



# Robins Air Force Base Environmental Advisory Board (EAB)

## Fact Sheet



Volume 8, Issue 2, November 2013

### 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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### EAB MEMBERS TOUR IRON DEPOSITION CONTROL SYSTEM AT LANDFILL NO. 3 (LF003)

During the fall EAB meeting, **Mr. David Fortune** from Cape Environmental Management, Inc. (CAPE) and **Mr. Brad Horn** of Redux Technology gave the EAB members an overview of the new iron deposition control system at LF003.



Mr. Dave Fortune of CAPE and Mr. Brad Horn of Redux Technology give the EAB members an overview of the iron deposition control system at LF003.

### November 2013 EAB Meeting

The fall EAB meeting was held on Thursday, November 7, 2013. EAB members met at the Warner Robins City Hall in Warner Robins, Georgia, where they boarded a bus to tour the iron deposition control system at Landfill No. 3 (LF003) and the ozone treatment system at the Groundwater Treatment Plant (GWTP).

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

**The next meeting will be held on Thursday, 6 February 2014.**

One of the primary components of the remedial system at LF003 is a groundwater pump and treat (P&T) system. Contaminated groundwater and leachate is removed from the subsurface by extraction wells and conveyed to the Base's centralized GWTP for treatment prior to discharge. One of the biggest challenges with operating this system is that the groundwater at LF003 contains high levels of dissolved iron. When the groundwater is extracted, the iron precipitates and subsequently clogs the extraction wells, pumps, pipelines, and the treatment systems, which reduces operational efficiency.

Historically, the iron precipitates have been periodically removed with harsh chemicals, such as hydrogen perox-

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## EAB MEMBERS TOUR IRON DEPOSITION CONTROL SYSTEM AT LANDFILL NO. 3 (LF003) (Cont'd)

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ide, which present safety concerns with regard to application and storage on-site. To address the iron fouling before it can occur, an iron deposition control system using deposit control chemicals has been developed for the P&T system at LF003.



Iron deposition on extraction well caps at LF003.

Deposit control chemicals are mixtures of various chemicals that keep iron from forming solids, or keep any solids that do form from growing (“agglomerating”) or settling in the treatment system. They are water-based liquids, chemically similar to detergents, which are added to the extracted groundwater at low levels.

The deposit control chemicals contain:

- sequesterants – “spider-like” molecules that react with iron keeping it dissolved;
- reducing agents – chemicals that keep iron in its more soluble ferrous form;
- dispersants – polymers with excess electronic charges, which are transferred to suspended solids, making them repel each other and thus stay suspended; and
- crystal modifiers – chemicals that interrupt the geometry of crystal growth and keep solids small and suspended.

The chemicals being used at LF003 include Redux 300 and Redux 340.

The unique system installed at LF003 adds the deposit control chemicals directly to the extraction wells. The extraction well heads were retrofitted to allow some of the extracted groundwater to be dosed with the deposit control chemical and returned to the well



A tote of Redux 340, one of the deposit control chemicals that will be used at LF003.

itself; keeping the well, recovery pumps, and pipelines free of iron solids. Other equipment includes a chemical storage tank and precision chemical feed pumps. The chemicals are fed to the well head via polyethylene tubing from a central location near the chemical storage tank.

Ongoing monitoring of the rate of iron deposition will indicate how well the deposit control chemicals are working. Deposition can be monitored by:

- observing losses in extraction well and pump capacities;
- visual inspections of system components; and
- measurements of system-wide iron levels.

Based upon the observations from these measurements, the chemical dosing can be increased or decreased to adjust effectiveness.



Mr. David Fortune explains the chemical dosing system at an extraction well vault (left). A close-up view of the extraction well head with the newly installed recirculation system to allow dosing of the deposit control chemicals (right).

# OZONE TREATMENT SYSTEM INSTALLED AT GROUNDWATER TREATMENT PLANT

The remediation strategies at most of the restoration sites on Robins AFB are currently being transitioned away from P&T to other more aggressive treatment technologies. As currently planned, LF003 will be the only site contributing flow to the GWTP, which will result in a significant decrease in the flow through the plant.

The groundwater conveyed from LF003 also has some of the highest contaminant concentrations of any of the sites that have contributed flow to the plant; and therefore, once the transition has occurred, the flow will be more concentrated.



Mr. David Fortune and Mr. Nelson Rosa of CAPE give an overview of the GWTP operations.

