



Engineering Technical Support Center FY08 Annual Report

Land Remediation and Pollution Control Division
National Risk Management Research Laboratory
Office of Research and Development
U.S. Environmental Protection Agency

March 2009

Engineering Technical Support Center (ETSC)
Annual Report
Fiscal Year 2008

For information, contact:

David J. Reisman, Director

(513) 569-7588 (office)

(513) 919-7136 (cell)

Table of Contents

SECTIONS	PAGE
1.0 Background.....	3
2.0 FY 08 ETSC Support	5
3.0 FY 08 Highlights of Assisted Sites	8
Appendix.....	14

FIGURES & TABLES	PAGE
Figure 1. Total Actions and Sites, FY 08 & Average Actions per Site, FY 08.....	5
Figure 2. EPA Class Summary, FY 08.....	6
Figure 3. Total Sites & Actions per Region, FY 08.....	6
Figure 4. Technologies Implemented at Assisted Sites, FY 08	7
Figure 5. Contaminant of Concern (COC) at Assisted Sites, FY 08.....	7
Table 1. ETSC Associates	4

1.0 Background

The United States Environmental Protection Agency's (EPA) Office of Research and Development (ORD), Office of Solid Waste and Emergency Response (OSWER) and Regional Waste Management offices established the Technical Support Project (TSP) in 1987 to ensure that ORD scientists and engineers were accessible to the Agency's Regional decision-makers, including Remedial Project Managers (RPM), corrective action staff, and On-Scene Coordinators (OSC). In addition, the establishment of the TSP was to allow ORD personnel to provide effective technical assistance. The TSP consists of a network of Regional forums and specialized Technical Support Centers (TSC) within ORD. The Engineering Technical Support Center (ETSC) is one of four major TSCs with an operative objective to network with EPA programs and other federal agencies for the delivery of the latest methods, approaches and technologies necessary to characterize, remediate and manage risk at contaminated sites.

The goal of the ETSC is to provide scientific and engineering knowledge and expertise in soil, sediment and mine remediation and technology to regional staff for risk management decisions. Services include field evaluation and demonstration of innovative technologies, verification of externally acquired data, development and testing of management techniques and disposal practices, and technical assistance to RPMs and OSCs. In the past several years, ETSC staff has also assisted in five-year Superfund site reviews and has completed applied research projects that support site-specific technical assistance requests.

Although the ETSC is primarily staffed with ORD Land Remediation and Pollution Control Division (LRPCD) scientists and engineers, additional assistance is provided by National Risk Management Research Laboratory (NRMRL) personnel from other ORD divisions, external contractors and consultants. Those LRPCD staff members actively involved in providing support in FY 08 are listed in Table 1.

ETSC constantly re-configures its operations to meet the myriad of site needs required by regional and site personnel. ETSC is known for its punctuality and the staff pride themselves on consistently responding within 48 hours of a request. ETSC insures quality support, through it's internal mechanisms, and is continually adding customers and increasing the growing number of return requesters.

TABLE I
FY 08 ETSC Associates

<p>Carolyn Acheson Ph.D., Chemical Engineering (513) 569-7190; Acheson.carolyn@epa.gov</p>	<p>Souhail Al-Abed Ph.D., Environmental Chemistry (513) 569-7849; Al-abed.souhail@epa.gov</p>
<p>Edwin Barth Ph.D., Environmental Health Engineering (513) 569-7669; Barth.edwin@epa.gov</p>	<p>Edward Bates M.S. Geology (513) 569-7534; Bates.Edward@epa.gov</p>
<p>Daniel Claes, Assistant to the Director Contractor (departed Fall 2008)</p>	<p>Robert Ford Ph.D., Environmental Systems Engineering (513) 569-7501; Ford.Robert@epa.gov</p>
<p>Verle Hansen Ph.D., Design and Planning (513) 569-7326; Hansen.Verle@epa.gov</p>	<p>Tammy Henry, Assistant to the Director Contractor (departed Fall 2008)</p>
<p>Terry Lyons M.S., Environmental Engineering (513) 569-7589; Lyons.Terry@epa.gov</p>	<p>Kenyari Moore, Assistant to the Director Contractor (513) 569-7336; Moore.Kenyari@epa.gov</p>
<p>Randy Parker B.S., Mechanical Engineering Remediation and Redevelopment Branch (RRB), Chief</p>	<p>David Reisman M.S., Environmental Science ETSC Director</p>
<p>Steven Rock M.S., Environmental Engineering (513) 569-7149; Rock.Steve@epa.gov</p>	<p>Kirk Scheckel Ph.D., Soil Chemistry (513) 487-2865; Scheckel.Kirk@epa.gov</p>
<p>Joseph Schubauer-Berigan Ph.D., Aquatic Ecology/Microbiology (513) 564-7547; Schubauer-Berigan.Joseph@epa.gov</p>	<p>Michelle Simon Ph.D., Soil, Water and Environmental Science (513) 569-7469; Simon.Michelle@epa.gov</p>
<p>Dennis Timberlake M.S., Chemical Engineering (513) 569-7547; Timberlake.Dennis@epa.gov</p>	<p>Thabet Tolaymat Ph.D., Environmental Engineering (513) 487-2860; Tolaymat.Thabet.epa.gov</p>
<p>Ann Vega M.S., Environmental Science (513) 569-7635; Vega.Ann@epa.gov</p>	

2.0 FY 08 ETSC Support

In FY08, ETSC developed a metric for measuring annual responsiveness to regional requests. A database was developed that included an entry for an action on a site where there was a written record. For example, a review of a document or a site visit are both recorded as an action. A total of 449 technical assistance actions were reported at 100 different sites in FY08 representing the second highest total in the history of ETSC. In FY08 assistance with abandoned mine land remediation and passive treatment alternatives continued to be a significant portion of ETSC work. Trend in site and actions totals from FY02-08 are displayed in Figure 1. The average number of actions per site for FY08 was 4.73 with the previous annual averages for FY02-08 also displayed in Figure 1.

In FY08, the technical support actions were dispersed among 100 sites, of which 78 or 78% of the total, fall under CERCLA classification, 7% more than the 72 CERCLA sites seeking technical assistance in FY07. Of those 78 sites in FY08, 35 are on the National Priorities List (NPL). Additionally, two ETSC sites classified as RCRA/CERCLA are Final NPL sites. Figure 2 indicates how the ETSC sites are classified.

All 10 Regions received ETSC technical assistance during FY08. Regions 4 and 8 were the recipients of the most technical support actions, 18% and 25% respectively. Region 4 had the most sites per region, 22% of the total, with Region 5 having the second highest amount of sites at 13%. A complete breakdown of total sites and actions per Region is displayed in Figure 3.

Approximately 24 technologies were implemented, or proposed, for the assisted sites and stabilization/solidification was the most implemented technology in FY08. Many sites are in earlier CERCLA stages, so either the technology has not been selected, or it is unknown. Other assistance included testing passive biochemical reactors and providing assistance on landfills, including capping, stability and gas extraction. As indicated in Figure 4, 19 of the 100 sites had no assigned remedial technology. A complete breakdown of all remedial technologies for FY08 is displayed in Figure 4. Figure 5 displays the totals for the contaminants of concern encountered at the sites assisted by ETSC staff in FY08, with metals and VOCs being the most common.

