



Division of Remediation

Division of Remediation's Charge

The Division of Remediation (DoR) is charged by the Commissioner of the Department of Environment and Conservation to implement the Hazardous Waste Management Act of 1983, Part 2 (TCA 68-212-201 et seq.), Property Where Methamphetamine Manufactured (TCA 68-212-501 et seq.), and the Drycleaner's Environmental Response Act (TCA 68-217-101 et seq.). DoR uses the Hazardous Waste Remedial Action Fund (the "Fund"), the Voluntary Cleanup Oversight and Assistance (VOAP) Fund, and the Drycleaner's Environmental Response Fund to investigate and clean up environmental problems caused by the release of hazardous substances into the environment. Each Act directs the process for fee collection with fees deposited into each Fund. Each Act also specifies how fund revenues may be used by TDEC. DoR is responsible for properly managing expenditures from these funds.

Division's Purpose and Function

DoR identifies and investigates hazardous substance sites and uses practical and effective remedies to stabilize, remediate, contain, monitor and maintain these sites. These activities eliminate hazardous substance threats to public health, safety, and the environment. Inactive hazardous substance sites include:

- Promulgated hazardous substance sites
- Brownfield and Voluntary sites
- Drycleaner Program sites
- Environmental Protection Agency National Priority List sites
- Department of Defense sites
- Department of Energy sites including Oak Ridge, and
- Other sites that may pose a threat to human health or the environment



Annual Legislative Report For July 1, 2012 - June 30, 2013

The purpose of this annual report is to report expenditures from the Hazardous Waste Remedial Action Fund from July 1, 2012 through June 30, 2013 as required by TCA 68-212-212.

DEPARTMENT OF
ENVIRONMENT &
CONSERVATION

DIVISION OF
REMEDATION



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FY 2012 - 2013 Performance Measures



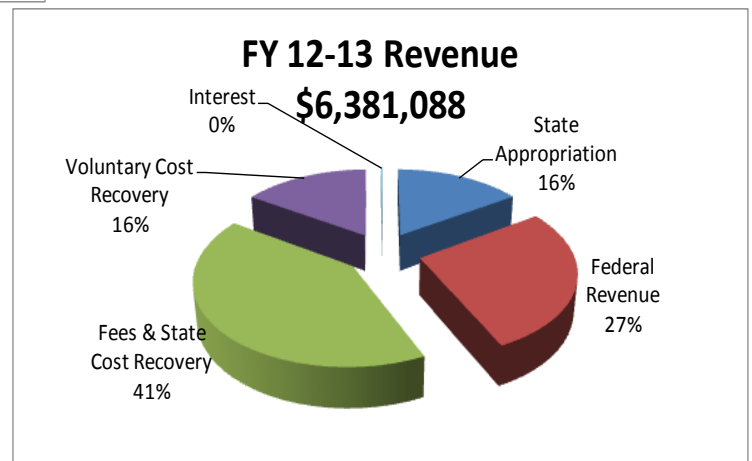
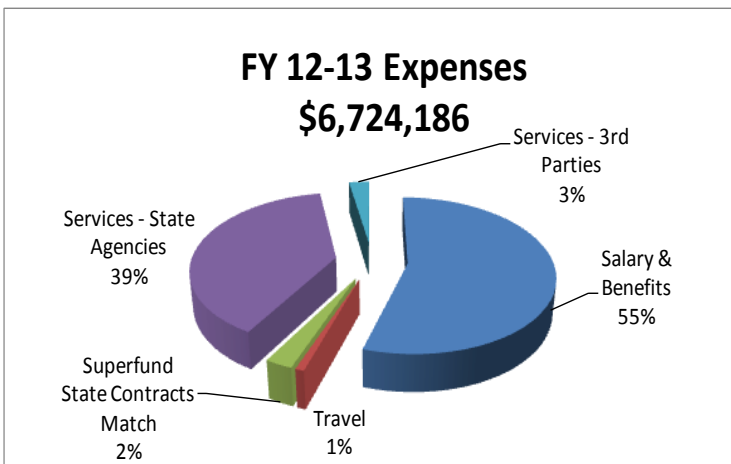
The Division of Remediation utilized the Remedial Action and VOAP funds to:

- ⇒ Complete remediation at eight hazardous substance sites
- ⇒ Continue the progress of investigation and cleanup at 298 sites (in 49 counties)

In addition, responsible parties at 51 sites reported:

- ◆ Spending in excess of \$17,102,104
- ◆ Treating or disposing 1,933,562,747 gallons of water or groundwater
- ◆ Removing 16,771 pounds of non hazardous materials, and
- ◆ Removing, treating, or disposing of 3375 pounds of hazardous waste/hazardous substances.

