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# FORMER PLUM BROOK ORDNANCE WORKS

## Sandusky, Ohio (Currently NASA Plum Brook Station)

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Monthly Fact Sheet

August 2013

**SITE DESCRIPTION** - PBOW is located approximately 4 miles south of Sandusky, Ohio, and 59 miles west of Cleveland. Although located primarily in Perkins and Oxford Townships, the eastern edge of the site extends into Huron and Milan Townships. PBOW is in general bounded on the north by Bogart Road, on the south by Mason Road, on the west by Patten Tract Road, and on the east by U.S. Highway 250. The area surrounding PBOW is mostly agricultural and residential.

**SITE HISTORY** - The 9,009-acre PBOW facility was built in early 1941 as a manufacturing plant for 2,4,6-trinitrotoluene, 2,4-dinitrotoluene (DNT), and pentolite. Production of explosives at PBOW began in December 1941 and continued until 1945. It is estimated that more than 1 billion pounds of nitroaromatic explosives were manufactured during the 4-year operating period. The three explosive manufacturing areas were designated TNT Area A (TNTA), TNT Area B (TNTB), and TNTC. Twelve process lines were used in the manufacture of TNT, four lines at TNTA, three lines at TNTB, and five lines at TNTC.

The manufacturing sites consisted of widely scattered buildings of wood frame construction with asbestos and sheet metal coverings. They also included a series of buried and/or overhead flumes and pipes used to transport various liquids associated with the manufacturing process.

In 1946, 3,230 acres of the property were initially transferred to the Ordnance Department, then to the War Assets. This transfer did not include the Plum Brook Depot area, which consists of 2,800 acres. The Department of the Army reacquired the 3,230 acres in 1954 and performed cleanup efforts from the mid-1950s until 1963. In 1955, the Army specifically completed further decontamination of the manufacturing sites. This effort included removal of contaminated surface and subsurface soil around the buildings and wooden and ceramic waste disposal lines containing TNT. Thousands of pounds of TNT were discovered in catch basins; this TNT was removed and burned at the burning grounds.

Two property use agreements were entered into by the National Advisory Committee of Aeronautics, the predecessor of the National Aeronautics and Space Administration (NASA), and the Army in 1956 and 1958, respectively. On March 15, 1963, accountability and custody of the entire PBOW property (6,030 acres) were transferred to NASA. NASA performed further decontamination efforts in the TNT Areas during 1964. The NASA decontamination process included removing contaminated surface soil above the drain tiles, flumes, etc.; destruction of all buildings by fire; then removal of all soil, debris,

sumps, and above-grade portions of concrete foundations. Portions of the concrete foundations located below grade were left buried, and some that had been previously slightly above grade were likewise buried. All materials, including the soil in those areas, were lashed; the area was then rough-graded. The decontamination process was also to have included the burning of nitroaromatic-filled flumes that were excavated.

NASA has operated and maintained PBOW since 1963, and the facility is currently the NASA Glenn Research Center, Plum Brook Station. NASA operates the former PBOW property as a space research facility in support of their John Glenn Research Center at Lewis Field, Cleveland, Ohio. Most of the aerospace testing facilities built in the 1960s at the site are presently on standby or inactive status. On April 18, 1978, NASA declared approximately 2,152 acres of PBOW as excess. The Perkins Township Board of Education acquired 46 acres of the excess acreage and uses this area as a bus transportation area. The General Services Administration retains ownership of the remaining excess acreage and currently has a use agreement with the Ohio National Guard for 604 acres of this land. NASA presently controls approximately 6,400 acres.

Nitroaromatic compounds (i.e., explosives) are the major soil contaminants at the site. The presence of nitroaromatic contamination is likely due to spills on the surface and leaks from holding areas, flumes, and pipelines associated with former manufacturing operations.

