

Proposed Plan for Reservoir No. 2 Burning Ground Former Plum Brook Ordnance Works, Sandusky, OH Public Meeting

Tom Siard

Risk Assessor

Shaw Environmental, Inc., Knoxville, TN

14 August 2012



US Army Corps of Engineers
BUILDING STRONG®



Purpose of the Reservoir No. 2 Burning Ground (R2BG) Proposed Plan

- Present the Preferred Alternative proposed for cleanup of contaminated soils
 - ▶ Based on results of remedial investigation/feasibility study (RI/FS) completed for R2BG
 - ▶ Prevents human exposure to soil containing constituents of concern (COCs) at levels above remediation goals (RGs; Table 3 of Proposed Plan)
 - ▶ Reduces potential ecological hazards
- Provide for public comment

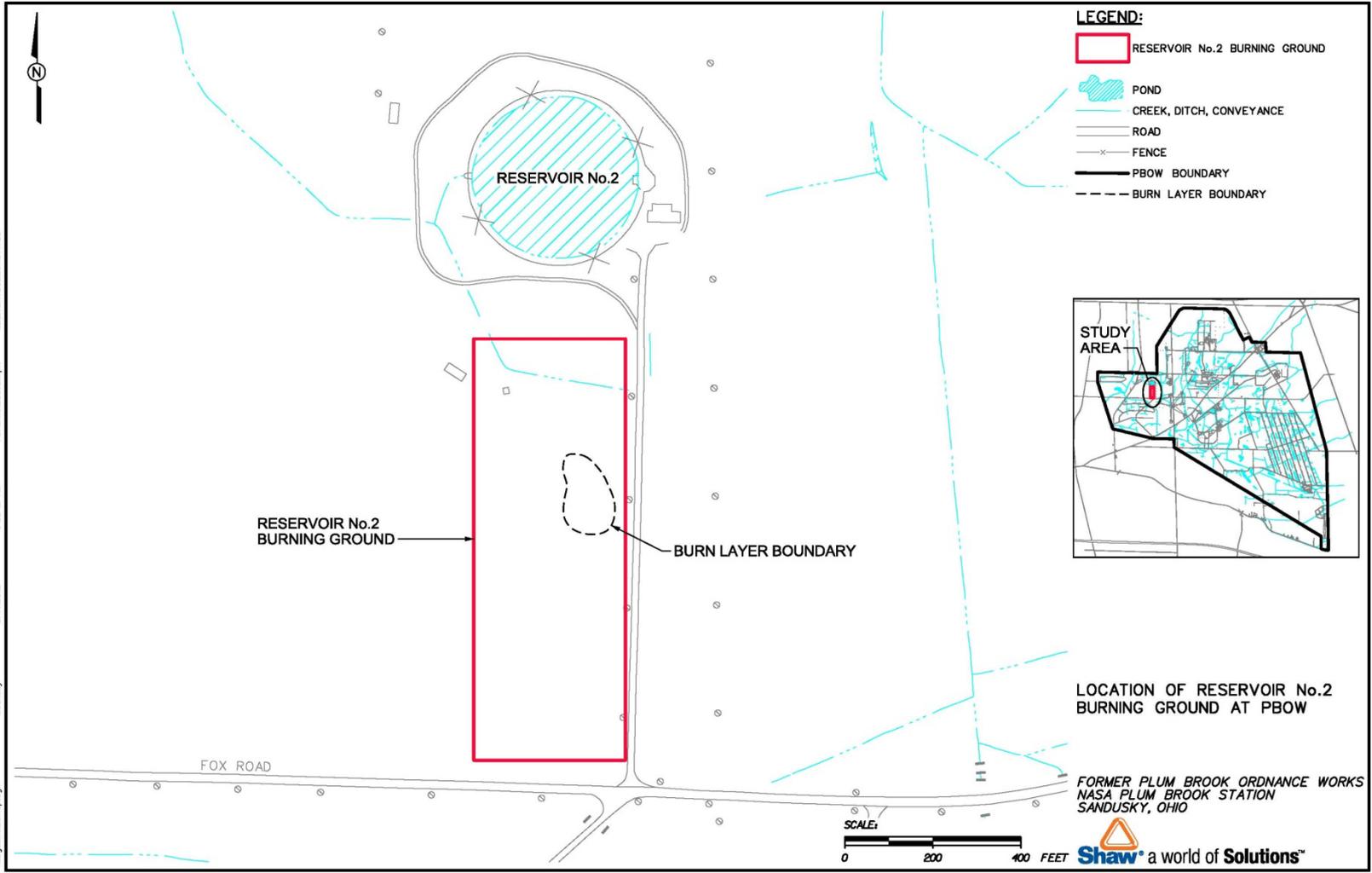


Community Involvement

- The Proposed Plan is made available to the public for a review and comment period
- At the end of the review and comment period (18 September 2012), all comments will be:
 - ▶ included in the Responsiveness Summary of the R2BG Decision Document,
 - ▶ documented in the administrative record (AR),
 - ▶ evaluated for consideration in final selection of remedial alternative
- Selected response action will be documented in the R2BG Decision Document