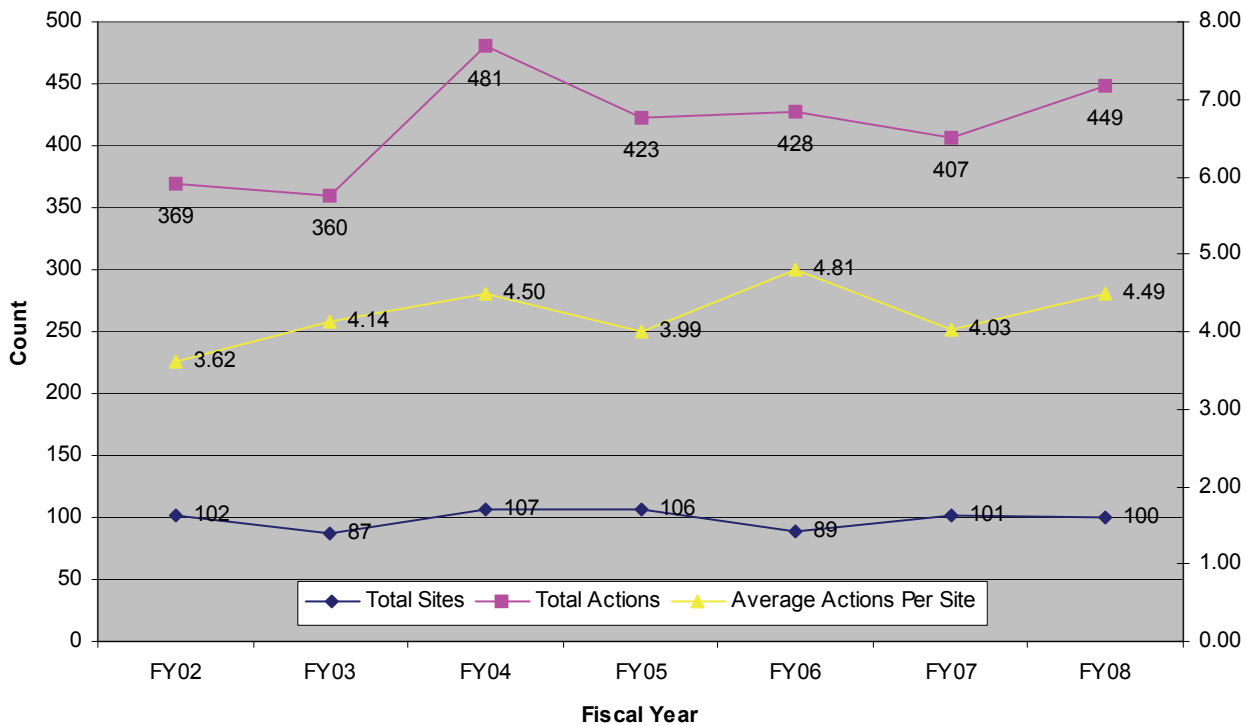


Figure 1. Total Actions and Sites, FY08 and Average Actions per Site, FY08

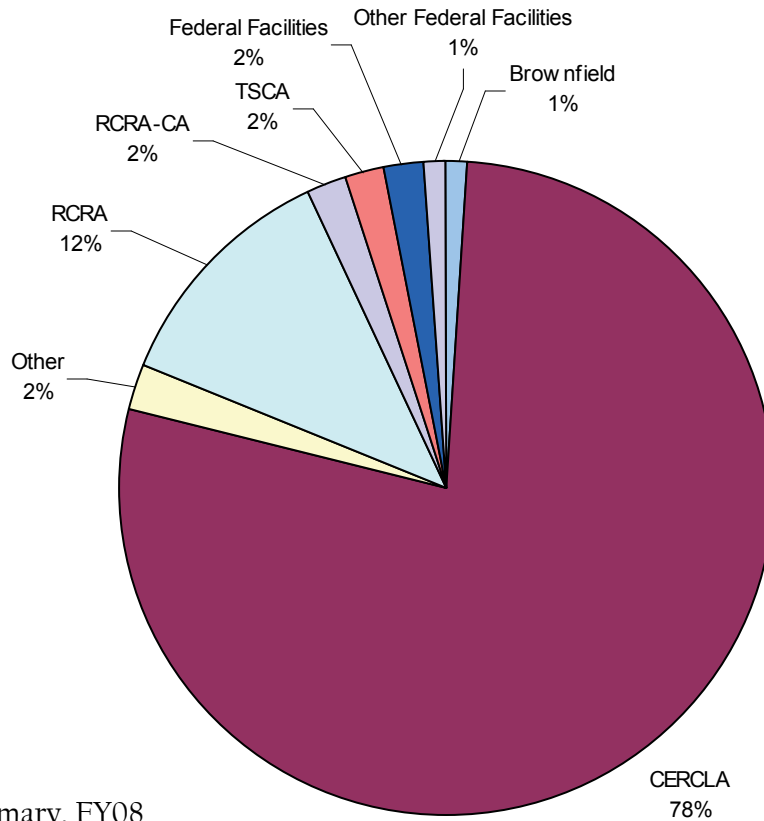


Figure 2. EPA Class Summary, FY08

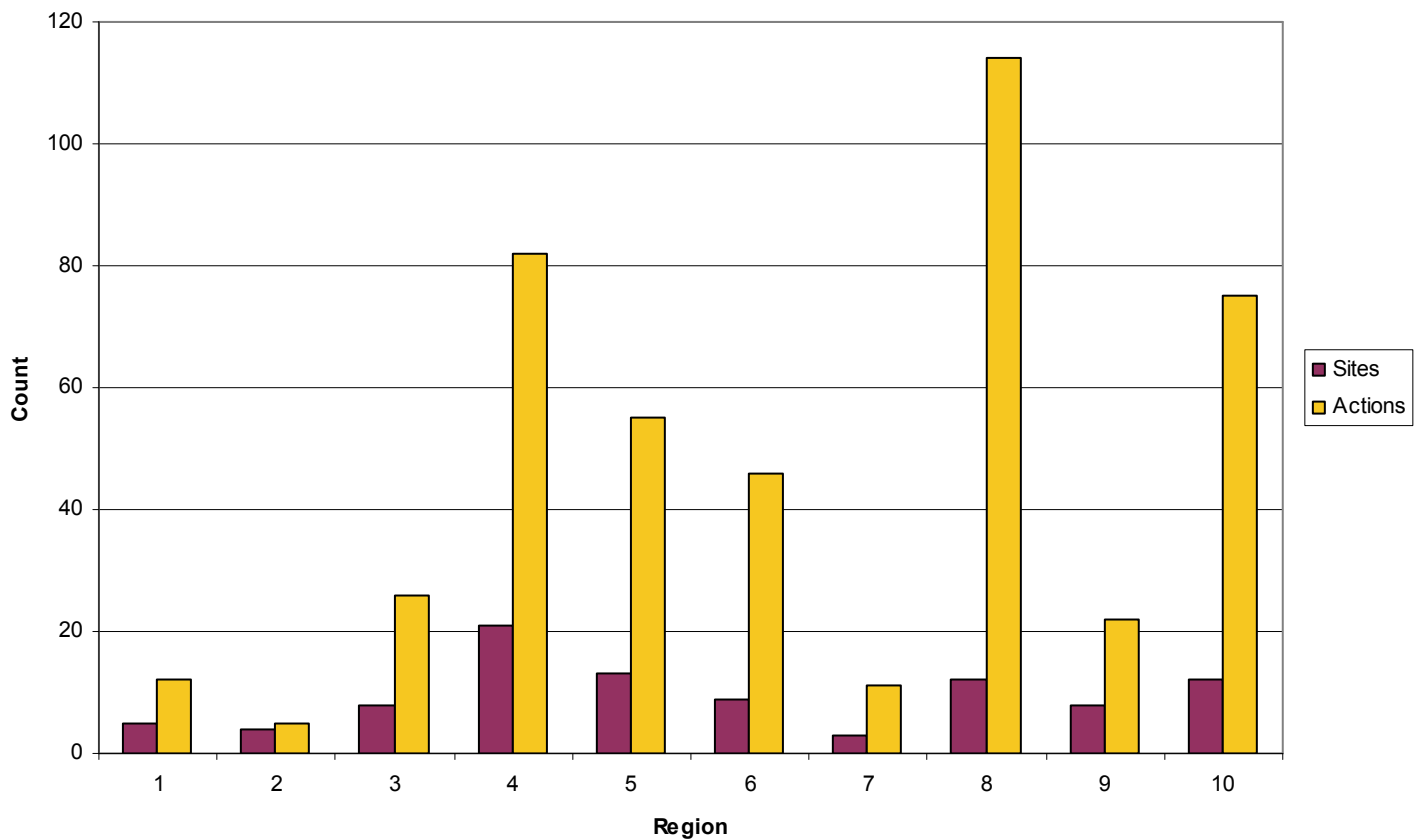


Figure 3. Total of Sites & Actions per Region, FY08

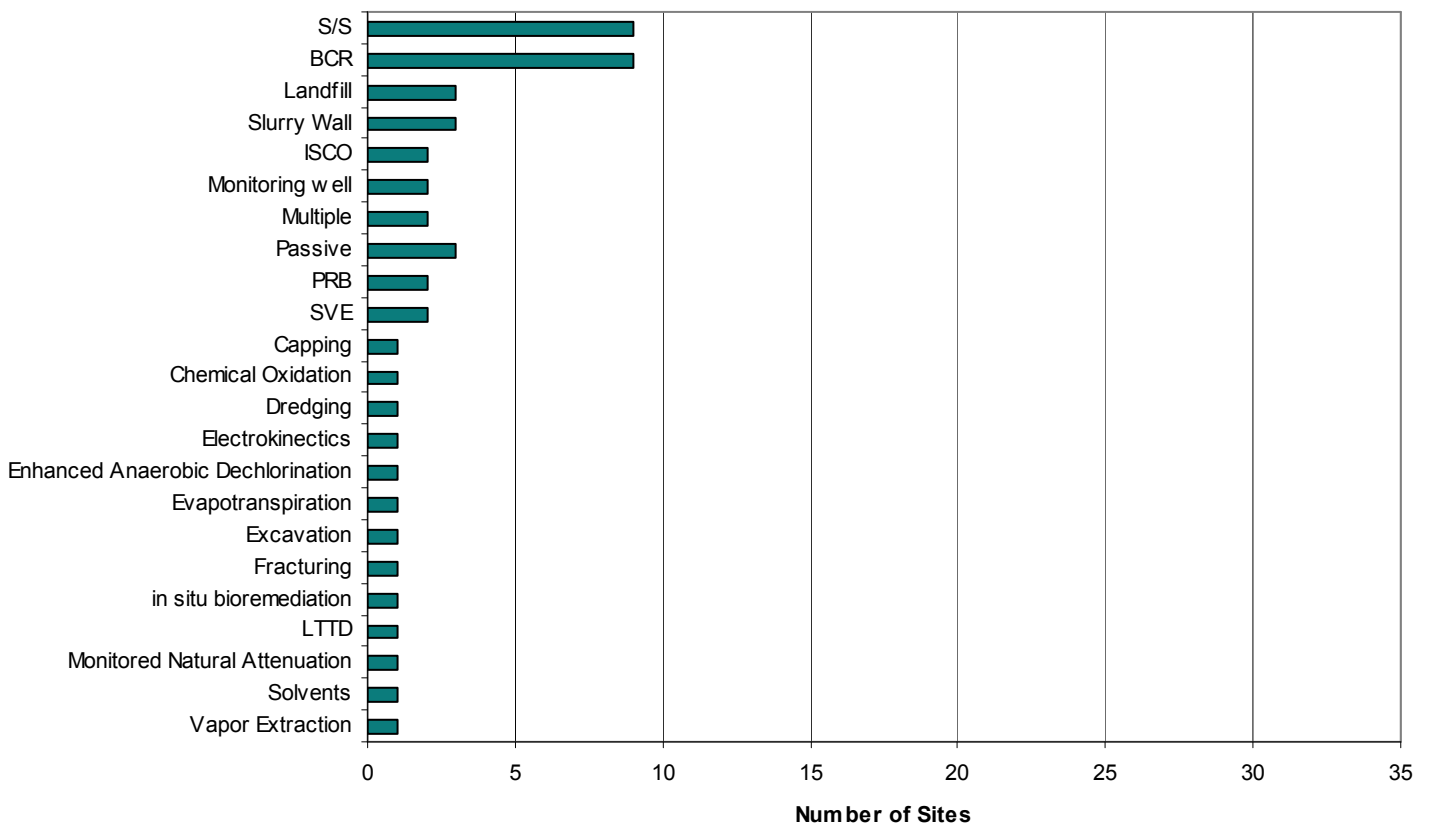


Figure 4. Technologies Evaluated/Implemented at Assisted Sites, FY08

50 sites contained non-tech related assistance

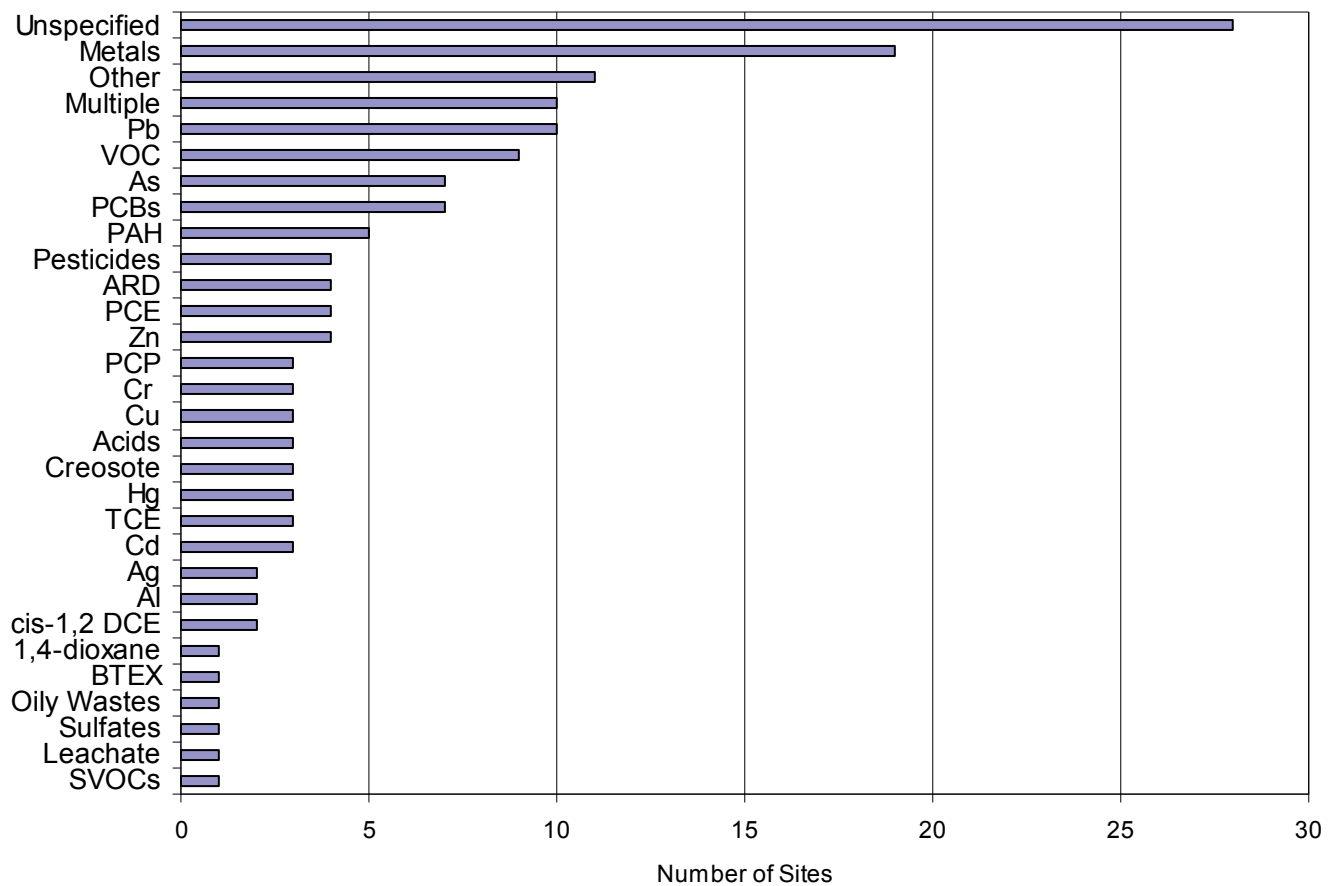


Figure 5. Principle Contaminant of Concern at Assisted Sites, FY08

3.0 FY08 Highlights of Assisted Sites

REGION 1	Mohawk Tannery Facility	
Technology: Undetermined	COC: unknown	EPA ID: NHD981889629

Mohawk Tannery Facility is located on approximately 30 acres in Nashua, Hillsborough County, New Hampshire and produced tanned hides for leather for 60 years (1924-1984). The facility is a Superfund site and was proposed due to disposal practices of waste water containing chromium, zinc and phenol into the Nashua River. Sludge containing chromium, pentachlorophenol, phenol and 2,4,6-trichlorophenol was deposited into various unlined disposal areas, or waste lagoons, at the site. Mohawk Tannery was placed on the National Priorities List in 2000. The risks posed by the site's waste disposal practices affect the approximately 5,025 people who receive drinking water from the groundwater wells within a 4-mile radius of the site. A majority of people receive potable drinking water from the local water district.



Previous to FY 08, ETSC had reviewed Region studies of the site for the RPM. Subsequently the Region requested ETSC to take a lead role in developing the remediation plan for the site and conducting studies leading to a possible remedy. During FY08 2008 ETSC staff issued an extensive scope of work to its contractor. ETSC then reviewed the contractual work plan, made suggested changes in concert with the Region and began work which included both bench and pilot scale treatability studies for the stabilization/solidification of the PAH-contaminated soils and sludges. In the final quarter of FY 08, ETSC staff reviewed the proposed workplan for the Mohawk Treatability Studies. In FY 08, ETSC staff provided comments and will continue to provide guidance /technical direction on the project scope under the workplan. Ed Bates serves as the primary ETSC lead on this project and as the contractual task order manager.

