bonczek and John Clark departed to assist the brush cutting crew at the Turrent Range. Received two more UTV's and one trailer. One of the two UTV does require field repairs (by the suppliers) which will be completed tomorrow. One of the trailers did not have the correct light hook-ups and the supplier will provide an adapter, tomorrow. 1200: Remedial Investigation (RI) crew departed for the field to commence operations in Range XX. While assisting the RI crew to the field, my conversations with the brush cutters indicated that they are encountering unexpected wetlands along the designated transect in the Turrent Range. IAW the WP, plans are to attempt to divert around the wetlands, if possible, and resume on the other side an/or divert the transect, (again) if possible. 1400: Crew notified of threatening weather and directed to commence preparations for inclement weather. 1430: notified by crew that the inclement weather has hit their location and that they are loaded and departing the woods for home. Secured the crew at 1530, due to inclement weather.
7/28/10	0600-	Mustered the crew. Daily tailgate safety briefing and planned operations



**EODT SUXOS Daily Log  
Conway RI / FS, Myrtle Beach, SC**

Date	Time	Event
	1700	discussed. RI team will resume intrusive operations at Range XX. Brush cutters and survey, with escort, will transfer field efforts to Range IV and VII, in North Myrtle Beach. SUXOS assisted and provided UXO escort for the surveyor. We continue to encounter far more wetlands than anticipated. Where feasible, we make minor diversions to the planned transects, per the WP. Many of the encountered wetlands extend far beyond the planned transect lines requiring us to terminate many of these transect lines at a shorter distance than planned. In addition, many of the original transect lines are in areas where we DO NOT have ROE's. Weather slowed operations by approximately 30 minutes in the late afternoon.
7/29/10	0600-1700	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. The RI team continues intrusive investigation along the transect line in Range XX. The brush cutters continue efforts in Ranges IV and VII. Survey resumes efforts to survey-in points of transects and to assist in identifying transect boundaries. RI team completed intrusive operations on Range XX. Survey completed assisting the brush cutters in Ranges IV and VII to indentify those accessible transects. 1530: Brush cutter UXO escort reports that the Bobcat brush cutter has thrown a track. Plans are to leave the Bobcat where it broke-down in the woods and purchase a new track tomorrow. RI team completed intrusive investigation of Range XX; 126 anomalies investigated, with all anomalies related to 50 caliber small arms (cartridges, links and rounds).
7/30/10	0600-1640	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. RI team has completed Range XX and is shifting to Turret Range 1. Brush cutters are repairing their brush cutter (tracks) and will resume operations in Range IV. Survey, along with SUXOS, will investigate transects in Turret Range II. After further investigation of the planned transect in Turret Range II, it was determined that this transect is virtually impossible to access with brush cutters and equipment. This transect is laid directly in between logging and power line trails that have large water-filled ditches on each side. This whole area is extremely low with standing water and wetlands throughout the area. All indications are that the ditches were dug to provide some drainage as well as fill for the logging trails. Called and briefed EODT PM on findings. Will return to this site next week to photo and survey the area for better documentation. Brush cutters have completed all brush cutting in Range IV Good first week of production considering the obstacles encountered.
8/02/10	0600-1730	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. RI team continues counting contacts in Turret Range 1 (TR-1). Survey to continue survey operations for those remaining transect lines that are accessible. At this point, there are few remaining transects that we can access. Survey, with escort, reports that the transects RIII-05 through RII-17 are all in a SCDHEC and DNR conservation area (with



**EODT SUXOS Daily Log  
Conway RI / FS, Myrtle Beach, SC**

Date	Time	Event
		keep out signs), as well as wetlands. A separate report, with pictures, to follow showing the wetlands and conservation areas. The RI team completed (contact counts) of both TR-1 and the Staffing Range. Survey conducted a recon (for the 3 <sup>rd</sup> time) of Turret Range 2 (TR-2) to make a final determination and documentation of access to this transect. As with previous attempts, it was determined that access to TR-2 is virtually impossible due to the large drainage ditches that have been dug around this site. .
8/03/10	0600-1700	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. RI team to commence investigations in Range IV and Range VII. Brush cutters are assisting survey with documentation of brush cut transects. Stephen W. Bruce, USACOE, Savannah District, Reality Specialist on site and conferred with the SUXOS regarding ROE's. Stephen is attempting to acquire additional ROE's, while the project is ongoing. RI team completed transect RVII-01 and commenced RVII-02.
8/04/10	0600-1645	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. Demobilized brush cutters until further notice. RI team to resume operations in Range VII. Coordinating with the EODT PM to identify any additional (optional) transects and to select locations for the proposed 50' x 50' grids. RI team completed transects in Range VII.
8/05/10	0600-1640	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. RI team to commence investigations in Range IV. This is the last range that we are able to access, due to ROE's and/or wetlands/conservation areas. On two separate occasions, both UTV's (being used in the field) went down. UXOSO/QC returned defective UTV's to the field office for repairs and to swap out for a functional one.
8/06/10	0600-1110	Half work day today. Mustered the crew. Phil Makeprang, EODT MR Safety Manager on site to, provide oversight, review processes and reports and assist UXOSO. RI team continues intrusive investigations in RIV. RSC on site to repair downed UTV's. One of the two will require RSC to effect repairs at their shop, to replace a CV joint. A third UTV, from Hertz rental, has been redlined due to a stuck seatbelt assembly.
8/09/10	0600-1745	Mustered the crew. Randy King, USACOE OES, on site to provide oversight. Daily tailgate safety briefing and planned operations discussed. RI team will continue investigations in R-IV and possibly, one more transect in R-VII. Team completed RI in Range IV and assisted survey with identifying grid locations in Range VII; there are no more transects in R-VII. Survey completed 3 grid placements/surveys and surveying all remaining transect points in Range VII. Contacted S&P Land Services to schedule additional brush cutting efforts in grids and/or additional transects. S&P scheduled to return on 8/11/10. Secured late to finalize survey points while in R-VII.
8/10/10	0600-	Mustered the crew. Daily tailgate safety briefing and planned operations





**EODT SUXOS Daily Log  
Conway RI / FS, Myrtle Beach, SC**

Date	Time	Event
	1645	discussed. Crew is focusing on doing as much of Turret Range (TR) – 2, as feasibly possible. We are running transects along the logging trails and placing grids (three each) in accessible locations. Due to the limited access (primarily due to wetlands and trenches), the only accessible areas in this range are on the logging trails. In addition, the three grids placements are going to be relatively close proximity to each other. USACE representative is with the crew to observe operations and confirm wetland areas. Crew made every effort to survey and investigate all required transects/grids in TR-2. Crew was able to investigate 4,909 feet of transect, and identify/survey three 50'X50' grids, and identify/survey-in one 100'X100' MC sampling grid.
8/11/10	0600-1645	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. RI team dispatched to TR-2 to conduct intrusive investigations on 3 grids. Survey, with escort, to R-VII and R-IV to identify locations and survey intrusive and MC sampling grids. RI team completed investigations of the three grids in TR-2; team located one 50 caliber cartridge and cultural debris. RI team shifted to R-VII and commenced intrusive investigation at that location. Brush cutters arrived at 0930 and commenced brush cutting in R-VII and R-IV. Busy day; we had a total of three flat tires that required immediate attention. In addition, we had crews spread out at three different locations at one time. Temperatures are oppressive, with heat indexes reaching 111 degrees.
8/12/10	0600-1700	Mustered the crew. Brian Woods, EODT PM, and Teresie Walker, EODT Scientist, onboard to conduct MC sampling. In addition, EODT PM to assist with any follow-on work and to provide assistance where needed. Daily tailgate safety briefing and planned operations discussed. RI team to initially assist survey with identifying grid locations in advance of the brush cutters. It is difficult for our survey to keep pace with the demand for assistance/direction once grid and transects are identified. As a result, I have asked the brush cutters to hold off until mid-morning before reporting for work to allow our field crews time to get a jump-start on the cutters. PM, SUXOS held numerous discussions with Randy King regarding the wetland areas we have encountered, specifically transects RIV 05-18. Subsequently conducted a tour, with Randy, to show him these areas. Transect RIV-18 is along a power line and is inaccessible. RI team primarily worked grids in Ranges IV and VII and assisted survey in the AM to identify grid areas.
8/13/10	0600-1650	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. RI team continues investigations in ranges IV and VII. Survey, along with brush cutters, continues in ranges IV and VII to close these areas out. SUXOS provided escort for MC sampling crew. Efforts to locate natural standing water, for background samples, were difficult. We were finally able to identify two locations and collect background water and sediment samples. Ambient temperature rose to 102 degrees with a



**EODT SUXOS Daily Log  
Conway RI / FS, Myrtle Beach, SC**

Date	Time	Event
		heat index of 117 degrees. We were unable to finalize all add-on transects and grids in ranges IV and VII. The decision was made to add additional grids closer towards locations where MD was located and to extend transects, where possible. New ROE's, coupled with the field decision to extend transects and add grids required last minute planning and adjustments. Most of the areas investigated are in fresh water forested/shrub and emergent areas, making brush cutting access difficult, due to the wet grounds. Randy King, USACE OESS demobilized.
8/16/10	0600-1700	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. Brush cutters off until tomorrow to allow crew to identify access areas for the last remaining transects/grids in all remaining operational areas. Plans are to intrusively complete those additional grids and transects in Range IV that were added after last Friday's field brainstorming. At the same time, we are surveying those grids (recently) brush cut. 1200: Crew completed intrusive investigations (for now) and have shifted to Ranges SF, TR-1 and XX off international road to identify last remaining grids in those ranges. SUXOS continues to provide escort services for MC sampling crew.
8/17/10	0600-1650	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. Brush cutters, with escort, to ranges IV and VII to finalize all remaining grids and add-on transects in that area. RI team to ranges XX, TR-1 and SR to identify grid locations for intrusive and sampling operations. Survey following the crew to finalize survey points. SUXOS with MC sampling team to continue sampling efforts and shifted with survey to finalize surveying points in ranges IV and VII. RI team was able to finalize locating and placing grids in ranges XX, TR-1 and SR.
8/18/10	0600-1800	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. RI team to start at Range IV to complete the last remaining transects and grids on that range and then shift to the ranges off international drive. Survey continues to multi-task to try and keep pace with surveying grids and transects to keep the crew game fully employed. SUXOS continues providing escort and assistance to the MC sampling crew. RI team completed transects and grids on R-IV and shifted to R-XX. Brush cutters have cut all but one transect in R-III. MC sampling crew completed their first MIS grid in R-VII. Another extremely hot day. SUXOS, Clark, Bonzcek and brush cutters late due to efforts to finish out grids in ranges off international drive.
8/19/10	0600-1800	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. RI investigative team to continue intrusive operations in the ranges off international drive. Survey continues to multi-task to try and keep pace with surveying grids and transects to keep the crew game fully employed. SUXOS and survey scouted out the most recent ROE transects on the SW portion off of Range III. These two transects (R-III-03 & 04) run directly through an upscale housing development (Plantation



**EODT SUXOS Daily Log  
Conway RI / FS, Myrtle Beach, SC**

Date	Time	Event
		<p>Lakes) and are inaccessible due to the development. Portions of these proposed transects maybe accessible, but would require an evacuation plan to execute these small portions. Brush cutters completed the last remaining transect in R-III along with a 100'X100' grid. MC sampling crew conducted sampling in the last grid in R-VII and set-up the next two sampling grids in R-IV. 1413: Crew placed on lightning hold. 1455: Made the call to secure operations due to inclement weather. Secured the majority of the crew at 1600. 1600-1740: held conference call between EODT Program Manager, Dave Mayfield, EODT Conway Project Manager, Brian Woods and myself to review operations (by range) and determine our final plan of action. Final plans called for us to acquire additional transect footage in the northern portion of Range VII and to assist MC sampling crew in acquiring as many locations, for sampling, as possible. In addition, we will make all efforts to use as much of the previous data, from previous and currently ongoing UXO remedial action locations in range III. Currently, EODT and Advent are working these locations and shared data will be used to help characterize this range.</p>
8/20/10	0600-1730	<p>Mustered the crew. EODT PM demobilized and returned to the home office. Daily tailgate safety briefing and planned operations discussed. RI team to finalize intrusive investigations on those placed grids in Range XX and to complete the two transects in Range III. Survey and SUXOS to investigate adding possible transect footage in Range VII and survey those points for further investigation. MC sampling completed the grids in Range IV and laid-in sampling grids in Range III and TR-2 for sampling next week. Busy week, with significant accomplishments. All but the added transects in Range VII are complete, and the only remaining tasks are completing MC sampling which should be completed by the end of next week. We had several extended work-hour days this week in an effort to finalize operations. Weather and temperatures this week have continued to be hot and humid, with the usual summertime afternoon rains and thunderstorms.</p>
8/23/10	0600-1730	<p>Mustered the crew. John Bonczek demobilized to support a 10-day construction support operation at Fort Stewart. Daily tailgate safety briefing and planned operations discussed. RI team, with the direction from survey, to Range VII to complete add-on transects 05, 06 &amp; 06A. MC sampling to continue, as planned. 1330: RI team completed transects R-VII-05 &amp; 06. At the same time, received a call from the EODT PM regarding his latest conversation with the USACE regarding job completion and a review of each range progress. The EODT PM explained that the USACE has directed us to make every effort to meander in Range III along proposed transects 03 – 17 and to place and prosecute three (3) intrusive grids, if possible. Transects 03 &amp; 04 are directly inside an upscale housing development and transects 05 -17 are directly in a DNR conservation area with a running stream and wetlands. Transects R-VII-01 &amp; 02 have been completed and are in an area where</p>



**EODT SUXOS Daily Log**  
**Conway RI / FS, Myrtle Beach, SC**

Date	Time	Event
		Advent is currently doing a DGM UXO remediation and a cleared lot adjacent to this property is being developed by a church, with ongoing construction. SUXOS and survey investigated the possibility of transect access adjacent to transects 03 & 04, in the Plantation Lakes subdivision of R-III. There is access along a canal bank within the ROE area of these proposed transects. Scott Solomon assisted Teresie with documenting and packaging the MC samples for further shipment. In addition, Scott followed Teresie to assist her with off-loading the coolers for shipment.
8/24/10	0600-1700	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. RI team to (modified) transect RIII-03 in the Plantation Lakes subdivision. MC sampling crew, with SUXOS, to RII and STR to collect required samples. Upon RI team's completion at RIII-03, they, (along with survey) are to attempt to acquire any data adjacent to transects RIII-05 through 18, within the given ROE. RI team was able to run approximately 600' of transect adjacent to RIII-14, along with a 50'X50' intrusive grid. No MEC and/or MD; all findings were cultural. 1300: SUXOS was informed by PM of a planned conference call with the USACE, sometime in the afternoon. Never received the call and at 1630 was informed that the conference call was postponed.
8/25/10	0600-1700	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. RI team is attempting to acquire additional access points anywhere adjacent to R-III-15-18. Our goals are to identify as much footage in this area, as possible. All of the transects, R-III-05-18, are adjacent to a known wetland area that has a running stream and is surrounded by standing water. In addition, we are looking for an area, within the ROE boundary, that we can place intrusive grids (two) and conduct MC sampling. MC sampling team to R-XX and TR-1 to complete sampling in this area. SUXOS responded via e-mail to the observations and suggestions e-mail from the USACE response to operations to date (see e-mails sent this day to Dave Mayfield and Brian Woods). RI team was able to hand cut some access points and acquire approximately 2,500ft of transect. In addition, they located and placed a 100'X100' MC grid with a 50'X50' intrusive grid. Today's total findings were one (1) survey nail. These areas are the only accessible locations along this area of transects in RIII. The RI team hand cut a large section, of the transect route, in order to make progress through the heavy vegetation and clear access. An extensive amount of time and effort was expended to try and access any footage adjacent to RIII-18, without any success. We attempted to approach this area from every feasible angle. This entire area is underwater and difficult to access. MC sampling crew completed TR-1 and Range XX.
8/26/10	0600-1650	Mustered the crew. Daily tailgate safety briefing and planned operations discussed. SUXOS received an early morning e-mail from the EODT PM, titled "Conway RI/FS Grids Resolution". The e-mail spelled-out the



