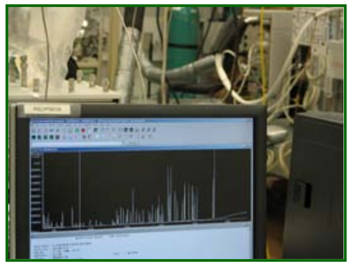
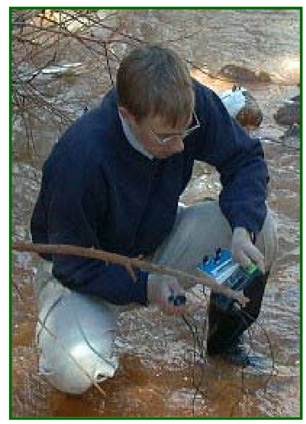
U.S. Environmental Protection Agency
Regional Laboratory System

EPA Regional Laboratories…
Advancing the Agency's Science Agenda


FY 2010 Progress Report

REGIONAL LABORATORY SYSTEM
2010 PROGRESS REPORT

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EXECUTIVE SUMMARY

The Regional Laboratory System is an inter-dependent network of the ten regional laboratories of the United States Environmental Protection Agency (EPA.) These laboratories provide the analytical, technical and programmatic support that is critical to accomplishing the Agency's mission of protecting human health and the environment. The regional laboratories ensure that analytical and technical expertise are available at the regional level and are well positioned to rapidly address the ever changing needs of a variety of environmental programs and help meet state and local partners' needs.

In 2010, the EPA Administrator outlined seven key priorities and themes to focus the work of the Agency. The Agency's priorities are:

- Taking Action on Climate Change
- Improving Air Quality
- Assuring the Safety of Chemicals
- Cleaning up Our Communities; Protecting America's Waters
- Expanding the Conversation on Environmentalism and Working for Environmental Justice
- Building Strong State and Tribal Partnerships.

The analytical, technical and programmatic support provided by the regional laboratories is critical to addressing many of these key priorities. Furthermore, the regional laboratory community continues to lead by example with regard to environmental management of their facilities. Efforts by the regional laboratories to achieve increased energy efficiency and efforts to reduce solid and hazardous waste are key to reducing greenhouse gas emissions that are associated with climate change.

In fiscal year (FY) 2010, the regional laboratories continued to provide a full range of routine and specialized chemical and biological testing of air, water, soil, sediment, tissue and hazardous waste for ambient and compliance monitoring as well as criminal and civil enforcement activities. The regional laboratories performed over 160,000 analyses in FY 2010 that supported over 1,200 sites and projects.

EPA's regional laboratories often rely on each other when capability limitations or lack of sample capacity becomes an obstacle to providing support for a variety of projects. This was especially true in 2010 as EPA responded to the massive British Petroleum (BP) oil spill in the Gulf of Mexico. Collectively, the regional laboratories analyzed over 600 water samples and over 200 ambient air samples associated with the oil spill. Two regional laboratories worked collaboratively to quickly develop and validate a method for analysis of the main component in the dispersant used in the Gulf Oil Spill response.

The regional laboratories continued to play a crucial role in EPA's Strategic Plan for Homeland Security. In FY 2010, the regional laboratories provided significant support for a number of Homeland Security related efforts including development of fixed laboratory capability for chemical warfare agents (CWA), participation, coordination, leadership, and technical support in response exercises and the strengthening of environmental response laboratory networks.

This progress report is divided into three sections.

- **Section I, Introduction:** provides general information about the Regional Laboratory System and outlines their collective mission statement.
- **Section II, Supporting EPA's Priorities:** summarizes the support provided by regional laboratories for EPA's national priorities including: Taking Action on Climate Change; Improving Air Quality; Assuring the Safety of Chemicals; Cleaning up Our Communities; Protecting America's Waters; Expanding the Conversation on Environmentalism and Working for Environmental Justice; and Building Strong State and Tribal Partnerships.
- **Section III, Regional Laboratory System Key Accomplishments:** summarizes the analytical support provided for EPA's various programs and describes joint regional laboratory projects and Regional Laboratory System efforts related to emergency preparedness. This section also describes accomplishments associated with ensuring the quality of laboratory data.