r2ba_silectmap.dgn
cbantlay
6/7/2012
9:39:18 AM
PDF_alth_Level1.plt
SELTEXTSUB_ONLY.TBL

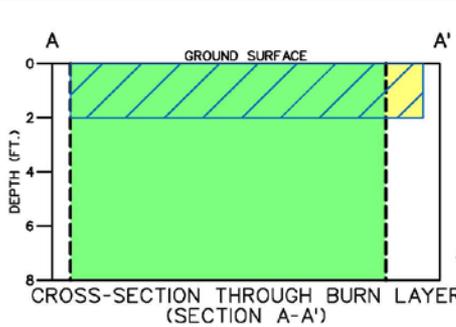


Summary of Preferred Remedial Alternative

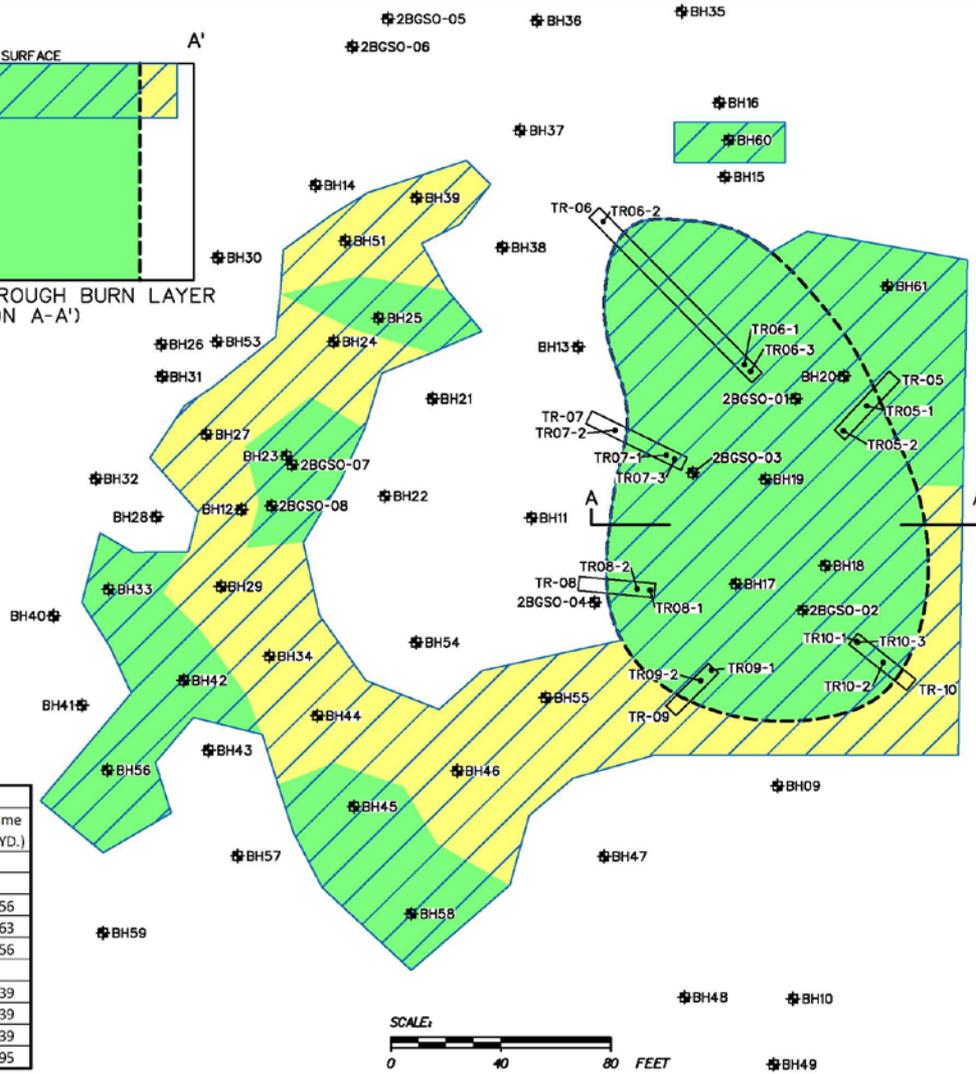
- USACE proposes to complete remedial action at R2BG consisting of:
 - ▶ Excavation of approx. 7,395 CY of contaminated site soil
 - ▶ Alkaline hydrolysis treatment of soil classified as hazardous due to 2,4-DNT
 - ▶ Chemical stabilization of soil classified as hazardous due to lead
 - ▶ Backfill with alkaline-treated soil that meets RGs for all COCs
 - ▶ Off-site disposal of stabilized and/or alkaline-treated soil with COC concentrations that exceed RGs



