



Robins Air Force Base Environmental Advisory Board (EAB)

Fact Sheet



Volume 8, Issue 4, May 2014

The Robins AFB EAB

Recognizing the importance of public involvement in environmental matters, Robins Air Force Base (Robins AFB) has established the Environmental Advisory Board (EAB). The mission of the EAB is to encourage participation of surrounding communities in the Base's environmental programs and allow community members and other stakeholders to have meaningful dialog with Base officials. Specifically, the EAB serves to promote community awareness and obtain constructive community review, comment, and input on current and proposed actions associated with environmental programs at Robins AFB. The EAB supports the Air Force environmental mission of sustaining readiness, being a good neighbor, protecting human health and the environment for the Base and community, and making smart business decisions.

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May 2014 EAB Meeting

The spring EAB meeting was held on Thursday, May 1, 2014. EAB members met at the Warner Robins City Hall in Warner Robins, Georgia, where they boarded a bus to tour the Horse Pasture Site.

This *Fact Sheet* provides a summary of the information and topics discussed during the tour.

The next meeting will be held at Centerville City Hall on Thursday, August 7, 2014.

EAB MEMBERS TOUR NEW REMEDIAL SYSTEMS AT HORSE PASTURE SITE

During the spring EAB meeting, **Mr. Mike Perlmutter** from CH2M HILL gave the EAB members an overview of the new remedial systems in place at the DC034 - Horse Pasture Trench Disposal Site [i.e., Solid Waste Management Unit (SWMU 36)].



The Horse Pasture Disposal Site was used as a disposal area from the 1950s until the 1970s. Soil and groundwater at the site were impacted by volatile organic compounds (VOCs) commonly associated with solvents and lubricants. Initial remediation activities consisted of excavation of the contaminated soil and in-situ chemical oxidation (ISCO) for the contaminated groundwater. Following completion of the excavation activities, No Further Action (NFA) status was granted for site soils.

The ISCO program for groundwater remediation was conducted in 2005 and 2006. While ISCO resulted in notable decreases in groundwater contaminant concentrations, concentrations at many locations remain elevated and additional remediation is required.

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EAB MEMBERS TOUR NEW REMEDIAL SYSTEMS AT HORSE PASTURE SITE (Cont'd)

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To address the residual groundwater contamination, the CAPE Team has implemented three new remedies at SWMU 36. These new remedies include: (i) enhanced reductive dechlorination (ERD); (ii) an air sparge/soil vapor extraction (AS/SVE) cut-off barrier; and (iii) aerobic bioremediation using an in situ submerged oxygen curtain (iSOC[®]). An overview of each technology is presented in the remainder of this Fact Sheet.

ERD Biobarriers

ERD involves injection of a carbon substrate [e.g., emulsified vegetable oil (EVO)] into the groundwater to facilitate oxygen consumption. In the reduced oxygen environment, anaerobic bacteria use the chlorinated ethene contaminants as an energy source, eventually reducing them to non-toxic compounds.

The natural groundwater quality at SWMU 36 is acidic, aerobic, and highly oxidizing. These groundwater conditions prevent the contaminants from naturally degrading to non-toxic compounds. Therefore, at SWMU 36, enhancement of the aquifer through biostimulation and bioaugmentation is necessary to facilitate biodegradation.

The initial injections for biostimulation of the groundwater consisted of injecting EVO (i.e., EOS Pro[®]) and a buffering agent into the groundwater. The EVO promotes anaerobic conditions, while the buffering agent increases the pH. The injections occurred from September 22 to October 23, 2013 at 51 injection wells along seven transects located perpendicular to the site groundwater flow. During this initial injection event, 46,200 pounds of EVO and 3,200 pounds of buffering agent were injected.

The CAPE team is currently monitoring the groundwater conditions at the site. When optimal groundwater conditions are achieved (i.e., a neutral pH, low dissolved oxygen, and negative oxidation-reduction potential), bacteria will be injected into the groundwater to speed up the contaminant degradation (i.e., bioaugmentation).