SECTION I: INTRODUCTION

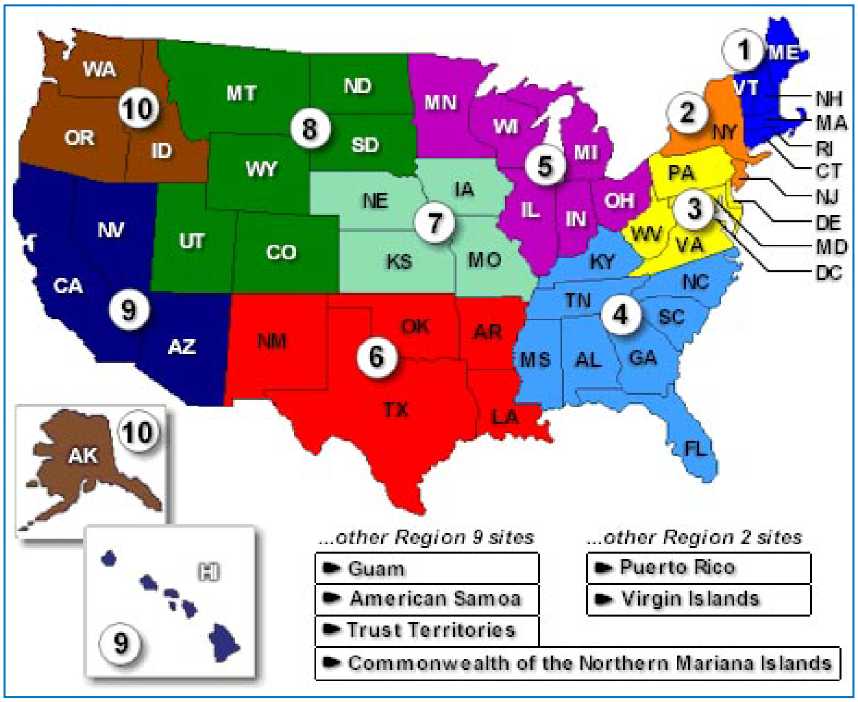
The regional laboratories were primarily established to provide analytical services and scientific and technical support to EPA's regional offices. EPA's regional offices are responsible within their states for the execution of the Agency's programs and require ready access to analytical services and technical support for various media program activities and management priorities. Analytical services provided by the regional laboratories include a full spectrum of routine and special chemical and biological testing in support of regional and national programs including air, water, pesticides, toxics, hazardous waste, ambient monitoring, compliance monitoring, criminal and civil enforcement, and special or emerging projects.

The regional laboratories also perform a long list of other core functions, including:

- technical advice and assistance to state and local agencies concerning analytical techniques, methodology and quality control;
- field sampling support;
- expert witness testimony;
- training of program staff and other organizations;
- on-site evaluation of drinking water laboratories;
- audits of states' drinking water certification programs;
- promotion of inter-laboratory communication and emergency preparedness;
- technical support to federal, state and local laboratories;
- technical support to internal and external organizations;
- applied research for regional initiatives;
- support national laboratory program initiatives;
- ensure the quality of laboratory data generated in support of Agency programs;
- provide benchmarks for environmental laboratories in areas such as analysis, pollution prevention and environmental compliance.

The regional laboratories focus on the application of science policies and methods to support regulatory and monitoring programs and special projects. This is done through direct implementation and through partnerships with a variety of groups including state, local and tribal governments, private industry, the academic community, EPA's program offices, EPA's Office of Research and Development (ORD) and the public. The regional laboratories are crucial to advancing the Agency's science mission, goals and priorities and have embraced the following commitments to achieve this goal:

- To integrate laboratory activities with those of field and quality assurance partners into a comprehensive, holistic, multi-media approach to solving ecosystem-based environmental problems.
- To provide scientific data of known quality to support Agency decisions through partnerships with regional and national program offices, state, local and tribal governments, academia, the private sector and the public.
- To maintain a fully equipped laboratory to produce physical, chemical and biological data of known quality to be used for environmental decision-making at all levels of government.
- To maintain and enhance a technically and scientifically skilled, dedicated and diverse staff through the excellence of our recruitment, career development, training, management and leadership.
- To advance the Agency's science agenda at the point where crucial decisions are made.



SECTION II: SUPPORTING EPA'S PRIORITIES

In 2010, the EPA Administrator outlined seven key priorities and themes to focus the work of the Agency. The analytical, technical, programmatic, and facility management actions accomplished by the regional laboratories are critical to addressing many of these key priorities.

Priority - Taking Action on Climate Change

Across the planet, there is a growing concern about the impacts of climate change on our environment and health. Greater energy efficiency and other technologies hold promise for reducing greenhouse gases and solving this global challenge.

The regional laboratories have historically demonstrated a commitment to leading by example with regard to environmental management of their facilities. This commitment extends to taking measures to reduce greenhouse gas emissions associated with operation of our facilities. Some of the measures taken at the regional laboratories are described below.

Energy Use at the Regional Laboratories

Reducing energy use is one of the best ways to reduce greenhouse gas emissions. There are several actions that regional laboratories have taken to increase energy efficiency and reduce energy consumption.

- **Green Buildings:** Leadership in Energy and Environmental Design **(**LEED) is an internationally recognized green building certification system for high-performance, low impact buildings. LEED provides third-party verification that a building is designed, built and operated using strategies aimed at improving performance related to energy savings, water efficiency, CO_2 emissions reduction, improved indoor environmental quality, stewardship of resources and sensitivity to their impacts. Currently, two regional laboratory facilities have achieved Gold Certified LEED status. A third regional laboratory facility is scheduled to gain LEED certification by 2011.