Hazardous Waste Remedial Action Fund FY 2012 - 2013



FUND BALANCE – July 2012	\$6,773,767
REVENUES	\$6,381,088
EXPENDITURES	\$6,724,186
DECREASE in FUND BALANCE	(\$343,098)
FUND BALANCE – June 2013	\$6,430,669

Site Accomplishment/Success Stories

Chattanooga Coke

After a decade of negotiations and delays, the Chattanooga Coke and Chemical facility has undergone remediation conducted by Mead Westvaco. Soil impacted by poly-aromatic hydrocarbons was removed to a minimum depth of two feet. Coal tar saturated soils were removed, where conditions permitted, until coal tar was no longer present. The maximum depth of coal tar excavation was 12 feet below grade. Saturated conditions approximately one foot thick still remain at a depth of approximately one to two feet below grade in the proximity of an active rail spur.

Removal began in January 2013 and was essentially completed by June 2013. A total of 23,904 tons of soils were disposed offsite as special waste. An estimated 1,269,264 gallons of shallow groundwater/ contact water was disposed via the POTW. An additional 700 cubic yards of characteristic hazardous material (benzene) were sent off site by rail for incineration. Excavations were backfilled

with 25,506 cubic yards of imported clean clay fill. The site is currently enrolled in the VOAP for redevelopment purposes with a third party.



Southside Lead

The Southside Lead project is located near downtown Chattanooga. In March 2011, DoR, along with EPA Removal Branch, began providing assistance to the State and local Health Departments to assess a situation involving a resident's acute exposure to lead. Samples obtained from soil adjacent to the residence indicated elevated lead levels. DoR and EPA began performing assessments to determine the source and extent of the contamination, with the first assessment conducted in May 2012. Results of the assessment warranted additional investigation, which began in October 2012. Over the course of several months, numerous residential yards were sampled as part of a phased investigative approach. Eventually, 84 yards were identified containing elevated lead levels and subsequently remediated. EPA initiated removal actions in September 2012 and completed them in November 2013.

The actual source of lead has not been determined, but is suspected to be associated with historic foundry operations. Presently, DoR and EPA are in the process of determining if additional assessment of surrounding areas is warranted.



Crew conducting removal of impacted surface soil



Condition of yard after remediation work completed

Site Accomplishment/Success Stories (Continued)

Wayne County Mercury Investigation

In early 2010, TDEC received a complaint of mercury in Beech Creek, Wayne County. While collecting sediment samples, elemental mercury was observed within the sediment, approximately 4-6 inches deep. A resident reported that he observed mercury in old bridge structures stored at the Wayne County Highway Department and that bridge structures were still in place on public and private roads throughout the county. TDEC staff evaluated area industries and discovered that the chlor-alkali industry utilized mercury cells to produce chlorine and sodium or potassium hydroxide. The Diamond Shamrock chlor-alkali plant had operated approximately 50 miles from Wayne County in Muscle Shoals, AL. Interviews with former Diamond Shamrock employees found 116 mercury cells were shut down and scrapped out in 1965. The 46 ft. long cells were cut in half at the facility before being hauled off site. Further investigation determined that the County purchased mercury cell plates from a scrap dealer in Alabama in the 1960s. Mercury cell plates were used by the Highway Department to construct bridges and temporary stream crossings in many locations around the county.

TDEC staff partnered with Wayne County Highway Department staff to canvas the entirety of Wayne County. Later, other locations in Hickman and Lewis Counties were also discovered. To date, 94 locations have been identified with suspect mercury containing material, either bridges or bridge panels. Glenn Springs Holdings (GSH) agreed to implement interim measures (foam application) and to replace bridges where mercury was identified. A total of 82 bridges/panels have been treated with foam and 33 bridges have been replaced. GSH anticipates 15 to 20 bridge replacements per year. TDEC and GSH will continue to identify former bridge locations and address them as necessary. TDEC will also evaluate surface water sampling data and develop a sampling plan for current/former County Highway Department storage yards.



Mercury Cell Plate Bridge



Underside of Mercury Cell Plate Bridge



Replaced Bridge

Site Accomplishment/Success Stories (Continued)

Lenoir City Car Works

The Lenoir City Car Works site consists of approximately 100 acres located in the southern portion of Lenoir City, Tennessee. The facility operated from 1907 through 1985 manufacturing rail cars and their components. Operations included ferrous (iron) and nonferrous (brass) foundries. Freight car journal bearings were also manufactured by re-processing scrap journal bearings.