**EODT SUXOS Daily Log  
Conway RI / FS, Myrtle Beach, SC**

Date	Time	Event
		<p>directions for the planned tasks and operations (as discussed between the PM and involved USACE personnel) to make-up lost mileage from the original proposed transects/grids. Basically it added those deficient transects and grids footage from non-ROE MS locations, as well as, from those transects and grids that were shortened as a result of wetlands and/or other unplanned obstacles. Consequently, today will be a non-production day to allow the crew to scout the newly proposed areas and determine where we can access and where we can't and to document today's findings. The MC sampling crew is collecting samples in RIII and one background area, within the ROE, but outside the ranges. RI team completed a reconnaissance of the newly proposed transects and grids to determine access and brush cutting needs. A separate e-mail was submitted to the PM addressing those findings and recommendations. MIS sampling crew completed all remaining sampling.</p>
8/27/10	0600-1700	<p>Mustered the crew. Teresie Walker to demobilize this morning. Daily tailgate safety briefing and planned operations discussed. RI team to Ranges IV &amp; VII to investigate those transects and grids that are accessible without brush cutters. In addition, the crew has been directed to acquire any additional footage, as close to the newly proposed transects and grids, as possible, without any brush cutting support. RI team was able to RI approximately 2,800ft of transect and one grid in Range IV. Weather this week was much milder then previous weeks, with milder temperatures and less humidity.</p>
8/30/10	0630-1715	<p>Work hours moved up a half hour due to morning darkness. Mustered the crew. Brush cutters (S&amp;P) returned for the third round. Daily tailgate safety briefing and planned operations discussed. RI team to continue in RIV. Brush cutters will start in RIII and move on to RIV &amp; RVII. Brush cutters completed all remaining transects/grids, as defined in the final resolution plan and agreed upon with all parties. Brush cutters to stay one additional day to confirm no further action. RI team made good progress today completing 4,600ft of transect and one grid with no significant finds.</p>
8/31/10	0630-1715	<p>Mustered the crew. Daily tailgate safety briefing and planned operations discussed. RI team, with survey support to continue investigations of all remaining transects and grids in Ranges III, IV and VII. 0900: After discussions with the EODT PM, demobilized the brush cutters. RI team completed all but a few remaining transects in RIV. Reviewed range transect and grid production to confirm listings, to date. Appears we have satisfied all but a few remaining transect investigations and can prepare for site close-down soon.</p>
9/01/10	0630-1715	<p>Mustered the crew. Daily tailgate safety briefing and planned operations discussed. RI team, with survey support to continue investigations of all remaining transects and grids in Ranges IV and VII. SUXOS and survey conducted a final review of transects/grids to insure compliance. With the exception of those remaining transects and grids, all assigned transects</p>



**EODT SUXOS Daily Log**  
**Conway RI / FS, Myrtle Beach, SC**

Date	Time	Event
		and grids have been completed. Plans are to finalize RI of all remaining transects/grids, insure GPS tracking and survey completion and commence site shut-down. 1200: RI team completed the last remaining transect and completed equipment and vehicle clean-up. All field work is completed. Turned-in all equipment except the conex container which is housing the MD and cultural scrap.
9/02/10	0630-1700	All but the SUXOS and UXOSO/QC demobilized. SUXOS and UXOSO/QC conducted final certification and verification of scrap. Scrap delivered to Allen's scrap yard for further processing as per the WP (see scrap turn-in documents). Completed arrangements for turn-in or shipment of all remaining equipment and vehicles. UXOSO/QC to demobilize tomorrow. <b>This is the final entry for this project.</b>



## **SAFETY/QC DAILY LOG**



**EODT Safety/Quality Specialist Daily Log  
Conway BGR RI/FS-4250, Myrtle Beach, SC**

<b>Date</b>	<b>Time</b>	<b>Event</b>
07/19/2010	0600	PM and Safety/QC arrive at Goodson staging location and meet SUXOS. The Goodson Safety Officer provided a safety briefing for Conway RI/FS Personnel new to the area.
	0700	Inventory, inspection and functional checkouts performed on all magnetometers. All magnetometers where tested in the Goodson test strip. Establish and verify project equipment requirements
	1300	Begin acquiring supplies identified as local purchase. Prepare all IT assets and deliver communication to local vendor for programming.
	1630	Secure operations for the day.
7/20/2010	0600	Attended the daily operations and safety briefing conducted for the Goodson Project. Project team listed tasks
	0630	Continued preparing equipment for and putting together safety equipment requirements for vehicles. Shortages identified to PM regarding safety equipment.
	0900	Surveyor and UXO Escort depart to find access to project work areas. Many areas require access through locked gates or a ROE has not been obtained to allow access.
	1500	Return to project staging area
	1630	Secure operations for the day.
7/21/2010	0600	Attend Goodson daily Safety Briefing
	0700	Accompany sub-contract Survey personnel to all project areas and establish control points for DGPS base station operations.
	1630	Secure daily operations
7/22/2010	0600	Conduct Daily operations and Safety Briefing for newly arrived RI/FS personnel and USACE counterparts. Mr. Cook and Parsons from the USACE were on-site.
	0630	Conducted vehicle inspections on vehicle received fro vendors.
	0715	All project personnel depart for training at a nearby hotel.
	1145	Training on the work plan, APP, HAZCOM, PPE and other required OSHA and USACE requirements were conducted.
	1300	Picked up remaining vehicles from vendor. All vehicles were inspected using EODT vehicle inspection checklist. One vehicle was removed from fleet due to tires being substandard. Requested Enterprise replaces bald tires. Instructed to deliver vehicle to nearest Firestone or Goodyear dealer and have tires replaced.
	1330	Conducted site familiarization for remainder of the day.
	1700	Secure for the day.
7/23/2010	0600-1730	(Rick Shellenbarger assumed the role as Safety/QC for the Conway RI/FS project in Horry County, SC). Performed daily safety meeting for RI/FS personnel (see attendance log for topics covered), conducted COM checks and went to Strafing Range with brush cutting crew to monitor downrange activities, performed Safety Inspection on handheld radios and cellular telephones coverage/range and the brush cutting operation, performed QC QAR Surveillance on Brush cutting crew operations, a UTV broke down and was returned to the vendor for repair due to quality/safety concerns (faulty starter), returned to EODT field office and secured daily operations.





**EODT Safety/Quality Specialist Daily Log  
Conway BGR RI/FS-4250, Myrtle Beach, SC**

Date	Time	Event
07-26-10	0600-1700	Performed daily safety meeting for RI/FS personnel (see safety training log for topics covered), performed COM checks, performed QC QAR surveillance on Survey team for safe vehicle operation, performed Safety inspection on Survey team and brush clearing crew for PPE, first-aid kits, fire extinguishers, and site house keeping. At 1230 a vehicle approached and broke down right next to work area on Turret Range. The driver exited and left on foot. Moment's later police arrived and shut down our site as a crime scene as the driver was a wanted felon and the car was stolen. We (QC/Safety, Survey Crew, Brush Crew, and UXO Team 1) were not allowed to leave the staging area as the police didn't want us traveling down the roads or walking around in the woods while they conducted their search for the criminal. At 1600 the police had secured the area and told us we could exit the area. Returned to EODT field office and secured daily operations.
07-27-10	0600-1530	Performed daily safety meeting for RI/FS personnel (see safety training log for topics covered), performed COM checks, took UXO team 1 (Vance, Solomon, Sebrell, Hill) to magnetometer test site and performed Schonstedt operational tests/certifications, performed QC QAR surveillance on magnetometer check out, performed Safety inspection on UXO team 1 UXO/OE detection equipment/calibration and their UTV trailer, found safety issue with trailer electrical plug that prevented the trailers taillights from working, dead-lined trailer until fixed. Performed vehicle inspections on two newly deliver UTV's. Went to Range XX to monitor UXO team 1 downrange activities. At 1350 a storm front approached our work area, at 1415 all EODT personnel at Range XX (Safety/UXO team 1) and surrounding areas (Survey crew/brush cutters) were on lightning hold, at 1430 all RI/FS operations were called due to unsafe weather conditions. All EODT personnel returned to EODT field office. Secured daily operations.
07-28-10	0600-1430	Performed daily safety meeting for RI/FS personnel (see safety training log for topics covered), performed COM checks, took John Bonczek to magnetometer test site and performed Schonstedt operational test/certification, went to Range XX to monitor downrange operations, performed QC QAR surveillance on RI/FS UXO Team 1's MEC investigation of Transect on Range XX, performed a safety inspection on RI/FS UXO Team 1 to ensure that proper physiological monitoring was being done IAW EODT SOP 111, went to Range 4 to monitor brush cutting operation, returned to Range XX to monitor RI/FS UXO Team 1, returned to EODT field office, secured daily operations.
07-29-10	0600-1630	Performed daily safety meeting for RI/FS personnel (see safety training log for topics covered), performed vehicle/UTV checkouts, performed COM checks, performed Schonstedt/White operational checks, went to range XX to monitor UXO team activities, performed QAR inspection on scrap removed from Range XX by RI/FS UXO Team 1, performed Safety Inspection on RI/FS UXO Team 1 (PPE/Work Practices follow WP/SSHP), went to Range 4, transect 13A-1 to monitor Survey and Brush Cutting teams, went to Turret Range 1 to monitor RI/FS UXO Team 1's activities. Returned to EODT field office, secured daily operations.



**EODT Safety/Quality Specialist Daily Log  
Conway BGR RI/FS-4250, Myrtle Beach, SC**

<b>Date</b>	<b>Time</b>	<b>Event</b>
07-30-10	0600-1630	Performed daily safety meeting for RI/FS personnel (see safety training log for topics covered), performed COM checks, performed Schonstedt/White operational check, went to Turret Range 1, performed a QAR Inspection on RI/FS UXO Team 1's Team Leader log book, went to Range 4 to monitor brush cutting operations, performed a safety inspection on UXO safety escort's first aid kits/eyewash kits, and communication equipment, returned to Turret Range 1 to monitor RI/FS UXO Teams activities, returned to EODT field office, secured daily operations.
08-02-10	0600-1630	Performed daily safety meeting for RI/FS personnel (see safety training log for topics covered), performed COM checks, performed Schonstedt/White operational checks, performed QAR surveillance on UXO Magnetometer checkout procedures, performed daily safety inspection on house-keeping and UXO/OE detection equipment, went with RI/FS UXO Team 1 to Turret Range 1, finished transect on Turret Range 1, went to Strafing Range to monitor RI/FS UXO Team 1's activities, finished Strafing Range. Returned to EODT field office, secured daily operations.
08-03-10	0600-1630	Performed daily safety meeting for RI/FS personnel (see safety training log for topics covered), performed COM checks, performed Schonstedt/White operational checks, performed 100% seat belt inspection on site Conway BGR site personnel, went with John Clark (Survey) to map transect end points on XX, Turret 1, and Strafing ranges, performed QC QAR surveillance on Survey operations. Returned to EODT field office, secured daily operations.
08-04-10	0600-1630	Performed daily safety meeting for RI/FS personnel (Physiological monitoring, Proper UXO anomaly investigation techniques, environmental concerns, emergency plans, hydration, and safe UTV operation), performed COM checks, performed Schonstedt/White operational checks, went with RI/FS UXO Team 1 to Range 7, Transects 1, 2, and 3 to monitor site activities, performed Safety surveillance on RI/FS UXO Team 1's physiological monitoring and anomaly investigation techniques, returned to EODT field office, performed QAR scrap inspection on MEC related debris and Cultural debris, no explosive hazards were present, secured daily operations.
08-05-10	0600-1630	Performed daily safety meeting for RI/FS personnel (heat stress, slips, trips, falls, falling tree limbs, emergency plan, hydration, and safe vehicle operation), performed COM checks, performed vehicle safety inspections, monitored Schonstedt/White operational checks, went with RI/FS UXO Team 1 to Range 4 to monitor site activities, performed a safety surveillance on UXO Team 1, UXO/OE intrusive investigation. Returned 2 disabled UTV's to EODT field office for repair, performed QAR inspection on scrap removed from Range 4, no explosive hazards were present. Secured daily operations.
08-06-10	0600-1100	Performed daily safety meeting for RI/FS personnel (Seatbelt use in vehicles/UTVs, traffic laws, deep ruts on trails, watch out for thumb injuries while driving UTV, heat stress, hydration, use of PPE), performed COM checks, monitored Schonstedt/White operational checks, went with RI/FS UXO Team 1 to Range 4 to monitor site activities, performed QC QAR inspection on RI/FS UXO Team 1's Team Leader log book, performed safety inspection on UXO Team 1's Heat Stress Prevention (Physiological Monitoring), returned to EODT field office, secured daily operations.



**EODT Safety/Quality Specialist Daily Log**  
**Conway BGR RI/FS-4250, Myrtle Beach, SC**

Date	Time	Event
08-09-10	0600-1630	Performed daily safety meeting for RI/FS personnel (Proper wear of PPE, Safe digging techniques, Seatbelt use in vehicles/UTVs, traffic laws, deep ruts on trails, heat stress, hydration, use of PPE), performed COM checks, monitored Schonstedt/White operational checks, performed Safety surveillance on magnetometer checkout, went with RI/FS UXO Team 1 to Range 4 to monitor site activities, performed QC QAR inspection on RI/FS UXO Team 1's MEC investigation of transects on Range 4, took flat tire from UXO Team 1's truck to tire shop to replace tire, Bill Serbell was stung by a Yellow Jacket, monitored for adverse reaction, nothing to report, returned to EODT field office, secured daily operations.
08-10-10	0600-1630	Performed daily safety meeting for RI/FS personnel (Proper wear of PPE, Don't get complacent, Vehicle speed limit while pulling trailers, Ivy decon, 2 person rule, heat stress, hydration), performed COM checks, monitored Schonstedt/White operational checks, performed safety inspection on site housekeeping and UXO/OE detection equipment, went with RI/FS UXO Team 1 to Turret Range 2 to monitor site activities, performed QC QAR surveillance on Survey operations on Turret range 2, checked with Bill Serbell to make sure his bee sting was ok, it was, returned to EODT field office, secured daily operations.
08-11-10	0600-1630	Performed daily safety meeting for RI/FS personnel (safe separation, always assume your digging on MEC, slips/trips/falls, adverse weather, emergency actions, heat stress prevention, no cell phones while driving), performed COM checks, monitored Schonstedt/White operational checks, went with RI/FS UXO Team 1 to Turret Range 2 to monitor site activities, went to range 7 with brush crew and survey, performed safety brief with brush crew, performed safety inspection on Survey team (PPE, WP/SSHP, First Aid Kits), performed QC QAR surveillance on Brush cutting operations on range 7, Tom Hinote was stung by a bee, no adverse reactions observed, returned to EODT field office, secured daily operations.
8-12-10	0600-1630	Performed daily safety meeting for RI/FS personnel (safe separation, always assume your digging on MEC, slips/trips/falls, adverse weather, emergency actions, heat stress prevention, use a ground guide while backing up), performed COM checks, monitored Schonstedt/White operational checks, , went with RI/FS UXO Team 1 to Range 4 to monitor site activities, went to range 4 with brush crew and survey to monitor their downrange activities, performed safety brief with brush crew, performed safety inspection on Survey and brush crew (PPE, First Aid Kits, fire ext, housekeeping), performed QC QAR surveillance on RI/FS UXO Tm 1's MEC investigation of transect grids on range 4, checked with Tom Hinote to see if his bee sting from yesterday was all better, no adverse reactions to report, returned to EODT field office, secured daily operations.



