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## **APPENDIX D – TECHNICAL PROJECT PLANNING MEETING MINUTES**

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**MEETING MINUTES**  
**TPP 1 Meeting**  
**For the**  
**Military Munitions Response Program (MMRP)**  
**Remedial Investigation**  
**Of the Ricochet Area Munitions Response Site (MRS)**  
**In State Game Lands 211, Pennsylvania**

**19 November 2009**  
**1000-1230**  
**Community Club, Fort Indiantown Gap, PA**

**Attendees:**

Kim Harriz – National Guard Bureau (NGB) – Cleanup Program Manager and COR

Jo Anderson – Pennsylvania Army National Guard (PAARNG), Department of Military and Veterans Affairs (DMVA), Environmental Management, Project Manager

Lieutenant Colonel Chris Cleaver – PAARNG – Public Affairs Officer (PAO)

Lieutenant Colonel Bill Yearwood – PAARNG – Directorate of Training Support (DOTS)

Colonel Grey Berrier – PAARNG - Garrison Commander – Fort Indiantown Gap (FIG)

Philip Duffy – PAARNG – Training Site Facility Engineer

Scott Weber – U.S. Army Environmental Command (USAEC)

Emily Schiffmacher – U.S. Army Corps of Engineers (USACE) – Baltimore District – Project Manager

Tom Colozza – USACE- Baltimore District – Project Geophysicist

Greg Daloisio – WESTON, Project Manager

John Gerhard – WESTON, Deputy Project Manager and MMRP Technical Manager

Stacie Popp-Young – WESTON, Project Engineer

John Williams – WESTON, Project Geophysicist

Laura Pastor – WESTON, MMRP Technical Manager

Deb Volkmer – WESTON, Community Outreach Specialist

Gary Moulder – Pennsylvania Department of Environmental protection (PADEP) – Chief Federal Facilities Section

Bill Kosmer – PADEP- Southeast Regional Office – Project Geologist/Project Manager

Scott Bills – Pennsylvania Game Commission (PGC) - Land Management Group Supervisor

Bruce Metz – PGC – Land Management Supervisor

See Attached Sign-In Sheet for Phone Numbers and Email.

Presentation Material – Attached

❖ Introductions

❖ COL Berrier - Presented Overall History of FIG and Ricochet Area MRS in SGL211. COL Berrier is moving to a different position within PAARNG in Washington, PA. New Garrison Commander is LTC Sam Hayes. LTC Hayes takes over duties on 12/13/09.

❖ Presentation – Combination of NGB and WESTON representative

❖ Topics Discussion Centered Around

- LTC Cleaver concerned with ultimate goal presented in Project Purpose slide. Need to potentially soften this presentation to the public in that they may be concerned with “protective of human health and the environment” language. WESTON and NGB agreed presentation needs to be straightforward however that is standard CERCLA language and is why this work is being conducted. WESTON will work with PAARNG PAO on presentation for future meetings with public.
- LTC Yearwood was concerned with range fan Safety Danger Zones (SDZ) as presented in figure. Important to note these were historical ranges from Army operation of the facility. Additionally the shape of the MRS is based off of the restricted airspace associated with FIG. US. Army restricted this area as a fall area for ordnance. Figure does not account for elevation of mountains which would have prevented majority of munitions from extending over mountain into SGL211.
- Land Use Controls – May not be restrictions on land but may also include public education, signage, brochures and outreach to local community and users.
- Proposed field work methods (visual transects, DGM transects and DGM grids) will emphasize minimal impact to vegetation. Transects will go around trees versus cutting them down. Project team wants to minimize cutting of brush and trees as team realizes this is a sensitive issues with SGL 211 users.
- MMRP follows CERCLA process and will not follow Act 2 Program. Team will utilize Act 2 standards when screening results of MC sampling. Additionally results used in risk assessments will be screened versus residential standards not industrial.
- Background Study of metals should be conducted in areas not immediately impacted by MEC. These should be collected in relatively undisturbed areas.
- Team agreed the TPP2 meeting would be held on 1/14/10 at Community Club at FIG to discuss the Work Plan and Planned fieldwork.
- Field work is planned for March through early May 2010, to minimize impacts to recreational users as requested by PGC. Review timelines for the Work Plan are critical to maintain this aggressive schedule. Efforts to provide comments earlier than later would be greatly appreciated.
- PADEP representative Gary Moulder is retiring at end of December 2009. His replacements for his current position and this specific project have not been identified yet by PADEP. William Kosmer from PADEP Southcentral Region office was in attendance as this project falls within his regional office coverage and will assist in reviewing documents and reports.
- WESTON also shared with Project team the Project Quality Pledge developed during Kickoff Team with NGB, PAARNG, USAEC and WESTON. PADEP and PGC in agreement.

❖ Action Items

- Meeting with Community Group Representatives on 12/8/09 at FIG Community Club from 5-8PM to introduce project and answer questions/concerns. PADEP and PGC invited to attend.
- PADEP will need to assign replacement for Gary Moulder for point of contact with project and review of documents.
- PGC will provide a Special Use Permit for PAARNG investigation of SGL 211. They will handle this out of the Southeast Regional Office.



CLIENT/SUBJECT \_\_\_\_\_ W.O. NO. \_\_\_\_\_

TASK DESCRIPTION \_\_\_\_\_ TASK NO. \_\_\_\_\_

PREPARED BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY	
DEPT _____	DATE _____

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# Fort Indiantown Gap, Pennsylvania Military Munitions Response Program



## Ricochet Area Remedial Investigation Technical Project Planning Meeting 1

19 November 2009



*The Trusted Integrator for Sustainable Solutions*

# Meeting Topics/Purpose

- Overview of TPP Meeting
- Military Munitions Response Program Overview
- Remedial Investigation Goals
- Conceptual Site Model for Ricochet Area
- Proposed RI Field Work

# Agenda

- 1000 – Opening Remarks
- 1030 – Conceptual Site Model
- 1100 – Proposed Fieldwork
- 1130 – Schedule and Next Steps
- 1200 – Closing Remarks

# Introductions

## MMRP

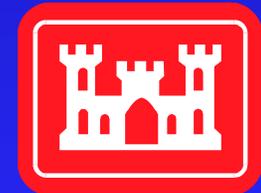
- Executing Agent – National Guard Bureau (NGB)
  - Cleanup Program Manager – Kim Harriz
- Pennsylvania Army National Guard Bureau (PAARNG)
  - Department of Military & Veterans Affairs (DMVA)
  - Environmental Management Chief – John Fronko
  - Project Manager – Joan Anderson
  - Public Affairs Officer – LTC Chris Cleaver



# Introductions *(Cont'd)*

## MMRP

- U.S. Army Environmental Command (USAEC)
  - Environmental Restoration Manager – Scott Weber
- U.S Army Corps of Engineers (USACE)
  - Baltimore District
    - Project Manager – Emily Schiffmacher
    - Geophysicist – Tom Colozza



# Introductions *(Cont'd)*

- Regulator – Pennsylvania Department of Environmental Protection (PADEP)
  - Chief , Federal Facilities Section - Gary Moulder
  - South Central Office - Bill Kosmer
- Property Owner – Pennsylvania Game Commission
  - Southeast Regional Office - Scott Bills



# Introductions *(Cont'd)*

- Contractor Support –  
Weston Solutions, Inc. (WESTON)
  - Client Service Manager – Brad Carpenter
  - Project Manager – Greg Daloisio
  - Deputy Project Manager/MMRP Technical Manager – John Gerhard
  - Project Engineer – Stacie Popp-Young
  - Project Geophysicist – John Williams
  - Project Chemist – Kelly Spittler
  - MMRP Technical Manager – Laura Pastor
  - Senior UXO Supervisor – Marty Holmes
  - Community Outreach Specialist – Deb Volkmer



# Terminology

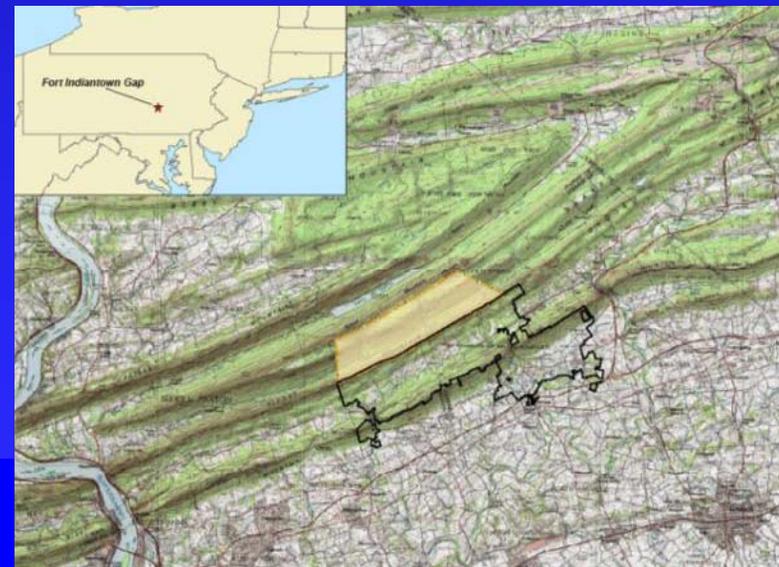
- MMRP – Military Munitions Response Program
- MRS – Munitions Response Site
- MC – Munitions Constituents
- MEC – Munitions and Explosives of Concern:
  - Unexploded Ordnance (UXO),
  - Discarded Military Munitions (DMM), and
  - Munitions Constituents (MC)
- MGFD – Munition with the Greatest Fragmentation Distance
- MPPEH – Material Potentially Presenting an Explosive Hazard
- DGM – Digital Geophysical Mapping

# TPP Process

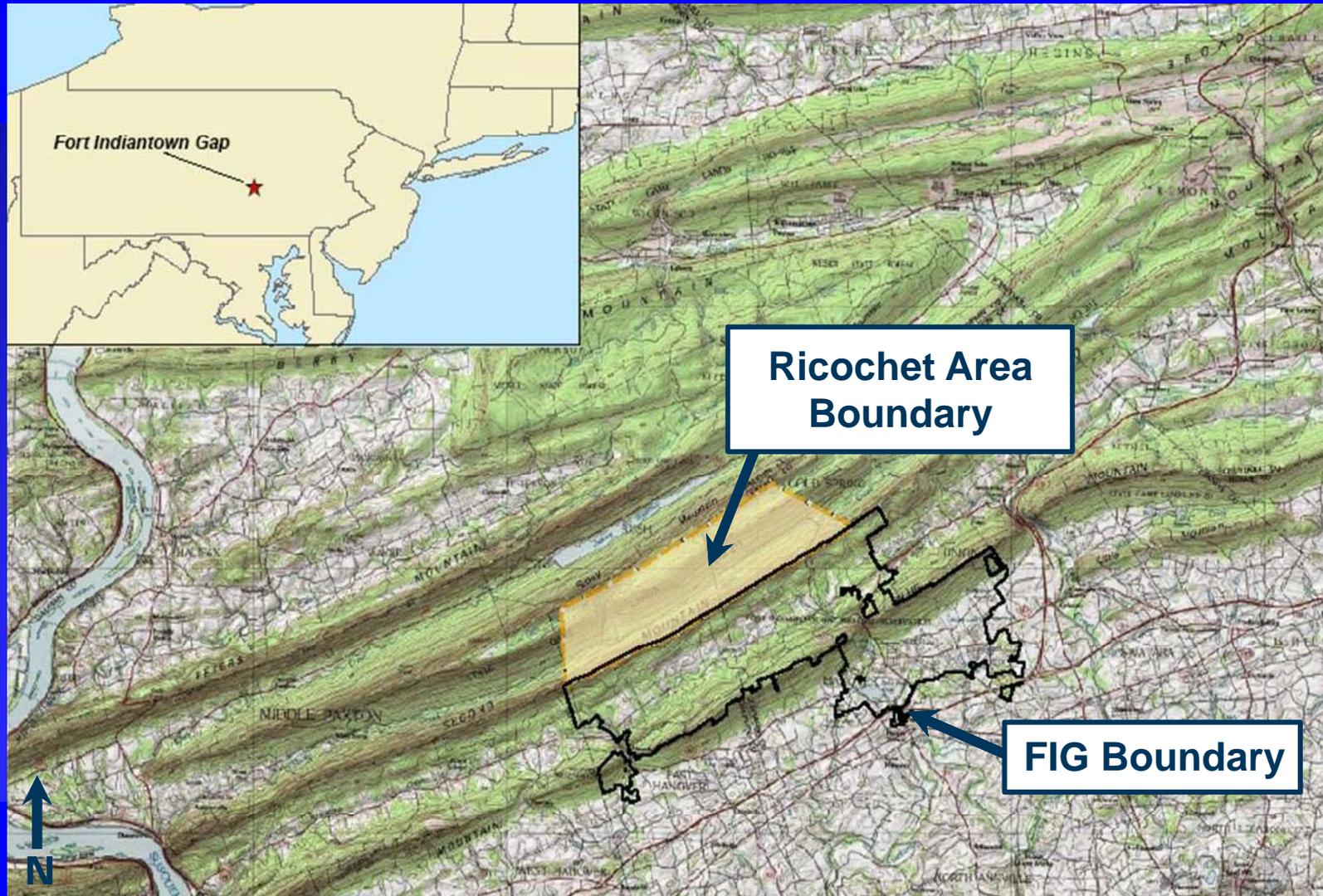
- Developed by USACE
- Comprehensive systematic planning tool
- Key Aspects
  - Early and often stakeholder involvement
  - Stakeholders communicate needs or concerns often
  - Determine data quality objectives
  - Determine type, quality and quantity of data to meet project objectives
  - 4 Phase program with meetings prior to each activity/stage
- TPP Meeting 1 Goal – provide project overview, present CSM and approach to field work in advance of Work Plans