REGION 2	Cortese Landfill	
Technology: Landfill	COCs: VOCs and heavy metals	EPA ID: NYD980528475

Located on five-acres, in the Village of Narrowsburg, Town of Tusten, Sullivan County, NY, is the Cortese Landfill site. Cortese Landfill, formerly managed by the John Cortese Construction Company, was in operation from 1970-1981. The site received industrial wastes including waste solvents, paint thinners, paint sludges and waste oils. In the 1980s the New York Department of Environmental Conservation found VOCs and heavy metals in the ground and surface water near the site. A municipal well, located approximately 1500 ft. from the site, was taken out of service as a precautionary measure.

The 1994 Record of Decision identified drum removal, capping of the landfill and groundwater extraction and treatment as the selected remedy for treatability. A reassessment of the ROD suggested an alternative groundwater treatment. In FY 2008 ETSC staff provided detailed guidance on the alternative groundwater treatment option. Region 2 staff proposed a treatability test that would utilize a surfactant-aided, alkaline activated, persulfate in-situ oxidation process (S-ISCO) to treat a mixed-NAPL at the landfill site in lieu of the 1994 ROD remedy of pump & treat. By re-evaluating the current treatment methods ETSC staff, in collaboration with Region 2 staff, are interested in using more innovative technologies to remediate the groundwater. It is anticipated that a decision regarding how best to address the groundwater will be made in summer 2009. Michelle Simon serves as the ETSC project lead.

REGION 3	Central Chemical	
Technology: Multiple	COCs: Pesticides and Metals	EPA ID: MDD003061447

A former pesticide and fertilizer blender, Central Chemical, located in Washington County in Hagerstown, MD, operated and produced commercial grade products for 50 years (1930-1980). Waste materials from the manufacturing process, as well as waste generated during the cleaning of processing equipment, were disposed of in an on-site depression. Contaminants found in site soil, groundwater, surface water, sediment and in the tissue of fish downstream include: arsenic, lead, benzene, aldrin, chlorodane, dieldrin, methoxychlor, DDD, DDE, and DDT.

In 2006, the PRP provided EPA with early portions of the feasibility study, evaluating the best cleanup options for the site. The draft feasibility study was provided to EPA in 2007 by seven potentially responsible parties. During FY 2008, ETSC staff provided direction and continued support to Region 3 and the RPMs as RI/FS plans were being made and the documents modified. ETSC staff suggested multiple options and a combined innovative treatment for remediation, including in-situ stabilization and/or solidifications of the pesticide lagoon, use of both augers and a Lang mixture for a soil treatment, and also and in-situ chemical oxidation (ISCO) using Fenton's reagent. The proposed plan, describing EPA's preferred cleanup alternative for the site soils and wastes, will be issued in 2009. Ed Bates serves as the ETSC technical lead for the project.

REGION 4	Brunswick Wood Preserving	
Technology: Solidification/ Stabilization	COCs: Creosote and PCPs	EPA ID: GAD981024466

Brunswick Wood Preserving, an 84-acre former wood treatment facility, operated from 1958-1991. The CERCLA site, located in Glynn County, GA treated wood using pentachlorophenol, creosote and CCA. The site opened in 1958 as the Escambia Treating Company and operated on a previously clean site for 37 years. Public risk from the site is due to municipal wells and private wells in the vicinity. Additionally, the site is adjacent to Burnett Creek, a local, tidally-influenced water source.

Removal of hazardous materials began in 1995 with most structures demolished and removed, sludges were dewatered, water was treated and drums and lab wastes disposed. Poles, lumber, equipment and scrap were salvaged. Large areas of contaminated soils and sludge were excavated. On-site private wells were extensively sampled and no impact has been found. The Remedial Investigation and Feasibility Study (RI/FS) was completed in 2001 and the proposed remedy for remediation, outlined in the OU1 is Capping with Construction of Subsurface Barriers to address site-wide soils and groundwater. Construction for the OU1 began in summer 2007 and old creosote ponds at the site were dewatered, excavated and backfilled. Excavated ponds, soils and sediments have been stockpiled on-site with the start-up of the solidification treatment component.

ETSC has worked continuously with Region 4 on this site for several issues under a long-term assistance arrangement, and Ed Bates received an award from the region in 2008 for his efforts at the site. During FY 08 ETSC staff continued technical support as it related to site construction of the slurry wall and limestone treatments. ETSC staff advised Region 4 staff regarding the next implementation of treatability tests and conducted on-site inspections of excavation and stockpile activity in preparation for S/S and slurry wall operations. Additionally, Ed Bates participated in meetings and conference calls regarding continued adjustments to the slurry wall and to evaluate the rock coring being done to the wall. Ed Bates is the ETSC project manager and will continue his assistance in FY 09.

REGION 5	Tremont City Barrel Fill	
Technology: Landfill	COCs: Undetermined	EPA ID: OHD980612188

Tremont City Barrel Fill, is located in Clark County about 2 miles west of Tremont City, Ohio and about 4 miles northwest of Springfield, Ohio. The 80-acre site is comprised of the closed landfill, a former waste transfer facility, and the closed barrel fill. The barrel fill includes 8.5 acres and is located on the northwest end. In 1969, the Ohio Department of Health approved plans to operate the landfill. The landfill operated until 1995. Material disposed of at the landfill included industrial wastes, including epoxy dust, lead-based paint sludge, and oil sludge. The waste transfer facility operated from 1977 to 1985. In the earlier part of this time, the facility operated as a waste oil and chlorinated solvent reclamation center. For five years (1980-1985) the facility recycled oil and in 1997, U.S. EPA took over responsibilities from Ohio EPA as the lead regulatory Agency for the site. In March 2007, the U.S. EPA divided the former Tremont City Landfill Site into three Sites: the Tremont City Barrel Fill Site, the Tremont City Landfill Site and the Tremont City Waste Transfer Facility Site.

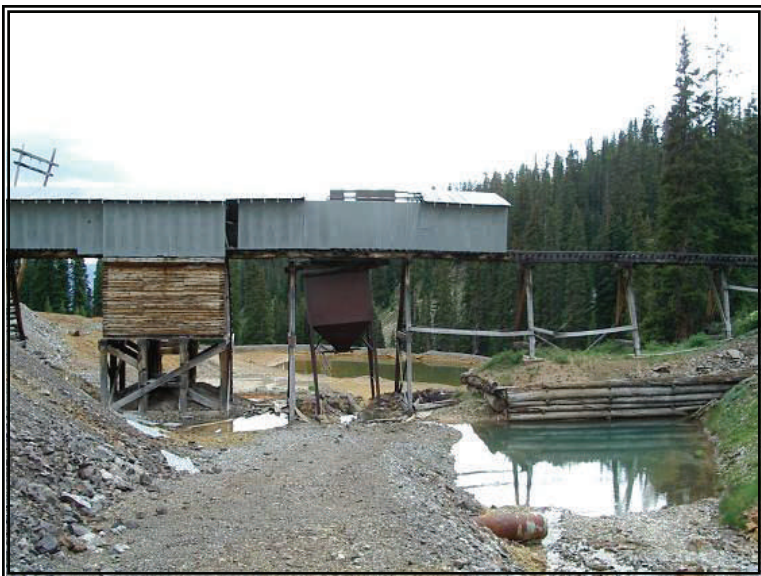
In FY 08, ETSC has worked closely with the region on reviewing the Feasibility Study (FS) and the proposed FS addendum. The current alternatives have been reviewed and differences in opinion exist among the PRP, Region and the Ohio EPA on the remedy alternative for the site. Conference calls have centered at looking at the original remedy alternatives, and additional remedies proposed during the review. The FS Addendum will be delivered to the EPA during FY 09 second quarter and additional review and discussions will be held on the alternatives. David Reisman is serving as the ETSC lead, assisted by Ed Barth.

REGION 6	Homestake Mine	
Technology: Undetermined	COCs: Metals	EPA ID: NMD0007860935

Homestake Mine is located 5.5 miles north of the Village of Milan in Cibola County, NM. This Superfund site is the a former uranium mill owned by Homestake Mining Company (HMC) at the time of mill operations. HMC operated the mill for 32 years (1958-1990) and the mill was decommissioned and demolished between 1993 and 1995. Two tailings piles are located on site: the first covers 200 acres, is 100 feet high and contains approximately 21 million tons of mill tailings and the second is a small impoundment covering 40 acres, is 25 feet high and contains approximately 1.2 million tons of mill tailings. The tailings piles are located on alluvium, overlying the Chinle and San Andres aquifers. Although the nearest residence and drinking well are 3000 feet away from the site, the alluvium was used primarily for domestic water supply, which affected the 200 people who live within a mile of the tailings piles.

