

FINAL

Slope Stabilization Plan For the  
Rocket Ridge Area in  
RVAAP-004-R-01 Open Demolition Area #2 MRS

Contract No: W912QR-12-D-004

April 7, 2016



**TETRA TECH**

Prepared by: Tetra Tech  
661 Andersen Drive  
Pittsburgh, PA 15220



Prepared for: U.S. Army Corps of Engineers  
Louisville District  
600 Martin Luther King, Jr. Place  
Louisville, KY 40202



**NATIONAL GUARD BUREAU**  
111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

June 8, 2016

Ohio Environmental Protection Agency (Ohio EPA)  
DERR-NEDO  
Attn: Mr. Nick Roope  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Slope Stabilization Plan at Open Demolition Area #2 (Rocket Ridge), Ohio EPA ID # 267-000859-089

Dear Mr. Roope:

This letter acknowledges that the Slope Stabilization Plan for Open Demolition Area #2 (Rocket Ridge) at the former RVAAP/Camp Ravenna submitted to Ohio EPA on April 7, 2016 was approved by the Ohio EPA via email on 4 May 2016. The Plan provided details for the tree planting at Rocket Ridge (which was conducted during the week of 16 May 2016) and stream bank stabilization activities along Sand Creek at Open Demolition Area #2 as requested by the Ohio EPA. The Plan was prepared by Tetra Tech for the Army in support of the RVAAP restoration program. The Draft Plan that was sent to and approved by the Ohio EPA can be considered the Final approved Plan for the administrative record as no comments were received.

Please contact the undersigned at (703) 607-7955 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Leeper", is positioned below the word "Sincerely,".

Mark Leeper PG., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, DERR-NEDO (letter only, via email)  
Rod Beals, Ohio EPA, DERR-NEDO (letter only, via email)  
Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Greg Moore, USACE Louisville (letter only, via email)  
Nathaniel Peters, II, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation  
Scott Nesbit, Tetra Tech



**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

April 7, 2016

Ohio Environmental Protection Agency (Ohio EPA)  
DERR-NEDO  
Attn: Mr. Drew Kocher, Site Coordinator  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull  
Counties, Draft Slope Stabilization Plan at Open Demolition Area #2 (Rocket Ridge),  
Ohio EPA ID # 267-000859-089

Dear Mr. Kocher:

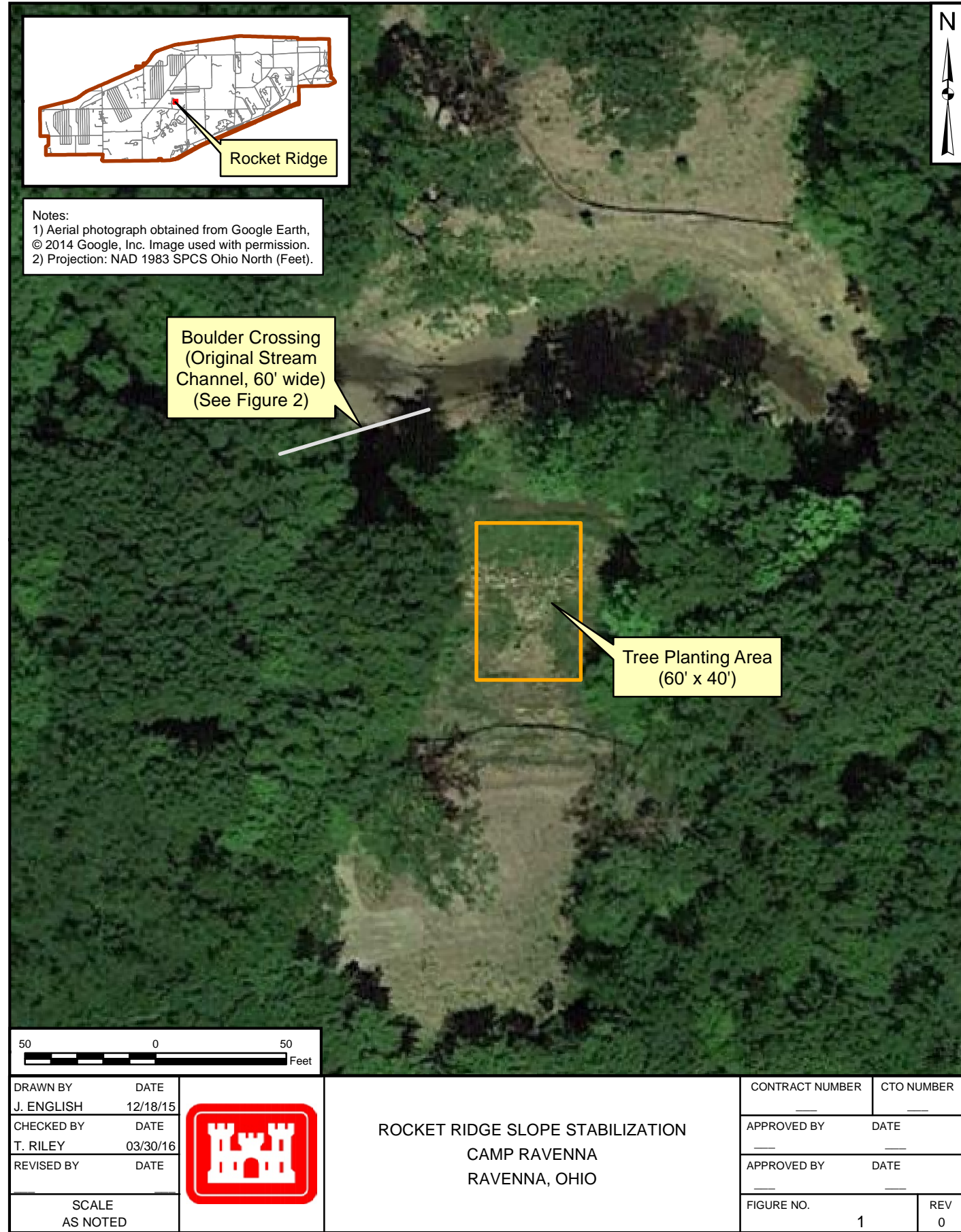
Enclosed for your review are one (1) hard copy and three (3) CDs of the Draft Slope Stabilization Plan for Open Demolition Area #2 (Rocket Ridge) at the former RVAAP/Camp Ravenna. The Plan provides details for the proposed tree planting at Rocket Ridge and stream bank stabilization activities along Sand Creek at Open Demolition Area #2 as requested by the Ohio EPA. This Plan was prepared by Tetra Tech for the Army in support of the RVAAP restoration program. Please note that the optimal time to plant bare-root seedlings as recommended by the OHARNG Natural Resources Manager is in April (prior to 1 May); therefore, Tetra Tech would like to mobilize to conduct their tree planting prior to 1 May.

Please contact the undersigned at (703) 607-7955 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, DERR-NEDO (letter only, via email)  
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Scott Nesbit, Tetra Tech



**BARE ROOT TREES TO BE PLANTED**

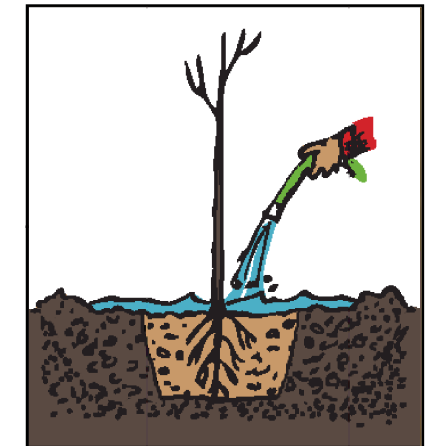
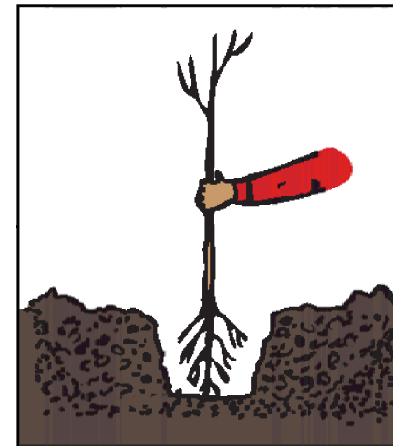
1. Mix of Northern Red Oak (*Quercus rubra*) and Red Maple (*Acer rubrum*).
2. Obtain trees from a nursery within 200 miles of Camp Ravenna. One possible source of trees is Musser Forests (Indiana, PA).