# Project Purpose

- Conduct MMRP Remedial Investigation at Ricochet Area Munitions response Site at State Game Lands 211 adjacent to Fort Indiantown Gap
  - Focus is MEC and MC from former use associated with ricochets from impact area and Cold Springs firing point.
- Ultimate Goal
  - Ensure property is safe for users of SGL 211
  - Protective of human health and the environment



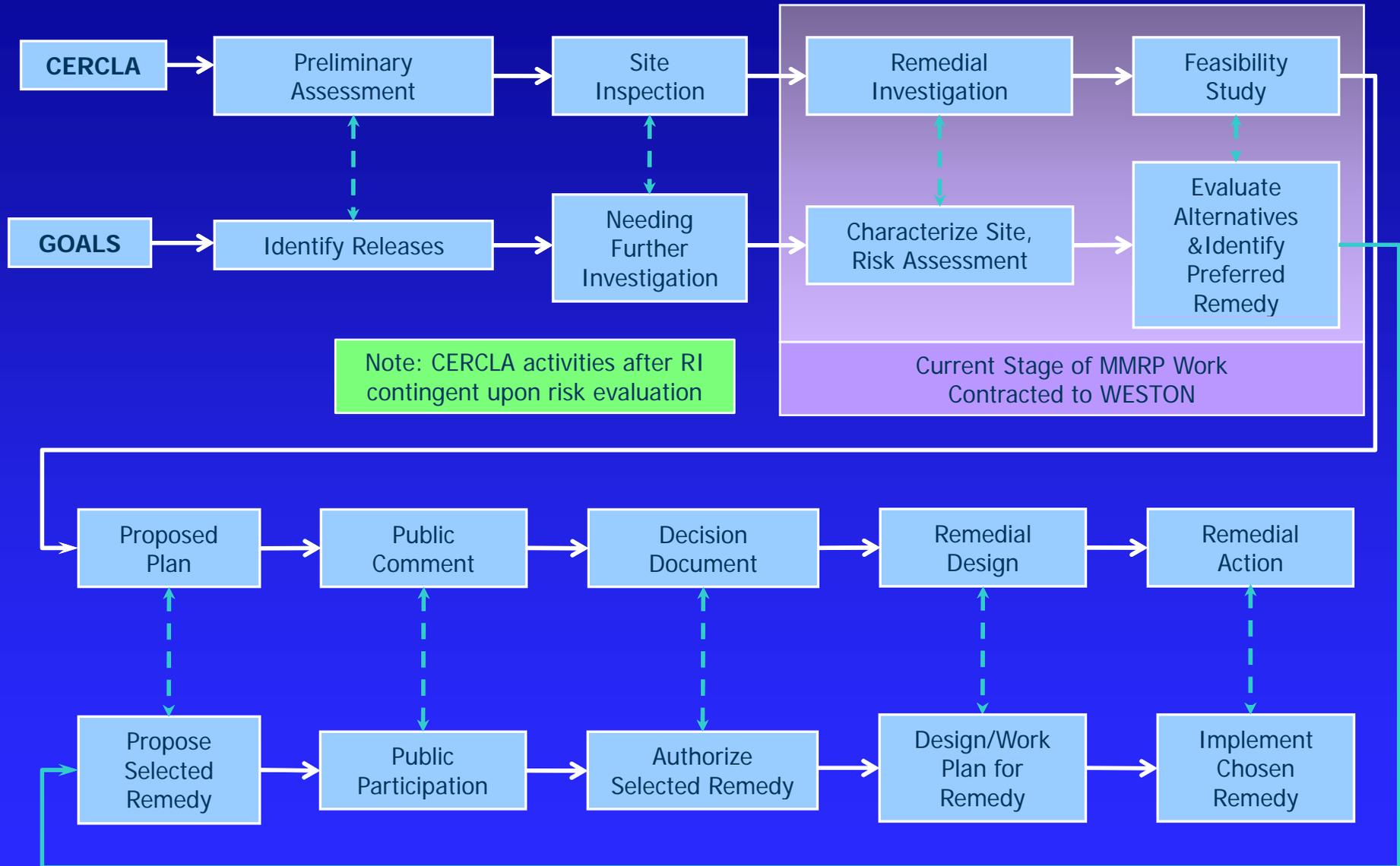
# Site Location: Fort Indiantown Gap



**Ricochet Area  
Boundary**

**FIG Boundary**

# Comprehensive Environmental Response, Compensation Liability Act (CERCLA) and Military Munitions Response Program (MMRP) Flow Chart



# MMRP RI Project Goals

- Collect sufficient information to develop remedial alternatives that will support decisions for future work (Feasibility Study through Decision Document)
- Update Conceptual Site Model (CSM) and reduction of MRS, if possible
- Update MRS Prioritization Protocol (MRSPP)
- Recommend adjustment to Future Land Use (if applicable)
- Support Cost to Complete (CTC) estimates

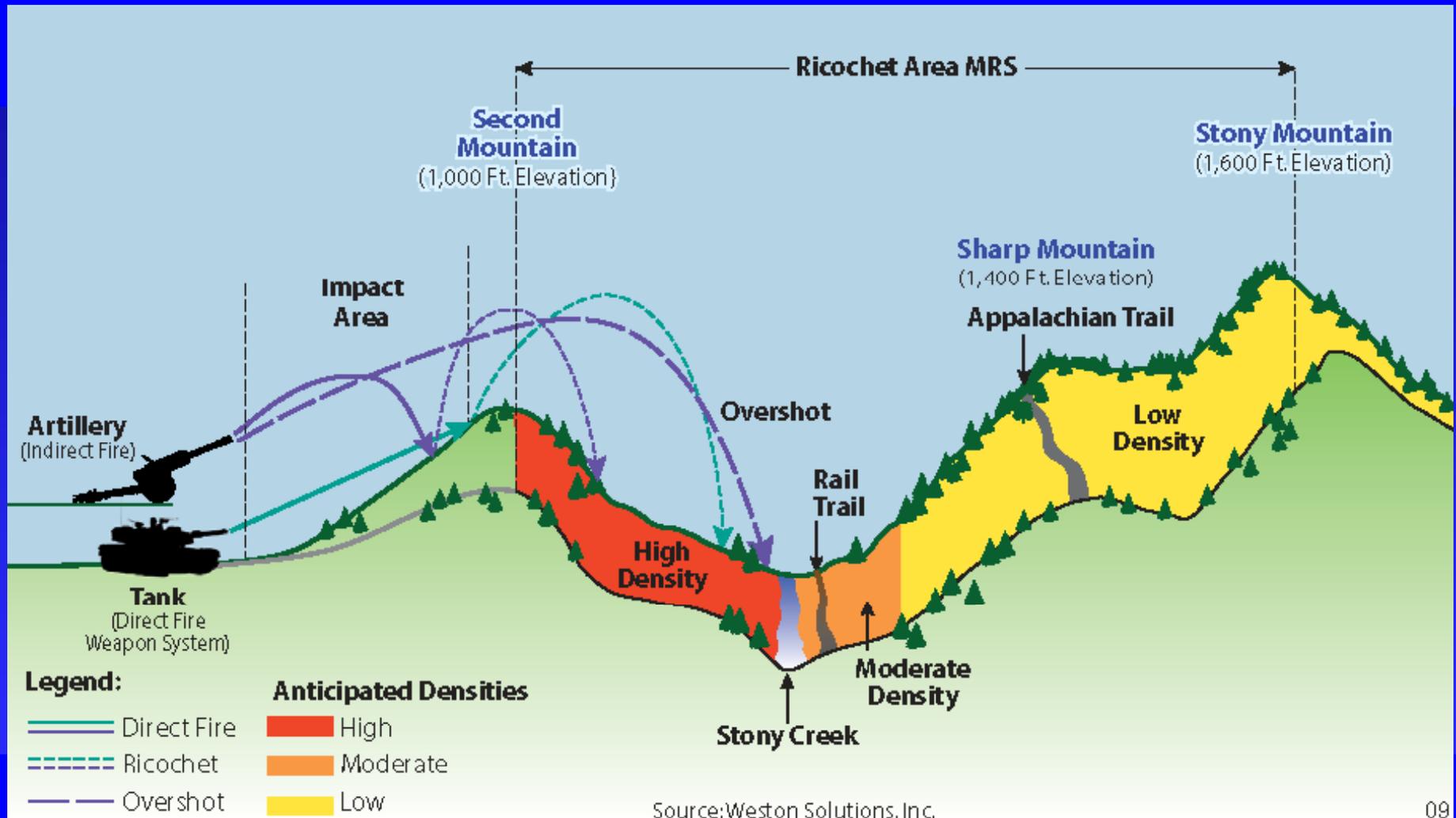
# MMRP RI Objectives

- Investigate the Ricochet Area to determine:
  - The presence or absence of MEC and MPPEH on the surface and in the subsurface
  - If MEC/MPPEH is present, assess the explosive safety hazards
  - Characterize the nature and extent of MC (metals and explosives) contamination
  - Perform a hazard assessment for MEC and a baseline risk assessment for MC

# Community Relations

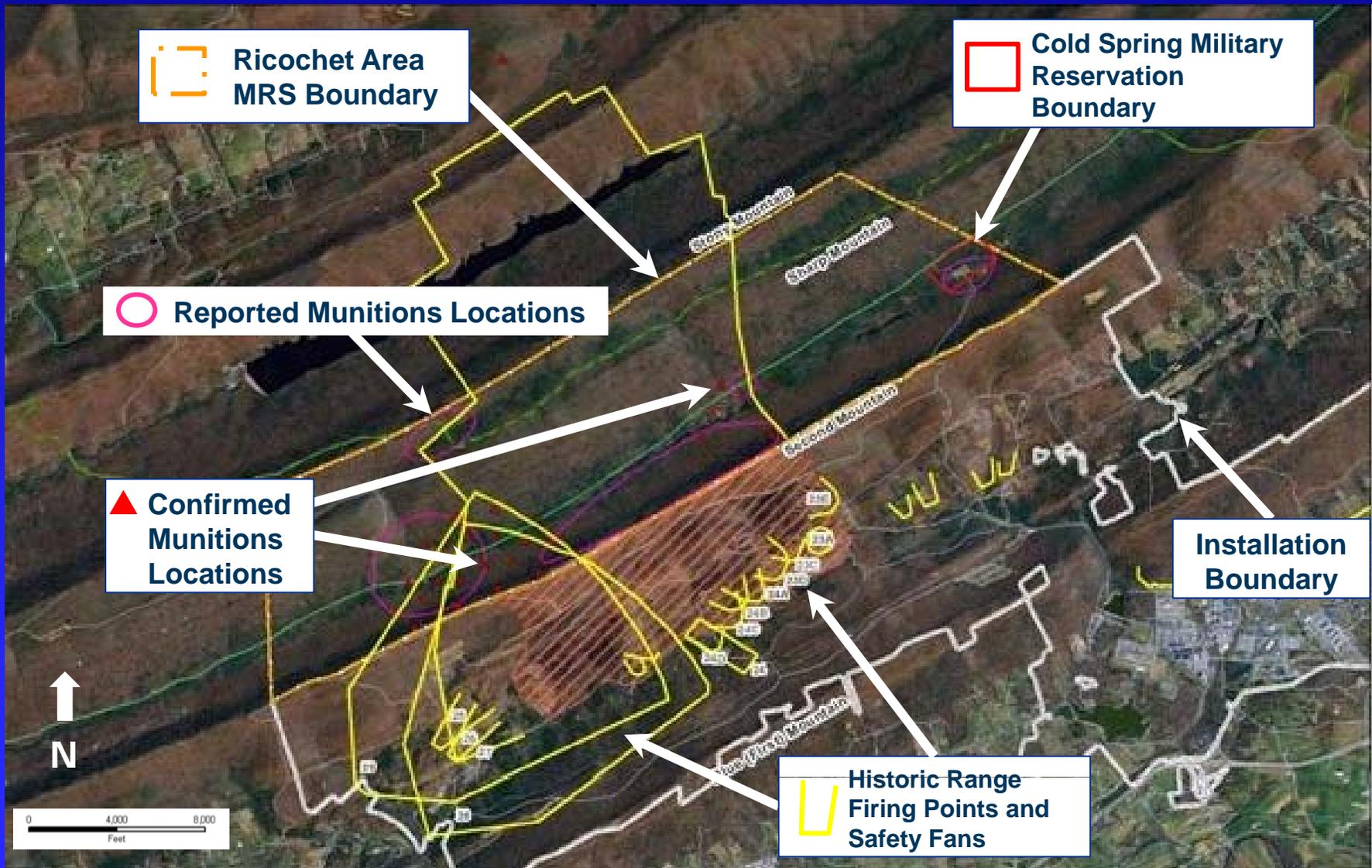
- Community Relations Plan
- Briefing State Legislature – Early December 09
- Community Interest Group Meeting -12/8/09
  - Additional meetings TBD
- Public Meeting/Open House – 2/18/10
  - News media and public invited
- Information Repository and Administrative Record will be established

# Graphical CSM



09

# Ricochet Area MRS Details



# Conceptual Site Model

- 1,351-acre impact area for live direct and indirect fire just adjacent to the southern border of MRS.
- Cold Spring portion of the MRS used for bivouacs and artillery training in the late 1940s/early 1950s.
- SGL 211 owned by Commonwealth of Pennsylvania.
- Munitions were not intentionally fired into the MRS.