- **Green Power:** Purchasing green power and renewable energy is one way to reduce greenhouse gas emissions. In 1999, the first federal government building in the nation to purchase 100% green power was an EPA regional laboratory. In 2010, all ten regional laboratories now operate on green power either as a delivered product to their facilities or through the purchase of renewable energy certificates (RECs)
- **Increasing Energy Efficiency:** Regional laboratories continually evaluate energy use and investigate opportunities to implement energy saving measures. Measures implemented in recent years are detailed below.
  - Direct digital controls: Several regional laboratories have installed direct digital controls to monitor the operating condition of the heating, ventilation and air-conditioning (HVAC) system in their facilities. These systems alerts building engineers when equipment is not operating optimally and therefore minimizes energy use throughout the facility.
  - Variable Air Volume (VAV) Fume Hoods: The operation of fume hoods account for a large portion of the energy consumed by laboratories. Several regional laboratories have recently replaced their constant volume fume hood systems with variable air volume (VAV) high-performance fume hoods. Variable air volume fume hoods reduce the amount of air exhausted through the fume hood which translates into significant energy savings.
  - Equipment Use and Replacement: Laboratories use a wide variety of energy consuming equipment including computers, refrigerators, freezers, ovens, autoclaves and analytical instrumentation. When available, laboratories replace and buy equipment and instrumentation that is Energy Star rated. At most laboratories, old refrigerators have been replaced with Energy Star units. In FY 2011, some laboratories reduced the number of printers at their facility by networking multiple user access to printers. Some laboratories have replaced single function printers with more efficient multi-function printers.

Materials Management at the Regional Laboratories

EPA's regional laboratories are committed to materials management approaches that use and reuse resources productively and sustainably throughout their life cycles, minimizing both the amount of materials involved and the associated environmental impacts. Waste reduction is a component of materials management and is critical for reducing carbon emissions. The regional laboratories have implemented numerous measures to reduce the generation of hazardous and non-hazardous waste.

- **Materials Recycling and Re-Use:** Most regional laboratories have aggressive recycling programs for glass, plastic, paper, aluminum, batteries of all types, cell phones, toner cartridges, ink jet cartridges, single-use metal gas cylinders, scrap metal and obsolete equipment. In 2010, one of our government-owned regional laboratories demonstrated both environmental stewardship and cost savings though a sustainable approach to their on-site building renovation project. Aggressive but achievable goals were written into the statement of work for the renovation of their biology wing, which encompasses over 5,000 square feet of their laboratory space. During the pre-bid conference, EPA emphasized the importance of an approach that mirrored our commitment to environmental stewardship and safety. Upon completion of the demolition and disposal activities, the successful Small Business had some noteworthy accomplishments to report. Of the 62 tons of materials disposed, 57% of the waste was recycled. The profit made from recycling materials (over $4,500) significantly exceeded disposal costs (about $1,800) reinforcing the cost-effectiveness of sustainability approaches and driving home the old adage that "recycling pays".

- **Solvent Recycling:** Most analytical procedures require the use of solvents for the preparation and analysis of environmental samples. Several regional laboratories operate solvent recovery systems to recycle solvent for reuse. Solvent recycling significantly reduces the amount of solvent disposed as hazardous waste.
- **Chemical Adoption Programs**: Some regional laboratories have initiated a chemical adoption or sharing program which not only reduces laboratory waste but benefits the academic community. Expired standards and chemicals may be "adopted" by universities, colleges, technical schools, and other educational institutions.
- **Composting:** One regional laboratory has started a composting program to reduce food waste generated by employees at its facility.
- **Water Reclamation:** A regional laboratory facility now reclaims water from HVAC units and uses the water as a make-up supply for the HVAC cooling tower. In summer months, the facility's water usage from the local utility had exceeded 500,000 gallons in one month. The facility now reclaims an average of 95,000 gallons of water per month from the HVAC units thereby reducing purchased water usage by as much as 25%.

Priority - Improving Air Quality

American communities face serious health and environmental challenges from air pollution. Improved monitoring and assessment is a critical building block for air quality improvement. EPA has a number of programs in place to ensure that ambient air monitoring data are of a quality that meets the requirements for informed decision making. The regional labs support the following air monitoring quality assurance programs by providing management and technical oversight of contractors, lab space for equipment storage and calibration, field and laboratory work and audits, and logistical support.

- **PM 2.5 Performance Evaluation Program (PEP):** The goal of the PEP is to evaluate total measurement system bias of the PM 2.5 monitoring network. The laboratory component of the program includes particulate matter (PM) filter handling, inspection, equilibration, and weighing; data entry, validation, management and distribution to client Regions; as well as filter archival and data submittal to the Air Quality System (AQS). The PM filter weighing lab is located at the regional lab in Region 4. In FY 2010, the laboratory processed and weighed 1,761 filters from state agencies, tribal nations and all ten EPA Regions. An additional 199 filters were processed and weighed by other regional laboratories.