2/20/2012
 B 14:23 AM
 pdf_to_rvtb_leaves.rvt
 SELTEXTSUB_ONLY.TBL
 c:\shenry
 r20g-pp_005.dgn



Remedial Areas and Volumes			
	Area (SQ. FT.)	Depth (FT.)	Volume (CU. YD.)
Hazardous Soil			
Inside Burn Area			
2,4-DNT	17,064	8	5,056
Lead	17,046	2	1,263
Subtotal	17,046		5,056
Outside Burn Area			
2,4-DNT	14,025	2	1,039
Lead	31,566	2	2,339
Subtotal	31,566		2,339
Total	48,612		7,395



LEGEND:

- BURN LAYER BOUNDARY (BASED ON JACOBS 2004 TRENCHING)
- REMEDIAL AREA - NONHAZARDOUS FOR 2,4-DNT (≤ 2.6 mg/kg)
- REMEDIAL AREA - HAZARDOUS FOR 2,4-DNT (> 2.6 mg/kg)
- REMEDIAL AREA - HAZARDOUS FOR LEAD (> 100 mg/kg) (SEE NOTES 1 AND 2)
- SURFACE SOIL SAMPLE LOCATION
- TRENCH SAMPLE LOCATION (SUBSURFACE)

- NOTES:**
- ALL SOIL FROM 0 TO 2 FEET IS ASSUMED HAZARDOUS WITH RESPECT TO LEAD.
 - ALL BURN AREA SOIL AT DEPTHS OF 2 TO 8 FEET IS ASSUMED HAZARDOUS DUE TO 2,4-DNT ONLY.
 - REMEDIAL AREAS CIRCUMSCRIBE SAMPLE LOCATIONS WITH A TOTAL CANCER RISK $> E-05$.
 - DEPTH OF REMEDIAL VOLUME INSIDE LIMITS OF BURN AREA = 8 FEET.
 - DEPTH OF REMEDIAL VOLUME OUTSIDE LIMITS OF BURN AREA = 2 FEET.

FIGURE 7
 PROPOSED REMEDIAL AREAS AND VOLUMES OF SOIL

RESERVOIR NO. 2 BURNING GROUND
 PROPOSED PLAN
 FORMER PLUM BROOK ORDNANCE WORKS
 NASA PLUM BROOK STATION
 SANDUSKY, OHIO



Summary of R2BG Investigations

- Site Investigation (SI) conducted in 1996
 - ▶ 8 surface soil and 16 subsurface soil samples collected
 - ▶ Screening criteria exceeded for nitroaromatics, PAHs and PCBs
- Remedial Investigation (RI) field activities were conducted in 2004 and 2005
 - ▶ Inside Burn Area:
 - 6 trenches were dug to delineate burn layer
 - 7 surface soil samples (0 to 1-foot depth)
 - 10 burn layer samples
 - 11 subsurface soil samples (depth ranging to 10 feet) collected below burn layer



Summary of R2BG Investigations (cont'd)

- 2004/2005 RI field activities (cont'd)
 - ▶ Outside Burn Area:
 - 37 surface soil samples
 - 16 subsurface soil samples
 - 3 bedrock monitoring installed and sampled
 - ▷ Slow recharge; could not be developed or purged
 - ▷ Had to be sampled by bailer
 - ▷ Highly turbid (101 to 1,910 NTUs)
 - 3 sediment samples were collected from adjacent drainage ditch
 - No surface water was present
- Delineation samples were collected in 2010 outside of Burn Area
 - 34 additional surface soil samples to support the feasibility study (collected after risk assessments were completed)