In FY 08, ETSC staff spent quite a bit of time working with the Region 6 RPM and his management on the site. Working with Kathleen Yager of the Office of Superfund (OSRTI), ETSC developed a scope of work, issued a contractual work order, and approved a work plan for conducting a remediation optimization study for the closed Homestake mine. The first draft was considered incomplete during agency and peer review, so an additional scope of work was issued, contractual work completed, and a final report was issued in the first quarter, FY 09. During the process, a site visit was conducted with a thorough site tour, and was combined with a public meeting with the stakeholders. The current remediation is an injection of water into the tailings combined with an extraction system, a reverse osmosis treatment facility, and on-site disposal and evaporation ponds. The site is actually a NRC and PRP-led remediation with the EPA and the State of New Mexico operating in an oversight capacity. David Reisman, assisted by Robert Ford, are the ETSC project personnel.

Region 8	Standard Mine	
Technology: BCR	COCs: heavy metals (As, Ba, Pb, Zn, Cd, Cu, Cr)	EPA ID: CO0002378230



Standard Mine, one of the three largest silver producing mines in the area, is situated on 10 acres in the Ruby Mining District of the Gunnison National Forest, CO. The mine was in operation for 100 years (1874-1974) and was identified by the Colorado Geological Survey as the most environmentally degraded mine site in the entire Ruby Mining District. The mine is located 30 miles north of Gunnison and 10 miles west of the town of Crested Butte.

The contaminants of concern at the mine site are primarily heavy metals with samples identifying elevated levels of manganese, lead, zinc, cadmium and copper. Depending on the season, Standard Mine releases 70 gpm (during high flow) and 5-20 gpm (low flow) of mine influenced water (MIW) from the abandoned mine workings into Elk Creek.

The potential threat from Standard Mine is to water users downstream from the site—Elk Creek, which flows through the mine site deposits heavy metals into Coal Creek (the city water supply), which runs through Crested Butte until it meets the Slate River. The remote site, located at an elevation of 11,000 feet, is accessible only by foot, mountain bike or four-wheel drive vehicles and consists of waste pilings with open and unmarked adits and shafts.

During FY 08 ETSC staff worked closely with contractors, the site RPM and OSC of Region 8 on site construction and the pilot BCR systems biochemical reactor (BCR), a new chitorem reactor and an aerobic polishing cell to clean the treatment effluent. Due to unforeseen issues, ETSC staff visited the site on several occasions to fix the pump and solar panels as well as the remote data collection system. This unique pilot system is a test prototype for the region to review with the possibility of building future systems at many of the mine sites in the region.

In FY 08, data was collected remotely using a unique sampling system that transmitted results by satellite. In addition, on-site biweekly water samples were taken of influent and effluent waters by ISCO samplers powered by a solar panel system designed specifically for the site. Excess solar energy was used to heat the shed in another uniquely-designed system. During the winter of 2008, the sampling shed and the BCR were covered by snow (snowfall exceeded 600 inches). Data showed the system was successful in treating water continuously throughout the year. An additional chitorem (chitin) substrate system was added in FY 08 to test the effectiveness of this system to remove manganese—the last metal found to exceed water quality standards. This system was constructed for under \$10 K. The final developed piece of the system was the aerobic polishing cell (APC) which was designed to increase oxygen in the discharged water.

The BCR effluent has been tested and is toxic to aquatic life because it is mostly anaerobic and contains very low amounts of dissolved oxygen. The danger posed to aquatic species is due to the levels of oxygen, as they need oxygenated water for survival. The APC is designed to aerate the effluent, as well as to change both the chemical and biological oxygen demands, and to remove other possible toxic elements before discharge. The system will be monitored in FY 09 by the region to insure the system is successful. ETSC will advise the region and will conduct an effluent toxicity study in FY 09. David Reisman serves as the project lead and co-designed the system along with engineers from Golder Associates, Inc.

Region 9	Purity Oil	
Technology: Solidification/ Stabilization and capping	COCs: Pb, acid waste & oily wastes	EPA ID: CAD980736151

Purity Oil Sales, a CERCLA site located in Fresno County, CA and situated in the San Joaquin drainage basin, operated as an oil reprocessing facility for 40 years (1934-1974). Oil and oil by-products from the refining process were collected and stored in sumps, storage tanks and on-site sludge pits. Waste from the site, such as waste oil sludge was used by local farmers for dust control or buried on-site in unlined pits and ponds. Contamination problems resulted during site operation from the improper storage and disposal of waste and numerous surface spills. In 1973 Purity Oil began to empty and backfill waste pits; although these pits were backfilled with construction debris there is no evidence that they were emptied. In 1976 a fire on site destroyed the main warehouse and adjacent equipment. The remaining equipment was removed from the site and the area was partially re-graded. By 1982 the site was abandoned.



Until October 2000, approximately 225 residents lived a trailer park adjacent to the site. The groundwater surrounding the site has been contaminated by VOCs and heavy metals and the Fresno Aquifer, located near the site is designated as a sole source aquifer, and provides water for municipal, industrial, and agricultural purposes, as well as for a number of private wells. Clean-up progress to date includes removing hazardous materials and tanks, providing alternate water supplies to affected residents, and fencing the site. These activities have reduced the risk of potential of exposure to contaminated materials at the site while final groundwater and soil cleanup activities are conducted.



ETSC staff provided technical assistance to Region 9 by visiting the site and maintained thorough oversight of the construction of capping waste. ETSC staff conducted an inspection of remediation operations and worked with the RPM on the SVE Workplan and the Sampling and Analysis Plan and Addendum. ETSC made recommendations concerning sampling and best practice methods throughout this stage.

ESTC was primarily instrumental in providing USEPA oversight continuity and technical expertise over more than 15 years of remedial operations. ETSC's Ed Bates and Michelle Simon assisted Region 9 RPM Gary Riley in the technical oversight for excavation and capping operations during FY08. ESTC's Michelle Simon added technical support for the design and interpretation of the enhanced landfill gas extraction system and data. The site has been successfully capped and the enhanced landfill gas extraction system is scheduled to be designed and installed in 2009.

REGION 10	Eastern Michaud Flats Contamination	
Technology: Landfill	COCs: phosphine and metals	EPA ID: IDD984666610

Located near Pocatello, ID in Power County, Eastern Michaud Flats contamination is situated on 2,530 acres and had two phosphate ore utilization facilities: FMC Corporation and J.R. Simplot Company. Most of the FMC site and buildings have been removed, but many waste cells remain.

The FMC plant produced approximately 250 million pounds of elemental phosphorus per year; the elemental phosphorus was sold and used in a variety of products from cleaning compounds to foods. Primary by-products from the production process were slag, which was stored on-site, ferrous-phosphate residuals, carbon monoxide and several aqueous streams, such as phosphy water/solids, precipitator slurry, calciner water/solids, and industrial wastewater. In December 2001 FMC shut down operations.



Simplot photo

Currently the J.R. Simplot facility produces 12 principle products, including five grades of solid fertilizer and four grades of liquid fertilizers. The raw materials for their processes are phosphate ore, sulfur, air and natural gas. Phosphogypsum is the primary waste by-product and is pumped as thick slurry to large unlined stacks south of the processing plant. The plant also treats water from the various processes which is nutrient rich and sold for irrigation and fertilizer.

Public and private wells, located three miles within the area of the site, provide water to approximately 55,000 residents and are also used to irrigate land. Risk from groundwater contamination from Eastern Michaud Flats was identified in 1976 by the Idaho Department of Health and Welfare though a monitoring study down gradient from the three plants. The study's results showed

elevated levels of arsenic, lead and cadmium exceeded Federal Drinking Water standards. Further sampling during the 1980s confirmed these results and the site was listed on the NPL in 1990.

During FY 08 ETSC staff continued working primarily with R10 regarding FMC Pond 16S and the potential hazards posed by the emissions of phosphine gas emanating from the pond (actually a capped disposal site). In the last three years, meetings have been held with the Region, State of Idaho Department of Environmental Quality, the Shoshone Tribe and other concerned citizens, as well as FMC and its contractor, MWH, Inc. As the initial portion of the remedial action work plan, FMC built a permanent extraction system and the design was reviewed and modified several times. When first put into operation during FY 08, the system was shutdown several times due to different failures. A several month delay occurred to modify the current functioning system to extract the phosphine gas, calculated to be greater than 200,000 ppm in the pond. Weekly data reports are reviewed by all parties and throughout FY 08 and FY 09, bi-weekly calls were and will be held to insure progress is being made and the system operates safely, effectively and efficiently. In FY 09, an optimization plan was finalized and the system is being tested.