**EODT Safety/Quality Specialist Daily Log**  
**Conway BGR RI/FS-4250, Myrtle Beach, SC**

Date	Time	Event
08-13-10	0600-1630	Performed daily safety meeting for RI/FS personnel (safe work practices, , slips/trips/falls, proper hygiene practices, emergency actions, heat stress prevention, vehicle/UTV safety), performed COM checks, monitored Schonstedt/White operational checks, went with RI/FS UXO Team 1 to Range 4 to monitor site activities, performed safety brief with brush crew, went to range 4 with brush crew and survey to monitor their downrange activities, performed safety inspection on Survey and brush crew (First Aid Kits, eyewash, fire ext, COMs), performed QC QAR inspection on RI/FS UXO Tm 1's TL logbook, went to Range 7 with brush cutting crew to monitor down range activities, returned to EODT field office, secured daily operations.
08-16-10	0600-1630	Performed daily safety meeting for RI/FS personnel (safe separation, always assume your digging on MEC, slips/trips/falls, adverse weather, emergency actions, heat stress prevention, use a ground guide while backing up), performed COM checks, performed Schonstedt/White operational checks, performed 100% seat belt inspection on site Conway BGR site personnel, went to range 7 to monitor activities, went to range XX to monitor activities, performed QC QAR surveillance on Survey operations. Returned to EODT field office, secured daily operations.
08-17-10	0600-1630	Performed daily safety meeting for RI/FS personnel (Proper wear of PPE, Don't get complacent, Vehicle speed limit while pulling trailers, Ivy decon, 2 person rule, heat stress, hydration), performed COM checks, monitored Schonstedt/White operational checks, went with RI/FS UXO Team 1 to Range XX to monitor site activities, performed safety inspection on UXO Tm 1's physiological monitoring heat stress prevention, went to Range 4 to meet up with brush cutters, performed safety brief with brush cutters, performed QC QAR surveillance on brush cutting ops on ranges 4 and 7, returned to EODT field office, secured daily operations.
08-18-10	0600-1630	Performed daily safety meeting for RI/FS personnel (Adverse weather precautions, don't become complacent, slips/trips/falls, snakes and ticks, heat stress prevention, and properly securing equipment), performed COM checks, monitored Schonstedt/White operational checks, performed safety inspection of COMs and UTV trailers, performed QC surveillance of magnetometer checkout, went with RI/FS UXO Team 1 to Turret Range 1 to monitor site activities, returned to EODT field office, secured daily operations.
08-19-10	0600-1630	Performed daily safety meeting for RI/FS personnel (Proper UXO anomaly investigation technique, do not touch something if you don't know what it is, call over an EOD tech to verify condition/identity of all unknown items found, insect bite avoidance, walking hazards (deep ruts covered by brush, sharp sticks, tripping hazards) heat stress prevention, vehicle safety (obey speed limits, accident prevention)), performed COM checks, monitored Schonstedt/White operational checks, performed safety surveillance on safe vehicle operations, specifically using ground guides while reversing, performed QC QAR surveillance on RI/FS personnel performing weekly vehicle inspections, as directed by EOD SOP 122, went with RI/FS UXO team to Strafing Range to observe field operations, placed teams on lightning hold, due to bad weather operations were called, returned to EODT field office, secured daily operations.



**EODT Safety/Quality Specialist Daily Log**  
**Conway BGR RI/FS-4250, Myrtle Beach, SC**

Date	Time	Event
8-20-10	0600-1630	Performed daily safety meeting for RI/FS personnel (Adverse weather, do not touch something if you don't know what it is, call over an EOD tech to verify condition/identity of all unknown items found, insect bite avoidance, walking hazards (deep ruts covered by brush, sharp sticks, tripping hazards) heat stress prevention, vehicle safety (obey speed limits, accident prevention)), Teams were placed on lightning hold for 30mins due to lightning, performed COM checks, monitored Schonstedt/White operational checks, performed safety surveillance on UXO detection equipment checkout and pre-op com checks, went with RI/FS UXO team to range 3 to observe field operations, performed QC QAR surveillance on RI/FS UXO teams investigation of transects on range 3, went to Turret Range 2 with Survey crew to monitor survey operations, returned to EODT field office, secured daily operations.
8-23-10	0600-1630	Performed daily safety meeting for RI/FS personnel (Adverse weather, avoid becoming complacent, personal decon, insect bite avoidance, walking hazards, heat stress prevention, vehicle safety (obey speed limits, accident prevention)), performed COM checks, monitored Schonstedt/White operational checks, performed safety surveillance on site housekeeping, communications, and UXO detection equipment, went with RI/FS UXO team to range 3 to observe field operations as they cleared additionally required grids, performed QC QAR inspection of RI/FS UXO TL Logbook, monitored sampling activities, secured daily operations.
08-24-10	0600-1630	Performed daily safety meeting for RI/FS personnel (Team separation, required PPE, fueling concerns, environmental concerns, emergency plans, hydration, and safe vehicle/UTV operation), performed COM checks, performed Schonstedt/White operational checks, performed 100% seatbelt check for Conway RI/FS personnel, went with RI/FS UXO TM 1 to Range 3 to monitor down range activities, returned to EODT field office to check on sampling operations, performed QAR scrap inspection on MEC related debris and Cultural debris from Range 3 transects, no explosive hazards were present, secured daily operations.
08-25-10	0600-1630	Performed daily safety meeting for RI/FS personnel (Quality work, don't be careless, required PPE, use of personal decon, environmental concerns, emergency plans, hydration, and safe vehicle/UTV operation), performed COM checks, monitored and performed QC QAR surveillance on Schonstedt/White operational checks, went with RI/FS UXO TM 1 to Range 3 to monitor down range activities, performed safety surveillance on UXO Teams use or PPE and worksite housekeeping, returned to EODT field office to check on sampling operations, secured daily operations.
08-26-10	0600-1630	Performed daily safety meeting for RI/FS personnel (Required PPE, use of personal decon (Ivy), safe use of brush cutting machete, emergency plans, hydration, and safe vehicle/UTV operation), performed COM checks, monitored and performed safety surveillance on Schonstedt/White operational checks, monitored and performed QC QAR surveillance on vehicle inspections of trucks and UTVs, went with RI/FS UXO TM 1 to Range 4 and 7 to monitor down range activities, returned to EODT field office to check on sampling operations, secured daily operations.



**EODT Safety/Quality Specialist Daily Log**  
**Conway BGR RI/FS-4250, Myrtle Beach, SC**

Date	Time	Event
08-27-10	0600-1630	Performed daily safety meeting for RI/FS personnel (Safe separation, proper digging of anomalies, insects, slips, trips, falls, emergency plans, hydration, and safe vehicle/UTV operation), performed COM checks, performed safety surveillance of team equipment boxes for required safety items and Com checks, observed Schonstedt/White operational checks, went with RI/FS UXO TM 1 to Range 4 and 7 to monitor down range activities, returned to EODT field office, performed QC QAR Inspection on UXO TL's logbook, secured daily operations.
08-30-10	0630-1700	Performed daily safety meeting for RI/FS personnel (Physiological monitoring, Proper UXO anomaly investigation techniques, environmental concerns, emergency plans, hydration, and safe UTV operation), performed COM checks, performed Schonstedt/White operational checks, went with RI/FS UXO Team 1 to Range 4 and 7 to monitor downrange activities, monitored brush clearing operations on range 4, performed Safety surveillance on seatbelt use for RI/FS personnel, returned to EODT field office, performed QAR scrap inspection on MEC related debris and Cultural debris, no explosive hazards were present, secured daily operations.
08-31-10	0630-1700	Performed daily safety meeting for RI/FS personnel (Proper UXO anomaly investigation technique, do not touch something if you don't know what it is, call over an EOD tech to verify condition/identity of all unknown items found, insect bite avoidance, walking hazards (deep ruts covered by brush, sharp sticks, tripping hazards) heat stress prevention, vehicle safety (obey speed limits, accident prevention)), performed COM checks, monitored and performed QC QAR surveillance on RI/FS UXO Tm 1's magnetometer check out, performed Safety surveillance of UXO team 1 UXO/OE detection equipment/calibration, first aid kits, went to Range 3, 4, and 7 to monitor UXO team 1 downrange activities. Returned to EODT field office. Secured daily operations.
09-01-10	0630-1700	Performed daily safety meeting for RI/FS personnel (last day of intrusive investigations, don't get complacent, slips, trips, falls, ticks, snakes, heat stress, vehicle safety, be careful driving home), performed COM checks, monitored magnetometer checkouts, cleaned, packaged and inventoried equipment, performed vehicle inspections, cleaned vehicles/utvs, performed safety surveillance on safe vehicle operations, turned in cell phone, laptop, printer. Returned truck, trailer, and utv to Hertz. Performed QC QAR Inspection on Jim Vance's RI/FS TL Logbook. Secured daily operations.
09-02-10	0630-1700	Performed daily safety brief to RI/FS SUXOS about utilizing proper PPE while inspecting scrap. Inspected RI/FS scrap, no hazards found, performed a safety survey on RI/FS SUXOS's use of proper PPE while performing scrap inspection and site clean up/housekeeping. Performed QC QAR inspection on all RI/FS scrap, no hazards found, took scrap to recycler. Returned to EODT field office, performed demobilization paperwork



## **QAR LOG**



## Quality Activity Log

Name: Rick Shellenbarger			Site/Task Order #: W912DY-04-0018/0012			Date Range: 7/19/2010 through		
Report No.	Type of Activity (I / S / CR / TPI)	Process	Pass	Fail	Condition Report (CR) #	Corrective Action Completion Date	Pass Date	Fail Date
07-001	I	Initial Equipment Inspection	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
07-002	S	Brush crew operations survey	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
07-003	S	Vehicle Operation Surveillance	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
07-004	S	Magnetometer Check out	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
07-005	S	MEC Investigation Operation	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
07-006	I	UXO Team 1 Scrap Insp.	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
07-007	I	UXO Team 1 Log Book Insp.	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-001	S	Magnetometer checkout	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-002	S	Transect Layouts	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-003	I	UXO Team 1 Scrap Insp.	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-004	I	UXO Team 1 Scrap Insp.	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-005	I	UXO Team 1 Log Book Insp.	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-006	S	MEC Investigation Operation	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-007	S	Turret Range 2 Transect Survey operations	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-008	S	Brush cutting ops, Range 7	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-009	S	MEC Investigation Operation	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-010	I	UXO Tm Leader log insp.	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-011	S	Range XX Grid Layouts, Survey Operations	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-012	S	Brush clearing ops on range 7 and 4	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-013	S	Magnetometer checkout	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-014	S	Weekly Vehicle Checkout	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-015	S	MEC Investigation Operation	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
08-016	I	UXO TL Log Book Insp.	X					





## Quality Activity Log

08-017	I	Scrap Inspection (range 3)	X					
08-018	S	Magnetometer Checkout	X					
08-019	S	Weekly Vehicle Checkout	X					
08-020	I	UXO TL Log Book Insp.	X					
08-021	I	UXO Team 1 Scrap Insp.	X					
08-022	S	Equip Checkout	X					
09-001	I	RI/FS TL Logbook	X					
09-002	I	RI/FS Final scrap inspection	X					



## **QAR REPORTS**



## Quality Activity Report

Report #: 07-001		
<b>Name:</b> Eugene Mikell	<b>Contract #/Task Order:</b> W912DY-04-0018/0012	<b>Date:</b> 7/19/2010
<b>Team/Function:</b> N/A	<b>Site Location:</b> Conway BGR-4250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input checked="" type="checkbox"/> Inspection <input type="checkbox"/> Surveillance
<b>Activity Results:</b> All Whites and Schoenstedt magnetometers were functioned tested IAW the technical manual as required by 3.5.1.2, 4.4.3 of the work plan and EODT GWI 12 on 7/19/2010 by Eugene Mikell. The Whites were tested against a known survey point located in the front packing lot of the project office trailer. The Schonstedts52cx were checked against the Goodson Test Strip. All seed items were located on a setting of 4.		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b>	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b>	<b>Quality Specialist Signature:</b>	



## Quality Activity Report

Report #: 07-002		
<b>Name:</b> Pressley, Lain; Stroupe, Colby	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 07-23-10
<b>Team/Function:</b> Brush cutting crew operations at Strafing Range	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<b>Activity Results:</b> Brush cutting crew performed their duties safely and IAW the work plan, APP, and AHA (sections 7.3.2, 3.7.4, D.13.5, D.11, D-2-9 through D-2-11) while clearing brush from Strafing Range by properly wearing/utilizing PPE, maintaining safe distances from Survey Crew (Clark, John; Futral, Jathan) and UXO Safety Escort (Shellenbarger, Richard), only clearing areas as needed to traverse the transects without interference, only clearing trees with diameters of 3" or less (going around those which have larger diameters), cutting as low to the ground as feasible without tearing up the root base, and identifying and not disturbing wetlands.		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>



## Quality Activity Report

<b>Report #:</b> 07-003		
<b>Name:</b> Clark, John (DDC Survey)	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 07-26-10
<b>Team/Function:</b> Safe vehicle operation	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b>  <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<p><b>Activity Results:</b> While leaving the EODT field office, located on Carolina Forest BLVD, to go to Turret Range, Mr. Clark safely operated his assigned vehicle IAW Applicable sections of EODT SOP 122 by properly wearing his seatbelt, maintaining safe distances between his vehicle and other vehicles, signaling, and not exceeding the posted speed limit.</p>		
<p><b>EODT Manager Comments:</b></p>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>



## Quality Activity Report

Report #: 07-004		
<b>Name:</b> James Vance, Bill Sebrell, Sandon Hill, Scott Solomon	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 07-27-10
<b>Team/Function:</b> UXO RI/FS Team 1 Magnetometer check out	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<b>Activity Results:</b> At 0800 RI/FS UXO Team 1 members (James vance, Bill Sebrell, Sandon Hill, Scott Solomon) each performed a qualification test, certifying the detecting capabilities of their Schonstedts and each respective operators proficiency using the Schonstedts IAW the work plan, section 3.5.1.6.2. All the above persons passed the test and each Schonstedt is in proper working condition.		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b> Tom Hinote	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b> Richard Shellenbarger	<b>Quality Specialist Signature:</b>	



## Quality Activity Report

Report #: 07-005		
<b>Name:</b> James Vance, Bill Sebrell, Sandon Hill, Scott Solomon	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 07-28-10
<b>Team/Function:</b> RI/FS UXO Team 1, Range XX Transect MEC investigation operation	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<b>Activity Results:</b> UXO Team 1 performed MEC remediation investigation of transect on Range XX IAW EODT SOP 120(A) and the work plan, sections 3.5.2.9 and 3.7.6 by using the prescribed UXO/OE detection device, maintaining an accurate count of anomalies, and incorporating safe digging techniques while performing intrusive investigations of anomalies.		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b> Tom Hinote	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b> Richard Shellenbarger	<b>Quality Specialist Signature:</b>	