Summary of Baseline Human Health Risk Assessment Results

- NCP Acceptable Cancer Risk Range is $1E-6$ to $1E-4$
- Cancer risk goal of $1E-5$ was selected by PBOW PDT
- Inside Burn Area - Surface Soil
 - ▶ PBOW ILCR (cancer risk) goal ($1E-5$) was exceeded for on-site resident ($3E-4$), groundskeeper ($8E-5$), and indoor worker ($4E-5$)
 - ▶ PBOW hazard index criterion (1) was exceeded for on-site resident (140), groundskeeper (12), indoor worker (6), and construction worker (33)
- Inside Burn Area – Subsurface Soil
 - ▶ PBOW ILCR (cancer risk) criterion ($1E-5$) was exceeded for on-site resident ($4E-3$) and construction worker ($5E-5$)
 - ▶ PBOW hazard index criterion (1) was exceeded for on-site resident (651) and construction worker (154)



Summary of Baseline Human Health Risk Assessment Results (cont'd)

- **Outside Burn Area - Surface Soil**
 - ▶ PBOW ILCR (cancer risk) criterion ($1E-5$) was exceeded for on-site resident ($3E-4$), groundskeeper ($8E-5$), and indoor worker ($4E-5$)
 - ▶ PBOW hazard index criterion (1) was exceeded for on-site resident (15) and construction worker (3)
- **Outside Burn Area – Subsurface Soil**
 - ▶ PBOW ILCR (cancer risk) criterion ($1E-5$) was exceeded for on-site resident ($8E-5$) only, but results from naturally occurring metals
 - ▶ PBOW hazard index criterion (1) was exceeded for on-site resident (5) only, but results from naturally occurring metals
- **Sediment risks/hazards sediment were minor/negligible**
- **Groundwater risks/hazards were associated with naturally occurring chemicals (arsenic in suspended sediment and benzene).**



Summary of Screening Level Ecological Risk Assessment Results

- Inside the Burn Area
 - Several ecological hazard quotient (EHQ) were elevated
 - 2,4-DNT (EHQ=19,000 in mouse), TNT (EHQ=4,200 in mouse), and 2,6-DNT (EHQ=660 in mouse) were main “risk drivers”
- Outside the Burn Area
 - Several EHQ were elevated
 - 2,4-DNT (EHQ=420 in wren), TNT (EHQ=59 in mouse), and 2,6-DNT (EHQ=23 in mouse)
- No threatened or endangered species are present
- Ecological risk drivers are also identified as COCs based on human health risks
 - ▶ Remediation to meet human health-based RGs will also address potential ecological concerns.



Chemicals of Concern for R2BG Soil

- Based on the risk assessment results, the following are identified as COCs in soil:
 - ▶ Polychlorinated dibenzodioxins/furans (as TCDD TEQ)
 - ▶ TNT
 - ▶ 2,4-DNT
 - ▶ 2,6-DNT
 - ▶ PCBs (Aroclor 1254 and Aroclor 1260)
 - ▶ Lead



Remedial Goals for R2BG Soil

COC	RG (mg/kg)
TCDD TEQ (ng/kg)	18
TNT	38
2,4-DNT	1.4
2,6-DNT	1.4
Aroclors 1254/1260	1.0
Lead	400



Summary of Evaluated Alternatives

- Alternative 1 – No Action
- Alternative 2 – Excavation and Off-Site Treatment/Disposal
- Alternative 3 – Excavation, Windrow Composting, Chemical Stabilization, and On-Site and Off-Site Disposal
- Alternative 4 – Excavation, Alkaline Hydrolysis, Chemical Stabilization, and On-Site and Off-Site Disposal



Alternative 1 Details

- No Action
 - ▶ Required by NCP as baseline for comparing other alternatives
 - ▶ Does not reduce human health risks to levels considered acceptable by US EPA (threshold criterion)
 - ▶ Does not employ removal, containment, or treatment actions that mitigate impact of source areas on receptors or other media
 - ▶ Thus, No Action was not recommended



Alternative 2 Details

- Excavation and Off-Site Treatment/Disposal
 - ▶ Excavate approximately 7,395 CY of contaminated soil
 - ▶ Backfill excavation with clean material
 - ▶ Off-site treatment and disposal of excavated soil in a hazardous waste treatment, storage, and disposal facility (TSDF)



Alternative 3 Details

- Excavation, Windrow Composting, Chemical Stabilization, and On-Site and Off-Site Disposal
- Excavate approximately 7,395 CY of contaminated soil
 - ▶ Windrow composting of 6,095 CY of excavated soil classified as hazardous due to 2,4-DNT
 - ▶ Chemical stabilization of 3,602 CY of excavated soil classified as hazardous due to lead
 - ▶ On-site disposal of composted soil with concentrations of all COCs < RGs
 - ▶ Off-site disposal of treated soil with COCs > RGs at a non-hazardous landfill
 - ▶ Backfill excavation with clean material