  The Region 4 lab also reviewed the data from PM2.5 PEP audits and evaluated individual audits for submittal to EPA's national ambient air database. The other regional laboratories also provided support for PEP through performance evaluation audits, quality assurance collocations and PEP audits. In FY 2010, the regional laboratories supported the completion of 406 PM2.5 PEP audits. Support was also provided for 12 chemical speciation audits and four audits of the Interagency Monitoring of Protected Visual Environments (IMPROVE) program.
- **Through-The-Probe (TTP) Audit System**: The Through-The-Probe audit system provides performance audits at state and local ambient air monitoring stations. In FY 2010, the regional laboratories supported the completion of nearly 250 through-the-probe audits. These performance audits ensure the validity of the ambient air quality monitoring data.

- **Standard Reference Photometer (SRP) Program**: Standard reference photometers (SRPs) are used to ensure that the national network of ozone ambient monitors is accurately measuring ozone concentrations. Eight regional laboratories maintain SRPs and provide verification or certification of primary and transfer ozone standards from state, local and tribal organizations.
- **Lead Monitoring**: On November 12, 2008 EPA substantially strengthened the national ambient air quality standards (NAAQS) for lead. In 2010, one regional laboratory's application for a Federal Equivalence Method (FEM) for lead on TSP ambient air filters was recommended for equivalent method designation to the Director of the National Exposure Research Laboratory. The method will be considered as a U.S. EPA-designated equivalent method when an official Notice of Designation has been authorized by the Director and has been published in the U.S. *Federal Register.* This method will assist state and local monitoring organizations for compliance monitoring associated with the new ambient air standard for lead. The laboratory will be utilizing this method when performing analyses in support of the quality assurance program for lead monitoring for Office of Air Quality Planning and Standards (OAQPS). Some regional laboratories were also selected to initiate and perform lead speciation audits in 2010.

Priority - Assuring the Safety of Chemicals

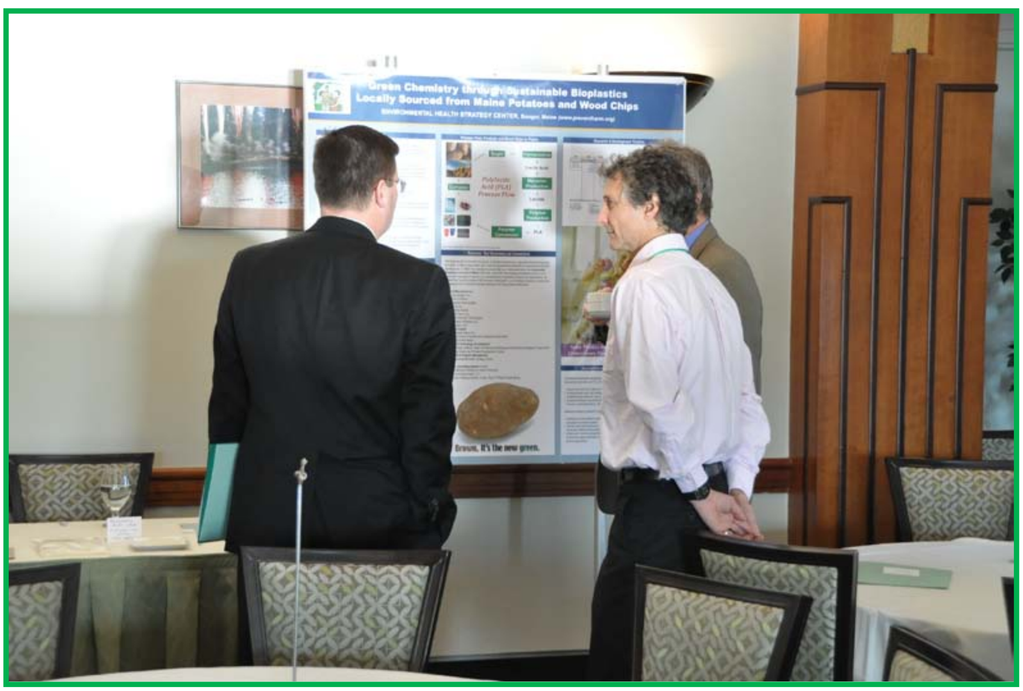
One of the Administrator's highest priorities is to assure the safety of chemicals in our products, our environment and our bodies. Essential to addressing this priority is the reauthorization and strengthening of the Toxic Substances Control Act (TSCA).