**HANDLING TREES UPON ARRIVAL**

1. Unpack trees as soon as they arrive.
2. Untie bundles and spread trees out.
3. Sprinkle tops and roots with water.
4. Cover roots with damp packing material and cover packing material with straw, white plastic or burlap to prevent drying.
5. Do not soak roots in water.
6. Keep roots moist and well covered until actual planting.
7. Plant within 2 days of arrival.

**PLANTING BARE ROOT TREES**

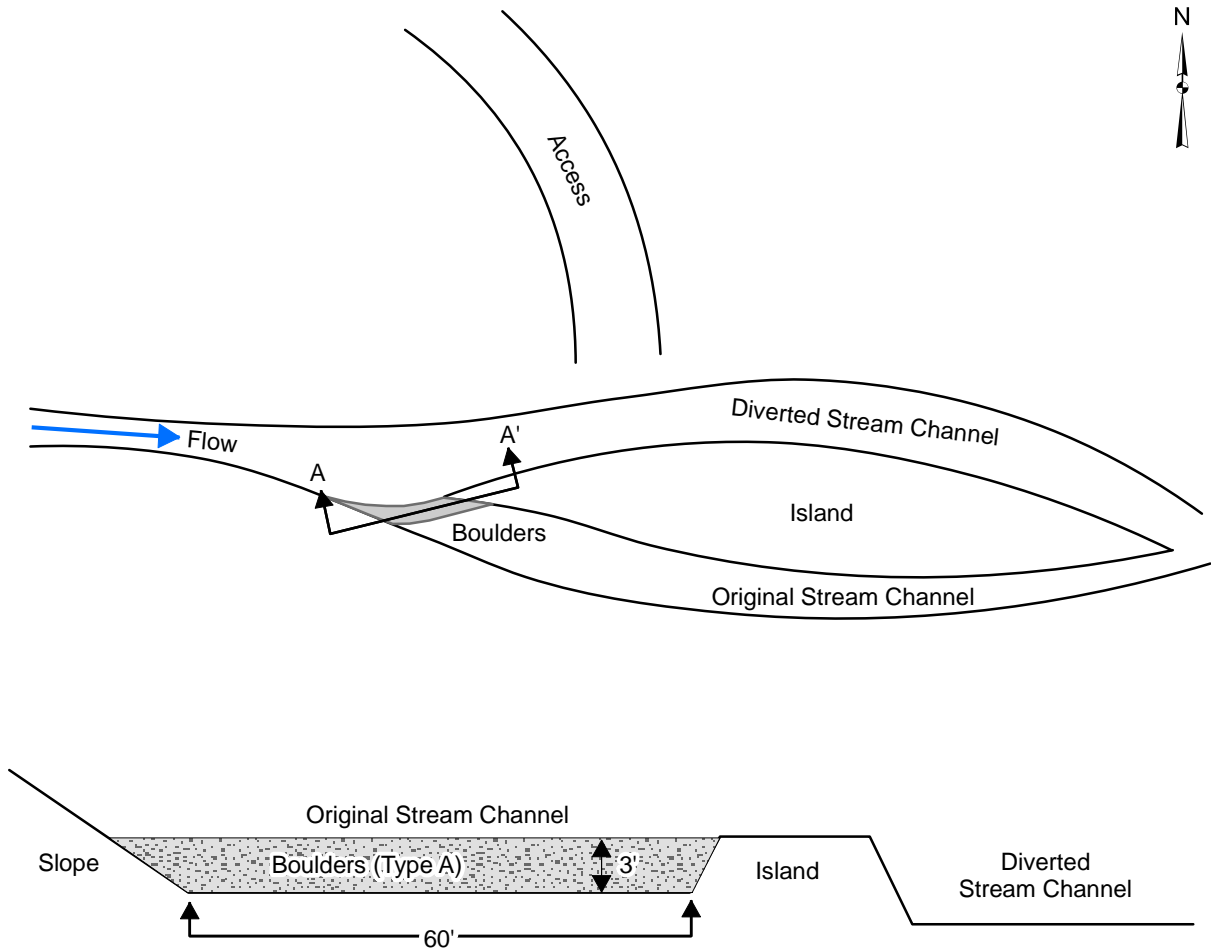
1. Trees will be carried to planting site in a planting bag or white plastic bag to keep them cool and moist. A piece of moist burlap can also be used to keep roots covered while planting.
2. Plant in 40 foot by 60 foot area on an 8-foot by 8-foot spacing.