## Quality Activity Report

<b>Report #:</b> 07-006		
<b>Name:</b> James Vance, Bill Sebrell, Sandon Hill, Scott Solomon	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 07-29-10
<b>Team/Function:</b> RI/FS UXO Team 1, Scrap Inspection.	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input checked="" type="checkbox"/> Inspection <input type="checkbox"/> Surveillance
<b>Activity Results:</b> Inspected scrap removed from Range XX transect IAW the work plan, section 4.3.3 and 4.8.2. All scrap was clear of explosive components.		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>





## Quality Activity Report

Report #: 07-007		
<b>Name:</b> James Vance	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 07-30-10
<b>Team/Function:</b> RI/FS UXO Team 1, Team leader log book inspection	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input checked="" type="checkbox"/> Inspection <input type="checkbox"/> Surveillance
<b>Activity Results:</b> Inspected RI/FS UXO Team Leader log book as required by the work plan, section 4.4.5. All entries satisfied the requirements listed in section 4.4.5		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b> Tom Hinote	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b> Richard Shellenbarger	<b>Quality Specialist Signature:</b>	



## Quality Activity Report

<b>Report #:</b> 08-001		
<b>Name:</b> James Vance, Bill Sebrell, Sandon Hill, Scott Solomon	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-02-10
<b>Team/Function:</b> UXO RI/FS Team 1 Magnetometer check out	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b>  <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<b>Activity Results:</b> At 0630 RI/FS UXO Team 1 members (James vance, Bill Sebrell, Sandon Hill, Scott Solomon) each performed an equipment test, verifying the detecting capabilities of their Schonstedts/Whites XLT's IAW the work plan, sections 3.5.1.2 and 3.5.1.6.2.		
<b>EODT Manager Comments:</b>          		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>



## Quality Activity Report

<b>Report #:</b> 08-002		
<b>Name:</b> John Clark	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-03-10
<b>Team/Function:</b> Conway BGR RI/FS Survey/Transect layouts	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b>  <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<p><b>Activity Results:</b> Transect layouts for Ranges XX and Turret 1 were performed by John Clark, Conway BGR Survey team with Conway BGR SSHO/QC providing UXO safety escort. The end points of the above listed transects were located and marked IAW the work plan, section 3.5.1.5.1.</p>		
<p><b>EODT Manager Comments:</b></p>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>



## Quality Activity Report

<b>Report #:</b> 08-003		
<b>Name:</b> James Vance, Bill Sebrell, Sandon Hill, Scott Solomon	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-04-10
<b>Team/Function:</b> RI/FS UXO Team 1, Scrap Inspection.	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input checked="" type="checkbox"/> Inspection <input type="checkbox"/> Surveillance
<b>Activity Results:</b> Inspected scrap removed from Range, transect's 1, 2, and 3, IAW the work plan, sections 4.3.3 and 4.8.2. Scrap included cultural debris, .50 caliber shell casings and projectiles, and deteriorated pieces of 100lb sand filled practice bombs. All scrap was clear of explosive components.		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>



## Quality Activity Report

<b>Report #:</b> 08-004		
<b>Name:</b> James Vance, Bill Sebrell, Sandon Hill, Scott Solomon	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-05-10
<b>Team/Function:</b> RI/FS UXO Team 1, Scrap Inspection.	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b>  <input checked="" type="checkbox"/> Inspection <input type="checkbox"/> Surveillance
<b>Activity Results:</b> Inspected scrap removed from Range, transect's 1, 2, and 3, IAW the work plan, sections 4.3.3 and 4.8.2. Scrap included cultural debris and deteriorated pieces of 100lb sand filled practice bombs. All scrap was clear of explosive components.		
<b>EODT Manager Comments:</b>          		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>



## Quality Activity Report

Report #: 08-005		
<b>Name:</b> James Vance	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-6-10
<b>Team/Function:</b> RI/FS UXO Team 1, Team leader log book inspection	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input checked="" type="checkbox"/> Inspection <input type="checkbox"/> Surveillance
<b>Activity Results:</b> Inspected RI/FS UXO Team Leader log book as required by the work plan, section 4.4.5. All entries satisfied the requirements listed in section 4.4.5		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b> Tom Hinote	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b> Richard Shellenbarger	<b>Quality Specialist Signature:</b>	



## Quality Activity Report

<b>Report #:</b> 08-006		
<b>Name:</b> James Vance, Bill Sebrell, Sandon Hill, Scott Solomon	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 8-09-10
<b>Team/Function:</b> RI/FS UXO Team 1, Range XX Transect MEC investigation operation	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b>  <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<b>Activity Results:</b> UXO Team 1 performed MEC remediation investigation of transect on Range IV IAW EODT SOP 120(A) and the work plan, sections 3.5.2.9 and 3.7.6 by using the prescribed UXO/OE detection device, maintaining an accurate count of anomalies, and incorporating safe digging techniques while performing intrusive investigations of anomalies.		
<b>EODT Manager Comments:</b>          		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>



## Quality Activity Report

<b>Report #:</b> 08-007		
<b>Name:</b> John Clark	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-10-10
<b>Team/Function:</b> Conway BGR RI/FS Survey/Transect layouts	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b>  <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<p><b>Activity Results:</b> Transect layouts for Turret Range 2 were performed by John Clark, Conway BGR Survey team with RI/FS UXO T2 John Bonczek providing UXO safety escort. The end points of the above listed transects were located and marked IAW the work plan, section 3.5.1.5.1.</p>		
<p><b>EODT Manager Comments:</b></p>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>





## Quality Activity Report

Report #: 08-008		
<b>Name:</b> Pressley, Lain; Stroupe, Colby	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-11-10
<b>Team/Function:</b> Brush cutting operations at Range 7	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<b>Activity Results:</b> Brush cutting crew performed their duties safely and IAW the work plan, APP, and AHA (sections 7.3.2, 3.7.4, D.13.5, D.11, D-2-9 through D-2-11) while clearing brush from selected grids on Range 7 by properly wearing/utilizing PPE, maintaining safe distances from Survey Crew (Clark, John; Hinote, Tom) and UXO Safety Escort (Bonczek, John), only clearing trees with diameters of 3" or less (going around those which have larger diameters), cutting as low to the ground as feasible without tearing up the root base, and not disturbing identified wetlands.		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>



## Quality Activity Report

Report #: 08-009		
<b>Name:</b> James Vance, Bill Sebrell, Sandon Hill, Scott Solomon	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 8-12-10
<b>Team/Function:</b> RI/FS UXO Team 1, Range XX Transect MEC investigation operation	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<b>Activity Results:</b> UXO Team 1 performed MEC remediation investigation of transect grids on Range IV IAW EODT SOP 120(A) and the work plan, sections 3.5.2.9 and 3.7.6 by using the prescribed UXO/OE detection device, maintaining an accurate count of anomalies, and incorporating safe digging techniques while performing intrusive investigations of anomalies.		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b> Tom Hinote	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b> Richard Shellenbarger	<b>Quality Specialist Signature:</b>	



## Quality Activity Report

<b>Report #:</b> 08-010		
<b>Name:</b> James Vance	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-13-10
<b>Team/Function:</b> RI/FS UXO Team 1, Team leader log book inspection	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input checked="" type="checkbox"/> Inspection <input type="checkbox"/> Surveillance
<p><b>Activity Results: Inspected RI/FS UXO Team Leader log book as required by the work plan, section 4.4.5. All entries satisfied the requirements listed in section 4.4.5</b></p>		
<p><b>EODT Manager Comments:</b></p>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>



## Quality Activity Report

<b>Report #:</b> 08-011		
<b>Name:</b> John Clark	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-16-10
<b>Team/Function:</b> Conway BGR RI/FS Survey/Grid layouts	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b>  <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<p><b>Activity Results:</b> Grid layouts on Range XX were performed by John Clark, Conway BGR Survey team with RI/FS UXO T2 John Bonczek providing UXO safety escort. The end points of the above listed grids were located and marked IAW the work plan, section 3.5.1.5.1.</p>		
<p><b>EODT Manager Comments:</b></p>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>



## Quality Activity Report

Report #: 08-012		
<b>Name:</b> Pressley, Lain; Stroupe, Colby	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-17-10
<b>Team/Function:</b> Brush cutting operations at Range 7 and 4	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<b>Activity Results:</b> Brush cutting crew performed their duties safely and IAW the work plan, APP, and AHA (sections 7.3.2, 3.7.4, D.13.5, D.11, D-2-9 through D-2-11) while clearing brush from remaining and grids on Range 7 and 4 by properly wearing/utilizing PPE, maintaining safe distances from Survey Crew (Clark, John; Hinote, Tom) and UXO Safety Escort (Bonczek, John), only clearing trees with diameters of 3" or less (going around those which have larger diameters), cutting as low to the ground as feasible without tearing up the root base, and not disturbing identified wetlands.		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>



## Quality Activity Report

Report #: 08-013		
<b>Name:</b> James Vance, Bill Sebrell, Sandon Hill, Scott Solomon	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-18-10
<b>Team/Function:</b> UXO RI/FS Team 1 Magnetometer check out	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<b>Activity Results:</b> At 0630 RI/FS UXO Team 1 members (James vance, Bill Sebrell, Sandon Hill, Scott Solomon) each performed an equipment test, verifying the detecting capabilities of their Schonstedts/Whites XLT's IAW the work plan, sections 3.5.1.2 and 3.5.1.6.2.		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b> Tom Hinote	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b> Richard Shellenbarger	<b>Quality Specialist Signature:</b>	



## Quality Activity Report

Report #: 08-014		
<b>Name:</b> Bill Sebrell, Sandon Hill, Scott Solomon, Tom Hinote, John Bonczek	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-19-10
<b>Team/Function:</b> Conway RI/FS Weekly Vehicle Inspection	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<b>Activity Results:</b> At 0630 RI/FS personnel inspected all vehicles and UTVs using the EODT Weekly Vehicle Checklist as the inspection criteria, IAW EODT SOP 122. No major deficiencies found.		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b> Tom Hinote	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b> Richard Shellenbarger	<b>Quality Specialist Signature:</b>	



## Quality Activity Report

<b>Report #:</b> 08-015		
<b>Name:</b> Jim Vance, Bill Sebrell, Sandon Hill, Scott Solomon,	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-20-10
<b>Team/Function:</b> Conway RI/FS UXO Tm 1, Anomaly Investigations	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b>  <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<b>Activity Results: UXO Team 1 performed MEC remediation investigation of additional transects on Range 3 IAW EODT SOP 120(A) and the work plan, sections 3.5.2.9 and 3.7.6 by using the prescribed UXO/OE detection device, maintaining an accurate count of anomalies, and incorporating safe digging techniques while performing intrusive investigations of anomalies.</b>		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>





## Quality Activity Report

Report #: 08-016		
<b>Name:</b> James Vance	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-23-10
<b>Team/Function:</b> RI/FS UXO Team 1, Team leader log book inspection	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input checked="" type="checkbox"/> Inspection <input type="checkbox"/> Surveillance
<b>Activity Results:</b> Inspected RI/FS UXO Team Leader log book as required by the work plan, section 4.4.5. All entries satisfied the requirements listed in section 4.4.5		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b> Tom Hinote	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b> Richard Shellenbarger	<b>Quality Specialist Signature:</b>	



## Quality Activity Report

Report #: 08-017		
<b>Name:</b> James Vance, Bill Serbell, Sandon Hill	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-24-10
<b>Team/Function:</b> RI/FS UXO Team 1 scrap inspection	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input checked="" type="checkbox"/> Inspection <input type="checkbox"/> Surveillance
<b>Activity Results:</b> Inspected scrap removed from Range 3 transects IAW the work plan, section 4.3.3 and 4.8.2. All scrap was clear of explosive components.		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b> Tom Hinote	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b> Richard Shellenbarger	<b>Quality Specialist Signature:</b>	



## Quality Activity Report

Report #: 08-018		
<b>Name:</b> James Vance, Bill Sebrell, Sandon Hill, Scott Solomon	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-25-10
<b>Team/Function:</b> UXO RI/FS Team 1 Magnetometer check out	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<b>Activity Results:</b> At 0630 RI/FS UXO Team 1 members (James vance, Bill Sebrell, Sandon Hill, Scott Solomon) each performed an equipment test, verifying the detecting capabilities of their Schonstedts/Whites XLT's IAW the work plan, sections 3.5.1.2 and 3.5.1.6.2.		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b> Tom Hinote	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b> Richard Shellenbarger	<b>Quality Specialist Signature:</b>	



## Quality Activity Report

<b>Report #:</b> 08-019		
<b>Name:</b> Bill Sebrell, Sandon Hill, Scott Solomon, Tom Hinote,	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-26-10
<b>Team/Function:</b> Conway RI/FS Weekly Vehicle Inspection	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b>  <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<b>Activity Results: At 0630 RI/FS personnel inspected all vehicles and UTVs using the EODT Weekly Vehicle Checklist as the inspection criteria, IAW EODT SOP 122. No major deficiencies found.</b>		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>



## Quality Activity Report

Report #: 08-020		
<b>Name:</b> James Vance	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-27-10
<b>Team/Function:</b> RI/FS UXO Team 1, Team leader log book inspection	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input checked="" type="checkbox"/> Inspection <input type="checkbox"/> Surveillance
<b>Activity Results:</b> Inspected RI/FS UXO Team Leader log book as required by the work plan, section 4.4.5. All entries satisfied the requirements listed in section 4.4.5		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b> Tom Hinote	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b> Richard Shellenbarger	<b>Quality Specialist Signature:</b>	



## Quality Activity Report

Report #: 08-021		
<b>Name:</b> James Vance, Bill Sebrell, Sandon Hill, Scott Solomon	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-30-10
<b>Team/Function:</b> RI/FS UXO Team 1, Scrap Inspection.	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input checked="" type="checkbox"/> Inspection <input type="checkbox"/> Surveillance
<b>Activity Results:</b> Inspected scrap removed from transects on Ranges 4 and 7, IAW the work plan, sections 4.3.3 and 4.8.2. Scrap included cultural debris, and deteriorated pieces of 100lb sand filled practice bombs. All scrap was clear of explosive components.		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b> Tom Hinote	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b> Richard Shellenbarger	<b>Quality Specialist Signature:</b>	



## Quality Activity Report

<b>Report #:</b> 08-022		
<b>Name:</b> James Vance, Bill Sebrell, Sandon Hill, Scott Solomon	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 08-31-10
<b>Team/Function:</b> UXO RI/FS Team 1 Magnetometer check out	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b>  <input type="checkbox"/> Inspection <input checked="" type="checkbox"/> Surveillance
<b>Activity Results:</b> At 0630 RI/FS UXO Team 1 members (James vance, Bill Sebrell, Sandon Hill, Scott Solomon) each performed an equipment test, verifying the detecting capabilities of their Schonstedts/Whites XLT's IAW the work plan, sections 3.5.1.2 and 3.5.1.6.2.		
<b>EODT Manager Comments:</b>          		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>		<b>Condition Report #:</b>
<b>Senior EODT Manager Name:</b> Tom Hinote		<b>Senior EODT Manager Signature:</b>
<b>Quality Specialist Name:</b> Richard Shellenbarger		<b>Quality Specialist Signature:</b>