# Conceptual Site Model

## Current and Future Land Use:

- Undeveloped and is host to recreational uses (e.g., hunting, hiking, fishing, bicycle riding, etc.). Frequent EOD responses to found munitions.
- Public has unrestricted access.
- PGC Management Plan includes road construction and maintenance, special wildlife area management, timber management, and preservation area maintenance.

# Conceptual Site Model

## Potential MEC/MC Sources and Release Mechanisms:

- In the SDZ or ricochets from firing into FIG impact area.
- In the SDZ from firing at Cold Spring into FIG impact area.
- MEC (DMM)/MC at the firing point at Cold Spring.

## Migration Pathways and Transport Mechanisms:

- MEC would be transported by soil/sediment disturbance, corrosion, frost heave, and erosion/deposition.
- MC transported by soil/sediment disturbance, hydrologic effects, degradation, and uptake.

# Conceptual Site Model

## Receptors and Exposure Routes:

- MEC pathways
  - Complete for human receptors
  - Incomplete for ecological receptors
- MC pathways
  - Incomplete for both human and ecological

## Munitions Constituents of Concern:

- Explosives: lead oxide, lead styphnate, mercury fulminate, TNT, RDX, HMX, tetryl
- Metals: lead, copper, mercury

# Conceptual Site Model

## Anticipated MEC

- From both direct and indirect fire
- 75mm, 76mm, 90mm and the 106mm projectiles most likely since *directly fired* into rocky Impact Area.
- 155mm, 8-in howitzers, 4.2-in and 60mm mortars would less likely ricochet over Second Mountain since *indirectly fired* into Impact Area.
- Range 24D highest likelihood of contributing to MEC presence in MRS due to use of direct-fire range and high-velocity weapons.

# Proposed Fieldwork

## Identify Surface and Subsurface Anomalies

- Investigation of a percentage of overall area to develop nature and extent
- Visual Surveys with analog instrumentation
- Geophysical mapping (transects and grids)

## Investigation of Selected Anomalies

- Qualified Unexploded Ordnance Technicians (UXO) perform visual and intrusive work
- Dig selected anomalies to determine if munitions/type
- MEC or MPPEH detonated (in-place or demo on FIG range)
- Munitions debris – verify free of explosives and dispose

# Proposed Fieldwork *(Cont'd)*

## Munitions Constituent Sampling

- Point source analytical sampling
- Explosives and metals analyses

## Evaluation of Site Risk

- Human Health
- Ecological
- Explosives Safety



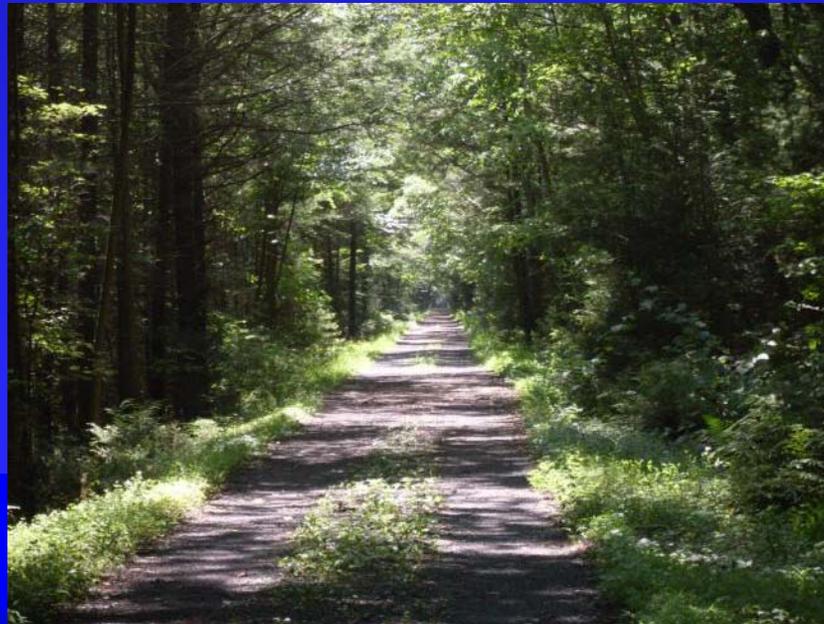
# Visual Survey with Analog Instrumentation

- Conducted using Schonstedt magnetic locators
- Approximately 31 transects with 300 ft spacing symmetric search pattern in an east to West direction
- Swath width of 10 ft. (2 personnel @ 5 ft per instrument)
- Transects and features logged using GPS



# Visual Survey *(Cont'd)*

- Anomalies will be intrusively investigated as team advances
- Existing trails and streams within the MRS will also be investigated (approximately 42 miles)



# Digital Geophysical Mapping

- DGM Transects - Magnetometer G-858 (vertical gradient)
- Transects conducted in Areas A-E to further define areas identified in visual survey

Area	Approximate No. of Transects	Approximate Linear Ft
A	2	8,000
B	5	26,400
C	3	47,520
D	2	1,575
E	2	5,280



- Navigation and positioning via DGPS as determined by quality of satellite reception or line and fiducial tracking.

# Digital Geophysical Mapping *(Cont'd)*

- DGM Survey Grids - Magnetometer G-858 (vertical gradient)
- Grid placement and frequency determined by analyzing anomaly density calculations computed from analog and digital transect data using GIS spatial analysis.
- Acreage of low, moderate, and high density areas will be determined on an ongoing basis.
- Navigation via Line and Fiducial tracking.

## Grid Survey Characterization Criteria

Anticipated MEC Density	Grid Distribution	Grid Size	Quantity of Grids	Description
Low	40%	100 x 100-ft	10	Cold Spring firing point– eastern side of MRS/Area E.
Moderate	30%	50 x 50-ft	40	Northern and central portions of MRS.
High	10%	50 x 50-ft		Range fans, western and southern portions of MRS.
Step-out or Discretionary	20%	50 x 50-ft 100 x 100-ft		Based on ongoing data and findings, and as required to complete characterization.

# Intrusive Activities

- Excavations will be conducted with hand tools.
- All items will be logged with WESTON's RespondFast – UXO Investigation tool.
- Munition with Greatest Fragmentation Distance (MGFD)
  - 105mm HEAT (M456)
  - Maximum horizontal fragment distance of 1,559 ft
  - Hazard fragment distance of 235 ft



# Explosive Operations

- Under supervision of a Weston Licensed Pennsylvania Blaster.
- Demolition activities will be conducted on an as needed basis in accordance with DOD, ATF, federal, state and local regulations.
- Disposal via blow-in-place (BIP) or transport of safe to move items to the open detonation area on the installation.



Electronic Remote Detonator

# Explosive Operations *(Cont'd)*

- Disposal operations will be coordinated with NGB/PAARNG and USACE
- On-demand explosive delivery from local vendor
- Area surrounding detonation area will be evacuated
- Appropriate engineering controls will be used (e.g., sandbags) to mitigate explosive hazards



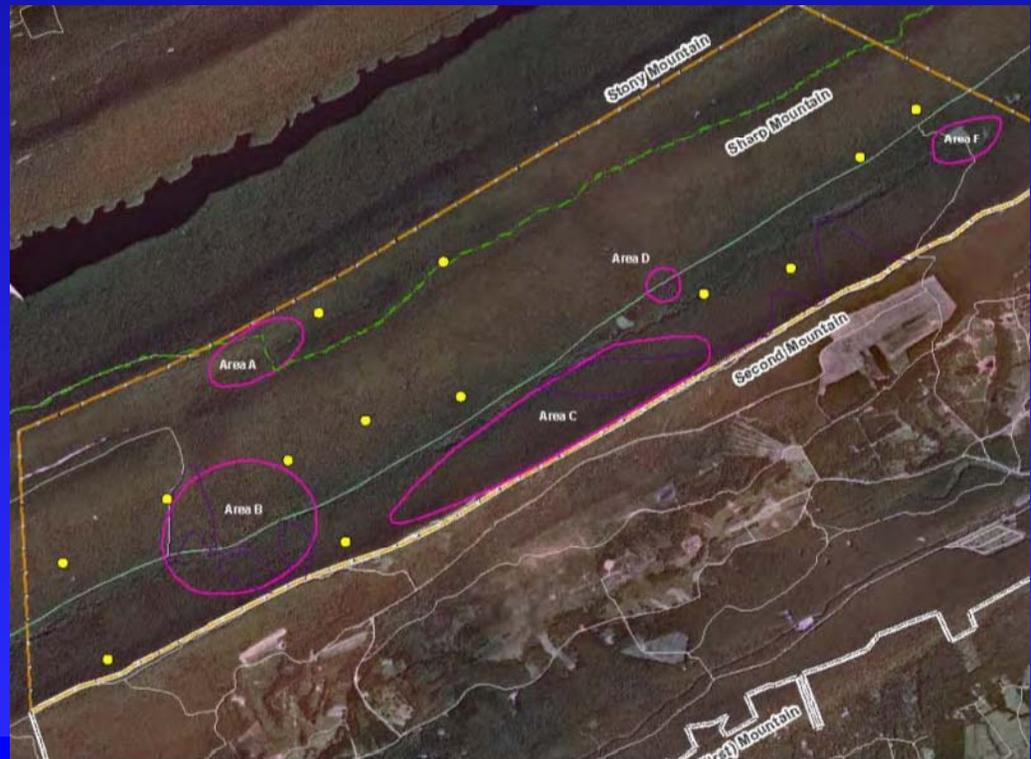
# Munitions Constituent Sampling

- MC samples will be collected in locations biased by MEC discoveries during Visual Survey, DGM Transects and DGM Grids
- Discrete point source sampling
  - Analytics will include:
    - Explosives (EPA SW-846 8330A)
    - Metals (EPA SW-846-6010B)
    - Mercury (EPA SW-7470A)

# Background Study for Metals

Background Study for Metals will be conducted in areas within MRS not impacted by MEC

- Visual Sampling Plan (VSP) used to develop sample numbers for defensible data
- Parametric simple random sampling approach
- 13 background samples
- Adjusted in the field to avoid areas impacted by MEC/ MC contamination



# Schedule/Next Steps

- Draft Final Work Plans Available - 12/9/09
- Review cycle 30 business days
  - If quicker, can get to field sooner
  - Comments Due -1/26/10
- TPP Meeting 2 - Scheduled for Mid January - 1/14/10
  - Review Comments on Work Plans
  - Proposed Field Work Discussed
- Final Work Plans Available for Backcheck -2/10/10
  - Review and Back Check Completed by 3/10/10
- Public Outreach Meeting - 2/18/10
- Field Work Start Late - March 2010
- Field Work Complete - Late April/Early May 2010
- Draft Final RI Report - November 2010



# Fort Indiantown Gap, Pennsylvania Military Munitions Response Program



Discussion and Questions?



*The Trusted Integrator for Sustainable Solutions*



## Military Munitions Response Program - Remedial Investigation Ricochet Area - Munitions Response Site Fort Indiantown Gap, Annville, PA Project Quality Pledge

We commit to ensuring the following Project Quality Goals are met

### These are our Quality Goals:

- **Safety** - Everyone's priority!
- **Execution** - Respect State Game Lands 211 property owners and users.
- **Approach** - Protect the current cultural and environmental aspects of SGL 211 by minimizing intrusive activities during RI.
- **Communication** - Ensure issues and challenges are addressed quickly and public information is disseminated timely, while reiterating impacts were from historical training activities.
- **Schedule** - Complete Remedial Investigation on time.