In 2010, EPA's regional laboratories provided over 750 analyses to support 24 projects related to TSCA. Many of these projects were related to enforcement of TSCA's polychlorinated biphenyls (commonly known as PCBs) regulations. TSCA prohibits the manufacture of PCBs, controls the phase-out of their existing uses, and sees to their safe disposal. PCBs are the only chemical class specifically named in TSCA because Congress believed that the chemical and toxicological properties of PCBs posed a significant risk to public health and the environment.

- **Enforcement of PCB Regulations**: A regional laboratory provided analysis of samples resulting from an inspection of a commercial hazardous waste facility that is one of ten regulated landfills in the country that handle PCBs. Analysis of samples collected during the inspection revealed spills next to the facility's PCB storage and flushing buildings. Samples in and around the building detected PCBs at elevated levels ranging from 2.1 parts per million (ppm) up to 440 ppm. These levels are above the regulatory limit of 1 ppm and, in soil demonstrate that PCBs were improperly disposed of in violation of federal law. This violation resulted in a fine of more than $300,000.

Another aspect of the Administrator's efforts to assure the safety of chemicals is to encourage the use of "green chemistry". Green chemistry, also known as sustainable chemistry, is the design of chemical products and processes that reduce or eliminate the use or generation of hazardous substances. EPA's regional laboratories are leading by example in several ways.

- **Analytical Procedural Changes**: When feasible, regional laboratories implement new analytical technologies that require less sample quantity, less solvent, or generate less waste. In 2010, one regional laboratory:
    - Installed a second discrete analyzer that can perform up to seven different chemistry tests, reducing the amount of chemical reagents and waste generated by 100 fold over previous automated chemistry techniques;
    - Installed a particle size analyzer that uses less than 5g of sample vs. the older sieve technique that used over 500g of sample; and,
    - Completed a semivolatile extraction method for toxicity characteristic leaching procedure (TCLP) extracts that only uses one tenth the methylene chloride that traditional liquid-liquid extraction requires.
- **Green Chemistry Partnership:** One regional lab provided support to a Pollution Prevention program led partnership with ORD seeking to foster development of a Green Chemistry economic cluster. The lab hosted an organizational meeting of the New England Green Chemistry Challenge and provided facilitation services for all of the initial coordinating committee meetings. Six strategic work groups (Government, Education, Business & Industry, Venture Capital & Investment, Advocacy & Demand, and Healthcare) are now formed and are drafting strategic plans that will ultimately work in concert to foster all the pieces necessary to generate a robust Green Chemistry cluster.



Priority - Cleaning Up Our Communities

In FY 2010, 52% of the analyses performed by the regional laboratories supported the cleanup of uncontrolled or abandoned hazardous waste sites associated with the Superfund Program. Another 2,693 analyses (2% of total analyses) were preformed to address hazardous and non-hazardous waste issues associated with the RCRA program and over 1,700 analyses addressed risks associated with leaking underground storage tanks.

In FY 2010, the regional laboratories performed over 700 analyses in support of the EPA's Brownfields Program. EPA estimates that there are more than 450,000 Brownfields in the United States. Brownfields include abandoned industrial and commercial properties, former mining sites and sites contaminated with a hazardous substance or pollutant of concern. EPA's Brownfields Program is designed to empower states, communities, and other stakeholders to inventory, assess, clean up, and redevelop potentially contaminated lands in order to recreate these lands into vital, functioning parts of their communities.

Several projects associated with this priority are described here.

- **Parker Street Landfill:** At large sites where contamination extends into communities that have developed on the footprint of older disposal sites, there is a need to get characterization and removal actions done swiftly and completely on the first effort. One regional lab deployed their field team and mobile lab for the characterization of PCB and metals contamination at a landfill that now has neighborhoods, a middle school, a public works department and other developments built on top of it. With their smaller hand towable Geoprobe®, the Lab's field team spent over a month on site making soil borings and collecting over 600 soil samples in residential yards that couldn't be accessed by larger units. A Geoprobe® is a special drilling machine used to make soil borings and to create temporary groundwater monitoring wells. The mobile lab was on site performing field method analyses for PCB and metals for seven weeks during the site characterization phase and returned for an additional three weeks for supplemental site characterization and to provide real time guidance on the limits of hot spot excavation later in the year. Between the two deployments the mobile lab conducted 1,405 screening analyses for PCBs by gas chromatography (GC) and 1,496 field analyses for metals by x-ray fluorescence (XRF).
- **Emergency Response Action at a Superfund Site:** Substantial analytical support was provided during an emergency response action at a Superfund National Priority List (NPL) site including analysis of over 90 residential well samples for a range of contaminants. The site is a former mining operation consisting of three principal areas that were directly affected by mining: Nineteenth century operations area, 1950s mine and mill site, and tailings impoundment. The mine site was host to intermittent mining of copper ore from the 1850s through 1962, with most mining occurring during two main periods of activity: 1873 to 1883 and 1957 to 1962. Flooded underground mine workings have contaminated groundwater in the vicinity of the mine and affected nearby private drinking water wells. Wastes from site operations are known to have contaminated surface water and sediment with acid and heavy metals. Mining-related activities have also affected downstream surface waters, sediment, and floodplain soils.