## Quality Activity Report

Report #: 09-001		
<b>Name:</b> James Vance	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 09-01-10
<b>Team/Function:</b> RI/FS UXO Team 1, Team leader log book inspection	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input checked="" type="checkbox"/> Inspection <input type="checkbox"/> Surveillance
<b>Activity Results:</b> Inspected RI/FS UXO Team Leader log book as required by the work plan, section 4.4.5. All entries satisfied the requirements listed in section 4.4.5		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b> Tom Hinote	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b> Richard Shellenbarger	<b>Quality Specialist Signature:</b>	





## Quality Activity Report

Report #: 09-002		
<b>Name:</b> James Vance, Bill Sebrell, Sandon Hill, Scott Solomon	<b>Contract #/Task Order:</b> WD12DY-04-0018/0012	<b>Date:</b> 09-02-10
<b>Team/Function:</b>	<b>Site Location:</b> Conway BGR-44250 Myrtle Beach, SC	<b>Activity: (Check One)</b> <input checked="" type="checkbox"/> Inspection <input type="checkbox"/> Surveillance
<b>Activity Results: Complete Inspection of all scrap removed from Conway RI/FS ranges IAW the work plan, sections 4.3.3 and 4.8.2. Scrap included cultural debris and deteriorated pieces of 100lb sand filled practice bombs, expended .50 cal cartridge casings and projectiles. All scrap was clear of explosive components.</b>		
<b>EODT Manager Comments:</b>		
<b>Pass</b> <input checked="" type="checkbox"/> <b>Fail</b> <input type="checkbox"/>	<b>Condition Report #:</b>	
<b>Senior EODT Manager Name:</b> Tom Hinote	<b>Senior EODT Manager Signature:</b>	
<b>Quality Specialist Name:</b> Richard Shellenbarger	<b>Quality Specialist Signature:</b>	



## **ANALOG MAG CERT**



# Analog Magnetometer Certification Record

Conway BGR RI/FS-4250

Myrtle Beach, SC

Employee Name / No.: Scott Solomon

**PASS** / FAIL  
(Circle One)

Magnetometer Model & S/N: Schonstedt GA-52CX EO37924

Contract and Task Order #: W912DY-04-0018/0012

Item #	Item	Depth in Inches	Orientation	Identified X & Y	Actual X & Y
1	GS019 - 6 lb Incendiary Bomb	28	Vertical		1.45 / 2.84
2	GS018 - 6 lb Incendiary Bomb	28	Horizontal		2.93 / 9.28
3	GS016 - 5" HVAR	43	Horizontal		1.15 / 15.96
4	GS021 - 4 lb Incendiary Bomb	16	Vertical		2.38 / 20.72
5	GS020 - 4 lb Incendiary Bomb	16	Horizontal		2.25 / 26.73
6	GS014 - 20 lb Frag Bomb	31.5	Horizontal		3.51 / 33.78
7	GS017 - 5" HVAR	45	Vertical		3.33 / 40.75
8	GS015 - 20 lb Frag Bomb	36.5	Vertical		3.20 / 46.91

Additional Comments / Recommendations: \_\_\_\_\_

CERTIFIER: Rick Shelledorfer SS4D DATE: 07-27-10



# Analog Magnetometer Certification Record

Conway BGR RI/FS-4250

Myrtle Beach, SC

Employee Name / No.: James Vance

**PASS** / FAIL  
(Circle One)


Magnetometer Model & S/N: Schonstedt GA-52CX EO37932

Contract and Task Order #: W912DY-04-0018/0012

Item #	Item	Depth in Inches	Orientation	Identified X & Y	Actual X & Y
1	GS019 - 6 lb Incendiary Bomb	28	Vertical		1.45 / 2.84
2	GS018 - 6 lb Incendiary Bomb	28	Horizontal		2.93 / 9.28
3	GS016 - 5" HVAR	43	Horizontal		1.15 / 15.96
4	GS021 - 4 lb Incendiary Bomb	16	Vertical		2.38 / 20.72
5	GS020 - 4 lb Incendiary Bomb	16	Horizontal		2.25 / 26.73
6	GS014 - 20 lb Frag Bomb	31.5	Horizontal		3.51 / 33.78
7	GS017 - 5" HVAR	45	Vertical		3.33 / 40.75
8	GS015 - 20 lb Frag Bomb	36.5	Vertical		3.20 / 46.91

Additional Comments / Recommendations: \_\_\_\_\_

\_\_\_\_\_

CERTIFIER: Rick Shellenbarger  DATE: 07-27-10



# Analog Magnetometer Certification Record

**Conway BGR RI/FS-4250**

**Myrtle Beach, SC**

Employee Name / No.: Sandon Hill

**PASS / FAIL**  
(Circle One)

Magnetometer Model & S/N: Schonstedt GA-52CX EO04076

Contract and Task Order #: W912DY-04-0018/0012

Item #	Item	Depth in Inches	Orientation	Identified X & Y	Actual X & Y
1	GS019 - 6 lb Incendiary Bomb	28	Vertical		1.45 / 2.84
2	GS018 - 6 lb Incendiary Bomb	28	Horizontal		2.93 / 9.28
3	GS016 - 5" HVAR	43	Horizontal		1.15 / 15.96
4	GS021 - 4 lb Incendiary Bomb	16	Vertical		2.38 / 20.72
5	GS020 - 4 lb Incendiary Bomb	16	Horizontal		2.25 / 26.73
6	GS014 - 20 lb Frag Bomb	31.5	Horizontal		3.51 / 33.78
7	GS017 - 5" HVAR	45	Vertical		3.33 / 40.75
8	GS015 - 20 lb Frag Bomb	36.5	Vertical		3.20 / 46.91

Additional Comments / Recommendations: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

CERTIFIER: Rick Shellenbarger SS40 DATE: 07-27-10



# Analog Magnetometer Certification Record

**Conway BGR RI/FS-4250**

**Myrtle Beach, SC**

Employee Name / No.: Bill Sebrell

**PASS / FAIL**  
(Circle One)

Magnetometer Model & S/N: Schonstedt GA-52CX EO04090

Contract and Task Order #: W912DY-04-0018/0012

Item #	Item	Depth in Inches	Orientation	Identified X & Y	Actual X & Y
1	GS019 - 6 lb Incendiary Bomb	28	Vertical		1.45 / 2.84
2	GS018 - 6 lb Incendiary Bomb	28	Horizontal		2.93 / 9.28
3	GS016 - 5" HVAR	43	Horizontal		1.15 / 15.96
4	GS021 - 4 lb Incendiary Bomb	16	Vertical		2.38 / 20.72
5	GS020 - 4 lb Incendiary Bomb	16	Horizontal		2.25 / 26.73
6	GS014 - 20 lb Frag Bomb	31.5	Horizontal		3.51 / 33.78
7	GS017 - 5" HVAR	45	Vertical		3.33 / 40.75
8	GS015 - 20 lb Frag Bomb	36.5	Vertical		3.20 / 46.91

Additional Comments / Recommendations: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

CERTIFIER: Rick Shellenbarger SS4D DATE: 02-27-10



# Analog Magnetometer Certification Record

Conway BGR RI/FS-4250

Myrtle Beach, SC

Employee Name / No.: John Bonczek

**PASS / FAIL**  
(Circle One)

Magnetometer Model & S/N: Schonstedt GA-52CX EO04403

Contract and Task Order #: W912DY-04-0018/0012

Item #	Item	Depth in Inches	Orientation	Identified X & Y	Actual X & Y
1	GS019 - 6 lb Incendiary Bomb	28	Vertical	✓	1.45 / 2.84
2	GS018 - 6 lb Incendiary Bomb	28	Horizontal	✓	2.93 / 9.28
3	GS016 - 5" HVAR	43	Horizontal	✓	1.15 / 15.96
4	GS021 - 4 lb Incendiary Bomb	16	Vertical	✓	2.38 / 20.72
5	GS020 - 4 lb Incendiary Bomb	16	Horizontal	✓	2.25 / 26.73
6	GS014 - 20 lb Frag Bomb	31.5	Horizontal	✓	3.51 / 33.78
7	GS017 - 5" HVAR	45	Vertical	✓	3.33 / 40.75
8	GS015 - 20 lb Frag Bomb	36.5	Vertical	✓	3.20 / 46.91

Additional Comments / Recommendations: \_\_\_\_\_

\_\_\_\_\_

CERTIFIER: Richard Schellweger DATE: 07-28-10

# APPENDIX H

## MUNITIONS RESPONSE SITE PRIORITIZATION PROTOCOL

for the

### Remedial Investigation (RI) Former Conway Bombing and Gunnery Range (BGR) Horry County, South Carolina

Prepared for:



U.S. Army Engineering and Support Center  
Attn: CEHNC-OE-DC (Ms. Chris Cochran)  
4820 University Square  
Huntsville, Alabama 35816-1822

U.S. Army Corps of Engineers, Charleston District  
Attn: Mr. Shawn Boone  
69A Hagood Avenue  
Charleston, South Carolina 29403-0919

**Contract No. W912DY-04-D-0018**  
**Task Order: 0012**  
**Project No. I04SC002501**

Prepared by:



EOD Technology, Inc.  
2229 Old Highway 95  
Lenoir City, Tennessee 37771

**July 2012**





**MUNITIONS RESPONSE SITE PRIORITIZATION PROTOCOL  
(MRSPPs)**

The MRSPPs can be found on the disk at the beginning of the RI report.

# **APPENDIX I**

## **BASELINE HAZARD ASSESSMENT FOR MUNITIONS AND EXPLOSIVES OF CONCERN**

for the

### **Remedial Investigation (RI) Former Conway Bombing and Gunnery Range (BGR) Horry County, South Carolina**

Prepared for:



U.S. Army Engineering and Support Center  
Attn: CEHNC-OE-DC (Ms. Chris Cochrane)  
4820 University Square  
Huntsville, Alabama 35816-1822

U.S. Army Corps of Engineers, Charleston District  
Attn: Mr. Shawn Boone  
69A Hagood Avenue  
Charleston, South Carolina 29403-0919

**Contract No. W912DY-04-D-0018**  
**Task Order: 0012**  
**Project No. I04SC002501**

Prepared by:



EOD Technology, Inc.  
2229 Old Highway 95  
Lenoir City, Tennessee 37771

**July 2012**

## **APPENDIX I**

### **BASELINE HAZARD ASSESSMENT FOR MUNITIONS AND EXPLOSIVES OF CONCERN**

#### **I.1 BACKGROUND**

This appendix contains the detailed descriptions of the munitions and explosives of concern (MEC) hazard assessments (HA) previously conducted for Munitions Response Site (MRS)-R01 (Range II), MRS-R09 (Machine Gun [MG]/Rifle Range), MRS-R03 (Range IV), MRS-R04 (Range VII) and MRS-R02 (Range III) at the former Conway Bombing and Gunnery Range (BGR). Qualitative hazard assessments were conducted to assess potential explosive hazards to human receptors associated with potentially complete MEC exposure pathways at the BGR. These hazard assessments qualitatively characterize the potential hazards from MEC and the primary causes of those potential hazards at each MRS.

An explosive hazard exists at a site if there is a potentially complete MEC exposure pathway. As explained in Subchapter 5.4 of this Remedial Investigation (RI) Report, a potentially complete MEC exposure pathway is present any time a receptor can come near or into contact with MEC and interact with it in a manner that might result in its detonation. The three elements of a potentially complete MEC exposure pathway – a source of MEC, a receptor, and the potential for interaction between the MEC source and the receptor – are explained in Chapter 5 of this RI Report; all three elements must be present for a potentially complete MEC exposure pathway to exist.

The qualitative hazard assessment technique presented here follows the MEC HA method, which assesses the acute explosive hazards associated with remaining MEC at an MRS by analyzing site-specific conditions and human issues that affect the likelihood that MEC accidents will occur. The MEC HA method focuses on hazards to human receptors and does not directly address environmental or ecological concerns that might be associated with MEC. The process for conducting the MEC HA is described in the MEC HA interim guidance document (Munitions and Explosives of Concern Hazard Assessment Methodology. Interim. [USEPA, 2008]) and uses input data based on historical documentation, field observations made during previous studies, and the results of the intrusive investigations previously conducted on the BGR, (see Chapter 5 of the RI Report). The MEC HA interim guidance was developed by the Technical Working Group for Hazard Assessment, which included representatives from the Department of Defense (DoD), the U.S. Department of the Interior, the United States Environmental Protection Agency (USEPA), and various states and tribes. The DoD has encouraged use of this method on a trial basis (Reference: Memorandum for the Assistance Secretary of the Army [Installations and Environmental], Assistant Secretary of the Navy [Installations and Environment], and Assistant

Secretary of the Air Force [Installations, Environment, and Logistics], Subject: Trial Use of the Interim Munitions and Explosives of Concern Hazard Assessment [MECHA] Methodology. Office of the Under Secretary of Defense, 3000 Defense Pentagon, Washington, DC. January 26. [DoD, 2009a]).

The MEC HA method reflects the basic difference between assessing acute hazards from exposure to MEC and assessing chronic environmental risks from exposure to potential contaminants, such as munitions constituents (MC). An explosive hazard can result in immediate injury or death, and therefore, risks from explosive hazards are evaluated either as present or not present. If the potential for an encounter with MEC exists, then the potential that the encounter may result in injury or death also exists. Conversely, if the potential presence of MEC at an MRS can be ruled out as a result of previous activities and earlier investigations then no explosive hazards are present and no MEC HA is necessary.

The MEC HAs presented in this RI Report were conducted to characterize the baseline conditions for MRS-R01, -R02, -R03, -R04, and -R09 with regard to explosive hazards. These baseline characterizations may be referenced in the subsequent feasibility study (FS), where they can provide the basis for the evaluation and implementation of effective management response alternatives.

## **I.2 DEFINING THE AREAS TO BE ASSESSED**

The MEC HA focuses on each MRS within a Munitions Response Area (MRA). The MEC-related characteristics within an MRS may differ with regard to the ordnance types and quantities, land uses, receptors, and other factors. If these factors vary significantly, it is likely that the qualitative MEC hazards will also differ. For example, the characteristics of a range impact area and its safety fan are likely to differ in the amount of MEC potentially present, or different land use activities may create differing potentials for MEC interaction with human receptors within a large maneuver area. Different MEC hazards may make different response alternatives appropriate. Each MRS will be the subject of a separate MEC HA for hazard characterization and subsequent response alternative evaluation. However, if an MRS is likely to be the subject of only one response alternative (e.g., the MRS is small), it may be most appropriate to evaluate the MRS as a single assessment area, despite the potential for differing MEC-related characteristics. In this event, the most conservative MEC HA input factors (see below) will be selected for the MEC HA.

## **I.3 OVERVIEW OF MEC HA INPUT FACTORS**

Under the MEC HA method, the potential hazards posed by MEC are characterized qualitatively for each MRS by evaluating three primary factors. These primary factors are related to the three

critical elements listed previously and are:

*Severity:* the potential consequences of the effect on a human receptor should a MEC item detonate;

*Accessibility:* the likelihood that a human receptor will be able to come into contact with a MEC item; and

*Sensitivity:* the likelihood that a MEC item will detonate if a human receptor interacts with it.

To complete the baseline MEC HA for each MRS, the various input factors are reviewed and suitable categories are selected based on historical documentation and field observations made during previous studies. The various input factors for the MEC HA method are explained in detail in the MEC HA interim guidance document (USEPA, 2008). Each category for each of the MEC HA input factors has an assigned score that relates to the relative contributions of the different input factors to the overall MEC hazard. These scores are part of the MEC HA method and were developed by the Technical Working Group for Hazard Assessment. The detailed technical basis for the scores assigned is provided in the MEC HA interim guidance document (USEPA, 2008). The following paragraphs provide an overview of these factors and their associated categories.