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**MEETING MINUTES**  
**TPP 2 Meeting**  
**For the**  
**Military Munitions Response Program (MMRP)**  
**Remedial Investigation**  
**Of the Ricochet Area Munitions Response Site (MRS)**  
**In State Game Lands 211, Pennsylvania**

**14 January 2010**  
**1000-1230**  
**Community Club, Fort Indiantown Gap, PA**

**Attendees:**

Scott Bills – Pennsylvania Game Commission (PGC) - Land Management Group Supervisor  
William Kosmer – Pennsylvania Department of Environmental Protection (PADEP) - Southcentral Regional Office – Project Geologist/Project Manager  
Kelly Sitch – Pennsylvania Department of Conservation and Natural Resources (DCNR) – Environmental Review Specialist  
Rebecca Brown – PA DCNR – Environmental Review Specialist

Kim Harriz – National Guard Bureau (NGB) – Cleanup Program Manager and COR

Lieutenant Colonel (LTC) Bill Yearwood – Pennsylvania Army National Guard (PAARNG) – Directorate of Training Support (DOTS)  
John Fronko – PAARNG – Department of Military and Veterans Affairs (DMVA) Environmental Division Chief  
Jo Anderson – PAARNG - DMVA, Environmental Management, Project Manager  
Rita Meneses – PAARNG – DMVA, Cultural Resource Manager  
Shannon Henry – PAARNG –DMVA – Forestry  
Joe Hovis – PAARNG –DMVA – Wildlife Specialist  
Bill Confer – PAARNG – DMVA – Master Planner, CFMO  
LTC Robert Spinelli – PAARNG JFHQ-SJA  
Major (MAJ) Rich Howett – PAARNG – TS-HQ  
Captain Steve Widnick – PAARNG – Fort Indiantown Gap (FTIG) Range Control  
Master Sergeant (MSG) Gregory Kirkpatrick – PAARNG – FTIG Range Control

Scott Weber – U.S. Army Environmental Command (USAEC)  
Tom Colozza – U.S. Army Corps of Engineers (USACE) - Baltimore District – Project Geophysicist

Greg Daloisio – WESTON, Project Manager  
John Gerhard – WESTON, Deputy Project Manager and MMRP Technical Manager  
John Williams – WESTON, Project Geophysicist  
Laura Pastor – WESTON, MMRP Technical Manager  
Deb Volkmer – WESTON, Community Outreach Specialist  
Marty Holmes – WESTON, Senior Unexploded Ordnance Supervisor (SUXO)

See Attached Sign-In Sheet for Phone Numbers and Email.  
Presentation Material – Attached

- ❖ Introductions
- ❖ Kim Harriz (NGB) Kicked Off Meeting with Introductions from personnel in attendance. PADEP representative Gary Moulder did not attend meeting and is planning on retirement at end of January 2010. Team will need to determine who will take his spot from PADEP. William Kosmer, Southcentral Regional Office has not been told this will be him from his direct manager at PADEP. Gary is out of a different section of PADEP dealing with Federal Facilities. Additionally Colonel Berrier has moved to new position and LTC Hayes is new Garrison Commander. LTC Yearwood is moving as well to another position on post. LTC Hepner will be new FIG Training Site Manager
- ❖ Presentation – Combination of WESTON representatives, NGB and PAARNG.
- ❖ Topics Discussion Centered Around
  - Graphical Conceptual Site Model (Slide 10) – PADEP (Kosmer) requested clarification on the green figures placed in figure as they could appear to be munitions items. WESTON clarified these were a cartoon figure showing trees. WESTON will add tree symbol to legend to prevent confusion.
  - CSM – Areas A-E (Slide 13) – USAEC (Weber) noted the figure indicates munitions finds throughout FIG and SGL 211. WESTON indicated figure will be revised to show only locations of munitions found within SGL 211 and the Ricochet Area MRS. WESTON also noted that a different version of this figure is included in the Work Plan documents.
  - CSM (Slide 15) – PGC (Bills) confirmed that PGC has no plans to change SGL 211 land use. This area will remain undeveloped. PAARNG (Menses) advised to change term from undeveloped to “no longer developed” terminology as area has had past development in its history.
  - WESTON skipped ahead in the presentation to the Biological Resources (Slide 19) and Cultural Resources (Slide 20) due to several representatives needing to attend another meeting. WESTON briefed group on response from PA DCNR on the PNDI request. Only response of four agencies to date.
  - DCNR (Sitch) indicated special species of concern within the potential area consist of American holly, Minniebush, and Netted chain fern (see attached fact sheets). DCNR presented the two options outlined in the response letter. The team can have a biologist conduct a plant survey in the specified project area prior to field work or they can allow avoidance measures of a 200 ft buffer around certain areas (e.g., stream banks, seeps, springs, wetland and riparian areas) with awareness training for field personnel. Additionally American holly should not be disturbed regardless of size. American holly is a PA Threatened species and should not be disturbed, cut or removed from the site. DCNR has requested a 50 ft buffer around American holly. The American holly present within the site is believed to be native plants. PAARNG (Hovis) asked when the last time Minniebush was found within Stony Valley. DCNR indicated in 1999 and that potential habitat exists for this plant. PAARNG (Hovis) also indicated that awareness training would need to address other ferns which look very similar to the Netted chain fern.

- WESTON presented the overall phased field approach to DCNR and attendees so that they could understand non invasive approach and schedule constraints. Project team is concerned with Stony Valley stream corridor and suspects a higher amount of munitions in this area. DCNR understands the approach to minimize disruption of the surrounding environment and is willing to work closely with the field team during operations. DCNR concerned with disturbance of vegetation. American holly and Minniebush are relatively easy to identify and can be avoided. If a UXO item required detonation these plants could be moved. A demolition video to show how engineering controls mitigate blast effects. PGC (Bills) pointed out that removal of American holly in this setting would not be an easy task based on access, topography and rocky soil. Minniebush could easily be relocated. It was agreed that different techniques would be utilized for different investigative methods. Visual, analog-assisted survey which will be conducted across the SGL 211 will have minimal disturbance and vegetation removal is expected. Areas where American Holly are present will be recorded so that they can be avoided during digital geophysical transects and mapping activities. Digital geophysical mapping for transects is not expected to have any vegetation removal activities. DGM grid surveys, may require vegetation removal. A qualified team member will survey area for threatened species. If species of concern are identified the areas will be shifted and appropriate precautions will be taken. A Standard Operating Procedure (SOP) will be provided to DCNR outlining approach to field work and how effects on sensitive plants will be minimized and conduct awareness training for personnel conducting fieldwork. DCNR will share locations of known plants with WESTON Biologist.
- PAARNG (Menses) indicated that the letters requesting review were provided to the State Historic Preservation Officer/Tribal Historic Preservation Officer in early January 2010. They may be lenient with project based on the UXO issues. She considers the area no longer developed versus undeveloped. The Native American groups will be interested primarily in bones. However if anything out of the ordinary is found the field team will be instructed to stop work and contact Ms. Menses for next steps. Avoidance of areas is preferred if known areas exist.
- WESTON resumed with description of CSM and planned field work. PAARNG (Hovis) indicated that an additional historic air to surface (ground) range was recently discovered during some logging operations. Not sure it is in the current CSM figures but PAARNG (Hovis/Anderson) will review and provide information to update CSM. Some MEC items are moved by man and may not fit models. He also noted that MEC items left in the ground will get a bath tub ring mark around them due to corrosion and rust. MEC item inclination can tell you a lot of information. He also suggested having more than one photo taken of each item. WESTON described the detailed dig sheet requirements so that the group was aware teams do record a lot of information about each item to feed into understanding of site. It was noted that ricochet areas may tend to have munitions in many different orientations versus a traditional impact area.
- PADEP (Kosmer) concerned with marking of found UXO items with flagging and then not addressing items. Public may investigate what the flagging is indicating. The field team will not leave flagging in place for munitions items. WESTON is required to provide security over UXO items until it is disposed of in accordance with DOD requirements. The field team will be digging as operation go to have efficient activities versus having to travel over areas multiple times during Visual Surveys.

- PGC (Bills) will work with WESTON on setting up a site visit in next couple of weeks to gain access to look for location of Geophysical System Verification bed and other access requirements.
- PAARNG (Fronko) concerned with how staff will maintain control over direction while conducting visual transects. WESTON will be using hand held and back pack global positioning systems. Tree cover canopy is concern and completing the visual transects earlier than later in March is preferred to avoid canopy issues.
- PAARNG (Fronko) concerned with safety setback distance for hikers during intrusive operations. WESTON clarified that hikers would need to stay at least 341 ft away from personnel digging and conducting demolition activities. The field team will stop operations and let hikers pass through as to not restrict the recreational use of the SGL 211. Perimeter is controlled by visual observation, audible signals from horn and during demolition activities personnel walk out necessary distance to ensure people are not within exclusion zones. Explosive operations will consist of Blow-In –Place. Items only moved if deemed safe to move. The FIG demolition range or storage facility for explosives. PGC asked how long after discovery till detonation. Usually 2-3 hours. Sand bags typically 200 per detonation with necessary plywood. PADEP acknowledged samples will be collected before detonation in some instances and asked if post detonation samples will be collected? Post detonation sampling is not planned based on past DOD studies indicating in high order explosions there are minimal munitions constituents remaining at detonation sites.
- Community Relations (Slide 12) – WESTON is following up with Community Interest Group working on keying in large mailing list provided by PAARNG.
- PAARNG (Anderson) asked how many people attended the previous public meeting Fronko stated around 100 people attended the Multi Purpose Training Range (MPTR) meeting. A news release was issued in PA Game News and PA Angler magazine for March 2010 issue to advise users of SGL 211 of field activities from investigation. NGB (Harriz) indicated the news release may be retracted if NGB PAO has issues with wording. Need to ensure communications on releases are clearer for future releases. PGC (Bills) indicated he thought local papers with outdoor editors may reach the hunters the best. WESTON asked if PGC would want to post on their website. PGC (Bills) requested we run through him and then Jerry Feaser who is the PGC Public Affairs person. PADEP website is not working very well right now so may not reach audiences.
- PAARNG (Fronko) asked what happens if community interest dwindles long term with project. Is the team still required to conduct community interest group meetings? Meetings could then be on a less frequent basis.

❖ Action Items

- WESTON will draft an SOP for conducting work in SGL 211 to minimize disruption to special plant species and provide to DCNR so they can issue their approval of the approach to be used during investigation.

- PADEP will need to assign replacement for Gary Moulder for point of contact with project and review of documents. William Kosmer will go back to Southcentral Regional Office and inquire how this is going to be handled by PADEP. PAARNG will also inquire via other contacts at PADEP.
- PGC will provide a signed copy of the Special Use Permit for PAARNG investigation of SGL 211. This will be handled out of the Southeast Regional Office.
- WESTON will coordinate with PGC on site visit for placement of GSV and other access coordination.
- LTC Yearwood requested that WESTON coordinate with Range Control on communications plan (radios) prior to fieldwork commencing; this includes subcontractors (surveyors). WESTON will also work with Range Control on potential office trailer and conex storage box location. This communication should be with MSG Kirkpatrick.
- PAARNG (Hovis/Anderson) will evaluate if current CSM (figures) captures recent discovery of historic air to surface (ground) range discovered during logging operation.

<u>NAME</u>	<u>ORGANIZATION</u>	<u>PHONE</u>	<u>EMAIL</u>
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JO Anderson	PAARNG-DMVA	717-861-9414	joanderson@state.pa.us
Tom Cowza	USACE	410-962-6647	THOMAS.S.COWZA@USACE.ARMY.MIL
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<del>John Gerhard</del>	<del>WESTON</del>	<del>610-361</del>	
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TC Bill Yearwood	FTIG Plans/TNE	717-861-2410	william.yearwood@us.army.mil
Bill Confer	MASTER PLANNER, CFMD	717-861-8449	c-wconfer@state.pa.us
Joe Hovis	DMVA WILD	717-861-9806	jhovis@state.pa.us
Bob Spinelli	JFHR-SJA	717 861-8635	robert.spinelli@us.army.mil

# American Holly

## *Ilex opaca*

### Description

American holly is an evergreen shrub or small tree that grows to 50 feet (15 meters) in height. It can be easily recognized in any season by its alternately arranged, thickish, evergreen leaves that have a sharp spine at the tip and additional spines along the margin. The flowers, appearing in May and June, are unisexual, so that the familiar berry-like fruit, red at maturity, can be found only on female plants.

### Distribution & Habitat

American holly has a distribution from coastal New England south and west into Florida and Texas. In Pennsylvania, it is near the northern end of its range, and occurs mostly in the southeastern counties. The species grows on wooded slopes and streambanks. It has also been grown as an ornamental, particularly in the southeastern counties, and may escape locally to woodlots, thickets, and fencerows.