At the Simplot site, ETSC staff is again working with Kathleen Yager of the Superfund office (OSRTI) on an independent design review of the facility and its operation. Focus will be mainly on GW contamination and looking at source areas, as well as the gypsum-phosphate slurry and stack to attempt to identify areas for improvement.

It is anticipated that other technical reviews on the two sites will be part of the FY 09 assistance. David Reisman is serving as the ETSC contact for the site. Until the gas is removed from Pond 16S, no remediation at the site can be started. There are additional ponds at the site that may have similar issues. The Region and the State are considering re-opening RCRA issues, such as a modification to the Pond Closure plans.



FMC site

Appendix

The following appendix lists an overview of the 100 ETSC FY08 sites and a summary of the support provided. In addition, the major contaminants of concern and the technology used, or considered, are listed for each site. For some sites in the early CERCLA phases (pre-Feasibility Study) the technology is undetermined or multiple technologies are being considered.

Region	Site	Technology	COCs	Summary of Support in FY 08
1	Elizabeth Mine	BCR	Cu, metals, ARD	E-mail; trip
1	Fletcher's Paint Works and Storage	Undetermined	PCB	Award of RARE proposal
1	Mohawk Tannery	Undetermined	Unknown	A few conference calls and e-mails regarding site needs and updates on field work; Reviewed and commented on Mohawk Treatability Studies and the QAPP and Sampling Plan
1	VAG Mine Site	Unknown	Metals	A few conference calls with the OSC, the Region and Technology vendor
1	West Kingston Town Dump/ URI Disposal Area	ISCO	Unknown	Review of ISCO Draft Pilot Study workplan and submission of a request for further FDSA Delineation activities
2	Cortese Landfill	Undetermined	VOCs	I-ISCO risk sharing proposal and participation on Technical Evaluation Panel
2	GEMS Landfill	Undetermined	Unknown	Initial contact made with site regarding questions of possible use of solar energy on the existing the existing landfill; sent draft of RARE report.
2	Mercury Refining, INC	Electrokinetics	Hg	Reviewed draft responses to comments on the proposed remedy (solidification/stabilization) for the ROD and provided advice on the responsiveness summary for the site; provided assistance on formulating a response to S/S comments.
2	Standard Chlorine	Undetermined	Unknown	Inspect slurry wall construction
3	Bendix Flight Systems	Undetermined	Unknown	Initial contact with site made; responded to a request for support from Region to evaluate technologies at the site.
3	Bettis Atomic Power Lab	Vapor Extraction	PCE, TCE, 1,2PCE	Several conference calls with one point of discussion being VOC removal from vapor; review and advise ESVE operations and inactive waste study with USACE; meeting with RPM and USACE to discuss site closure criteria with several follow-up meetings, both internal and external.
3	Central Chemical (Hagerstown)	Multiple	Pesticides	Continued support and advising on FS/RI; Evaluation of ISCO for Remediation; suggested use of augers and a Lang mixture for soil treatment and Fenton's reagent for ISCO remediation.
3	Foote Mineral Co	S/S	Li, tar	Inspect site and discuss remedial design
3	Keystone	Undetermined	Unknown	Review of July 2007 Keystone Performance Monitoring Report; discussion on velocity calculations from monitoring points to extraction wells
3	Marjol Battery	S/S	Pb	Provided subject advice on arsenic content as a contaminant of concern and leaching prevention methods and also discussed cap design in a conference call summary.
3	Maryland Sand, Gravel & Stone	LTTD	VOCs, SVOCs	Reviewed and commented on Pre-final Design Report for OU3 with Addendum A-1 and had discussions on AIR2D

Region	Site	Technology	COCs	Summary of Support in FY 08
3	Sauer Dump Site	PRP	PCB	Discussed possible remedial actions with Region 3
3	Straight Creek UAA	Undetermined	Unknown	TDS technology discussion with ORD and requested water chemistry
4	American Creosote-Tennessee	PRB Permanganate	Unknown	Discussed data needs, the direct push sensor and schedule for PRB; several site trips to oversee data collection, plume borings, and the treatment area for PRB well; provided guidance on LIP and MIP field work and investigation of plumes and participated in a RD scoping meeting.
4	BF Goodrich	Undetermined	Vinyl chloride	Initial discussion with STL regarding the contractor's SOW and critical review of SOW and contract work order.
4	Barite Hill/Nevada Goldfields	Not selected	Metals	Meeting with OSC and contractor to inspect clean-up activities and evaluate risk/advantages involved in the proposed grouting of the seep from the mine. Additional review and comments on Creek report, specifically advise on how to handle seepage from the pit into the stream.
4	Brunswick Wood Preserving	S/S	Creosote, PCP	Review of draft conference call summary and advised that alternative methods of measuring perms are not an option; continually advise and comment on wall alignment boring for the barrier wall and approved realignment of RFI-1 MA-4/5 barrier wall; inspect excavation and stockpile activity in preparation for S/S and slurry wall operations; review of preliminary bench scale results
4	Cabot/Koppers	Monitoring Well	Creosote, PCP	Met with Region staff and RPM; discussed potential technologies to remediate the site with PRP and contractor; participated in a conference call regarding minutes, updated remedial activities and response to the county's comments; participated in a technical meeting regarding status of site characterization, interpretation of site data and additional information for remedy selection and the RD and provided technical advice on the comprehensive sampling plan and analysis of contaminants at site.
4	Camilla Wood Preserving Company	Slurry Wall	PCP, creosote, dioxins	Oversaw installation of six rotosonic deep wells for PCP plume and collected samples for treatability tests.
4	Cape Fear	Undetermined	Cr, PAHs, benzene	Provided comments and continued review of the Draft Biopile Soil Treatment Unit Construction and Operation Plan
4	Defense Depot	Undetermined	PCA, PCE, PAH, PCB	Made initial contact; reviewed the distal end air sparger design and the remedial design. Provided advice on preliminary questions.
4	Gulf States Steel	Undetermined	Unknown	Review of draft and final work plan.
4	Marine Corp Logistics Base	Undetermined	Base neutral acids, metals, PAH, PCB	Review of request to alter installation specifications.
4	Meco Quarry Site(Jones Quarry VOAP Site)	in situ bioremediation	Multiple	Addressed request of evaluation point for services, clarified timeline and suggested better monitoring and performance measures of biotreatment.

Region	Site	Technology	COCs	Summary of Support in FY 08
4	MRI Corp.	S/S	Pb, As, Al	Provided advice on the conceptual design; reviewed and commented on the draft FDEP letter, proposed fact sheet, the revised "Cost Estimates for Remedial Alternatives," the final draft of the MRI proposed Plan Fact Sheet and technical memoranda: "Summary Treatability Study" and "Interim findings of Slurry Wall Compatibility"; resolved response to the F5 for OU2 and met to assemble technologies into remedial action alternatives.
4	National Starch and Chemical Company	Undetermined	Unknown	Reviewed Supplemental OU4 Feasibility Study and disagreed with SVE remediation.
4	Olin Chemical McIntosh Plant	Not selected	Hg, Cr, Pb	Discussed SOW for a subcontract to TetraTech; continued comment and review of SOW and Work Plans; several conference calls with RPM and contractor regarding contracts and 2008 work; approval of Contractor Management Task/Work Plan and commented on COPC lists for database.
4	Ore Knob Mine	Evapotranspiration	Metals, acids	Discussion with RPM regarding Bauxsol and other substrate treatments.
4	Redstone Arsenal 1	Undetermined	Unknown	Reviewed and commented on stabilization treatability study for arsenic, mercury and contaminated soils on-site.
4	Rock Creek (USFS: Daniel Boone National Forest)	Undetermined	Unknown	Reviewed cost data for AML treatment; participated in conference call on WQ standards; attended meetings and site visits with key individuals, technical experts and stakeholders to discuss strategies; and reviewed notes form WQ standards.
4	Sanford Gasification Plant	S/S	Pb, Ed, metals	Resolved issues with remedial design, schedule design admission and schedule remedial action.
4	Stauffer Chemical-Tampa	Excavation	Toxaphene, DDT, TPH, pesticides	Discussion regarding the use of subsurface walls at hazardous waste sites; met with RPM and PRPs to inspect the site and resolved plans for completing S/S treatability test and to inspect progress.
4	United Metals, Inc.	S/S	Pb, Cd, metals	Reviewed and commented on 30% Remedial Design Basis of Report; participated in a conference call to discuss the remedial design and advised RPM and contractor on site soils testing.
4	Velsicol Chemical Corporation/Hardeman Landfill	Solvents	HEX	Participated in two conference calls with RPM and contractor (Environ) on H&S plan issues with exposure, history and HEX wastes.
5	AK Steel Corporation/Dick's Creek	Multiple	PCBs, metals	Site visit; participated in conference call regarding IM3 design; reviewed and commented comments made by the state on the Phytoremediation Completion Report; reviewed and commented on conceptual design for the capture and treatment system proposed for MDA-33S; and proposed meeting to discuss the Floodplain Sediment design document.
5	AK Steel Manufacturing	Not selected	PCB	Suggested research of ion diffusion, circling hanging wall slurry wall and collection pipes installed by horizontal well drilling techniques; reviewed "Proposed Approach for MDA-33S Containment System"; and attended a meeting regarding the proposed trench/treatment system area.
5	Bennett's Dump	Undetermined	PBC, VOC	Initial contact made; provided technical support and assistance regarding best practices for PCB contaminated soils.