*Energetic Material Type:* This factor describes the general type of energetic material associated with the munition(s) known or suspected to be present within the MRS. The six possible categories for this factor, ranging from the most to least potentially hazardous, are “high explosives and low explosive fillers in fragmenting rounds,” “white phosphorus,” “pyrotechnics,” “propellants,” “spotting charges,” and “incendiaries.” The selection of a category for each MRS is made using the energetic material with the greatest potential explosive hazard known or suspected to be present.

<b>Category</b>	<b>Description</b>	<b>Score</b>
High explosives and low explosive filler in fragmenting rounds	High explosive (HE) fillers, including bulk explosives and cased munitions filled with compounds such as TNT, tetryl, RDX, and HMX. Fragmenting rounds filled with low explosive fillers (generally black powder) are also included in this category.	100
White phosphorus	A bursting smoke filler that burns rapidly when exposed to oxygen. Skin contact can cause burns.	70
Pyrotechnic	Used to send signals, illuminate areas of interest, simulate other weapons during training, and as ignition elements for certain weapons. Pyrotechnics produce heat but less gas than explosives or propellants.	60
Propellant	Compositions used to propel projectiles and rockets and to generate gases for powering auxiliary devices.	50



Spotting charge	produce a flash and smoke when detonated, providing observers or spotters a visual reference of munitions impact.	40
Incendiary	Any flammable material that is used as filler in munitions intended to destroy a target by fire.	30

*Location of Additional Human Receptors:* It is possible that human receptors other than the individual who causes a detonation may be exposed to overpressure and/or fragmentation hazards from the detonation of MEC. This factor describes whether there are additional human receptors within the MRS within the explosive safety quantity-distance (ESQD) arc surrounding the MRS. The two possible categories for this factor are “inside the MRS or inside the ESQD arc surrounding the MRS” and “outside the ESQD arc.”

Category	Description	Score
Inside the MRS or inside the ESQD arc surrounding the MRS	Places where people might congregate are located within the MRS or within the ESQD arc established for the MRS.	30
Outside of the ESQD arc	There are no places where people might congregate within the MRS or within the ESQD arc.	0

*Site Accessibility:* The site accessibility factor describes how easily human receptors can gain access to the MRS and takes into account the various barriers to entry that might be present. The four possible categories of site accessibility range from “full accessibility” (i.e., a site with no barriers to entry) to “very limited accessibility” (i.e., a site with guarded chain link fences or terrain that requires special skills and equipment to access). Note that this factor differs from the potential contact hours factor (see below) and also does not include or account for land use controls (LUCs) that might restrict site access. The effects of LUCs are assessed using the alternatives assessment component of the MEC HA that is conducted during the FS.

Category	Description	Score
Full accessibility	A site with no barriers to entry, including sites with signage but no fencing.	80
Moderate accessibility	A site with some barriers to entry, such as barbed wire fencing or rough terrain.	55
Limited accessibility	A site with significant barriers to entry, such as unguarded chain-link fences or requirements for special transportation (e.g., boats or all-terrain vehicles) to reach the site.	15
Very limited accessibility	A site with guarded chain-link fences, or terrain that requires special skills and equipment (e.g., mountain climbing) to access.	5



*Potential Contact Hours:* This factor accounts for the amount of time receptors spend in the MRS during which they might come into contact with MEC and intentionally or unintentionally cause a detonation. Both the number of receptors and the amount of time each receptor spends in the MRS are used to calculate the total “receptor-hours/year.” This total is calculated for all activities that might result in potential MEC interaction, and there are four possible categories, ranging from “many hours” ( $\geq 1,000,000$  receptor-hours/year) to “very few hours” ( $< 10,000$  receptor-hours/year).

<b>Category</b>	<b>Description</b>	<b>Score</b>
Many hours	$\geq 1,000,000$ receptor-hours/year	120
Some hours	100,000 to 999,999 receptor-hours/year	70
Few hours	10,000 to 99,999 receptor-hours/year	40
Very few hours	$< 10,000$ receptor-hours/year	15

*Amount of MEC:* This input factor describes the relative quantity of MEC that is anticipated to remain within the MRS as a result of past munitions-related activities. For example, a greater quantity of MEC would be expected to be present in a former target area than at a former firing point. The nine possible categories for this factor, from the largest to the least anticipated amount of MEC, range from “target area” and “Open Burn and Open Detonation (OB/OD) area,” through “burial pit” and “firing point,” to “storage” and “explosives-related industrial facility.”

<b>Category</b>	<b>Description</b>	<b>Score</b>
Target area	Areas at which munitions fire was directed.	180
OB/OD areas	Sites where munitions were disposed of by OB/OD methods. This category refers to the core activity area of an OB/OD area (see “Safety buffer areas” category for information on safety fans and kickout areas).	180
Function Test Range	Areas where the serviceability of stored munitions or weapons systems are tested. Testing may include components, partial functioning or complete functioning of stockpile or developmental items. Also includes ranges used for research and development and surveillance.	165
Burial pit	The location of a burial of large quantities of MEC items.	140
Maneuver areas	Areas used for conducting military exercises in a simulated conflict area or war zone.	115
Firing points	The location from which a projectile, grenade, ground signal, rocket, guided missile, or other device is to be ignited, propelled, or released.	75



Safety buffer areas (range safety fans and OB/OD kick-out areas)	Areas outside of target areas, test ranges, or OB/OD areas that were designed to act as a safety zone to contain munitions that do not hit targets or to contain kick-outs from OB/OD areas.	30
Storage	Any facility used for the storage of military munitions, such as earth-covered magazines, above-ground magazines, and open-air storage areas.	25
Explosives-related industrial facility	Former munitions manufacturing or demilitarization sites and TNT production plants.	20

*Minimum MEC Depth Relative to the Maximum Receptor Intrusive Depth:* This factor indicates whether the MEC in the MRS are at depths that might be reached by the anticipated human receptor activities. For the baseline MEC HA, the four possible categories concern whether MEC are at the surface and in the subsurface within the MRS, or whether MEC are present in the subsurface only, and whether the receptor intrusive depth overlaps with this MEC location.

Category	Description	Score
MEC located surface and subsurface	The area contains munitions that are entirely or partially exposed above the ground surface as well as entirely beneath the ground surface, and the known or suspected minimum depth of the subsurface MEC is less than the expected depth of intrusive activity.	240
MEC located only subsurface Intrusive depth <i>overlaps</i> with minimum MEC depth	The area contains munitions that are entirely beneath the ground surface. The known or suspected minimum depth of the subsurface MEC is less than the expected depth of intrusive activity.	150
MEC located only subsurface Intrusive depth <i>does not overlap</i> with minimum MEC depth	The area contains munitions that are entirely beneath the ground surface. The known or suspected minimum depth of the subsurface MEC is greater than the expected depth of intrusive activity.	50

*Migration Potential:* The migration potential factor addresses the likelihood that MEC in the MRS might be moved by natural processes (e.g., erosion or frost heave) that could increase the chance of subsequent exposure to potential human receptors. The two possible categories for this factor are “possible” and “unlikely.”

Category	Description	Score
Possible	Historical or physical evidence indicates that it is possible for natural physical forces in the area (e.g., frost heave, erosion) to expose subsurface MEC items or to move surface or subsurface MEC items.	30
Unlikely	Historical or physical evidence indicates that natural physical forces in the area (e.g., frost heave, erosion) are unlikely to expose subsurface MEC items or to move surface or subsurface MEC items.	10



*MEC Classification:* This factor accounts for how easily a human receptor might cause a detonation of the MEC and relates directly to the MEC sensitivity. The six possible categories for this factor, ranging from the highest to lowest sensitivity (and explosive hazard) are “sensitive unexploded ordnance (UXO),” “other UXO,” fuzed sensitive discarded military munitions (DMM),” “fuzed DMM,” “unfuzed DMM,” and “bulk explosives.” The selection of category for each MRS is made using the MEC with the highest potential sensitivity known or suspected to be present, and where uncertainty exists, conservative assumptions will be made and documented. For example, UXO is always assumed to be present within a known target area, even if the investigation uncovers no UXO at the site.

Category	Description	Score
Sensitive UXO	UXO items with fuzes that are more likely to function with any movement (e.g., all-way-acting fuzes) or potential environmental conditions (e.g., piezoelectric fuzes).	180
UXO	All other UXO items.	110
Fuzed Sensitive DMM	DMM with a fuzing mechanism present, but not armed (put into a state of readiness) for use. Sensitive DMM fuzes can be armed and functioned through human activity (e.g., hand grenades).	105
Fuzed DMM	DMM with a fuzing mechanism present, but not armed (not put into a state of readiness) for use. Fuzes on DMM in this category require high inertial energy (e.g., g-forces or rapid rotation) to be armed. This category also contains unarmed fuzes not installed in munitions.	55
Unfuzed DMM	DMM without fuzing mechanisms. This category also includes boosters, bursters, and blasting caps	45
Bulk explosives	Explosive material that is not contained in cased munitions or is present in soils or sediment.	45

*MEC Size:* This factor indicates how easy it is for a typical human receptor to move the MEC item(s) present within the MRS. For example, an individual is considerably more likely to pick up or accidentally kick a hand grenade than a 200-pound bomb. The basic assumption used in this category is that MEC weighing 90 pounds or more are unlikely to be moved without the use of special equipment. Based on this, the two possible categories for this factor are “small” (i.e., items weighing less than 90 pounds) and “large” (items weighing 90 pounds or more). The selection of category for each MRS is made using the MEC known or suspected to be present with the highest potential to be moved (i.e., the smallest item).

Category	Description	Score
Small	MEC items that weigh less than 90 pounds; • Mark or model of munitions used at MRS small enough for a receptor to be able to • Outer diameter of munitions move and initiate a detonation.	40
Large	MEC items that weigh 90 pounds or more; too large to move without equipment.	0

Scores for the categories are in multiples of five, with a total maximum possible score for all factors of 1,000 and a minimum possible score of 125. These MEC HA scores are *qualitative references only* and should *not* be interpreted as quantitative measures of explosive hazard. A summary of the maximum possible scores for each MEC HA input factor and its related weighting is shown in Table I.1.

**Table I.1  
Summary of MEC HA Scoring**

Explosive Hazard Component	Input Factor	Maximum Scores	Weights
Severity	Energetic Material Type	100	10%
	Location of Additional Human Receptors	30	3%
	<i>Component Total</i>	<i>130</i>	<i>13%</i>
Accessibility	Site Accessibility	80	8%
	Total Contact Hours	120	12%
	Amount of MEC	180	18%
	Minimum MEC Depth vs. Maximum Intrusive Depth	240	24%
	Migration Potential	30	3%
	<i>Component Total</i>	<i>650</i>	<i>65%</i>
Sensitivity	MEC Classification	180	18%
	MEC Size	40	4%
	<i>Component Total</i>	<i>220</i>	<i>22%</i>
<b>Maximum Total Score</b>		<b>1,000</b>	<b>100%</b>

Source: MEC HA interim guidance document (USEPA, 2008)

#### **I.4 OVERVIEW OF MEC HA OUTPUT FACTORS**

Once the categories and scores for all input factors have been determined for each MRS at the site, the related scores for each category are totaled to calculate an overall MEC HA score for each MRS. The total maximum possible MEC HA score for an MRS is 1,000, while the minimum possible score is 125. The MEC HA method describes associated hazard levels for these scores, which range from 1 (highest) to 4 (lowest). The basis for these hazard levels is provided in the MEC HA interim guidance document (USEPA, 2008). Again, the total MEC HA scores and associated hazard levels are *qualitative references only* and should *not* be interpreted as

quantitative measures of explosive hazard. A summary of the hazard levels and their related MEC HA scores is in Table I.2.

**Table I.2  
Hazard Level Scoring Rankings Table**

<b>Hazard Level</b>	<b>Maximum MEC HA Score</b>	<b>Minimum MEC HA Score</b>
1	1,000	840
2	835	725
3	720	530
4	525	125

Source: MEC HA interim guidance document (USEPA, 2008)

## **I.5 BASELINE MEC HAZARD CHARACTERIZATIONS**

### **I.5.1 MEC HA Characterization for Areas of Concern with Confirmed Potential MEC Hazards**

The qualitative baseline characterizations of potential MEC hazards were conducted for the MRSs by reviewing each of the MEC HA input factors described in Subchapter I.3 above. The data collected during the previous field investigation, and the historical data available from prior studies, were used to determine the appropriate categories for each MEC HA input factor. The selection of these categories for each of the areas evaluated is discussed in the following subchapters.

#### **I.5.1.1 MRS-R01 (Range II)**

MRS-R01 (Range II) was not characterized during the RI. Therefore information on MEC hazards in this MRS is based on previous investigations, including the EE/CA. According to historical records, it appears this MRS was used as an impact area; reports of 0.50-cal small arms ammunition and 100-lb practice bombs have been noted for this MRS. The EE/CA reported a single 100-lb practice bomb, found at 40-inches BGS.

*Location of Additional Human Receptors:* The ESQD is based on the finding from previous intrusive investigations conducted on the Conway BGR. The ESQD for the 100-pound practice bomb is “N/A”, due to it not being a fragmenting munition. Currently there are features or facilities where people might congregate within the MSA; therefore; under current conditions, the location of additional human receptors would be “inside the MSA”.

*Site Accessibility:* The land uses in this MRS are primarily residential, landfill and parks/recreational. Access to this MRS is not anticipated to change significantly in the future. Based on this information, the MRS is considered to be a site with no barriers to entry and is classified as having “full accessibility” for this MEC HA.

*Potential Contact Hours:* The land in this MRS is partially developed and is used for residential, landfill and parks/recreation. For residential, receptor-hours are calculated by assuming up to 150 people for 4,380 per year for a total of 657,000 receptor-hours/year for this activity. For commercial receptor-hours are calculated by assuming up to 100 workers and delivery drivers consumers outside for an average of 2080 hours per, for a total of 208,000 receptor-hours/year for this activity. For parks and recreation receptor-hours are calculated by assuming up to 2,500 people for an average of 50 hours per year, for a total of 125,000 receptor-hours/year for this activity. Based on these assumptions, the potential contact hours for the MRS under current conditions (and anticipated future conditions) correspond to a classification of “some hours” (100,000 to 999,999 receptor-hours/year). The potential contact hours are not anticipated to change in the near future. A summary of Potential Receptor Contact Hours is provided in Table I.3

**Table I.3  
Potential Receptor Contact Hours  
MG/Rifle Range**

<b>Activity</b>	<b>People (1)</b>	<b>Hours/year (2)</b>	<b>Potential Contact Time (receptor-hrs/yr)</b>
Residential	150	4,380	657,000
Landfill	100	2080	208,000
Parks/Recreation	2,500	50	125,000

(1) Number of people who participate in the activity.

(2) Number of hours per year a single person spends on the activity.

*Amount of MEC:* The MEC presence within the MRS is the result of military training using practice munitions. Because this MRS is an impact area at which munitions fire was directed, the classification of the amount of MEC for this MRS is assessed to be “target area” for this MEC HA.

*Minimum MEC Depth Relative to the Maximum Receptor Intrusive Depth:* MEC and MD have been found in the subsurface of this MRS. The primary land uses in this MRS include residential, landfill and parks/recreation. Typical activities related to residential development could result in intrusive activities in the subsurface (up to 6 feet) (assumes no additional digging in the landfill). Based on this information, the minimum MEC depth relative to the maximum

receptor intrusive depth at this MRS is assessed to be “MEC located only subsurface” for this MEC HA.