Proposed Action Description – Alternative 4

- Excavate areas where RG concentrations are exceeded (approx. 7,395 CY, consolidated)
- Segregate lead-contaminated soil (estimated 3,602 CY) for chemical stabilization
 - ▶ Off-site disposal of 5,546 tons of stabilized soil and chemical amendments used in stabilization and, if applicable, alkaline hydrolysis
- Segregate soil contaminated with 2,4-DNT for alkaline hydrolysis treatment (estimated 6,095 CY)
 - ▶ Alkaline chemical mixture (e.g., caustic soda and ferric chloride) blended into soil using a windrow turner or other machinery
 - ▶ If any RGs are exceeded after treatment, dispose of at nonhazardous landfill
 - ▶ If no RGs are exceeded after treatment, place on site



Proposed Action Description – Alternative 4 (cont'd)

- Treated soil that exceeds RGs is suitable for off-site disposal in non-hazardous landfill
 - ▶ Soil hazardous for 2,4-DNT will be treated to non-hazardous concentrations
 - ▶ Soil hazardous for lead will be stabilized so that leachable lead is non-hazardous
 - ▶ PCB concentrations in soil are < 50 ppm and acceptable for disposal in non-hazardous landfill
 - ▶ Dioxin and furan concentrations in soil are acceptable for disposal in non-hazardous landfill
- Backfill excavation
 - ▶ Use alkaline hydrolysis-treated soil that does not exceed RGs
 - ▶ Supplement with clean, imported soil
 - ▶ Use only the non-treated, imported soil from ground surface to a depth of 2 feet
 - Neutralized soil may adversely affect plant growth if too near the surface



Remedial Performance of Proposed Action

- Alternative 4 is protective of human health and the environment
- Complies with Applicable or Relevant and Appropriate Requirements (ARARs)
 - ▶ i.e., complies with all environmental and hazardous waste regulations
- Permanently removes COCs from R2BG soil at concentrations above RGs
- Permanently reduces toxicity and mobility of contaminants
- Will be designed to protect the community and environment during implementation
- Is technically & administratively implementable
 - ▶ No engineering or regulatory restrictions prevent implementation
 - ▶ Amendments and equipment required are readily available



Proposed Action Schedule

- Alternative 4 can be implemented in approximately 34 months
 - ▶ Work plan development
 - ▶ Mobilization and excavation of 7,395 CY of contaminated soil
 - ▶ Pre-compliance testing
 - ▶ Alkaline Hydrolysis treatment of excavated soil
 - ▶ Neutralization as required
 - ▶ Confirmatory sampling
 - ▶ Disposal of treated and untreated nonhazardous soil that fails RGs
 - ▶ Backfill with clean soil (treated and imported)
 - ▶ Demobilization



Proposed Action Costs

- The total projected construction cost for the entire scope of the R2BG remedial action, as identified in the FS, is \$2.8 million.
- A detailed cost estimate is presented in Table 4-3 of the FS.
- A general summary of the cost estimate is as follows:

1. Treatability Study, Work Plans, Reports and Procurement	\$115,000
2. Mobilization/Demobilization of Equipment and Personnel	\$6,000
3. Site Preparation	\$0
4. Excavation of Contaminated Soil (7,395 CY)	\$296,489
5. Alkaline Hydrolysis and Neutralization (6,095 CY)	\$1,163,386
6. Chemical Stabilization of Lead-Contaminated Soil (3,602 CY)	\$116,197
7. On-Site Disposal of Treated Soil < Remedial Goals (3,793 CY)	\$25,043
8. Off-Site Disposal of Non-Haz Soil > Remedial Goals (3,602 CY)	\$183,662
9. Site Restoration	\$250,739
Subtotal	\$2,156,516
Contingency (25%)	\$539,129
Contractor Oversight (5%)	\$107,826
Total	\$2,803,471

Note: All volumes expressed as bank cubic yards (in place)



Questions/Comments????

- Questions on Presentation
- Written Public Comments
 - ▶ All written public comments and responses will be included in the Responsiveness Summary
 - ▶ Comment Period tonight through 18 September 2012
- Mail written comments to:
 - ▶ U.S. Army Corps of Engineers, Huntington District
Attn: CELRH-PM-PP-P (Mr. Rick Meadows)
502 8th Street
Huntington, WV 25701
- Email written comments to:
 - ▶ Richard.L.Meadows@usace.army.mil
- We want to know your concerns