## **PROJECT ACTIVITIES**

### **Project 1803 – RI/FS Low Scope**

#### *Phase Completion*

- Remedial Investigation/Feasibility Study (RI/FS) – Completed 30 September 1998
- Project Closeout (PCO) – Completed 30 September 2004

### **Project 1806 – ASR Complete NOFA OEW MMRP**

#### *Phase Completion*

- PCO – Completed 26 October 2009

### **Project 1809 – Site Management**

#### *Phase Completion*

- Site Investigation (SI) – Completed 30 September 2009
- PCO – Completed 30 September 2009

### **Project 1810 – Community Relations and Restoration Advisory Board**

#### *Phase Completion*

- No phase associated – On-going

#### *Monthly Update*

- Quarterly Restoration Advisory Board (RAB) meetings
- Most recent RAB Meeting was held Wednesday 28 August 2013 and consisted of a site visit to see the TNT A RA-C Phase 2 remediation efforts..
- Next scheduled meeting is Thursday, 12 December 2013 and be an update of projects.

### **Project 1811 – Additional BGs**

#### *Phase Completion*

- PCO – Completed 19 September 2009

### **Project 1812 - Reservoir No. 2 Burning Ground**

#### *Phase Completion*

- RI/FS – On-going
- Engineering Evaluation/Cost Analysis (EE/CA) – Left report in the draft-final stage (March 2007) per HQ determination of no immediate risk issue. Picked back up in the RI/FS process to complete remediation under RD and RA-C phases.
- Removal Design (RmD) – Completed 11 May 2007

#### *Monthly Update*

- Draft Remedial Investigation Report was submitted for USACE review 5 October 2012 and the final report was issued 8 January 2013.
- The draft Proposed Plan was submitted for full-team review on 19 April 2012, with Public Meeting Presentation held on 14 August 2012 (30-day review period was 14 Aug – 18 Sept 2012).
- Draft Decision Document was submitted for USACE review 11 January 2013, for CX review 27 March 2013 and OEPA and public review on 17 July 2013. OEPA replied 27 September 2013 with no comments.
- INPR Revision- LRL has revised INPR and is sending to LRD for official approval by end of September 2013.

### **Project 1813 - TNT Area A (Soils)**

#### *Phase Completion*

- RI/FS – Completed 29 June 2011
- RD – On-going (Kept open to allow for Phase 1 (exc only) and Phase 2 (exc and remediation) efforts)
- RA-C – Phase I completed 31 March 2013. Phase 2 on-going.

#### *Monthly Update*

- Phase 2 RA-C efforts are underway. Non-haz stockpiled soil is awaiting transport to landfill. Alkaline hydrolysis process has begun on all windrows, with chemical application as needed based on process monitoring data. Effort is on schedule.

### **Project 1814 - TNT Area B (Soils)**

#### *Phase Completion*

- RI/FS – Completed 23 September 2009
- RmD – Completed 16 June 2006
- Removal Action-Construction (RmA-C) – Completed 5 June 2007
- PCO – Completed 31 March 2010

### **Project 1815 - TNT Area C (Soils)**

#### *Phase Completion*

- RI/FS – Completed 15 January 2010

- RD – Completed 22 January 2010
- RA-C – Completed 31 March 2013
- PCO – on-going

*Monthly Update*

- Submitted PCO report to Ohio EPA for their concurrence. Once obtained, then packet will be sent to LRL for their approval.

**Project 1816 – TNT Loading Area**

*Phase Completion*

- LSI – Completed 31 July 2000
- PCO – Completed 30 September 2002

**Project 1817 - Waste Water Treatment Plants 1 and 3 with Wooden Sewer Lines**

*Phase Completion*

- LSI – Completed 30 September 2000
- RI/FS – On-going – WWTPs 1 and 3 as well as the sewer lines A and B from WWTP 1 have been broken out for scheduling purposes. A contract was awarded in June 2008 to conduct an RI to delineate the traces of these sewer lines and to investigate potential nitroaromatic contamination which may have affected soil and groundwater along these traces. A contract was awarded in December 2011 to complete RI through DD for the WWTP#1 to TNT A sewer line and to the TNT B sewer line

*Monthly Update – WWTP #1*

- Final SCR submitted in 6 June 2011
- Final SLERA / BHHRA for WWTP#1 submitted 7 December 2011
- Final Remedial Investigation Report for WWTP #1 & #3 was issued 9 May 2013

*Monthly Update – WWTP #3*

- Final SCR for WWTP#3 submitted 16 August 2011
- Final SLERA / BHHRA for WWTP#3 submitted 10 April 2013

