Ravenna Army Ammunition Plant Restoration Advisory Board Meeting

Culvert and Bank Stabilization at Open Demolition Area 2







- Rocket Ridge Slope Stabilization
- Sand Creek Stabilization
- Sand Creek Culvert Replacement

#### Scott Nesbit, PE Project Manager, Tetra Tech

# **Project Objectives**



- Slope Stabilization at Rocket Ridge
- Removal and replacement of culvert where Sand Creek crosses ODA2 access road
  - Removal of potential munitions from the culvert area

## Slope Stabilization – Rocket Ridge



- Prior remedial actions within ODA2 involved removal of Munitions and Explosives of Concern (MEC).
- Subsequent flooding damaged base of reconstructed slope.
- Stream bank and original Sand Creek channel require stabilization.

#### **Stabilization Area**





### Slope Stabilization – Rocket Ridge

#### Reforestation

- Planting completed May 16 and 17, 2016
- Red Oak (Quercus rubra) and Red Maple (Acer rubrum)
  - Musser's Forests (Indiana, PA)
- 40 x 60-foot grid, 8 foot spacing
  - Rows alternated with oaks and maples
  - Fifty-three bare root trees
  - Bamboo stake and flagging placed next to each tree
- Trees watered at completion
  - Watered twice in June
  - Vegetation cleared around each tree









#### Sand Creek Stabilization

- 40 tons of rock to be placed in Sand Creek
  - Type A; 85% larger than 18-inch but less than 30-inch.





### Sand Creek Culvert Replacement

- ODA2 access road at Camp Ravenna
- Crosses Sand Creek
  - Two 48-inch diameter culverts
  - Insufficient capacity
    - Erosion and overtopping during recent storms
- MEC items have been observed within backfill
  - Material Presenting a Potential Explosive Hazard (MPPEH) may have been inadvertently placed in backfill over culvert during prior roadway repair.



# Culvert Replacement Work Area



November 16, 2016

# **Existing Conditions**

MONITORING MELL OF

DA2M8-107 N2 580478.241 E) 2354924.098





November 16, 2016



# **Culvert / Roadway Design**

- Pass 100-year storm
  - Drainage Area 3.69 square miles
  - Peak flow 695 cubic feet / second
- Concrete roadway (6 inches)
  - 14 feet travel way, 2 feet shoulders
  - HS20 vehicle loading





#### **Replacement Culvert**

- Three-sided arch culvert
  - Prefabricated concrete arch
    - 21 feet wide, 24 feet long, 7 feet tall
  - Prefabricated footings
  - 45 degree wing walls at entrance/exit
- Open channel, rock lined
  - Type D riprap (4-inch to 12-inch diameter)



### **Culvert Construction**

- Wetland avoidance
  - Will be marked prior to work
- Erosion controls to be installed prior to work
  - Silt fence, rock check dams
  - Bypass pumps used to maintain flow in Sand Creek
- Reuse of excavated soils (110 cubic yards)
  - If free of MPPEH and MEC
    - Low probability for containing MEC items
    - Visual inspection and magnetometer survey of excavated material
- Site restoration
  - Reseeded with Camp Ravenna approved seed mix







# Sand Creek Culvert Replacement Schedule

- Permitting:
  - Pre-construction notice for Nationwide Permit (NWP) #3
    - NWP issued August 12, 2016
- Planning:
  - Plans finalized September 2016
    - Incl. Site Safety and Health Plan
- Construction
  - Arch culvert fabrication November 2016
  - Installation December 2016



# Questions



