

**United States Environmental Protection Agency**  
**Region IV**  
**POLLUTION REPORT**

**Date:** Monday, August 18, 2014

**From:** Perry Gaughan, OSC

**To:** James Webster, USEPA R4 ERRB                      William D Adkins, USCG NPFC  
Robert Blair, Emergency Response Branch        Greg Harper, USEPA R4 ERRB  
Manager

**Subject:** EPA ERT conducts Geophysics Assessment  
Boyd's Creek III Oil Site  
Oil Well Road, Glasgow, KY  
Latitude: 36.9428600  
Longitude: -85.9426100

<b>POLREP No.:</b>	38	<b>Site #:</b>	Z426
<b>Reporting Period:</b>	6/01/2014 - 8/18/2014	<b>D.O. #:</b>	
<b>Start Date:</b>	6/1/1993	<b>Response Authority:</b>	OPA
<b>Mob Date:</b>	6/1/1993	<b>Response Type:</b>	Non-Time-Critical
<b>Demob Date:</b>		<b>NPL Status:</b>	Non NPL
<b>Completion Date:</b>		<b>Incident Category:</b>	Removal Action
<b>CERCLIS ID #:</b>		<b>Contract #</b>	
<b>RCRIS ID #:</b>		<b>Reimbursable Account #</b>	
<b>FPN#</b>			

#### **Site Description**

Over recent months, the National Pollution Fund Center has prompted EPA Region 4 to conduct additional efforts at closing this Site out since it has been an ongoing response since the early 1990's. The OSC received additional funding from NPFC to conduct an additional geophysics assessment upgradient of the collection system in an effort to find remnants of old abandoned oil wells. Similar efforts performed by OSCs Webster and Eger during the 1990s and 2003 proved successful in finding abandoned wells and has decreased the flow of oil contaminated groundwater to the collection system.

This Site involves an ongoing discharge of crude oil into Boyd's Creek and the Barren River Lake which is a navigable waterway. This ongoing removal action was continued under an Interagency Agreement between EPA Region 4 and the Tennessee Valley Authority. Funding was obtained under the OSC's OPA authority and through support from the National Pollution Fund Center in December, 2008.

#### **Current Activities**

During the week of June 2nd, 2014, EPA ERT's Greg Powell and technical contractors conducted the geophysics assessment upgradient of the oil water collection system.

A summary of the weeks activities included:

EM 31-MK2: The EM 31 measures apparent conductivity and locates magnetic targets. The 2001 grid was resurveyed to verify targets 3 & 4. A significant anomaly was still apparent at locations 3 & 4. The depth that the EM 31 is effective approximately 6 meters.

EM-34: EM-34 survey lines were run westward from anomalies 3 & 4 to the edge of the upper field. The EM-34 performs the same function as the EM-31 but has an approximate effectiveness of 60 meters depending on coil spacing.

Seismic Refraction: Three seismic refraction lines were run from anomalies 3&4 to the crest of the edge of the upper field. The survey can characterize geologic structure and identify boundaries such as the ground water table and soil/ bedrock interface. It appears that excellent data was obtained.

Electrical Resistivity: An electrode array was installed mimicking the three refraction lines. The survey detects layers of varying resistance in the subsurface. Shales have less resistance than sandstone. High conductive soils that are brine influenced display different resistivity signatures than unaltered ground water. The data that was collected looked promising.

VLF: The VLF is an electromagnetic instrument that also measures the apparent resistivity of the earth. An excellent tool for locating fractures and faults. Power line interference may have limited the quality of data.

Preliminary Results indicates geologic feature running parallel with the swale (possible fault). Anomalies 3&4 are still a puzzle it could be a well(s) or brine discharging from the bedrock feature from an upgradient source. A closer look at the data will help better define the issue. Additional assessment of the upper field may be necessary, but ERT needs to evaluate current data more closely. The upper field would have to be cut for an effective survey.

Further evaluation by ERT and its technical consultant in July 2014 revealed a fracture in the resistivity and seismic data. The EM-34 data was usable despite lightning interference. In addition the data revealed there is still a significant anomaly at the top of the hill near the barn (anomaly one in the 2001 report). In 2001 we thought the anomaly was related to the chlorine associated with the swimming pool. The anomaly now appears to be real. Based on the seismic data the depth to bedrock is around 30 feet. Geoprobng for this anomaly appears to be the best method for assessing for oil.

The new EM-31 conductivity survey indicates a target along the gravel road to the treatment system (Martin Anomaly 2). ERT thinks there are two targets in that area. We were not able to survey that area in 2001 due to cultural interference. Bedrock should be very shallow in that area so excavating would be the method to assess.

### Next Steps

Geoprobe assessment of the upper field anomaly and shallow excavation of the anomalies near the collection system are currently being planned for September/October of 2014.

### Estimated Costs \*

	Budgeted	Total To Date	Remaining	% Remaining
<b>Extramural Costs</b>				
IAGs	\$50,000.00	\$40,000.00	\$10,000.00	20.00%
<b>Intramural Costs</b>				
<b>Total Site Costs</b>	\$50,000.00	\$40,000.00	\$10,000.00	20.00%

\* The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The OSC does not necessarily receive specific figures on final payments made to any contractor(s). Other financial data which the OSC must rely upon may not be entirely up-to-date. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

[response.epa.gov/BoydCreek](http://response.epa.gov/BoydCreek)

POLREP #38 Last Updated 8/26/2014