*Monthly Update – WWTP #1 to TNT A Sewer Line*

- Internal CX draft FS submitted for review 10 June 2013, CX provided comments, responses were provided, and the CX concurred with responses 23 September 2013.
- Final SCR from WWTP#1 to TNT A Sewer Line submitted 6 January 2012
- Draft SLERA/BHHRA from WWTP#1 to TNT A Sewer Line submitted 16 February 2012, with final submitted 19 July 2012

*Monthly Update – WWTP #1 to TNT B Sewer Line*

- Final SCR from WWTP#1 to TNT B Sewer Line submitted 30 November 2011
- Final SLERA/BHHRA from WWTP#1 to TNT B Sewer Line submitted 16 December 2011

**Project 1818 - Waste Water Treatment Plant #2 with Sewer Lines**

*Phase Completion*

- RI/FS – On-going

#### *Monthly Update*

- Final BHHRA/SLERA Work Plan submitted 25 June 2013.
- A contract was awarded in September 2010 for the RI/FS to include the sewer line from TNT C to WWTP #2
- A contract was awarded in December 2011 to complete the remedial investigation through decision document for the steel sewer line between WWTP 1, 2, 3
- Work Plans for the site characterization were finalized 5 May 2011 w/ sampling completed 12 April 2012
- Draft Remedial Investigation Report (including draft SCR, BHHRA, and SLERA for WWTP #2, TNT C to WWTP #2 sewer lines, and steel sewer lines) submitted 24 July 2013; awaiting OC comments.

#### **Project 1819 – Pentolite Waste Area Lagoons (PAWL)**

##### *Phase Completion*

- LSI – Completed 30 September 2000
- PCO – Completed 30 September 2002

#### **Project 1820 - Red Water Ponds Area (Soils for PRRWP only)**

##### *Phase Completion*

- RI/FS – On-going
- RmD – Completed 5 June 2007
- RmA-C – Completed 30 March 2009, however, residual risk issues remain and further remediation will be conducted under the RA-C phase.

#### *Monthly Update*

- Internal Draft Proposed Plan was submitted on 26 June 2013 for LRN and LRH review, with review comments requested by 29 July 2013; LRL-OC comments received 23 August 2013.
- Final Feasibility Study Addendum submitted 14 May 2013.
- Site Delineation Report detailing residual risk issues remaining at PRRWP was finalized 15 September 2011.
- Value Engineering Study was completed for the Internal Draft Focused Feasibility Study Addendum, which included findings from the Site Delineation Report, (11-15 June 2012). The document was then resubmitted to CX for their review; CX comments have been incorporated and the Final FS Addendum was issued 14 May 2013.

#### **Project 1821 - Ash Pits 1 and 3**

##### *Phase Completion*

- LSI – Completed 30 September 2000
- RI/FS – On-going (Ash Pits 1 & 3 have separate schedules/reports for site characterization and risk assessment efforts, however, findings from each area will be addressed / evaluated under one Feasibility Study)

#### *Monthly Update – Ash Pit 1 Coal Yard (RI Portion)*

- Shaw completed the Draft Site Characterization Addendum report 11 June 2012. After full team review, final addendum report was issued 18 October 2012
- Shaw issued Draft BHHRA and SLERA for Ash Pit 1 Coal Yard on 7 May 2013 for full team review; comments requested by 8 July 2013; received AIPH comments 11 September 2013 and provided responses to comments 30 September 2013.

*Monthly Update – Ash Pit 3 (RI Portion)*

- Shaw conducted the spring groundwater sampling for inclusion into the Site Characterization (May 2012)
- Shaw completed the Draft Site Characterization Addendum report 31 October 2012. After full team review, final addendum report was issued 20 February 2013
- Shaw submitted the Draft BHHRA and SLERA Addenda including Coal Yard 3 and Ash Pit 3 groundwater sampling on 12 June 2013; comments requested by 12 August 2013; received AIPH comments 17 September 2013 and provided responses to comments 30 September 2013.