- **Old Esco Superfund Removal Support:** Extremely quick turn-around was provided for a large number of Superfund samples for PCB analysis at the Old Esco site. Approximately 100 samples were analyzed within 30 hours of receipt for preliminary reports, and final, fully reviewed reports were provided within seven days of receipt for all samples. This was necessary to verify that residential areas had been cleaned up to appropriate safe levels while the removal contractor was still on site. The ability to get quick confirmation that the clean up goals had been met resulted in significant savings to the Superfund Program. The majority of the 100 samples were received and completed within a six week period.
- **Commencement Bay-South Tacoma Channel Well 12A:** Both 24-hour results and a high level of technical expertise were provided to a remedial design phase of a clean-up effort on a Superfund site. This included 300 volatile organic analyses with a 24-hour turn-around time from the time of sampling, and over 200 samples for other organics and TLCP metals. This extraordinarily short turnaround time was not available either through our Contract Laboratory Program (CLP) or Field and Analytical Services Teaming Advisory Committee (FASTAC), Tier 4 contracts and had it been available it would have been cost prohibitive. This site includes an area surrounding a city municipal water supply well that had been contaminated by a former company which began operations in 1923 and used the site as a manufacturing facility for paint and lacquer thinner and as an oil recycling facility. The paint and lacquer thinner manufacturing process involved the use of solvents that were stored in barrels, some of which may have leaked. The waste-oil recycling process consisted of collecting waste oil in a large tank, adding chemicals such as sulfuric acid, and pressurizing and heating the contents of the vessel. During the sampling the on-site staff discovered an underground storage tank which contained some oily waste. Our regional expert modified an existing method to oily material and discovered the presence of more than one type of Aroclor. This discovery was a surprise to the design team as PCBs had not been found at the site previously. Additional PCB Aroclor analyses were then conducted to determine the extent of the pollution which is likely to affect the remedial design plan.

Priority - Protecting America's Waters

America's waterbodies continue to face incredible perils. Water quality and enforcement programs face complex challenges, from nutrient loadings and stormwater runoff, to invasive species and drinking water contaminants. The Agency continues to implement comprehensive watershed protection programs for the Chesapeake Bay and Great Lakes. Measures are needed to address post-construction runoff, water quality impairment from surface mining, and stronger drinking water protection.

The regional laboratories play an important part in protecting and restoring the nation's water resources by providing key data so that the regions and their partners have the information they need to target actions to protect human health and aquatic ecosystems more efficiently. In addition, the regional laboratories support the Agency's water goals by providing technical assistance and regulatory support to drinking water laboratories, by providing training and expertise for water quality monitoring efforts, and by providing analytical support for various projects across the country. Some of the areas where the regional laboratories provide support for the Agency's water goals are described below.

- **Surface Mining Assessments:** Chemistry data for 15 ecosystem assessments conducted at mountainous surface mining sites was provided by the regional laboratory to determine environmental impact. Mountaintop coal mining is a surface mining practice involving the removal of mountaintops to expose coal seams, and disposing of the associated mining overburden in adjacent valleys, known as "valley fills". Valley fills occur in steep terrain where there are limited disposal alternatives. Mining operations are regulated under the Clean Water Act (CWA), including discharges of pollutants to streams from valley fills and the valley fill itself where the rock and dirt is placed in streams and wetlands. Among the environmental impacts associated with mountainous surface mining are:
    - Minerals increase in the water. Increased levels of zinc, sodium, selenium, and sulfate may negatively impact fish and macroinvertebrates leading to less diverse and more pollutant-tolerant species,
    - Streams in watersheds below valley fills tend to have greater base flow,
    - Streams are sometimes covered up, and,
    - Wetlands are, at times inadvertently and other times intentionally, created; these wetlands provide some aquatic functions, but are generally not of high quality.

- **Monitoring Acid Mine Drainage:** Four water quality monitors (or sondes) have been deployed and are being maintained by the regional laboratory at a Superfund site associated with an abandoned open-pit sulfur mine. The mine is located in the Sierra Nevada Mountains at an elevation of approximately 7,000 feet. Acid drainage from the mine has had negative impacts on valuable nearby water sources. The sondes are placed in creeks emanating from the site. Nearly 100,000 measurements (pH, conductivity, oxidation reduction potential, dissolved oxygen and temperature) were recorded at this site in FY 2010. The real-time internet accessible data are used to monitor acid mine drainage treatment systems, and document water quality trends throughout the year.
- **Remote Sensing Buoy Project:** In 2010, a regional lab deployed two real-time water quality monitoring buoys to measure current water quality conditions in two urban rivers. This project was the first deployment of such equipment, which allows for the display of real-time water quality data measured at one meter depth, recorded every fifteen minutes and transmitted to a website. The measured parameters were used to assess water quality conditions and to help track the occurrence and severity of blooms of cyanobacteria, toxic blue-green algae. Cyanobacteria blooms in these rivers have led to closed beaches, posted warnings and cancelled swimming competitions. This project and on-going research will help evaluate how remote monitoring using sensors can help in tracking the occurrence, severity, and duration of cyanobacteria blooms. For this project, sondes with water quality sensors were used to measure pH, dissolved oxygen, temperature, conductivity, phycocyanin (a pigment unique to cyanobacteria) and chlorophyll.