*Migration Potential:* The landscape for this MRS is primarily residential and commercial. There have been no recorded instances of munitions being exposed by erosion or frost heave at the site. Based on these various factors, the migration potential is characterized as “unlikely”.

*MEC Classification:* The MEC items known or suspected to be present within the MRS range is limited to the 100-lb practice bomb. Based on this information, the MEC classification for this MRS is assessed as “UXO” for this MEC HA.

*MEC Size:* The suspected munition within the MRS (100-lb practice bomb) weighing more than 90 pounds, and therefore, based on the criteria defined in the MEC HA method, the MEC size for the MRS is classified as “large”.

#### **I.5.1.2 MRS-R09 (MG/Rifle Range)**

MRS-R09 (MG/Rifle Range) was unavailable to RI Teams. Therefore information on MEC hazards in this MRS is based on previous removal actions. According to historical records, it appears this MRS was used as a small arms range, however during previous MEC removals MEC items including 2.36” rockets and 37mm projectiles were encountered.

All of the MEC items recovered were found from the surface to a depth of approximately 6 feet.

*Location of Additional Human Receptors:* The ESQD is based on the finding from previous intrusive investigations conducted on the Conway BGR. The ESQD for the Mk1 High Velocity Air Rocket (HVAR) 5” Warhead is 349 feet, based on the hazardous fragment distance (HFD) of the warhead, which is the most hazardous of the explosively configured munitions known or suspected to be present in the MRS. Currently there are features or facilities where people might congregate within the ESQD; therefore; under current conditions, the location of additional human receptors would be “inside the ESQD arc”.

*Site Accessibility:* The land uses in this MRS are primarily residential, commercial and parks/recreational. Access to this MRS is not anticipated to change significantly in the future. Based on this information, the MRS is considered to be a site with no barriers to entry and is classified as having “full accessibility” for this MEC HA.

*Potential Contact Hours:* The land in this MRS is partially developed and is used for residential, commercial and parks/recreation. For residential, receptor-hours are calculated by assuming up to 3,000 people for 4,380 per year for a total of 13,140,000 receptor-hours/year for this activity. For commercial receptor-hours are calculated by assuming up to 2,000 consumers

outside for an average of 2 hours per week for 52 days a year, for a total of 208,000 receptor-hours/year for this activity. For parks and recreation receptor-hours are calculated by assuming up to 500 people for an average of 50 hours per year, for a total of 25,000 receptor-hours/year for this activity. Based on these assumptions, the potential contact hours for the MRS under current conditions (and anticipated future conditions) correspond to a classification of “many hours” (greater than 1,000,000 receptor-hours/year). The potential contact hours are not anticipated to change in the near future. A summary of Potential Receptor Contact Hours is provided in Table I.4

**Table I.4  
Potential Receptor Contact Hours  
MG/Rifle Range**

<b>Activity</b>	<b>People (1)</b>	<b>Hours/year (2)</b>	<b>Potential Contact Time (receptor-hrs/yr)</b>
Residential	3,000	4,380	13,140,000
Commercial	2,000	104	208,000
Parks/Recreation	500	50	25,000

(1) Number of people who participate in the activity.

(2) Number of hours per year a single person spends on the activity.

*Amount of MEC:* The MEC presence within the MRS is the result of military training using various live and practice munitions. Because this MRS is an impact area at which munitions fire was directed, the classification of the amount of MEC for this MRS is assessed to be “target area” for this MEC HA.

*Minimum MEC Depth Relative to the Maximum Receptor Intrusive Depth:* MEC and MD have been found in the subsurface of this MRS. The primary land uses in this MRS include residential, commercial and parks/recreation. Typical activities related to residential development could result in intrusive activities in the subsurface (up to 6 feet). Based on this information, the minimum MEC depth relative to the maximum receptor intrusive depth at this MRS is assessed to be “MEC located only subsurface” for this MEC HA.

*Migration Potential:* The landscape for this MRS is primarily residential and commercial. There have been no recorded instances of munitions being exposed by erosion or frost heave at the site. Based on these various factors, the migration potential is characterized as “unlikely”.

*MEC Classification:* The MEC items known or suspected to be present within the MRS range from 37mm projectiles to 5” HVAR Rocket Warheads. Based on this information, the MEC

classification for this MRS is assessed as “UXO Special Case” for this MEC HA.

*MEC Size:* The smaller of the suspected munitions within the MRS (e.g., 37mm projectiles) weighing less than 90 pounds, and therefore, based on the criteria defined in the MEC HA method, the MEC size for the MRS is classified as “small”.

### **I.5.1.3 MRS-R02 (Range III)**

MRS-R02 (Range III) encompasses approximately 649 acres. Range III was determined based on the historical data of the site having existed as a multiple combined range and considered to be the main impact area. The highest concentration of MEC and munitions debris finds were located in this MRS.

All MEC and munitions debris previously recovered in this MRS were located on the surface to a depth of 3 feet.

*Location of Additional Human Receptors:* The ESQD is based on the finding from previous intrusive investigations conducted on the former Conway BGR. The ESQD for the M4120 lb Fragmentation Bomb is 1634 feet, based on the HFD of the bomb, which is the most hazardous of the explosively configured munitions known or suspected to be present in the MRS. There are currently features or facilities where people might congregate within the ESQD; therefore; under current conditions, the location of additional human receptors would be “outside of ESQD arc”.

*Site Accessibility:* The land uses in MRS are primarily recreational, hunting, camping, horseback riding and logging. Access to this MRS is not anticipated to change significantly in the future. Based on this information, this MRS is considered to be a site with no barriers to entry and is classified as having “full accessibility” for this MEC HA.

*Potential Contact Hours:* The land in this MRS is undeveloped and is used for both recreational and commercial logging, and the associated receptors are commercial workers (loggers) and recreational users. For recreation, receptor-hours are calculated by assuming up to 30 people for 30 per year for a total of 900 receptor-hours/year for this activity. For loggers receptor-hours are calculated by assuming eight people working outside for an average of eight hours per day for 3 months (60 days) a year, for a total of 3,840 receptor-hours/year for this activity. Based on these assumptions, the potential contact hours for the MRS under current conditions (and anticipated future conditions) are calculated to be 4,740 receptor-hours/year, which corresponds to a classification of “very few hours” (less than 10,000 receptor-hours/year). The potential contact hours are not anticipated to change in the near future.

*Amount of MEC:* The MEC presence within the MRS is the result of military training using various live and practice munitions. Because this MRS is an impact area at which munitions fire was directed, the classification of the amount of MEC for this MRS is assessed to be “target area” for this MEC HA.

*Minimum MEC Depth Relative to the Maximum Receptor Intrusive Depth:* MEC and MD have been found in the surface and subsurface of this MRS. The primary land uses in this MRS include recreation and logging. Typical activities related to logging could result in intrusive activities in the shallow subsurface (up to 1 foot). Based on this information, the minimum MEC depth relative to the maximum receptor intrusive depth at this MRS is assessed to be “MEC located on surface and in subsurface” for this MEC HA.

*Migration Potential:* The landscape for this MRS is primarily residential and commercial. There have been no recorded instances of munitions being exposed by erosion or frost heave at the site. Based on these various factors, the migration potential is characterized as “unlikely”.

*MEC Classification:* The MEC items known or suspected to be present within the MRS range from 37mm projectiles to 250-lb GPOS Bomb. Based on this information, the MEC classification for this MRS is assessed as “UXO Special Case” for this MEC HA.

*MEC Size:* The smaller of the suspected munitions within the MRS (e.g., 3” Mortars) weigh less than 90 pounds, and therefore, based on the criteria defined in the MEC HA method, the MEC size for the MRS is classified as “small”.

#### **I.5.1.4 MRS-R03 (Range IV)**

MRS-R03 (Range IV) encompasses approximately 649 acres. Range IV was determined based on the historical data of the site having existed as a multiple combined range and considered to be the main impact area.

All MEC and munitions debris previously recovered in this MRS were located on the surface to a depth of 10 feet.

*Location of Additional Human Receptors:* The ESQD is based on the finding from previous intrusive investigations conducted on the former Conway BGR. The ESQD for the M57 General Purpose Old Style (GPOS) Bomb is 536 feet, based on the HFD of the bomb, which is the most hazardous of the explosively configured munitions known or suspected to be present in the MRS. There are currently no features or facilities where people might congregate within the ESQD; therefore; under current conditions, the location of additional human receptors would be “outside of ESQD arc”.



*Site Accessibility:* The land uses in MRS are primarily recreational, hunting, camping, horseback riding and logging. Access to this MRS is not anticipated to change significantly in the future. Based on this information, this MRS is considered to be a site with no barriers to entry and is classified as having “full accessibility” for this MEC HA.

*Potential Contact Hours:* The land in this MRS is undeveloped and is used for both recreational and commercial logging, and the associated receptors are commercial workers (loggers) and recreational users. For recreation, receptor-hours are calculated by assuming up to 30 people for 30 per year for a total of 900 receptor-hours/year for this activity. For loggers receptor-hours are calculated by assuming eight people working outside for an average of eight hours per day for 3 months (60 days) a year, for a total of 3,840 receptor-hours/year for this activity. Based on these assumptions, the potential contact hours for the MRS under current conditions (and anticipated future conditions) are calculated to be 4,740 receptor-hours/year, which corresponds to a classification of “very few hours” (less than 10,000 receptor-hours/year). The potential contact hours are not anticipated to change in the near future.

*Amount of MEC:* The MEC presence within the MRS is the result of military training using various live and practice munitions. Because this MRS is an impact area at which munitions fire was directed, the classification of the amount of MEC for this MRS is assessed to be “target area” for this MEC HA.

*Minimum MEC Depth Relative to the Maximum Receptor Intrusive Depth:* MEC and MD have been found in the surface and subsurface of this MRS. The primary land uses in this MRS include recreation and logging. Typical activities related to logging could result in intrusive activities in the shallow subsurface (up to 1 foot). Based on this information, the minimum MEC depth relative to the maximum receptor intrusive depth at this MRS is assessed to be “MEC located on surface and in subsurface” for this MEC HA.

*Migration Potential:* The landscape for this MRS is primarily residential and commercial. There have been no recorded instances of munitions being exposed by erosion or frost heave at the site. Based on these various factors, the migration potential is characterized as “unlikely”.

*MEC Classification:* The MEC items known or suspected to be present within the MRS range from 37mm projectiles to 250-lb GPOS Bomb. Based on this information, the MEC classification for this MRS is assessed as “UXO Special Case” for this MEC HA.

*MEC Size:* The smaller of the suspected munitions within the MRS (e.g., 3” Mortars) weigh less than 90 pounds, and therefore, based on the criteria defined in the MEC HA method, the MEC size for the MRS is classified as “small”.

### **I.5.1.5 MRS-R04 (Range VII)**

MRS-R04 (Range VII) encompasses approximately 649 acres. Range VII was determined based on the historical data of the site having existed as a multiple combined range and considered to be an impact area.

All MEC and munitions debris previously recovered in this MRS were located on the surface to a depth of 4 feet.

*Location of Additional Human Receptors:* The ESQD is based on the finding from previous intrusive investigations conducted on the former Conway BGR. The ESQD for the M38 100 lb practice Bomb is 0 feet, based on the HFD of the bomb, which is the most hazardous of the explosively configured munitions known or suspected to be present in the MRS. There are currently no features or facilities where people might congregate within the ESQD; therefore; under current conditions, the location of additional human receptors would be “outside of ESQD arc”.

*Site Accessibility:* The land uses in MRS are primarily recreational, hunting, camping, horseback riding and logging. Access to this MRS is not anticipated to change significantly in the future. Based on this information, this MRS is considered to be a site with no barriers to entry and is classified as having “full accessibility” for this MEC HA.

*Potential Contact Hours:* The land in this MRS is undeveloped and is used for both recreational and commercial logging, and the associated receptors are commercial workers (loggers) and recreational users. For recreation, receptor-hours are calculated by assuming up to 30 people for 30 per year for a total of 900 receptor-hours/year for this activity. For loggers receptor-hours are calculated by assuming eight people working outside for an average of eight hours per day for 3 months (60 days) a year, for a total of 3,840 receptor-hours/year for this activity. Based on these assumptions, the potential contact hours for the MRS under current conditions (and anticipated future conditions) are calculated to be 4,740 receptor-hours/year, which corresponds to a classification of “very few hours” (less than 10,000 receptor-hours/year). The potential contact hours are not anticipated to change in the near future.

*Amount of MEC:* The MEC presence within the MRS is the result of military training using various live and practice munitions. Because this MRS is an impact area at which munitions fire was directed, the classification of the amount of MEC for this MRS is assessed to be “target area” for this MEC HA.

*Minimum MEC Depth Relative to the Maximum Receptor Intrusive Depth:* MEC and MD

have been found in the surface and subsurface of this MRS. The primary land uses in this MRS include recreation and logging. Typical activities related to logging could result in intrusive activities in the shallow subsurface (up to 1 foot). Based on this information, the minimum MEC depth relative to the maximum receptor intrusive depth at this MRS is assessed to be “MEC located on surface and in subsurface” for this MEC HA.

*Migration Potential:* The landscape for this MRS is primarily residential and commercial. There have been no recorded instances of munitions being exposed by erosion or frost heave at the site. Based on these various factors, the migration potential is characterized as “unlikely”.

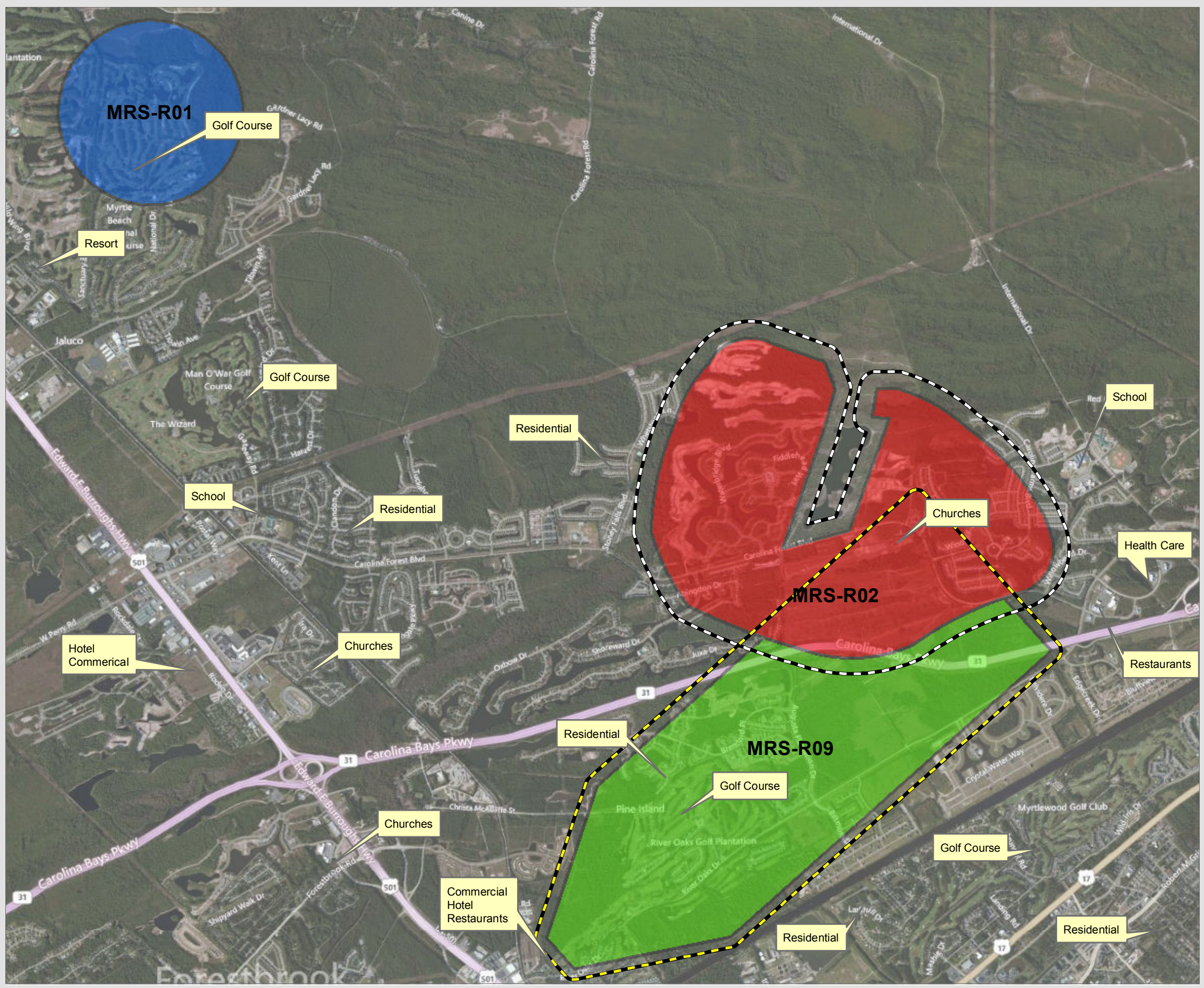
*MEC Classification:* The MEC items known or suspected to be present within the MRS range are 100 lb practice Bombs. Based on this information, the MEC classification for this MRS is assessed as “UXO” for this MEC HA.