During the operational history of the Car Works site, approximately 200,000 cubic yards of spent foundry sand was disposed of on the ground over a majority of the 100 acre parcel, ranging in thickness from a few inches to over 10 feet. Hazardous substances identified on the site primarily include arsenic and lead associated with the foundry sand and slag. Both lead and arsenic are present at concentrations of concern for either a residential or industrial future use scenario.

The Norfolk Southern Railway Company and their affiliate, Southern Region Industrial Realty, developed a remedial strategy for addressing the widespread contamination, with a plan to consolidate the foundry sand and contaminated soil under an Engineered Cover System (ECS) onsite. Actual remediation activities began in July 2012 on a smaller 11 acre portion of the eastern part of the site. During remediation of the Eastern Parcel, approximately 18,000 cubic yards of foundry sand/soil were excavated and staged on the main parcel for placement under the ECS. Remediation of the remainder of the site began in May 2013. To date, approximately 230,000 cubic yards of foundry sand/soil have been excavated and placed in the onsite cell. After remediation of the site is completed around mid-2014, approximately 50 to 60 acres of the original 100 acres will be available for future industrial development.



Before



After



Committed and Anticipated Uses of the Fund

The Hazardous Waste Remedial Action Fund has historically funded the state match on EPA Fund Lead National Priority List (NPL) sites. A number of EPA Fund Lead sites are ongoing or anticipated in the very near future. Therefore, it is anticipated that significant resources from the Hazardous Waste Remedial Action Fund will be required not only to support ongoing program activities but to also cover state matches on EPA Fund Lead NPL sites.

Superfund State Contracts (SSCs)

Investigation and cleanup (remedial action) of sites listed to the U. S. Environmental Protection Agency (EPA) National Priority List (NPL) may be financed by either the Potential Responsible Party (PRP) or in some cases by the EPA. Except for a special case where either the State or a political subdivision of the State operated the site during disposal of the waste, EPA finances 100% of the investigation of EPA financed NPL sites. After investigation, remedy selection, and remedial design are complete, Federal law requires that for sites financed by Federal funds, the EPA and the State effectuate a Superfund State Contract (SSC) prior to EPA obligating or expending funds for remedial action. The SSC must include the percentage of the remedial action financed by EPA (typically 90%) and by the State (typically 10%) and other assurances such as the State committing to finance 100% of operation and maintenance (O&M) for as long as O&M is needed.

“The President shall not provide any remedial action...unless the state in which the release occurs first enters into a contract or cooperative agreement with the President providing assurances...” CERCLA § 104(c)(3)

An SSC is a joint, legally binding contract between the EPA and a State enforceable in federal court. The Department of Environment and Conservation reports estimated costs in Government Accounting Board Standard 49 (GASB 49) reporting for SSCs and anticipated SSCs. The Department strives to manage and budget State obligations for SSCs through the Hazardous Waste Remedial Action Fund.

Federally financed NPL sites are described below that either have current SSCs, the Department is currently negotiating SSCs with EPA, or are nearing a stage where the Department should begin planning on how to fund the SSCs.

Velsicol Hardeman County Landfill NPL Site

Reportedly, approximately 130,000 to 300,000 drums of waste containing pesticides, carbon tetrachloride and other pollutants were disposed of in 10 to 15 foot deep, unlined trenches at a site near the town of Toone. The burial trenches have for the most part been capped. Erosion of the cap and exposing the waste in the trenches could create an imminent and substantial danger. About 2003, a Groundwater Extraction and Treatment System (GETS) was determined ineffective and was discontinued to evaluate other remedial alternatives. Additional investigation, alternative evaluation, and pilot studies have shown that soil vapor extraction along with access restrictions, cap extension and cap maintenance should be effective in controlling the source area and reducing additional pollution of surface water, air and groundwater by removing an estimated 5,000,000 and 6,000,000 pounds of carbon tetrachloride and other volatile organic compounds.

The Department is negotiating two SSCs with EPA on the Velsicol Hardeman County Landfill with combined capital costs and remedial action treatment and monitoring costs of about \$46,266,000. EPA would fund 90% of these costs and the State would fund 10% (about \$4,626,600) of these costs. The Department will be required to commit in the SSC to inspect, mow, and maintain the 24 acre cap and repair the landfill fence indefinitely.