- **New England Lakes and Ponds Project:** The New England Lakes and Ponds Project, the culmination of three years of lake assessment work between national, regional, state, local, and academic partners, was completed in 2010 with the release of the final project report. In conjunction with the National Lakes Assessment, the regional lab undertook an expanded study of New England lakes and ponds. The report compares New England lakes' and ponds'water quality and ecological conditions to the rest of the country, compares lakes on a regional basis, and provides a case study for implementing new technologies and engaging local stakeholders in monitoring and improving lake conditions. New England lakes were assessed for seventeen indicators. A slightly higher percentage of New England lakes were rated in "good" condition when compared with national lake averages. The results also point out that habitat loss and alteration are a significant concern, and are as important to lake condition as water quality. The report is accompanied by a companion website that makes tools and assessments developed through the course of the project readily available to water quality practitioners and the general public.

- **PCB Congener Monitoring of the Lake Ontario Watershed:** For the past eight years, the regional laboratory provided regular monitoring of tributaries of the Lake Ontario Watershed for critical pollutants. The purpose of this program is to develop reliable estimates of loadings of critical pollutants to the Lake in order to provide accurate information for updates of the Lake-wide Management Plan. Data from the program are also shared with modelers for use with the Lake Ontario Mass Balance Model, and with the State, who may use it to supplement their ambient data for 303(d) reporting. The laboratory provides analysis of 209 PCB Congeners at the part per quadrillion (ppq) level using a modified version of EPA Method 1668A. The method uses a High Resolution Gas Chromatograph/Mass Spectrometer.
- **Dunkard Creek Fish Kill:** In FY 2010, a massive fish kill occurred on Dunkard Creek. Dunkard Creek watershed drains approximately 180 square miles in Monongalia County in West Virginia and Greene County in Pennsylvania. The kill on Dunkard Creek spanned approximately 43 miles and included a complete kill of the mussel population. The regional laboratory provided analysis for water quality parameters and noted high levels of total dissolved solids (TDS) and component ions (e.g., chloride, sulfate, magnesium, bicarbonate) to assist in identifying the cause of the fish kill. Elevated levels of TDS and component ions are toxic to aquatic life. Sampling continued well into 2010 to assess chronic conditions on the creek and to confirm presence of golden algae *Prymnesium parvum*. Presence of golden algae was noticed during the fish kill. More investigations continue to determine the ecology and distribution of the algae and water quality in this region.

- **Fort Detrick Water Incident**: A suspicious green dye passed through the Fort Detrick Wastewater treatment plant in early September 2010. Based on field testing the suspected green dye was identified as fluorscein. The regional laboratory analyzed samples taken from the wastewater treatment plant to confirm the presence of the fluorscein dye and also to eliminate other potentially hazardous contaminants. By using fourier transform Infrared Spectroscopy, high pressure liquid chromatography, and a variety of other instrumental techniques the green dye was considered to be present without other hazardous contaminants.
- **Hexavalent Chromium Analysis Method Development**: Regional labs worked in cooperation with the National Institute for Standards and Technology and with the Office of Solid Waste on an improved method for analysis of test samples containing varying levels of Chromium (VI) to a limit of quantitation of less than 0.06 parts per billion range. The Cr (VI) species, found in groundwater as a result of usage in metal, leather and wood industries, has

recently gained national attention from a released study of tap water sources showing widespread contamination from Cr (VI) and raising much public concern about this pollutant due to its toxicity. The method which can be used for any water matrix, including drinking water, was developed using the latest instrumentation technology and has been submitted for publication in the SW 846 test series as Method 7194.

- **Invasive Species**: Assistance was provided to the US Army Corps of Engineers in their Asian Carp monitoring program to prevent the invasive species from reaching the Great Lakes. Asian Carp are a significant threat to the Great Lakes Ecosystem because of their large size, ravenous appetites, and rapid rate of reproduction. The regional laboratory completed development of quantitative polymerase chain reaction (qPCR) tests for environmental DNA (eDNA) to support this effort. Environmental DNA (eDNA) is a methodology developed by researchers at the University of Notre Dame to evaluate water samples for the presence or absence of DNA released by specific species, including Asian Carp.
- **Support to NPDES - Offshore Oil Production Platforms, Outer Continental Shelf**: Abalone toxicity testing was performed on produced water from offshore oil platforms. The data will be used by the Clean Water Act (CWA) Standards and Permits Office to determine whether specific produced water constituents exceed National Pollutant Discharge Elimination System (NPDES) general permit limits for southern California oil platforms.