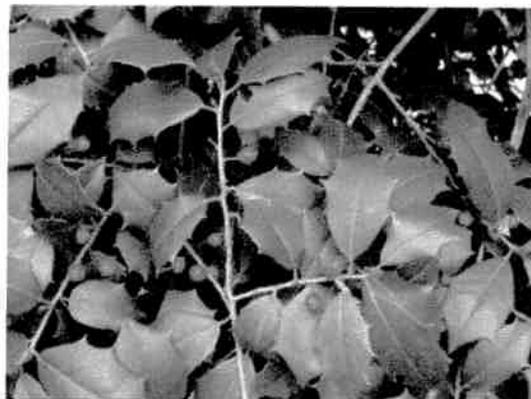
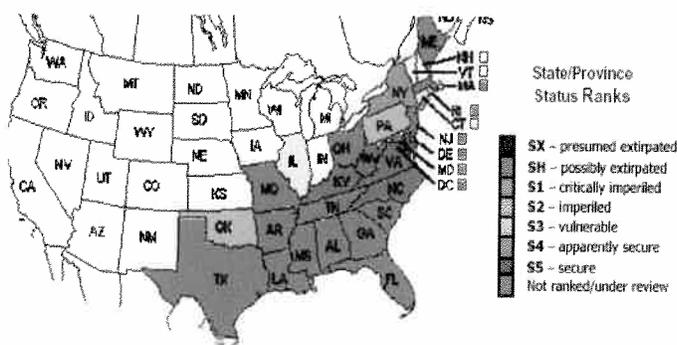


Photo source: John Kunsman (PNHP)

### North American State/Province Conservation Status

Map by NatureServe 2007



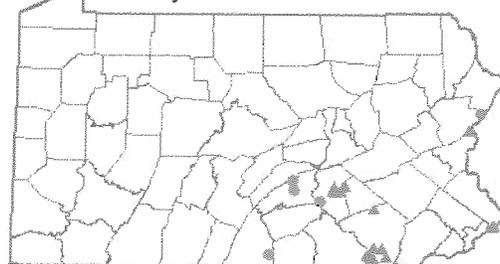
### Current State Status

The PA Biological Survey (PABS) considers American holly to be a species of special concern, based on the relatively few native occurrences that have been recently confirmed. The species has a PA legal rarity status and a PABS suggested rarity status of Threatened.

### Conservation Considerations

The conservation of American holly in Pennsylvania has concentrated on protecting populations that are believed to be indigenous and that represent native genotypes. Occurrences of the species that have resulted from escapes from plantings are of uncertain genetic origin and are considered to be of much lower conservation significance. As a woodland species, proper forest management and control of invasive species are important for the long term viability of American holly. Gathering of the branches of wild trees for winter decoration should be discouraged.

### Pennsylvania Distribution



▲ Current records ● Records > 30 years old  
Pennsylvania Natural Heritage Program data 2007

### NatureServe conservation status ranks

G5 – Globally secure; S2 – Imperiled in Pennsylvania

### References

- NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>.
- Rhoads, A.F. and T.A. Block. 2007. The Plants of Pennsylvania: An Illustrated Manual. 2<sup>nd</sup> edition. University of Pennsylvania Press, Philadelphia.



Pennsylvania Natural Heritage Program

## Minniebush (*Menziesia pilosa*)

Plantae>Magnoliophyta>Magnoliopsida>Ericales>Ericaceae>*Menziesia pilosa* (Michx. ex Lam.) Juss. ex Pers.



Minniebush is a common blueberry-like shrub of the Mountains, rare in the western Piedmont. The branches and both surfaces of the leaves are pilose (covered with long, soft hairs).

Macon Co., NC 5/14/06.



Alleghany Co., NC 5/29/05.

Bark detail.

Macon C



# Netted Chainfern

## *Woodwardia areolata*

### Description

Netted chainfern grows from 1½ to 2½ feet (5-8 dm) in height, and may form small colonies due to the presence of creeping underground stems. The leaves are easily distinguishable into vegetative and fertile types. The vegetative leaves have a typical fern-like appearance, being green, flattened, and divided into 7 to 12 very deep lobes (or distinct leaflets on the lower part of the leaf) that are not further subdivided into smaller lobes. The leaf veins are conspicuous and have a net-like or chain-like arrangement, as the common name implies. The fertile leaves of netted chainfern are dark colored, much narrower, not flattened and leaf-like, and have spore-producing structures on their underside. The vegetative leaf of this species resembles the leaf of the sensitive fern (*Onoclea sensibilis*), a common species in Pennsylvania, but the lobes in netted chainfern tend to be alternately arranged along the leaf stalk while the lobes of sensitive fern tend to be oppositely arranged.



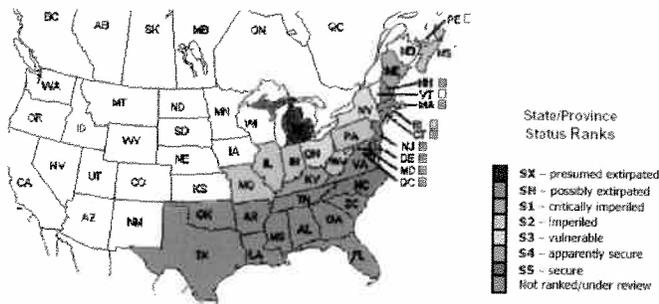
Photo source: Andrew Strassman (PNHP)

### Distribution & Habitat

Netted chainfern has a distribution centered mainly on the Atlantic coastal plain from Nova Scotia south and west into Texas and Florida. In Pennsylvania, the species has been documented historically in scattered counties, particularly in the Delaware River drainage. It grows in swamps, seepages, wet woods, boggy wetlands and along the margins of streamlets.

### North American State/Province Conservation Status

Map by NatureServe 2007



### Current State Status

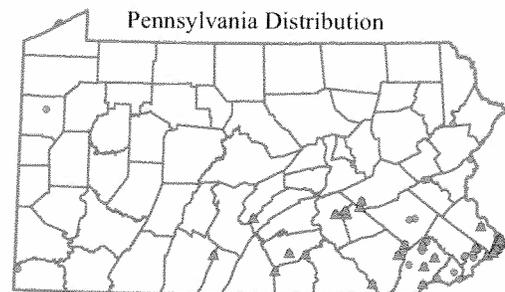
The PA Biological Survey (PABS) considers netted chainfern to be a species of special concern, based on the relatively few occurrences that have been recently confirmed and the wetland habitat. It has no PA legal rarity status, but has been assigned a suggested rarity status of Threatened by PABS. About 30 populations are currently known from the state.

### Conservation Considerations

The viability of populations of netted chainfern and its habitat may be enhanced by establishing buffers around wetlands, controlling invasive species, and protecting the natural hydrology surrounding wetlands.

### NatureServe conservation status ranks

G5 – Secure globally; S2 – Imperiled in Pennsylvania



▲ Current records ● Records > 30 years old  
Pennsylvania Natural Heritage Program data 2008

### References

- NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available at <http://www.natureserve.org/explorer>.
- Pennsylvania Natural Heritage Program. 2007.
- Rhoads, A.F. and T.A. Block. 2007. The Plants of Pennsylvania: An Illustrated Manual. 2<sup>nd</sup> edition. University of Pennsylvania Press, Philadelphia.



Pennsylvania Natural Heritage Program



# Fort Indiantown Gap, Pennsylvania Military Munitions Response Program



## Ricochet Area Remedial Investigation Technical Project Planning Meeting 2

14 January 2010



*The Trusted Integrator for Sustainable Solutions*

# Project Team

- Regulator – Pennsylvania Department of Environmental Protection (PADEP)
  - Chief, Federal Facilities Section – Gary Moulder
  - South Central Office – Bill Kosmer
- Property Owner – Pennsylvania Game Commission
  - Southeast Regional Office – Scott Bills



# Project Team *(Cont'd)*

## Military Munitions Response Program (MMRP)

- Executing Agent – National Guard Bureau (NGB)
  - Cleanup Program Manager – Kim Harriz



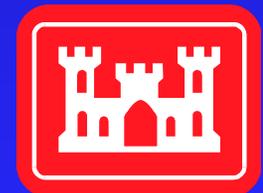
- Pennsylvania Army National Guard Bureau (PAARNG)

- Department of Military & Veterans Affairs (DMVA)
- Environmental Management Chief – John Fronko
- Project Manager – Joan Anderson
- Public Affairs Officer – LTC Chris Cleaver



# Project Team *(Cont'd)*

- U.S. Army Environmental Command (USAEC)
  - Environmental Restoration Manager – Scott Weber
- U.S Army Corps of Engineers (USACE)
  - Baltimore District
    - Project Manager – Emily Schiffmacher
    - Geophysicist – Tom Colozza



# Project Team *(Cont'd)*

- Contractor Support –  
Weston Solutions, Inc. (WESTON)



- Project Manager – Greg Daloisio
- Deputy Project Manager/MMRP Technical Manager – John Gerhard
- Project Geophysicist – John Williams
- MMRP Technical Manager – Laura Pastor
- Senior UXO Supervisor – Marty Holmes
- Community Outreach Specialist – Deb Volkmer

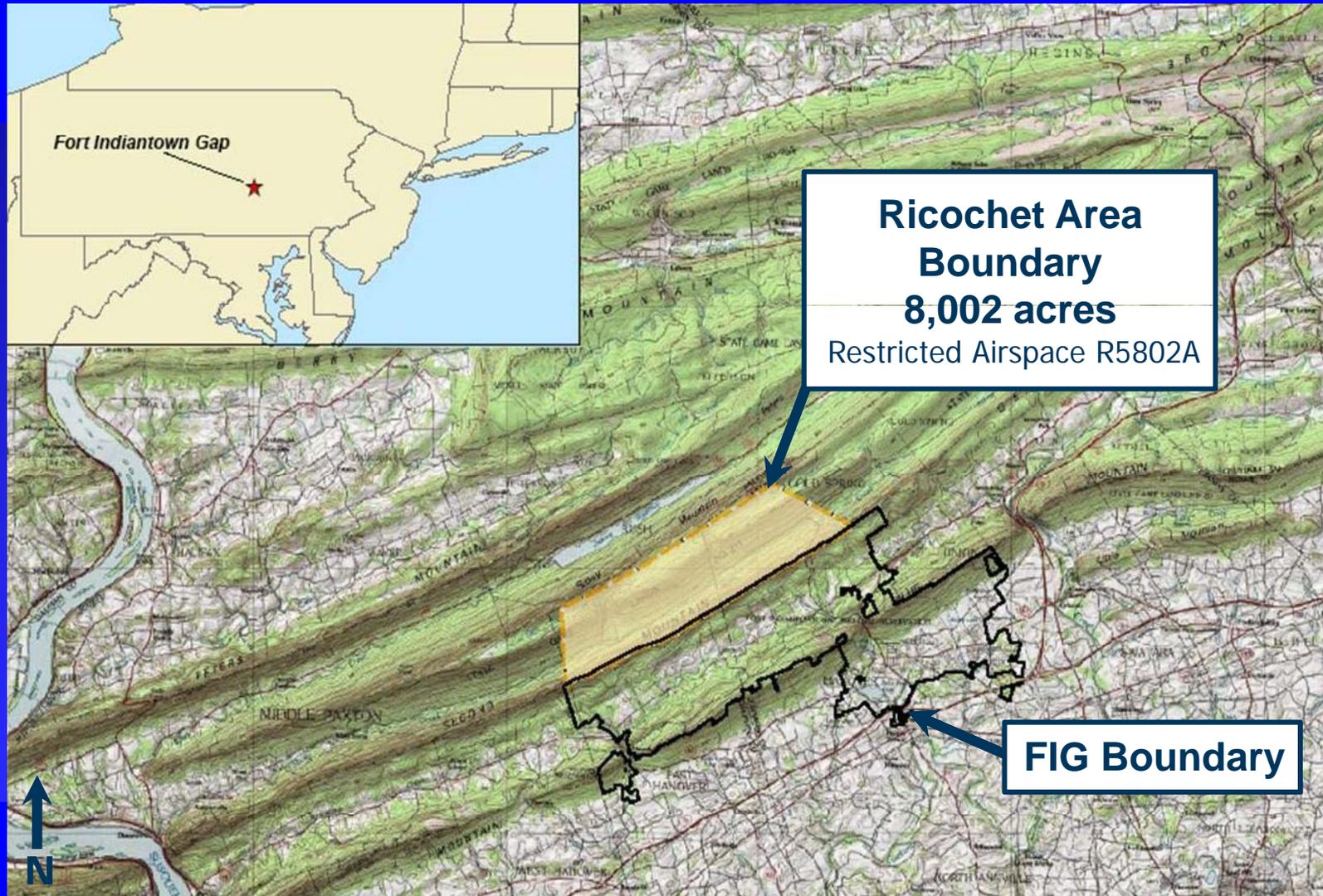
# Meeting Overview

- Project Purpose
- MMRP Remedial Investigation Objectives
- Conceptual Site Model (CSM)
- Planning
  - Pennsylvania Natural Diversity Inventory (PNDI)
  - Cultural and Archeological Resources
- Fieldwork
  - Visual Surveys
  - Geophysical Surveys
  - Intrusive Activities
  - Demolition Activities
  - Munitions Constituents Sampling and Analysis
  - Risk Assessment
  - Reporting
- Community Relations

# Project Purpose

- Conduct MMRP Remedial Investigation at Ricochet Area Munitions Response Site (MRS)
  - Focus is munitions and explosives of concern (MEC) and munitions constituents (MC) from potential ricochets and/or overshoot from historical munitions training at FIG and Cold Springs firing point