Installation of Typical ERD Injection Well



Staging Area with Secondary Containment for EOS Pro[®]



ERD Injection Setup

AS/SVE Cut-Off Barrier

The AS/SVE system was designed to cut-off the SWMU 36 groundwater contaminant plume at the Robins AFB property boundary using volatilization (for the chlorinated ethenes) and aerobic bioremediation (for the chlorobenzene).

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EAB MEMBERS TOUR NEW REMEDIAL SYSTEMS AT HORSE PASTURE SITE (Cont'd)



Excavation for the SVE Trench



SVE Trench Backfilled with Gravel



View Looking Down the Alignment of the AS/SVE Barrier



AS/SVE Equipment Compound

The AS/SVE system consists of 21, 2-inch diameter AS wells installed 45 to 57 feet below ground surface (ft bgs). Air is injected into the groundwater through the AS wells. The air volatilizes the contaminants in the groundwater, and air bubbles with the contaminants rise toward the ground surface, where they are captured by the SVE system.

A 420-foot long, 24-inch wide, 40 to 50-foot deep gravel-filled trench was constructed to provide a conduit for the air bubbles to rise to the surface. Near the top of the trench, the CAPE Team installed three 4-inch diameter horizontal SVE wells. The SVE wells are under vacuum, and the air is collected and conveyed to a remediation compound for treatment in Granular Activated Carbon (GAC) units prior to release to the atmosphere. The system began operation in early 2014.

iSOC®

The iSOC® is designed to deliver high levels of oxygen into the aquifer to stimulate aerobic bioremediation of the chlorobenzene groundwater plume in the southern and southeastern portion of SWMU 36.

The iSOC® units are placed in 14 infusion wells located along three transects at SWMU 36. Compressed oxygen cylinders are housed in equipment sheds located near each transect. The iSOC® units contain highly porous fibers that promote a high mass transfer of oxygen into the groundwater. The system is powered solely by the oxygen cylinders.



Mr. Don Thompson (left) and Mr. Mike Perlmutter (right) Inspect an iSOC® Unit

EAB MEMBERS TOUR NEW REMEDIAL SYSTEMS AT HORSE PASTURE SITE (Cont'd)

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As the ground-water passes through the transects, the oxygen is delivered to support the aerobic bacteria, which promotes the degradation of chlorobenzene. Approximately one cubic foot of oxygen is injected per well per day.

The system began operation in early 2014.



View of iSOC® Passive Gas Infusion Unit

Typical iSOC® Manifold Setup

Acronyms

- AFB Air Force Base
- AS Air Sparge/Soil Vapor Extraction
- EAB Environmental Advisory Board
- ft bgs feet below ground surface
- ERD Enhanced Reductive Dechlorination
- EVO Emulsified Vegetable Oil
- GAC Granulated Activated Carbon
- ISCO In Situ Chemical Oxidation
- iSOC® In Situ Submerged Oxygen Curtain
- NFA No Further Action
- SWMU Solid Waste Management Unit
- VOCs Volatile Organic Compounds

For more information regarding the EAB, please contact
Ms. Charline Logue, Robins AFB EAB Manager, at (478) 327-9268
or visit <http://www.robinseab.org>

Environmental Advisory Board Members

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| Mr. Alexander Stokes, Robins AFB Installation Co-Chair | Dr. Dan Callahan, Warner Robins Community Member | Ms. Debra Jones, Warner Robins Community Member | Mr. Don Thompson, Macon Community Member |
| Dr. Brian E. Rood, Macon Community Co-Chair | Mr. James Harden, Warner Robins Community Member | Mr. Mike Maffeo, Macon Community Member | Mr. Penrose Wolf, Perry Community Member |
| Ms. Lila Llamas, US EPA Region 4 Hazardous Waste Division | Mr. John Harley, Centerville Community Member | Dr. Linda Smyth, Macon Community Co-Chair | |
| Ms. Mary Brown, GA EPD Hazardous Waste Management | Mr. Stephen Johnson, Macon Community Member | Dr. Joseph Swartwout, Fort Valley Community Member | |