Superfund State Contracts (SSCs) (Continued)

Smalley Piper NPL Site

The Smalley-Piper Site is approximately 9 acres in size and is located in Collierville, Shelby County, Tennessee. The Site is comprised of a self-storage facility, concrete buildings, metal storage buildings, a vacant lot, and a paved parking area. From the 1950's to 1980's, various industrial activities, one of which was magnesium battery casing manufacturing, were conducted at the Site. The battery casing treatment utilized caustic soda, acetic acid, chromium acid, and water. The wastes generated from facility operations were treated in unlined on-site equalization ponds with liquid sulfur dioxide. However, the waste in the ponds received inadequate treatment resulting in the contamination of soils, surface water pathways, and groundwater in the Memphis aquifer in the vicinity of the Site, culminating with the shutdown of the nearby Water Plant #2 (Collierville) in December 2003 to present time. These on-site equalization ponds were closed in early 1980s, and all on-site operations at the facility ceased in 2007.

Soil and Soil Flushing Remedy

The amended SSC addresses the previously performed soil remedy and adds a soil flushing component. The amended SSC has a total current estimated cost of \$7,781,970 with the State's 10% match being \$778,197. The original SSC addressing the soil remedial action was performed at a cost of \$1,982,915. As of February 4, 2013 the State has paid to EPA the total billed amount of \$172,703 of the anticipated \$778,197. No operation and maintenance (O&M) other than institutional controls is anticipated for this remedial action. The intent of the soil flushing remedy is to reduce the contaminant concentrations that remain in subsurface soil which may continue to leach into groundwater.

Water will be extracted by onsite recovery wells and will be treated by chemical reduction, precipitation and ion exchange treatment modules. The treated water will then be re-injected into the former source area, via the infiltration gallery. It is anticipated that the system will operate for one year with the goal for completion of the remedy by July 31, 2015.



Western pond area (post-excavation) being prepared for soil flushing gallery

Superfund State Contracts (SSCs) (Continued)

Ross Metals NPL Site

The Ross Metals site is a Federal Superfund financed National Priority List (NPL) site where a former secondary lead smelter was located near the center of Rossville, Tennessee. Operating from 1979 until 1992, scrap lead and batteries were brought in and processed to recover the lead. As a result of the battery cracking and recovery process, battery acids laden with lead drained into the soils on the property and impacted both soils and surficial groundwater. Response at the site was broken up into two operable units (OU). Response at OU 1 included removing lead contaminated soil and debris with off-site disposal. OU 2 management has consisted of groundwater monitoring and maintenance.

OU 1 was management of contaminated soils (completed in 2004) with the State's 10% match previously paid to EPA totaling \$691,585.49. EPA is requesting an additional \$159,384 but the Department is waiting on receipt of appropriate supporting documentation. OU 2 was the management of contaminated groundwater (currently ongoing). The Department has signed an SSC for Credit for ground water monitoring. The Department will sample wells and perform activities which may minimize or eliminate the need for the Department to finance long term O&M. The EPA proposed ground water remedy (OU-2) calls for monitored natural attenuation with O&M. The O&M costs would be 100% funded by the Department.

Alamo Ground Water Plume NPL Site

A contaminated ground water plume from known and unknown sources has impacted the City of Alamo water supply. The City currently uses an air stripper to reduce VOC's concentration in the water. The Site was placed on the federal NPL in September 2011. An evaluation is currently underway on possibly relocating the water supply wells away from the groundwater plume. TDEC expects to fund 10% of the cost of relocating the water supply if the current evaluation determines that the relocation is necessary.

Wrigley Charcoal NPL Site

This facility was a former iron, charcoal and wood distillation products manufacturer. Contaminants on-site and off-site in both soil and groundwater include both free-product and dissolved phase Base Neutral Acids, Inorganics, Metals, PAHs and VOCs. EPA is currently reevaluating the site and intends to revise the Record of Decision (ROD). A Feasibility Study is being finalized which evaluates potential remedial actions, with a proposed total cost estimate for the site of \$15,433,000 including ~\$1,340,000 in long-term O&M costs. Before EPA can implement a remedial action, an SSC must be executed with the Department.

Smokey Mountain Smelters NPL Site

This site was added to the National Priority List (NPL) during 2010. EPA stabilized the site by installing a temporary soil cover over aluminum dross and salt cake under an EPA Superfund removal action. This action addressed the immediate threats from the site and since it was a removal action there was no state match. An appropriate remedial action that provides a long term solution has not been determined.

Murray Ohio Landfill

Murray Ohio Landfill is a former municipal/industrial dump with on-site groundwater and soil contamination from heavy metals including chromium, nickel, and zinc, as well as VOCs. The landfill was allegedly operated by a subdivision of the State and, if correct, the State match may be 50% instead of 10%. The State intends to take the lead in performing portions of the Remedial Action in an effort to control costs. Costs included in the EPA 95% Remedial Design for stream/groundwater remediation, cap repairs and O&M are estimated at \$4,811,232. The State anticipates beginning this work in 2014. Site specific financial assurance exists to pay some of the expenditures for this site.