Region	Site	Technology	COCs	Summary of Support in FY 08
5	ChemCentral	Slurry Wall	VOC	Telephone consultation
5	Countywide Landfill	Landfill	Al	Participated in conference call with the State of Ohio and the region; participated in an on-site review of groundwater conditions; and discussed hydrogeology and groundwater issues.
5	Indiana Dunes National Lakeshore	Undetermined	Unknown	Review of NPS and USGS reports and conducted a site visit to sample plants and soils.
5	Indiana Harbor Canal (IHC)	Undetermined	Unknown	Reviewed adequacy of slurry wall design; participated in conference call regarding the South Cutoff Wall and discussed and reviewed Corp and Region 5 design documents; provided final comments of design documents; meeting with USACE concerning revised design proposal for the South Cutoff Wall; and reviewed South Cutoff Wall test section compliance report.
5	Little Traverse Bay CKD	S/S	CKD, Hg, As	Correspondence via e-mail concerning possible treatability study; reviewed and discussed alternative remediation; provided advice and assistance on mercury sorption by bauxite.
5	Menominee River (Great Lakes AoC)	Dredging	Ar	Initial contact for assistance with river sediment dredging
5	Ralston Street Lagoon	Capping	PCBs, metals	Advised and shared best practices for pilot study on LSD lagoon remediation; conducted a site visit and helped meetings regarding remediation and participated in a conference call to discuss two options for the site: compression and capping and filling the lagoon and solidifying
5	St. Regis Paper Company	Undetermined	PAH	Obtained background information regarding the site and previous operations and provided site with wood treatment sampling expertise.
5	Tremont City Barrel Fill Site	Undetermined	Unknown	Commented on Feasibility Study; participated in a three hour conference call with the region, OEPA, PRPs and attorneys on FS issues and ORD comments; reviewed and commented on RI and FS drafts and alternatives regarding waste seepage and containment longevity; and additional conference calls on alternatives.
5	Univar USA Inc-South Bend	Enhanced anaerobic dechlorination	VOCs	Discussion with contractor regarding plume remodeling; reviewed "Pilot Test Final Report" and participated in several follow-up conference calls regarding revisions; participated in internal discussion, as well as conference calls regarding "Corrective Measures Study" and participated in internal discussion of Univar BioChlor modeling.
6	Crystal Chemical Co.	Unknown	Unknown	Initial contact made and identified trees for hydrological control near slurry wall; created and participated in a conference call on the phytohydraulic control test.

Region	Site	Technology	COCs	Summary of Support in FY 08
6	Homestake Mine	Not selected	Metals, Ur, radioneucleotides	Delivery of contractor draft report on Homestake Mine Optimization Study; Work order task sent to contractor for site review; addressed OSRTI request to assist RPM; collaborated with region, state and contractors on Optimization Study; participated in several conference calls regarding scope of ORD effort and contracting issues; conducted several site visits and assisted RPM in development of a PowerPoint presentation for a public meeting; reviewed public meeting report.
6	Jones Road Ground Water Plume	ISCO	PCE	Reviewed SOW for the RI report preparation and Pilot Scale Study, reviewed Pilot study SOW; and revised Draft Pilot Work Plan for the TCEQ.
6	Malone Service	S/S	VOCs, BTEX	Discussed Tier 3 7-day SPLP and 7 and 14-day results as well as 7 and 14 day UCS results; discussed site progress and future RA operations and other actions; approved S/S treatability report submitted by the PRPs; and provided assistance on the Tier 4 formulations/results and accepted recommendations of six formulas for verification.
6	Molycorp Inc.	Undetermined	Metals, Pb, As, tailings	Participated in a conference call regarding capping issues; reviewed agency's response to draft plans; provided information regarding mining issues, background and efforts; participated in a conference call with RPM, State and contractors regarding capping and tailings and suggested the use of surface mining regulations as ARARs and capping/reeveg of waste rock piles.
6	Nacimiento Mine	BCR	Unknown	Reviewed draft SOW for long term O&M of the Rock Substrate Recycler eBioreactor Treatment system; reviewed construction and progress reports for the BCR; met with Forest Service Regional Engineer; attended a meeting to develop O&M bid for bioreactor and to inspect construction and corresponded to confirm site operation meeting held later summer 2008.
6	San Jacinto River Waste Pits	Unknown	Undetermined	Obtained and discussed threat/risk background information and clean-up costs; corresponded via e-mail and telephone with RPM regarding a new request on phytoremediation for a new site and on the status of the existing site.
6	Tar Creek	Passive	Pb, ARD	Conducted a site visit and attended a public meeting on the OU4 Work Plan; reviewed and commented on the final report, specifically advising on leaving data in the report but not refer to it as part of the study; and commented on Hydrogeologic study Work Plan.
7	57 th and North Broadway Streets	Monitoring Wells	VOCs, PAHs	Reviewed CH2N Hill's Draft Interim Remedial System Evaluation 2 report and planned for further discussion on final report (4-4-08).
7	Lead Belt Materials	Undetermined	Unknown	Discussed preliminary results of Chat Study; reviewed and commented on Final Report for Region 7 draft; continued assistance with Chat Study, specifically addressing concerns regarding grain size manipulation; reviewed and commented on final QA review issues on Chat Study; correspondence with BOSC to discuss final QA reviews and comments to incorporate in final document; and published paper and presented at 2008 ASMR National Meeting (June 2008) .

Region	Site	Technology	COCs	Summary of Support in FY 08
7	Red Oak City Landfill	Undetermined	Unknown	Evaluation of proposed landfill cover uses and options.
8	Argo Mine	Undetermined	Unknown	Review of e-mail and confirmation of findings by ETSC review; conducted a site visit and inspection and met with county, region and contractors; provided advice on tailings treatment; during site visit analyzed development for tailings and collected samples; spoke with RPM and state regarding tests on tailings and rock pre-impoundment; discussed information regarding funding for Argo treatability study; and commented and reviewed analytical reports regarding the treatability mixture.
8	Basin Watershed, Crystal Mine, Helena	Undetermined	Metals	Made initial contact; spoke with RPM and contractors on site issues and planning; participated in a conference call with RPM, region 8 manager and SF HQ on site status; and completed site visit with RPM and contractors for RI.
8	Captain Jack Mill	Passive	Metals	Provided comments on Revised Feasibility Study and responses to RPM questions on Captain Jack treatment remedy; continued assistance on FS and Priority Panel Package; proposed alternative remediation approach and reviewed by Region and Headquarter, developed by contractor and ROD issued in Fall, 2008.
8	Gates Rubber and Cherokee Denfor	Undetermined	Unknown	Review of TAC, Acadis Field Investigation, and three contract reports (TOSC).
8	Gladstone Mine/Upper Animas River	Mine remediation	Cu, Zn	Participated in EPA-BLM joint planning meeting on funding IWT Pilot for FY08; Delivery of final QAPP and SAP by contractor for RCTS demonstration; provided comments and participated in discussion on QAPP development and demonstration arrangements; reviewed the modified BLM SOW; ARSG discussion with contractor for meeting and initial start of the demo; continued correspondence regarding SOW for data collection and demonstration; discussed with contractor, RPM and BLM regarding Two Mine water treatment in August 2008; reviewed QAPP and SAP for the RCTS demo; participated in two demonstrations of RCTS system by EPA-BLM and contractors.
8	Monticello Mill Tailings	Monitored natural attenuation	Ur	Review and comment on draft "Surface Water and Ground-Water Compliance Strategy" and addressed shortfalls in performance.
8	North Fork Clear Creek	BCR	Zn, Co, acids	Met with RPM to discuss F4; participated in presentation at UCCWA shareholders monthly meeting; several site visits with contractors (CSM, CSU) and subcontractors regarding FY07 results and FY08 planning, reviewed data and provided data collection assistance on pilot BCR demo; instrumental in the publication of three peer-reviewed papers that were presented at ASMR national meeting (June 2008); reviewed QAPP submission and approval by QA manager for biological stressor study to mine drainage; reviewed final submission of substrate comparison test by subcontractor (CSM); and discussed further development of META 4 model (WASP) for chemical fate and transport study.