To accommodate these changes, the treatment process has recently been modified. The modifications include decreasing pump and pipe sizes, as well as replacing the ultraviolet (UV) treatment system with an ozone treatment system.

At the fall EAB, the EAB members received an overview of the new ozone treatment system from **Ms. Jane Piper** of Piper Environmental, who designed the system.

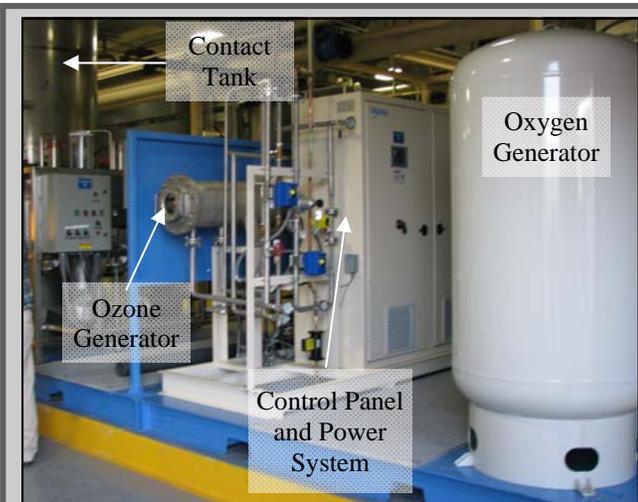
Ozone is a gas made up of three oxygen atoms. It is a strong natural oxidizer that will break down contaminants in groundwater to carbon dioxide, water, chloride, and less persistent and less toxic molecules.



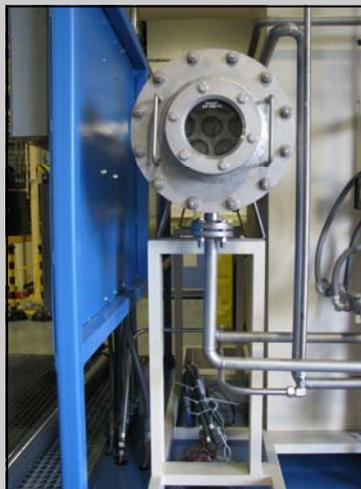
Ms. Jane Piper from Piper Environmental gives a detailed explanation of the ozone treatment system.

Ozone treatment at the GWTP begins with compressed air that is transported to an oxygen concentrator. The concentrated oxygen is then conveyed to the ozone generator, where the oxygen molecules are transformed to ozone molecules by applying a high voltage electrical arc. The ozone molecules are then injected into the contaminated groundwater through a side stream recirculation system, where the contaminants are oxidized.

For control of the ozone concentrations, an Oxidation Reduction Potential (ORP) monitor has been installed. The effectiveness of the ozone system will be measured by analyzing the effluent flow to confirm contaminant concentrations are below the GWTP effluent limits. Treated groundwater is discharged to surface water under a National Pollutant Discharge Elimination System (NPDES) permit.



View of ozone system at the GWTP.



Close-up of Ozone Generator.



Close-up of Contact Tank.

## EAB HAPPENINGS

Mr. James (Jim) Ashworth participated in the fall EAB tour. Mr. Ashworth recently joined the Georgia Environmental Protection Division (GA EPD) and will be working with the Robins AFB restoration program.

Mr. Ashworth is a geologist with over 25 years of experience in the environmental remediation arena.



Mr. Jim Ashworth,  
GA EPD

Engineer Group, Robins Air Force Base winning the 2013 Secretary of Defense Environmental Quality – Industrial Installation Award.

Mr. Stokes acknowledged that Ms. Logue went above and beyond to take the initiative and lead the efforts to draft and edit the award package. The award showcased and highlighted the many accomplishments of Team Robins.



Mr. Lex Stokes presents a commendation letter to Ms. Charline Logue.

During the meeting portion of the EAB tour, Mr. Lex Stokes presented a commendation letter to Ms. Logue recognizing her outstanding efforts that led to the 78th Civil

### Acronyms

AFB	Air Force Base
CAPE	Cape Environmental
EAB	Environmental Advisory Board
GA EPD	Georgia Environmental Protection Division
GWTP	Groundwater Treatment Plant
LF003	Landfill No. 3
NPDES	National Pollutant Discharge Elimination System
ORP	Oxidation Reduction Potential
P&T	Pump and Treat
UV	Ultraviolet

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

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