

Spring 2014

# Oversight News

Newsletter of the Commonwealth's Environmental Oversight of the Paducah Gaseous Diffusion Plant (PGDP)

*Kentucky Department for Environmental Protection  
Division of Waste Management  
Hazardous Waste Branch  
Paducah Gaseous Diffusion Plant Section*

## C-400 Update: Phase 2A Operations Successful Despite Record Cold Winter

Phase IIa of the cleanup at the C-400 Building trichloroethene (TCE) spill site is progressing despite several setbacks, some of which were directly related to the unseasonably cold weather that the region has been experiencing. Problems experienced during the course of the project have ranged from electrical issues to damaged pipes. Problems such as these are not uncommon when dealing with complex treatment systems such as the those installed at C-400.

Phase IIa of the C-400 TCE cleanup operations began during the fall of 2012 with the installation of an electrical resistance heating (ERH) system consisting of 52 electrical heating electrodes and 33 vapor extraction wells. The system is designed to remove TCE from soils down to approximately 70 feet below ground surface near the C-400 Building. It accomplishes this by heating the soil and groundwa-

ter to a temperature of 194 F, which is hot enough to vaporize TCE. The vapor extraction wells in turn are used to extract the TCE vapor so that it can be treated to remove the TCE.

During the summer of 2013, two of the electrodes stopped working due to a short at one electrode. Without electricity flowing between the electrodes, the nearby soil began to cool. It takes time and a considerable amount of energy to heat soil to a temperature of 194 F, so any cooling in the area being treated prior to remedy completion is undesirable. To remedy the problem, project managers devised a fix that entailed installing a smaller electrode near the electrode that had failed. This had the effect of re-establishing current flow between the original two electrodes and allowed soil heating in the area to continue.

Later in the year another problem involving the vapor treatment system caused portions of the ERH system to periodically shutdown. The vapor treatment system is designed to remove TCE from the extracted vapor and then eject the treated air from a nearby stack. Air coming from the stack is

monitored continuously to insure that TCE has been removed from the vapor. The problem arose when small periodic spikes of TCE were detected at the stack. The vapor extraction system is designed to automatically shut down when TCE is detected at the stack above preset concentrations. The problem was remedied by replacing the carbon media intended to capture the small excess levels of TCE, thereby preventing any further system disruptions.

As winter progressed and the temperatures fell, equipment freeze damage became an issue. Pipes, gaskets, valves and heat exchangers all suffered problems that required repair. These repairs were successfully completed in early January of this year.

As of mid-January 2014, the electrical resistance heating system has been operating as designed. On March 8, 2014, approximately 711 gallons of TCE had been removed and the average soil temperature had reached approximately 183 F. It is anticipated that temperatures will continue to rise before leveling off at around the 194 F goal. Shortly thereafter it should be possible to discontinue heating.



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## Tornado Damages Portions of USEC Facility

The PGDP sustained storm damage from a tornado that struck the plant on the afternoon of Nov. 17, 2013. Areas damaged included portions of the C-333 Process Building. Large steel roll-up doors and some transite panels located on the west side of the building were blown inward. The southeast corner of the building sustained more significant damage (below) when the storm ripped off at least 12 large transite panels. The



largest pieces of transite found on the ground were about 6 to 8 inches wide and 10 to 12 inches long. These were removed by USEC personnel. An inspection conducted by PGDP Section personnel of areas east of the building failed to locate any additional pieces of transite paneling. Repairs to a large hole left in the side of the building were completed by the afternoon of November 22.

The C-633-4 Cooling Tower located to the east of the C-333 Process Building was also damaged. Large fiberglass shrouds located at the top of the tower were blown off along with some transite and sheet metal panels. Due to the USEC shut-down, the cooling tower was not in operation at the time of the incident.

Less significant damage was reported to a gondola rail car located at the southeast corner of the fenced area. A



lid covering the rail car had been removed. The interior of the rail car was inspected by PGDP Section personnel and was found to be empty. USEC reported that on-site monitoring confirmed that there had been no release of radiological or other hazardous material.

## Elevated Levels of Radioactive Constituents Reported in DOE's Outfall 20

In late July 2013, it was learned that leachate discharged from the on-site C-746-U Landfill through plant Outfall 20 contained levels of gross alpha, gross beta and uranium that were elevated relative to historical norms. Uranium levels began increasing in March 2013 and peaked in June at 1,740 µg/L. Gross alpha levels peaked at 472 pCi/L in June and gross beta peaked in July at 228 pCi/L. These results were reported officially in DOE's discharge monitoring report (DMR) submitted to the Kentucky Division of Water. Outfall 20 is permitted for the release of leachate from the S, T and U landfills.

While these results were below DOE's acceptable discharge limits,

they were much greater than what has been historically detected at Outfall 20. In 2012, Outfall 20 discharges averaged below 19.7 pCi/L for gross beta and 15.6 µg/L for uranium with gross alpha results falling below detection limits. Investigation by DOE and its contractors determined that



increased levels were most likely due to the disposal at the U-Landfill of demolition material from the C-340 decontamination and decommissioning project.

Subsequent DMRs have shown that concentrations of these radioactive contaminants have decreased, but not to 2012 levels. The most recent DMR (January 2014) for Outfall 20 reported total alpha at 199 pCi/L, total beta at 84.6 pCi/L and uranium at 478 µg/L.

Kentucky continues to monitor the discharge on a weekly basis. DOE is also investigating ways to prevent similar releases in the future.

## Increase in DOE's FY 14 Budget Allows Work to Restart

The Paducah Gaseous Diffusion Plant (PGDP) will receive \$324 million in cleanup funding in 2014 thanks to a trillion dollar federal omnibus spending bill signed into law in January. This is a sizable increase over the FY 13 \$142 million funding level and is welcome news given that the site's obligations and cleanup scope are about to grow significantly.

With the announcement last May that the United States Enrichment Corp. (USEC) would no longer continue to

operate the PGDP, the clock is ticking for DOE to prepare to assume complete control over the site. Building maintenance, security and other functions once performed by USEC must now be performed by a DOE contractor that has yet to be selected. Significant levels of additional funding will be required to support these new activities. There will also be a need to begin decontamination and decommissioning activities at many of the now inactive structures once leased by USEC.

In addition to its new responsibilities, DOE must also continue to fund its pre-PGDP shutdown cleanup mission at the site. Inactive facilities, contaminated burial grounds, soils and groundwater must all be addressed.

From an economic standpoint, the additional site funding couldn't have come at a better time. Numerous LATA Kentucky workers were laid off in late 2013 due to lack of additional cleanup funding. Many of these workers had

been tasked with removing one of the site's larger inactive facilities, the C-410 Building Complex. Using the additional funding provided by Congress, DOE will be able to re-hire many of those laid off, which in turn will ensure that the C-410 facility is removed by June of next year. Current funding will also help to ensure that other high-paying jobs tied to the cleanup mission will remain at the site.

Significant funding challenges lie ahead for the site. While

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**The mission of the Kentucky Division of Waste Management is to protect human health and the environment by minimizing adverse impacts on all citizens of the Commonwealth through the development of fair, equitable, and effective waste management programs.**



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### Kentucky Department for Environmental Protection

[Kentucky Environmental Oversight News](#) is published quarterly by the Kentucky Department for Environmental Protection's Division of Waste Management. It features information regarding environmental cleanup activities at the Paducah Gaseous Diffusion Plant site and related topics. Additional information is available from:

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