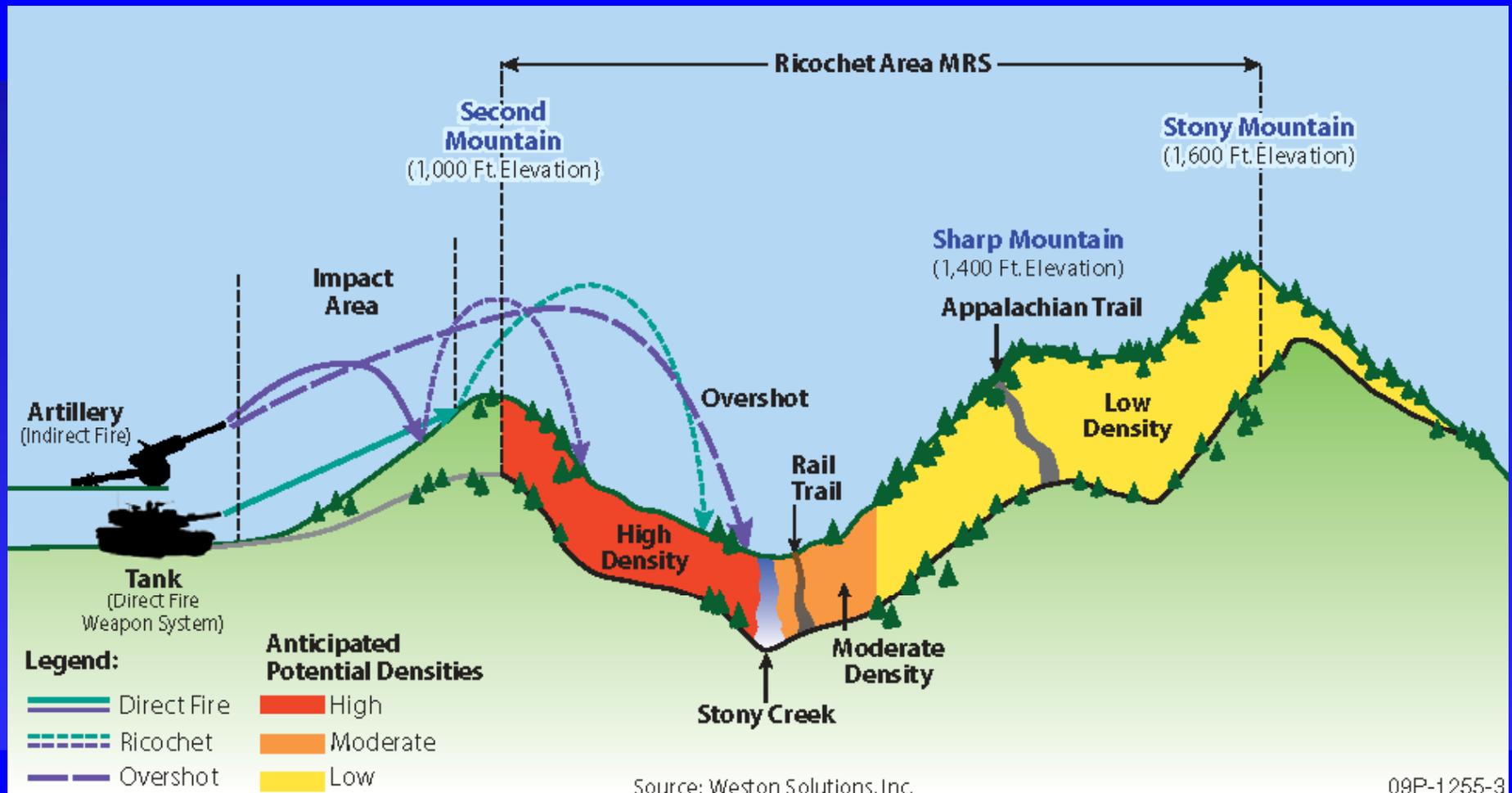
# Site Location: Fort Indiantown Gap



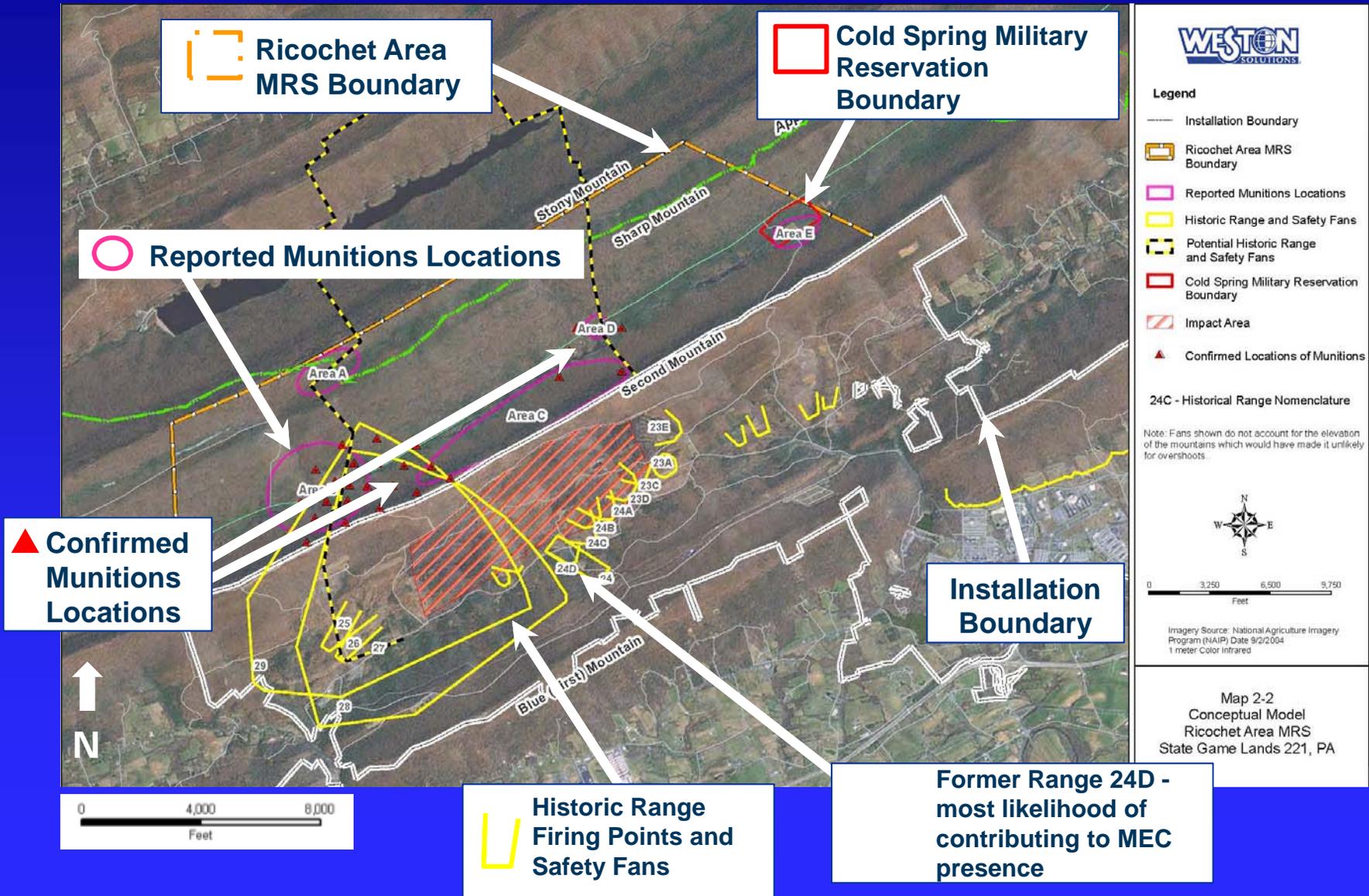
# MMRP RI Objectives

- Investigate the Ricochet Area to determine:
  - The nature and extent of MEC and Material Potentially Presenting an Explosive Hazard (MPPEH) on the surface and in the subsurface
  - If MEC and/or MPPEH is present, assess the explosive safety hazards
  - Characterize the nature and extent of MC (metals and explosives) contamination
  - Perform a hazard assessment for MEC and a baseline risk assessment for MC

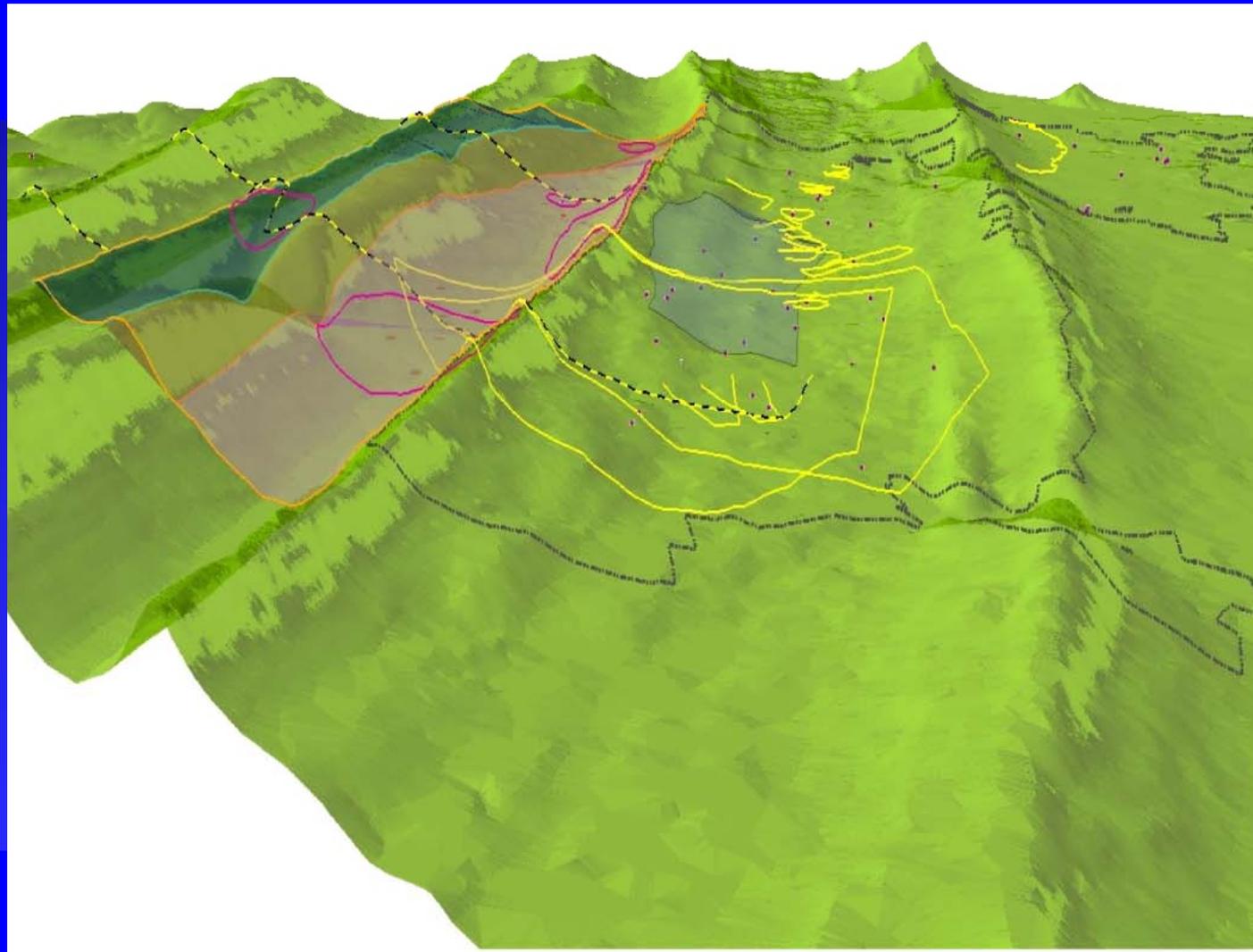
# Graphical CSM



# CSM



# MRS 3-D Representation



## Legend

- Installation Boundary
- Ricochet Area MRS Boundary
- Reported Munitions Locations
- Impact Area
- Potential Historic Range and Safety Fans
- Historic Range and Safety Fans
- MEC Items Found