**Project 1822 - Powerhouse 2 Ash Pits**

*Phase Completion*

- RI/FS – On-going

*Monthly Update*

- The final site characterization report was submitted 17 September 2010; however, an addendum was prepared / submitted 8 May 2012 that included the coal yards for this area.
- After full team review the Final SCR Addendum was issued 28 September 2012
- Shaw submitted Final BHHRA and SLERA Addenda for Coal Yard #2 31 July 2013.
- Internal Draft Proposed Plan is scheduled for issue 31 December 2013.

**Project 1823 - Acid Areas 1, 2 & 3**

*Phase Completion*

- LSI – Completed 30 September 1999
- RI/FS – On-going (Acid Areas 1, 2 & 3 have separate schedules, therefore an INPR revision (schedule shown under Res 2 BG project 1812) was submitted completed and is currently sitting at LRD for approval. Once approved, new project numbers will be assigned to Acid Areas 2 & 3, leaving Acid Area 1 as project 1823. The monthly fact sheet will be revised to reflect these changes once they are approved by LRD and new project numbers obtained).

*Monthly Update – Acid Area 1*

- The final Site Characterization Report (part 1) was completed 20 July 2009
- The final Risk Assessment was completed July 2010
- Draft Remedial Investigation (RI) Report was issued for internal review 19 February 2013 and review was completed 17 April 2013
- Final RI Report was issued 10 July 2013
- A contract was awarded in December 2010 to conduct the Feasibility Study which included additional sampling to further delineate the area
- The Draft FS was submitted for internal review 24 April 2012, followed by a CX Draft on 25 June 2012 and an External Draft on 24 October 2012

- Prior to issuing the CX Draft, a VE study was conducted 11-15 June 2012
- Final FS was issued 18 April 2013
- The Internal Draft Proposed Plan was submitted 17 June 2013 for LRN and LRH review. Review comments were requested to be submitted by 17 July 2013; received LRL-OC comments 12 September 2013.

*Monthly Update – Acid Area 2*

- Final Remedial Investigation Report was issued 28 June 2013
- The draft Focused FS was submitted in April 2012 w/ comments requested by 20 May 2012. To date Ohio EPA and CX have not submitted comments.
- VE Study was conducted 11-15 June 2012 with all comments and valid VE suggestions incorporated into final FFS (to be submitted by 25 July 2012).
- Proposed Plan presented to Public 21 March 2013. Public comment period 21 March- 23 April 2013. No comments received from Ohio EPA or public.
- Draft Decision Document undergoing internal Corps reviews. Draft for CX review expected to be issued 2 July 2013. Draft for Ohio EPA review expected to be issued 14 August 2013. (The money funding this contract expires end of September 2013. Due to LRN Contract office processes, contractor will have to end their work in July 2013 and LRN will take over finalization of document. Quick reviews by reviewers will help greatly.)

*Monthly Update – Acid Area 3*

- The draft Focused FS was submitted in April 2012 w/ comments requested by 20 May 2012. To date Ohio EPA and CX have not submitted comments, therefore LRN continues to send out reminders / requests for their comments.
- VE Study will be conducted 11-15 June 2012 (in LRN) with all comments and valid VE suggestions incorporated into final FFS (to be submitted by 25 July 2012).
- Proposed Plan presented to Public 21 March 2013. Public comment period 21 March- 23 April 2013. No comments received from Ohio EPA or public.
- Draft Decision Document undergoing internal Corps reviews. Draft for CX review expected to be issued 2 July 2013. Draft for Ohio EPA review expected to be issued 14 August 2013. (The money funding this contract expires end of September 2013. Due to LRN Contract office processes, contractor will have to end their work in July 2013 and LRN will take over finalization of document. Quick reviews by reviewers will help greatly.)
- Final Remedial Investigation Report was issued 17 September 2013.

**Project 1824 – Lower Toluene Tanks (LTT)**

*Phase Completion*

- LSI – Completed 26 June 2006
- PCO – Completed 5 October 2006

**Project 1825 - Garage Maintenance (Locomotive Bldg, Wash House, Sellite and Unloading Areas)**

*Phase Completion*

- LSI – Completed 30 September 2000

- RI/FS – On-going – Work had already progressed on Locomotive Building and Rail Car Wash area thru Risk Assessment completion (finals submitted June 2011). However, two additional areas were identified (Sellite and Unloading Areas) and added to the overall RI/FS. Therefore, these two additional areas would be completed thru RA and join the original effort in the FS stage.