3. Dig hole large enough so roots can spread in a natural position without curling. Any excessively long roots should be trimmed back. A slow-release fertilizer tablet may be placed in bottom of hole and allow some soil to fall over it before inserting roots. Roots should not touch fertilizer tablet.

4. Pack soil firmly around roots and add water. Use heel to firmly pack soil. Make sure to leave no air pockets that would allow roots to dry out. Leave slight depression to collect water or rainfall.


5. Do not incorporate or top dress with granular or liquid fertilizer when planting. However, slow release fertilizer tablets may be used at planting time provided there is an inch or so of soil between tablet and roots.
6. *Correct depth:* Soil line should be about one inch above top root. Roots are then spread out. Soil is tamped in a slight depression to catch rain water.  
*Wrong depth (tree is planted too deep):* Roots are twisted and curled.  
*Wrong depth (tree is planted too shallow):* Roots are exposed to air, which may kill the tree.
7. Water each tree immediately after planting and weekly for one month.
8. Once planted, insert a bamboo stake into the ground next to each tree and attach a bright color biodegradable flag to each stake.



**BOULDERS TO BE PLACED INTO SAND CREEK ORIGINAL STREAM CHANNEL**

1. Place approximately 40 tons of boulders as shown in Sand Creek original stream channel. Boulders will be a specified material from Ohio DOT, Construction and Materials Specifications, Section 703.19.B, Dump Rock Fill and Channel Protection, Type A with exception. Boulders shall not contain any recycled Portland cement concrete (RPCC). (a.) Type A material has at least 85 percent of the total material by weight larger than an 18-inch (0.5 m) but less than a 30-inch (0.8 m) square opening and at least 50 percent of the total material by weight larger than a 24-inch (0.6 m) square opening. Furnish material smaller than an 18-inch (0.5 m) square opening that consists predominantly of rock spalls and rock fines, and that is free of soil.
2. Use a clean and leak-free excavator within the stream bed of Sand Creek diverted stream channel.
3. Move loose materials from original stream channel bed prior to boulder placement. Place loose materials against the boulders when complete.
4. Deliver boulders from the north side of Sand Creek using the existing access.
5. Pick-up boulders from the north side of Sand Creek and place boulders to dimensions as shown. Do not place/fill above island height.

Plan view and cross-section are not shown to scale.

DRAWN BY J. ENGLISH	DATE 12/14/15		ROCKET RIDGE BOULDER PLACEMENT		CONTRACT NUMBER ___	CTO NUMBER ___
CHECKED BY T. RILEY	DATE 03/24/16		CAMP RAVENNA		APPROVED BY ___	DATE ___
REVISOR 	DATE 		RAVENNA, OHIO		APPROVED BY ___	DATE ___
SCALE AS NOTED					FIGURE NO. 2	REV 0