## Estimated MEC Density

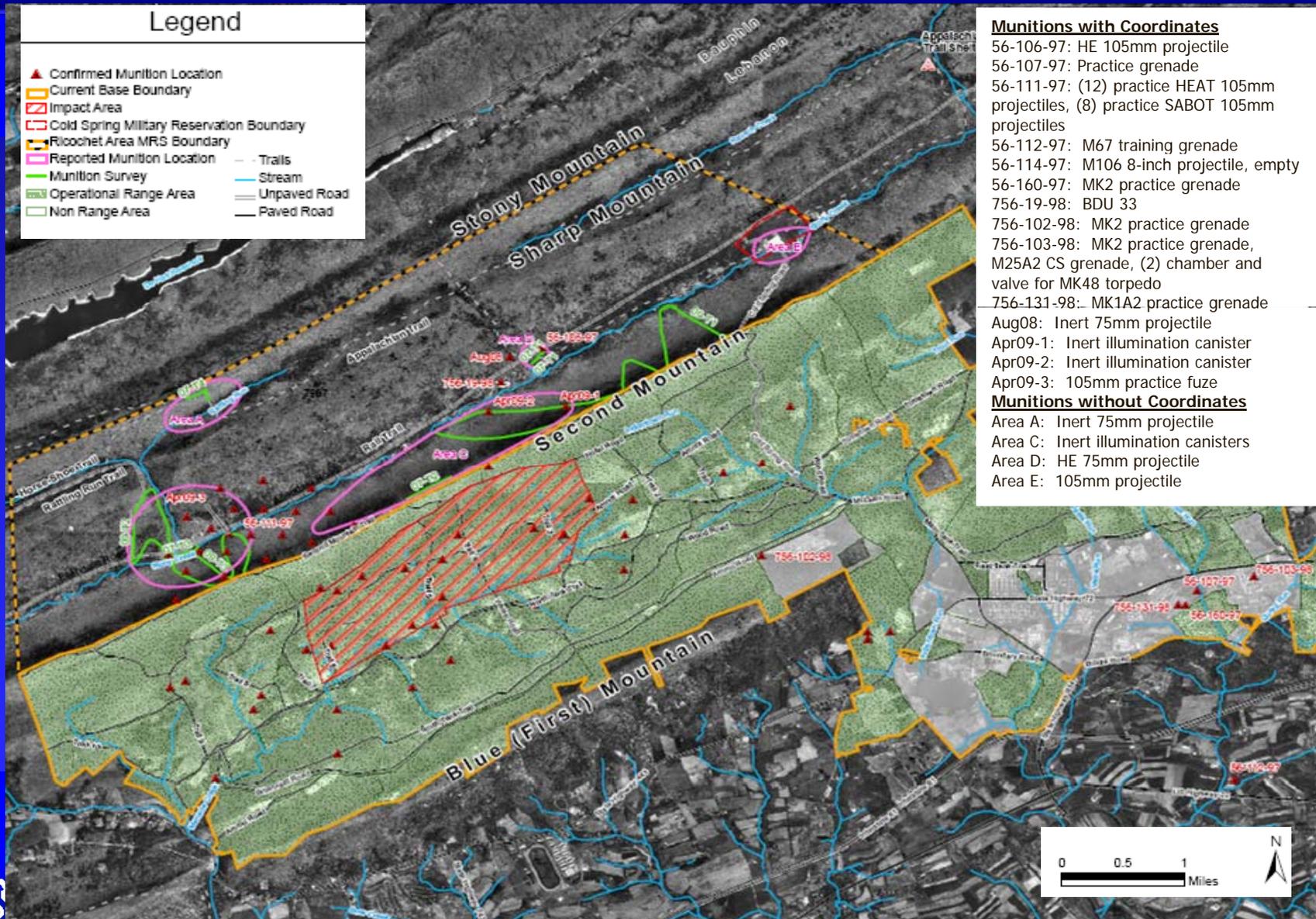
- High
- Moderate
- Low

Note: Fans shown do not account for the elevation of the mountains which would have made it unlikely for overshoots

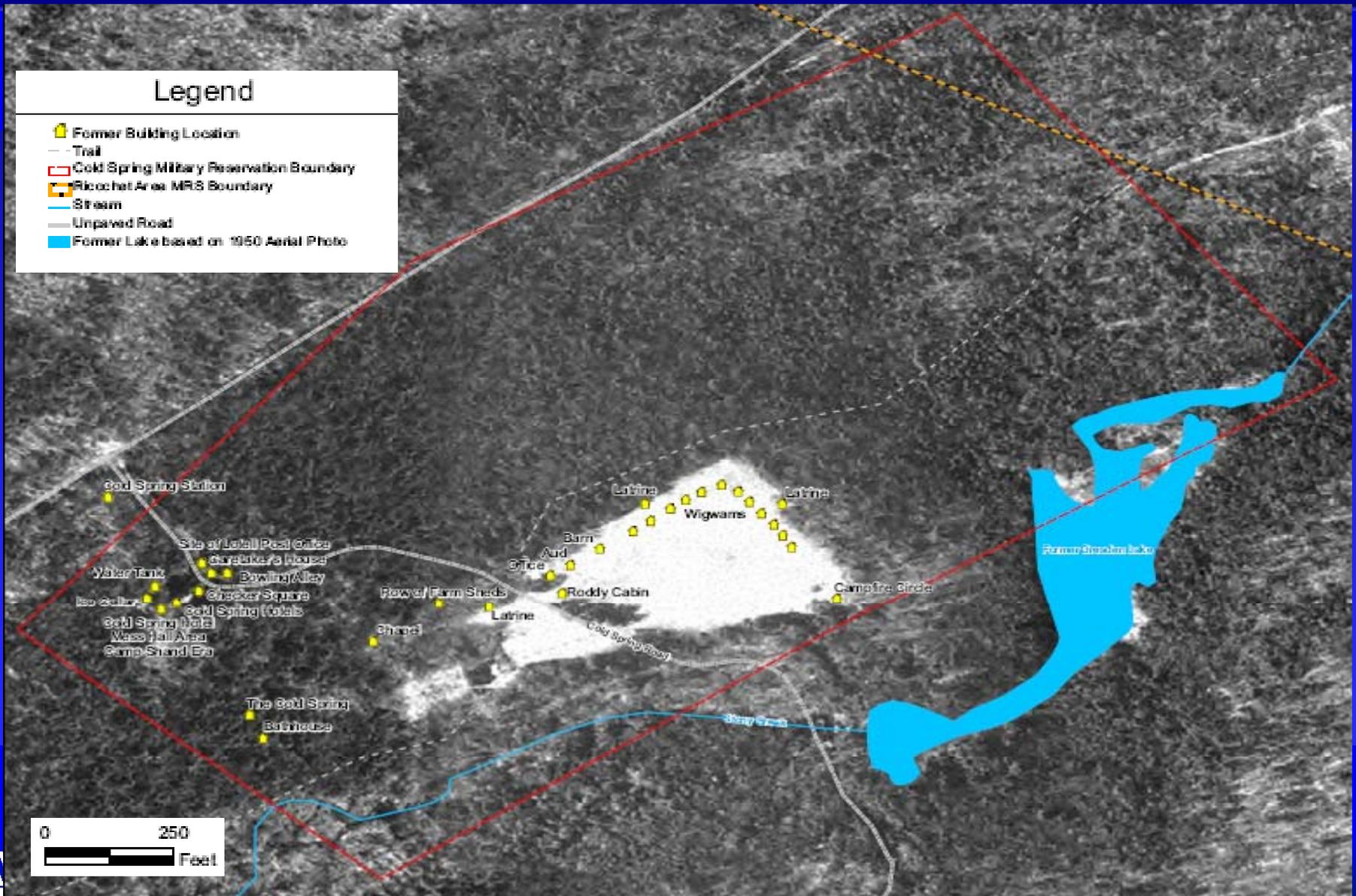


Map 2-3  
3D Conceptual  
Model Representation  
Ricochet Area MRS  
State Game Lands 211, PA

# CSM – Areas A-E



# Former Cold Springs Military Reservation



# CSM

## Current and Future Land Use:

- Undeveloped, recreational use, unrestricted access, PGC construction and maintenance, special wildlife area management, timber management, and preservation area maintenance

## Potential MEC/MC Sources and Release Mechanisms:

- Ricochets and/or overshoot from FIG impact area, firing from former Cold Spring Firing Point into FIG impact area, and burial of discarded military munitions (DMM) at the firing point at former Cold Spring Firing Point

# CSM

## Migration Pathways and Transport Mechanisms:

- MEC would be transported by soil/sediment disturbance, corrosion, frost heave, and erosion/deposition
- MC transported by soil/sediment disturbance, hydrologic effects, degradation, and uptake

## Receptors and Exposure Routes:

- MEC pathways are complete for human receptors and incomplete for ecological receptors
- MC pathways are incomplete for both human and ecological receptors

## Munitions Constituents of Concern:

- Explosives: lead oxide, lead styphnate, mercury fulminate, TNT, RDX, HMX, tetryl
- Metals: lead, copper, mercury

# CSM – Anticipated Munitions

## Munitions that have been reported/discovered within the MRS

- 105-mm high explosive (HE) projectile
- MK1A2 practice grenade
- 105-mm practice high explosive anti-tank (HEAT) projectile
- 105-mm practice SABOT
- M67 training grenade
- 8-in (M106) projectile
- MK2 practice grenade
- Inert 75-mm projectile
- Inert illumination canisters
- 105-mm practice fuze
- 75-mm HE projectile

# CSM – Anticipated Density and Depth

- Direct-fired munitions contribution to Ricochet MRS
- Indirect-fired munitions contribution to Ricochet MRS
- Range 24D highest likelihood of contributing to MEC presence in MRS due to use of direct-fire range and high-velocity weapons
- Overshot not likely due to standard operations and Second Mountain over 1,000 ft elevation
- **Penetration depths limited due to**
  - MRS consists of rocky soils
  - Direction and velocity of ricochet impacts

# Biological Resources

- No Federally Threatened or Endangered Species
- Follow the requirements of the Pennsylvania Natural Heritage Program (PNHP)
- Letters submitted to:
  - U.S. Fish and Wildlife Service (USFWS)
  - Department of Conservation and Natural Resources (DCNR)
  - Pennsylvania Fish and Boat Commission (PAFBC)
  - Pennsylvania Game Commission (PGC)
- Received response from DCNR at this time
- Special Status Species – American holly (*Ilex opaca*),  
Netted Chainfern (*Woodwardia areolata*), and Minniebush  
(*menziesia pilosa*)

# Cultural and Archeological Resources

- Initiated Section 106 regulatory process
- Letters submitted via NGB/PAARNG to State Historic Preservation Officer/Tribal Historic Preservation Officer (SHPO/THPO)
- Awaiting response from SHPO/THPO

# Proposed Fieldwork

- Use Visual Surveys with analog instrumentation
- Digital Geophysical Mapping (DGM) to identify surface and subsurface anomalies
- Investigate selected anomalies using Unexploded Ordnance (UXO) Technicians
- Conduct on-site demolition, as necessary
- Dispose of munitions debris
- Conduct munitions constituent sampling
  - Point source analytical sampling
  - Explosives and metals analyses

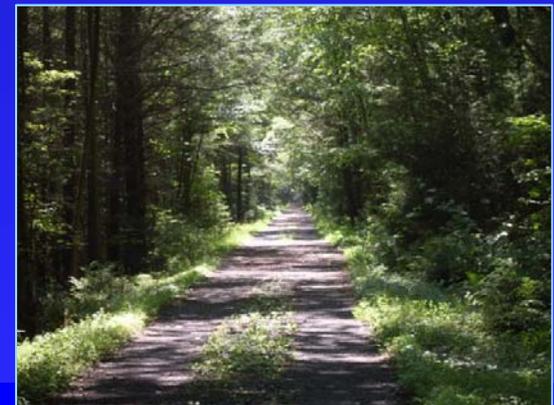


# Geophysical System Verification

- Approach used to monitor and verify analog and DGM equipment functionality
- Alternative to traditional Geophysical Prove-Out (GPO)
- Advantage is a simplified, more rigorous verification of equipment and reallocating resources usually devoted to GPO
- Instrument Verification Strip will be constructed and seeded with at least three surrogate Industry Standard Objects

# Visual Survey with Analog Instrumentation

- Linear transects over approximately 367 acres (~31 transects)
- Swath width of 10 ft (2 personnel @ 5 ft per instrument)
- Transects and features logged using GPS
- Anomalies will be intrusively investigated as team advances
- Streams and Rail Trail included



# Field Work Approach



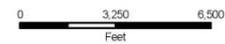
## Legend

- Installation Boundary
- Ricochet Area MRS Boundary
- Focus Areas
- Transect Spacing - 300 ft  
*Note: Transects will be adjusted to field conditions.*