Region	Site	Technology	COCs	Summary of Support in FY 08
8	Pennsylvania (Colorado) Mine	Not selected	Metals	Continued support on EE/CA, specifically: reviewed and commented on EE/CA in preparation for a conference call; corresponded via e-mail with RPM regarding EE/CA and established a review meeting date.
8	Silver Creek tailings/Prospector Mine/Park City	BCR	Pb, Cd, Ag	Advised city government and contractors on BCR design and construction (finished and working on BCR December, 2008); responded to inquiry regarding HDPE liner, standardized fittings, limestone substitution and rockwall issues. Also reviewed design specifications for BCR system at Park City site.
8	Standard Mine (Crested Butte)	BCR	Heavy metals, As, Ba, Pb	Several conference calls with contractor and RPM discussing the progress of the site; conducted several site visits and sampling events—several visits to fix and repair the pump, solar electricity and acquired data and samples; helped resolved telemetry and data collection issues; and met with RPM and R8 staff
8	Ten Mile Creek/Luttrell Repository	BCR	ARD, leachate	Met with INL regarding the auto-sampler remote system, on another occasion discussed summer 2008 plans for remote monitoring data collection system; several site visits and meetings with RPM and Region Contractor to review progress and obtain samples, additionally met on another occasion regarding permanent BCR and plumbing changes and to review site needs and treatment options; attended and presented Applied Research and Tech Support results at a national meeting; sent SOW to IAG (contractor) INL for remote data collection FY08 season; participated in quarterly update call with ROM and requested technical presentation on systems; aided in finalizing journal publication for microbiology study; and developed and presented five years of treatment presentation for annual meeting.
8	Ten Mile Creek/Susie Mine	BCR	ARD, leachate	Met with INL on remote telemetry system repair and FY08 plans; participated in discussion regarding system start-up and INL telemetry with contractor and also established a start date for the RDCS and site visit; and held meeting with INL on summer 2008 plans for the remote monitoring data collection system and visited site for inspection.
8	Ten Mile Creek/Peerless Jenny King	BCR	Zn, sulfates	Presentation of Applied Research and Tech Support results at a national meeting and conducted a site visit with RPM and contractors to review progress and obtain samples.
9	Afterthought Mine	Undetermined	metals	Discussed removal action to help future passive remediation as well as discussed options for starting remediation during remedial stages.
9	Anaconda Copper Co./ Yerington	Unknown	Undetermined	Evaluated well installation and groundwater sampling procedures and reviewed OU1 Remedial Investigation Work Plan.
9	Cooper Drum	Chemical oxidation	VOCs, TCE, cis-1,2DCE, 1-4 dioxane	Participated in three discussions on Hydroxyl Radical Chemistry; site visit to witness Battelle Laboratory Experimentation.

Region	Site	Technology	COCs	Summary of Support in FY 08
9	del Amo	Undetermined	Base neutral acids, PAH, pesticides VOC	Met with RPM to discuss modification to the long-term monitoring plan
	Halaco Engineering Company	Undetermined	ammonia	Addressed initial request for support regarding ammonia on-site formation chemistry; met with RPM to discuss ammonia formation from smelter site; and aided in searching for researched journal and biosketch databases for an EPA expert in aluminum chemistry.
	Iron King Mine	Undetermined	Metals	Participated in a conference call with RPM and region management regarding site issues and made initial contact by arranging a site visit and testing.
	Leviathan Mine	Multiple	Metals, As	Reviewed US Army Corp of Engineers oversight report and advised a lower bioreactor effluent and measurement of ORP; inspected on-site construction prior to the winter shutdown and participated in TAC meeting.
	Purity Oil	S/S	Pb, acid waster, oily wastes	Several site visits to oversee the construction of the cap and inspected action remediation operations; sent draft comments on SVE Work Plan and SAP; met with RPM, PRPs and the Project Navigator on SVE pilot design; and reviewed "Sampling and Analysis Plan Addendum Purity Oil Sales Superfund Site" draft and responded with recommendations concerning sampling and best practices.
10	Almeda Mine	Undetermined	AMD, metals	Completed two reviews of SOW and recommended adding high flow data, clearer instructions to the contractor and to conduct a site survey.
10	Coeur d'Alene-Canyon Creek	Not Selected	Pb, ARD	Reviewed and commented on multiple (48) bench and lab column studies on substrates for treatment.
10	Eastern Michaud Flats Contamination (FMC)	Landfill	Phosphine, metals	Advised on load and compression measurements of Pond 16S cap for future road traffic loads; several discussion on Pond 16S road, specifically: suggested speed limit, railroad ties, and sufficient grade on cap; reviewed and commented on FMC Work Plan for Task #3 under the UAO; reviewed Removal Action Work Plan (RAWP) and attachments; participated in conference calls on the roadway work plan and issues; drafted a letter regarding Pond 16S road expectations; discussed remaining issues prior to approval of road surface; addressed comments and questions on the addendum and road design and advised for gas flowing measuring devices to have an error of +/-5%; participated in a final construction bi-weekly conference call (April 2008); participated in several meetings with State, OSC, RP, the region and local tribes to address RAWP issues; site visit and inspection to GETS and GESS systems for phosphine gas extraction; reviewed the following documents: FMC Pond 16S Monitoring and Reporting Plan, Pond 16S Preliminary Start-Up and Optimization Plan, Pond 16S Removal Action Plan, Pond 16S Review of Response to Agencies and Tribes, Pond 16S Post-Closure Modification Plan, various weekly reports and lab analyses; participated in several conference calls concerning site issues, GETS system RAWP and other issues; made continuous comments on RAWP; and commented on the remedial design project.

Region	Site	Technology	COCs	Summary of Support in FY 08
10	Eastern Michaud Flats Contamination (FMC) Pond 16S	Landfill	Phosphine, metals	Made amendments to weekly UAO status reports; reviewed and commented on addendum to 6 ETS operating plan for gas extraction; provided technical assistance regarding treatability of COCs; corresponded with OSC and State regarding issues with PRPs failures; planned a meeting for 08-08; responded to RPM issue with disposal of spend carbon in on-site landfill; reviewed test plan and FMC tests on GES and GETS systems; sent RI document; and participated in a teleconference on redesign of Pond 16S GETS design and analysis report.
10	Formosa Mine	Undetermined	Unknown	Responded to request for site visit; met with RPM and discussed RI study.
10	Grouse Creek	Undetermined	Unknown	Initial meeting with HECLA on possible Peer Review.
10	Hanford	Undetermined	Unknown	Sent waste report to contractor and issued the work order; participated in several conference calls with the contractor and subcontractor, RPM to discuss modifications to SOW and labor hours; advised on material and method of destruction analysis; corresponded via e-mail with RPM and contractor regarding work progress; reviewed the following contractor deliverables: T033, WO2, T1, Permafix documents, and SOP and revisions; and suggested the use of an expert TA on mixed waste thermal treatment issues.
10	Midnite Mine	Not Selected	Metals, sulfates	Reviewed uranium fact sheet and TOSC review of public document and press article (issues remain).
10	Morton International	Undetermined	Unknown	Reviewed RCRA funding request; participated in the initial discussion for ORD Technical support; participated in the Project Manager transition and Site Overview meeting; provided comments concerning BCEE degradation; and participated in a conference call with PRPs and contractors.
10	North Morrow	Undetermined	Unknown	Reviewed technology proposal for testing; participated in a conference call with the region on technologies for perchlorate and nitrates remediation.
10	Southeastern Wood	Undetermined	Unknown	Proposed meeting to finalize logistics regarding two mobilization studies at the site (old lagoon and swamp areas); discussed plan of action to accomplish the geoprobe work on site; and met with removal program OSC, reviewed site characterization information, assess current release hazards and determined if additional site investigations were needed.
10	Swift Creek	Undetermined	Unknown	Provided assistance on asbestos leachability testing.