*MEC Size:* The smaller of the suspected munitions within the MRS (e.g., 3” Mortars) weigh less than 90 pounds, and therefore, based on the criteria defined in the MEC HA method, the MEC size for the MRS is classified as “large”.

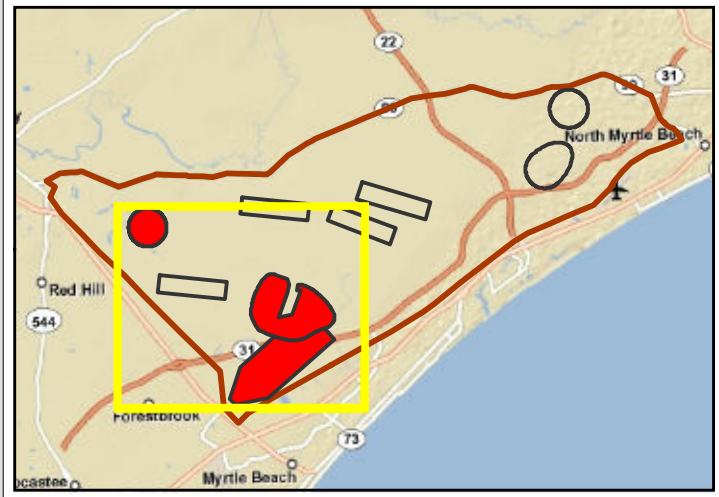
### **I.5.2 MEC HA Results Summary**

For areas at former Conway BGR where potential MEC hazards were determined to be present hazards were characterized using the MEC HA method (USEPA, 2008). Five MRSs were characterized using the MEC HA method based on the results from current and previous investigations.

**Figure I-1**  
**Report for the Remedial Investigation**  
**at the Former Conway Bombing and Gunnery**  
**Horry County, South Carolina**  
**MRS-R01, MRS-R02 and MRS-R09**  
**(MEC HA EQSD)**



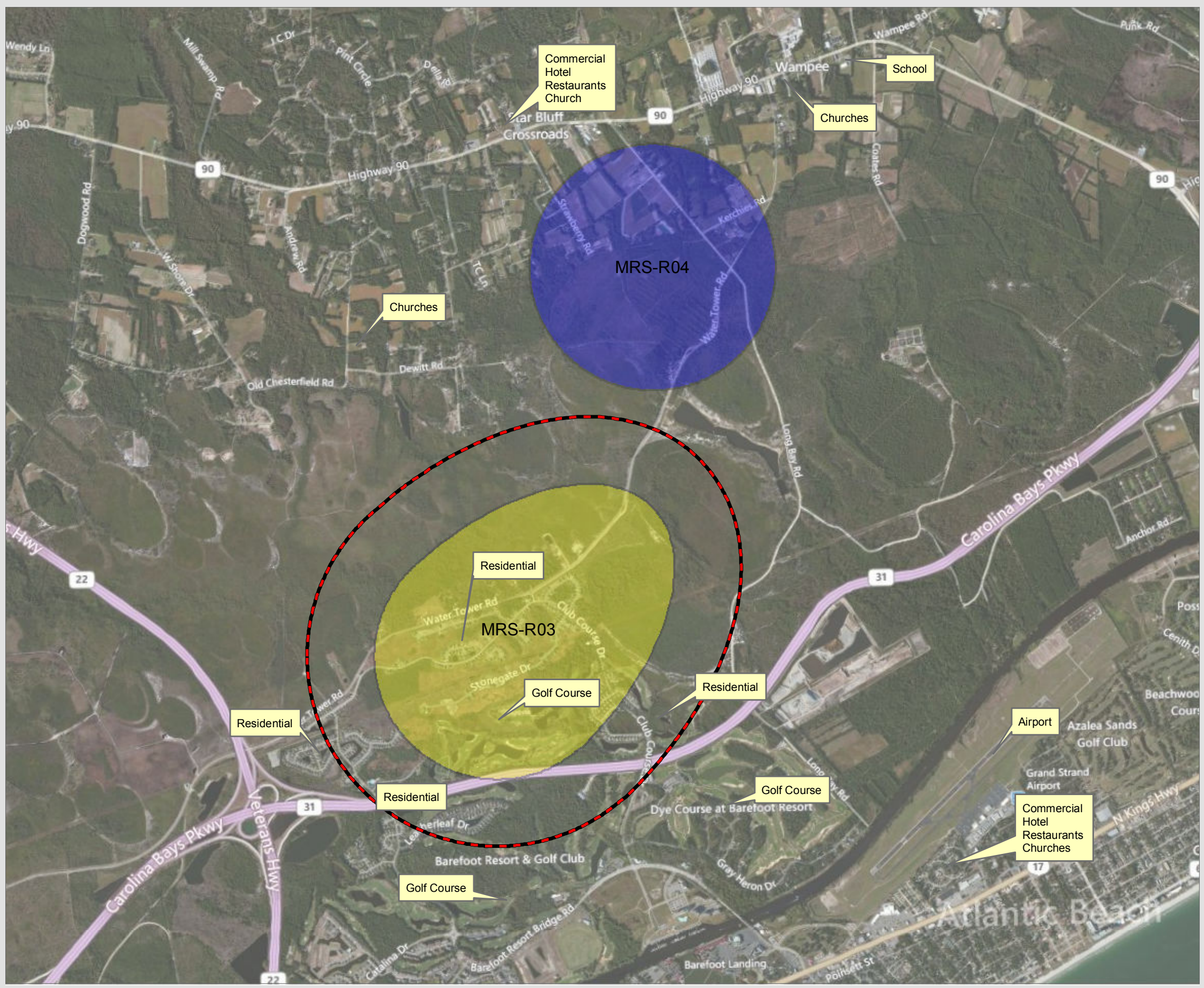
- Legend**
- EQSD (MK1 HVAR 5" Warhead) 349ft Buffer
  - EQSD (M57 250-lb GPOS) 536ft Buffer
  - MRS-R01, Range II
  - MRS-R02, Range III
  - MRS-R09, MG/Rifle Range



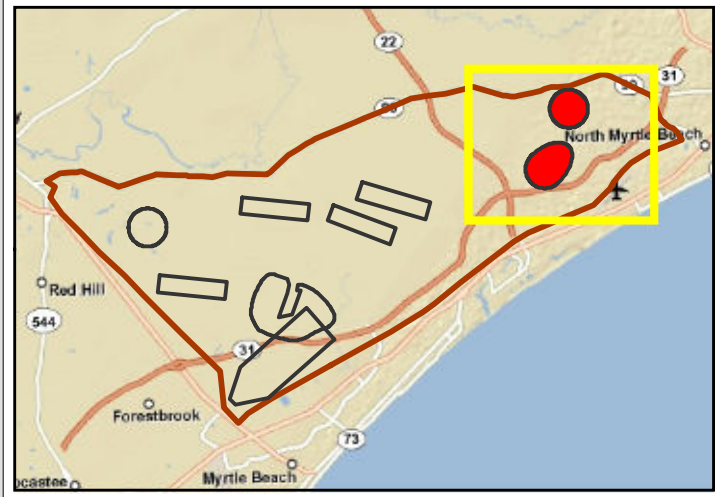
	Author: TKM	Date: 5/11/2012	HB# 44630	Path: L:\Conway\Maps\RIFS\RIFS Report\RI Report\MECHA\J-1 MRS_R02_R09_MECHA.mxd
	Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet Intl			

The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

**Figure I-2**  
**Report for the Remedial Investigation**  
**at the Former Conway Bombing and Gunnery**  
**Horry County, South Carolina**  
**MRS-R03 and MRS-R04**  
**(MEC HA EQSD)**



- Legend**
- EQSD (20-lb M41 Frag Bomb (TNT Filled) 1634ft Buffer
  - MRS-R03, Range IV
  - MRS-R04, Range VII



	Author: TKM	Date: 5/9/2012	HB# 44630	Path: L:\Conway\Maps\RIFS\RIFS Report\RI Report\MECHA\I-2 MRS_R03_R04_MECHA.mxd
	Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet Intl			

The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.



## **MEC HAs**

The MEC HAs can be found on the disk at the beginning of the RI Report.

# APPENDIX J

## PHOTO LOG

for the

### **Remedial Investigation (RI) Former Conway Bombing and Gunnery Range (BGR) Horry County, South Carolina**

Prepared for:



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U.S. Army Corps of Engineers, Charleston District  
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Charleston, South Carolina 29403-0919

**Contract No. W912DY-04-D-0018**  
**Task Order: 0012**  
**Project No. I04SC002501**

Prepared by:

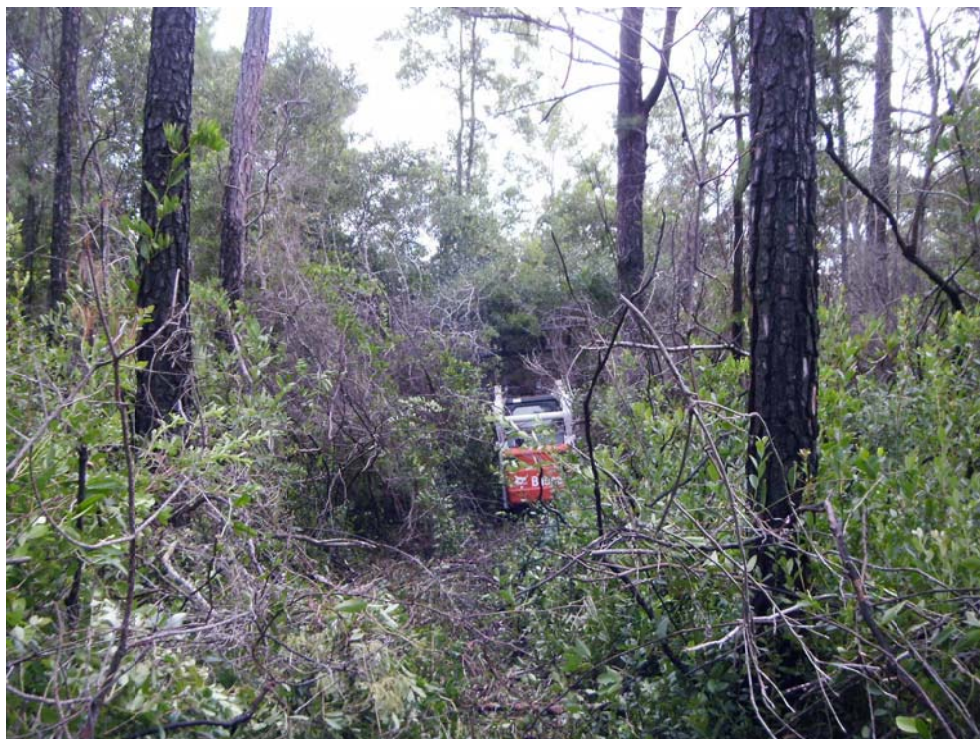


EOD Technology, Inc.  
2229 Old Highway 95  
Lenoir City, Tennessee 37771

**July 2012**



**Brush cutting in transect in R-XX**



**Brush cutting operations**





**After brush cutting in TR-1**



**Water Obstacle/Wetlands TR-2**



**TR-2 Transect Start Point**



**Conservation Area Warning Signs**



**Proposed Transect R-III**



**Surveying transect point in R-III**



**TR-1 Transect After Brush Cutting**



**Strafing Range Transect After Brush Cutting**



**R-VII Transect After Brush Cutting**



**TR-2 Transect After Crush Cutting**



**R-VII Grid 01**



**Team Surveying Transects in TR-2**



**Team Surveying Transect in TR-2**



**TR-2 Wetlands**



**TR-2 Transect 05 – Ending Point**



**TR-2 Grid 02**





**TR-2 Transect 05 – Ending Point**



**TR-2 Grid 02**



**Brush Cutting in R-VII**



**Grid Placement in R-VII**



**Brush Cutting Grid in R-IV**



**EODT PM Assisting with Water Samples**



**Alternate Transect R-IV, 3A-2 Start Point**



**EODT Scientist & PM Taking Water/Sediment Samples**



**EODT Scientist & PM Taking More Samples**



**More Water/Sediment Samples**



**More Water/Sediment Samples**



**More Water/Sediment Samples**



**EODT Scientist & PM Taking Soil Samples in Grid**



**Weighing Soil Samples**



**R-III Wetlands**



**R-XX, Grid 3**





**Strafing Range, Grid 3**



**R-III, Transect Along Canal (right side)**



**R-III, Transect Along Canal**



**R-III Transect 15**



**R-III Transect 17 Wetland Obstacle**



**TR-2 Grids 2 & 2A Showing 50'x50' Intrusive Grid Within 100'x100' Sampling Grid**

# APPENDIX K

## GIS DATA

for the

### **Remedial Investigation (RI) Former Conway Bombing and Gunnery Range (BGR) Horry County, South Carolina**

Prepared for:



U.S. Army Engineering and Support Center  
Attn: CEHNC-OE-DC (Ms. Chris Cochrane)  
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**Contract No. W912DY-04-D-0018**  
**Task Order: 0012**  
**Project No. I04SC002501**

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**July 2012**



## **GIS DATA**

The GIS Data can be found on the disk at the beginning of the RI Report.

# **APPENDIX L**

## **ANALOG DID TABLE**

for the

### **Remedial Investigation (RI)**

### **Former Conway Bombing and Gunnery Range (BGR)**

### **Horry County, South Carolina**

Prepared for:



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**Contract No. W912DY-04-D-0018**  
**Task Order: 0012**  
**Project No. I04SC002501**

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**July 2012**



## **ANALOG DID TABLE**

The Analog DID Table can be found on the disk at the beginning of the RI Report.