## Estimated MEC Density

- High
- Moderate
- Low

Grid Distribution	MEC Density
10%	High
30%	Moderate
40%	Low



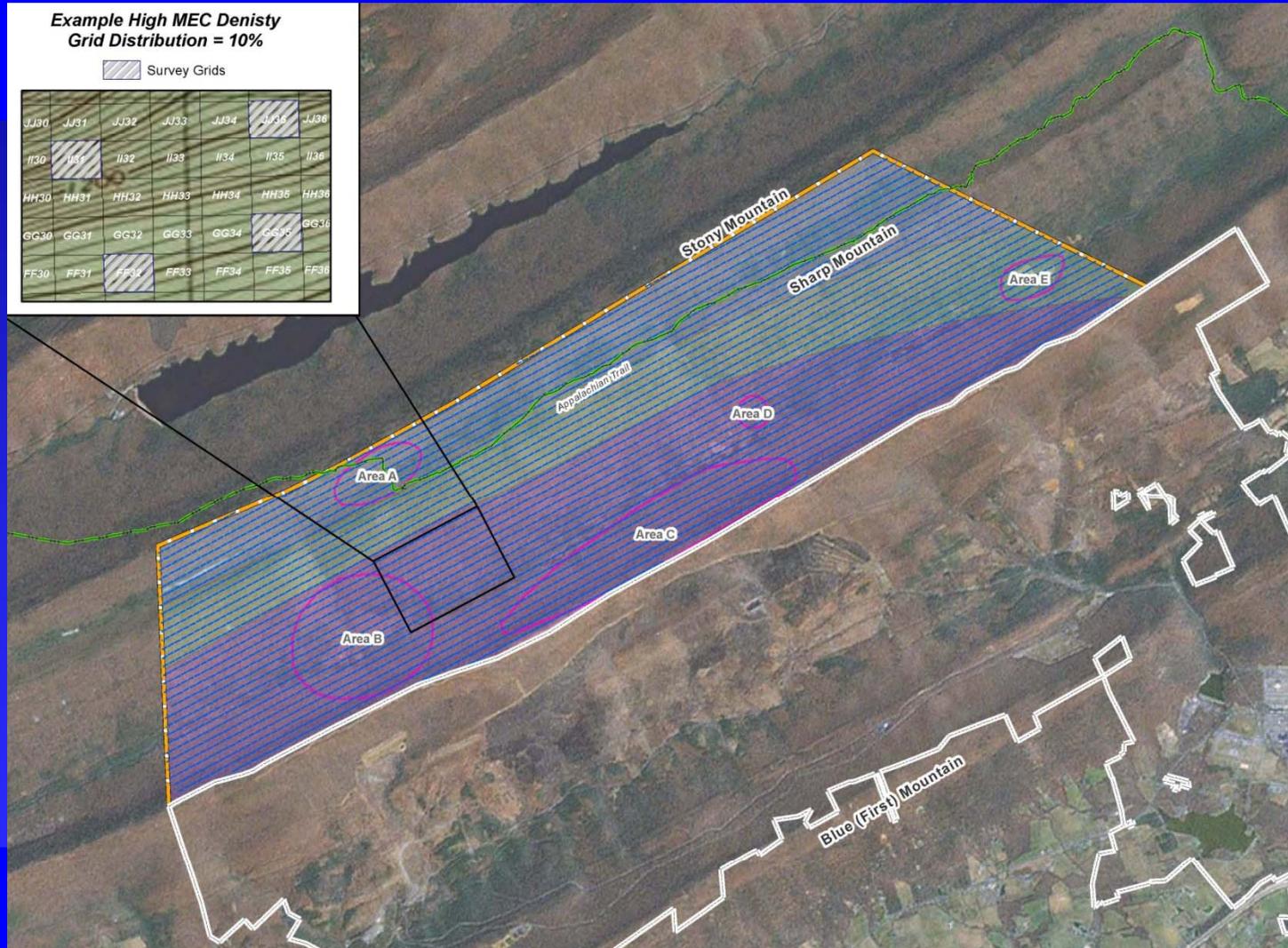
Imagery Source: National Agriculture Imagery Program (NAIP) Date 9/2/2004  
1 meter Color Infrared

Map 2-4  
Transect and Grid Layout  
Ricochet Area MRS  
State Game Lands 211, PA

### Example High MEC Density Grid Distribution = 10%

Survey Grids

JJ30	JJ31	JJ32	JJ33	JJ34	JJ35	JJ36
II30	II31	II32	II33	II34	II35	II36
HH30	HH31	HH32	HH33	HH34	HH35	HH36
GG30	GG31	GG32	GG33	GG34	GG35	GG36
FF30	FF31	FF32	FF33	FF34	FF35	FF36



# Digital Geophysical Mapping Transects

- Magnetometer G-858 (vertical gradient)
  - Areas A-E (14 transects ~ 88,775 ft)
  - Appalachian Trail (1 transect ~ 47,520 ft)
- Verify horizontal extent and determine density
- Navigation and positioning via Differential Global Positioning System (DGPS) or line and fiducial tracking
- Data evaluated against anomaly selection criteria to determine which anomalies likely represent MEC and will require further intrusive investigation
- Anomaly selection on Appalachian Trail will be conducted after all other site data has been analyzed
- Concurrence from Appalachian Trail Coalition prior to intrusive activities



# Digital Geophysical Mapping Grids

- Magnetometer G-858 (vertical gradient)
- Grid placement and frequency
  - Analyzing anomaly density from analog and digital data via Geographic Information System (GIS) spatial analysis
- Low, moderate, and high density areas determined on an ongoing basis
- Navigation via Line and Fiducial tracking

# Digital Geophysical Mapping Grids

## Grid Survey Characterization Criteria

Anticipated MEC Density	Grid Distribution	Grid Size	Quantity of Grids	Description
Low	40%	100 x 100 ft	10	Eastern side of MRS (Focus Area E).
Moderate	30%	50 x 50 ft	40	Northern and central portions of MRS. Cold Spring firing point.
High	10%	50 x 50 ft		Range fans, western and southern portions of MRS.
Step-out or Discretionary	20%	50 x 50 ft 100 x 100 ft		Based on ongoing data and findings, and as required to complete characterization.

# Intrusive Activities

- Excavations will be conducted with hand tools
- All items will be logged with WESTON's RespondFast<sup>SM</sup> – UXO Investigation tool
- Munition with Greatest Fragmentation Distance (MGFD)
  - 105mm HE M1
  - Maximum horizontal fragment distance of 1,939 ft
  - Hazard fragment distance of 341 ft



Log Dig Items	
ID	2
Item	UXO
Category	UXO
MEC	<input checked="" type="checkbox"/>
Item Count	1
Item Type	Projectile
MEC Desc	75mm
MEC Type	High Explosive
MEC Part	Projectile
MEC Condition	Live
Desc	Loc/Status
	Comments
File	Item

RespondFast<sup>SM</sup> – UXO Investigation.

# Explosive Operations

- Supervised by Weston Licensed Pennsylvania Blaster
- Demolition activities will be conducted on an as needed basis (e.g., local delivery of explosives) in accordance with DoD, ATF, federal, state and local regulations
- Disposal via blow-in-place (BIP) using engineering controls (e.g., sandbags) to mitigate fragmentation
- Safety zone established by UXO Technicians prior to detonation. Safety perimeter will be evacuated

# Explosive Operations *(Cont'd)*

- Disposal operations will be closely coordinated with FIG Range Control, NGB/ PAARNG, USACE and PGC



Electronic Remote Detonator



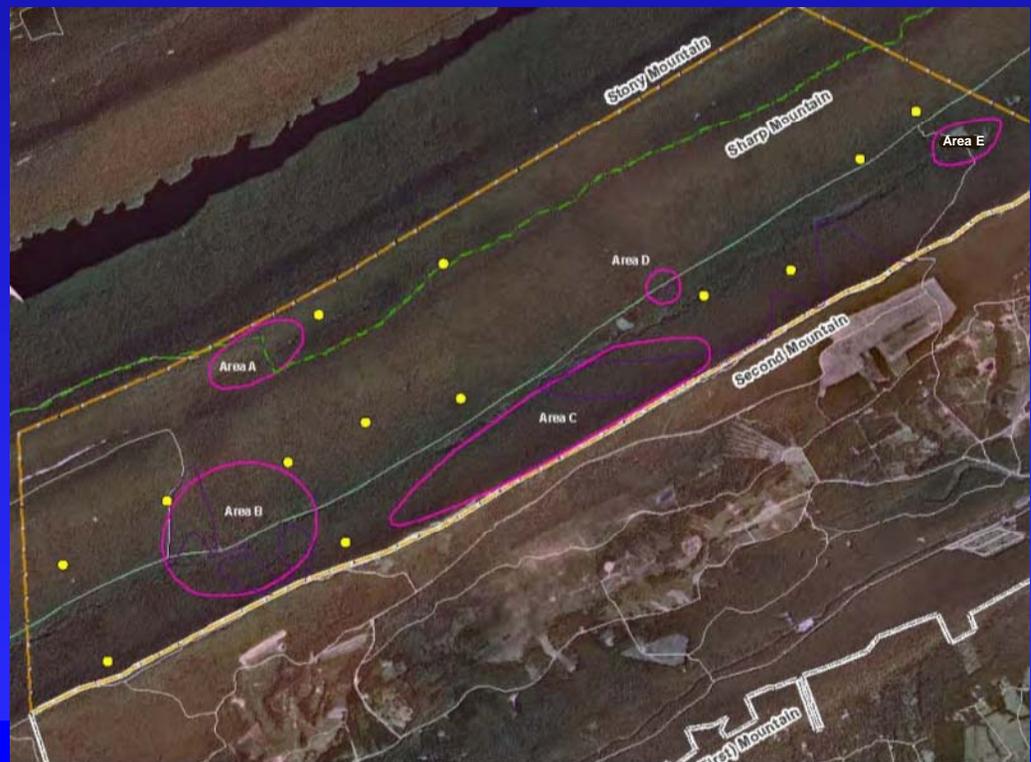
# Munitions Constituent Sampling

- Samples will be collected in locations biased by MEC discoveries during Visual Survey, DGM Transects and DGM Grids
- Discrete point source sampling
  - Analytics will include:
    - Explosives (EPA SW-846 Method 8330A)
    - Metals (EPA SW-846 Method 6010B)
    - Mercury (EPA SW-846 Method 7470A)

# Background Study for Metals

**Background Study for Metals will be conducted in areas within the MRS not impacted by MEC**

- Visual Sampling Plan (VSP) used to develop sample numbers for defensible data
- Parametric simple random sampling approach
- 13 background samples
- Adjusted in the field to avoid areas impacted by MEC/MC contamination



# Analytical Methods

Method	Analytes	Description
EPA SW-846 Method 8330B	1,3,5-Trinitrobenzene, 1,3-dinitrobenzene, 2,4,6-Trinitrotoluene, 2,4-Dinitrotoluene 2,6-Dinitrotoluene, 2-Amino-4,6-Dinitrotoluene 4-Amino-2,6-Dinitrotoluene, Cyclotetramethylene- tetranitramine (HMX), 3-Nitrotoluene, Nitrobenzene, 2-Nitrotoluene, 4-Nitrotoluene Cyclotrimethylenetrinitramine (RDX), Tetryl	Analytical method for explosives in soil/sediments
EPA SW-846 Method 6010B	Aluminum, Antimony, Arsenic, Barium, Beryllium Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc.	Analytical method for selected metals in soil/sediments
EPA SW-846 Methods 7470A/7471A	Mercury	Analytical method for mercury in soil/sediments

# Risk Assessments

- MEC Hazard Assessment (MEC HA)
- Human Health Risk Assessment (HHRA)
  - Risk Assessment Guidance for Superfund (RAGS)
- Screening-Level Ecological Risk Assessment (SLERA)
  - Ecological RAGS (ERAGS)
- Baseline Ecological Risk Assessment (BERA), if necessary
- Data will be screened against EPA Residential Regional Screening Levels (RSLs), Ecological Benchmarks and PADEP Act 2 Residential Values

# Community Relations

- Draft Final Community Relations Plan – **12/22/09**
- Community Interest Group Meeting – **12/08/09**
  - Following up with attendees on interest for additional involvement
- Public Meeting/Open House – **02/18/10**
  - News media and public invited
- Information Repository and Administrative Record will be established

# Schedule/Next Steps

- Comments due on Draft Final Work Plans – **02/01/10**
- Comments due on Draft Final Community Relations Plan – **02/08/10**
- Final Work Plans Available for Backcheck – **02/16/10**
- Public Outreach Meeting – **02/18/10**
- Field Work Start Late – **March 2010**
- Field Work Complete – **Late April/Early May 2010**
- Draft Final RI Report – **November 2010**

# Acronyms

- BERA Baseline Ecological Risk Assessment
- BIP Blow-in-Place
- CSM Conceptual Site Model
- DCNR Department of Conservation and Natural Resources
- DGM Digital Geophysical Mapping
- DGPS Differential Global Positioning System
- DMM Discarded Military Munitions
- DMVA Department of Military & Veterans Affairs
- ERAGS Ecological Risk Assessment Guidance for Superfund
- HE High Explosive
- HEAT High Explosive Anti-Tank

# Acronyms *(Cont'd)*

- HHRA Human Health Risk Assessment
- GIS Geographic Information System
- GPO Geophysical Prove-Out
- MC Munitions Constituents
- MEC Munitions and Explosives of Concern
- MEC HA MEC Hazard Assessment
- MGFD Munition with Greatest Fragmentation Distance
- MMRP Military Munitions Response Program
- MPPEH Material Potentially Presenting an Explosive Hazard
- MRS Munitions Response Site
- NGB National Guard Bureau

# Acronyms *(Cont'd)*

- PAARNG Pennsylvania Army National Guard Bureau
- PADEP Pennsylvania Department of Environmental Protection
- PAFBC Pennsylvania Fish and Boat Commission
- PGC Pennsylvania Game Commission
- PNDI Pennsylvania Natural Diversity Inventory
- PNHP Pennsylvania Natural Heritage Program
- RAGS Risk Assessment Guidance for Superfund
- RSLs Regional Screening Levels
- SHPO/THPO State Historic Preservation Officer/Tribal Historic Preservation Officer
- SLERA Screening-Level Ecological Risk Assessment
- USACE U.S. Army Corps of Engineers

# Acronyms *(Cont'd)*

- USAEC U.S. Army Environmental Command
- USFWS U.S. Fish and Wildlife Service
- UXO Unexploded Ordnance
- VSP Visual Sampling Plan
- WESTON Weston Solutions, Inc.



# Fort Indiantown Gap, Pennsylvania Military Munitions Response Program



Discussion and Questions?



*The Trusted Integrator for Sustainable Solutions*