*Monthly Update – Locomotive Building and Wash House Areas*

- The Final Site Characterization Report was submitted 29 Sept 2010.
- The Risk Assessments were completed and submitted June 2011. A contract was awarded 31 May 2012 to complete the FS, PP and DD for the project, which will include all aspects of the various areas on this project.
- Currently nothing is being done on this portion of the project.

*Monthly Update – Sellite and Unloading Areas*

- A contract was awarded in December 2010 to conduct a data gap investigation for the former sellite area and unloading area which will be included in the overall FS for this site
- Direct-push soil and groundwater sampling was performed May-June 2011
- Well sampling was completed in the dry season (December 2011) and wet season (April-May 2012).
- Draft Site Characterization Report for the Sellite Area was issued for full team review 14 December 2012 and the Final (incorporating review comments) was issued 11 April 2013
- Draft Site Characterization Report for the Unloading Area was issued for full team review 14 January 2013 and the Final (incorporating review comments) was issued 8 May 2013
- The Final BHHRA and SLERA RA work plans for the data gap portion of the project were issued 16 May 2013.
- Draft BHHRA and SLERA addendum for Sellite Area was issued 19 August 2013 with comments requested by 18 October 2013.
- Draft BHHRA and SLERA addendum for Unloading Area was issued 3 September 2013 with comments requested by 4 November 2013.

**Project 1826 - Groundwater - TNT A, B and C & Red Water Ponds Areas**

*Phase Completion*

- SI – Completed 30 September 1999
- Remedial Action-Operations (RA-O) – Completed 30 September 2005 (This covered the well maintenance/monitoring portion of the project and LRD told us to include that under the current phase from then on.)
- RI/FS – On-going

*Monthly Update*

- Draft Remedial Investigation report was issued for internal review 8 November 2012; comments from the internal review were incorporated and the Final RI Report was issued 12 December 2012
- The Final PP was issued 26 March 2012 and presented to the public
- Only 1 comment was received (Mark Bohne – RAB member) and was addressed in the draft DD Responsiveness Summary
- Draft DD was issued for internal review on 27 June 2012, followed by a CX Draft (incorporating internal review comments) on 20 November 2012.

- Responses to CX review comments were returned to the CX 8 May 2013
- Currently the plan is No Further Action based on latest comments from CX OC; response to latest round of comments were returned to the CX on 23 September 2013.
- A round of groundwater sampling is planned for fall 2013 to establish current conditions for future sampling; procurement for this sampling event is ongoing.
- All ROEs for 3 of the 4 off-site wells (MW 29, 30 and 33) were obtained and fall sampling effort is good to go. MW-28 is on NASA property and doesn't require a ROE.

### **PROJECT TEAM MEETINGS**

Team meetings are conducted prior to each RAB meeting to discuss project issues and review presentation material planned for the RAB meeting. A Full Team Meeting includes representatives from USACE, NASA, OEPA, and USACE contractors. Next team meeting is scheduled for 12 December 2013 at the PBOW Engineering Building.

### **PBOW WEBSITE**

USACE Huntington continues to maintain the website which is dedicated to keeping the public informed about the PBOW activities. This site is updated throughout the year. The PBOW Administrative Record is available at [www.lrh.usace.army.mil/projects/current/derp-fuds/pbow](http://www.lrh.usace.army.mil/projects/current/derp-fuds/pbow). New documents are uploaded as they become available. The Public Repository (for public viewing) is maintained at the Firelands College Library Reference Desk and updated on a quarterly basis.

### **PBOW TOLL FREE NUMBER**

USACE Huntington has a toll-free number in place for your use. If you have any information such as personal knowledge, photographs, maps, newspaper articles of past activities or other information you would be willing to share, or if you have questions about current activities at the site, please feel free to use the toll free number. USACE is interested in hearing from you. You may call toll free (800) 822-8413 to speak with the USACE PBOW Technical Coordinator.

### **PROJECT CONTACT**

The PBOW Project Manager may be contacted at (304) 399-5388, fax (304) 399-5715 or via email at [PBOW@usace.army.mil](mailto:PBOW@usace.army.mil).