Priority - Expanding the Conversation on Environmentalism and Working for Environmental Justice

EPA has begun a new era of outreach and protection for communities historically underrepresented in EPA decision-making. The Agency is building strong working relationships with Tribes, communities of color, economically distressed cities and towns, young people and others. The protection of vulnerable subpopulations is a top priority, especially with regard to children. Children may be especially vulnerable to environmental exposures because their bodily systems are still developing, they eat more, drink more, and breathe more in proportion to their body size and because their behavior can expose them more to chemicals and organisms. Some of the projects that the regional laboratories have participated in to support this priority are discussed below.

- **Community Exposure Assessment:** Kettleman City is a low income minority community impacted by agriculture and pesticide use, heavy truck traffic and a chemical waste facility that accepts PCBs. As part of a community exposure assessment, the regional laboratory provided analysis of more than 60 soil samples and 19 water samples collected from residences, the municipal water supply well, elementary school well, and surface water sources. Samples were analyzed for metals, organochlorine pesticides, PCBs, volatile organic compounds, semi-volatile organic compounds, hexavalent chromium, total petroleum hydrocarbons, and coliform bacteria. The data provided by the regional laboratory supported an investigation into the public health and environmental exposures in Kettleman City. The assessment was initiated to address concerns about birth defects in the area and whether there is a link to the nearby hazardous waste facility or to agricultural pesticide use.

- **Yakima Nitrates Project:** One regional laboratory provided significant support to an Environmental Justice Showcase project in Yakima Valley, which is one of the most productive agricultural regions in the nation. The Valley has high poverty rates and approximately 50% of the population is of Latino or tribal heritage. Twenty percent of private drinking water wells sampled in a 2001 study were found to contain nitrate pollution at levels that exceed the EPA drinking water standard. Samples were collected from approximately 150 residential sites often in late afternoons and evenings after receiving consent from the homeowners. The 48-hold time for nitrate required close coordination between the EPA laboratory and field team, and a willingness to accept samples in the evening and on weekends, with the necessity of commencing analysis immediately. Laboratory analyses were complimented by field analyses for microbiological contaminants, which were used to determine if the wells were contaminated with organisms (human or ruminant) that might help determine the origin of the nitrate contamination. Overall the laboratory analyzed over 1,800 samples for nitrate, nitrite, ammonia, anions and microbiological parameters. These data are currently being mapped and evaluated to help the EPA Office of Water and Watersheds determine the next steps.

- **Mossville Environmental Justice Project:** EPA has worked with the community of Mossville for many years regarding a number of environmental concerns in this environmental justice community. In response to the concerns expressed by the community, one regional laboratory performed approximately 155 organic analyses. The regional laboratory provided data that assisted EPA in evaluating the environmental conditions at the site. Samples for dioxin analysis were analyzed through the non-routine analytical services program and the data was reviewed by the Regional Environmental Services Assistance Team (ESAT). Through EPA regional oversight of the dioxin data, it was determined that the data was not defensible and a new round of sampling was performed. The second round of dioxin data resulted in acceptable results. EPA continues to work with the community to honor the Agency's commitment to the citizens of Mossville.
- **Calumet Refinery Support**: Air toxics analysis and coordination support was provided for the Clean Air Act/Environmental Justice investigation near the Calumet Refinery in Shreveport, LA. This monitoring was done at the request of the surrounding community near the site. Specifically, the focus of the study was to collect and compare quality-assured ambient VOC measurements and compare them to EPA health based screening levels (these levels were used in the EPA School Air Toxics Initiative). The comparisons were to assist in evaluating where any VOC ambient air quality concentrations of concern were detected near the community. The EPA collected samples over a twelve week period. Fourteen valid samples were taken and analyzed for VOCs. Only one sample result for one pollutant was above a short-term screening level. The average benzene concentration measured in this effort was 8.4 ug/m3, well below the short –term screening level of 30 ug/m3.

- **Partnering to Develop an Innovative Science Curriculum:** For the past four year, a regional laboratory sponsored a shadowing program with two New Jersey high schools. The shadowing program allows the students to visit local science-based industries to observe, participate, and ask questions regarding applied science in the workplace. This year, over 30 students visited the regional laboratory over an eight week period. Laboratory chemists and biologists covered one topic each week in the fields of organic and inorganic chemistry, microbiology, and biology. The students observed demonstrations of analyses, including sample preparation, instrument calibration, and data generation.

Priority - Building Strong State and Tribal Partnerships

States and Tribal nations bear important responsibilities for the day-to-day mission of environmental protection, but declining tax revenues and fiscal challenges are pressuring state agencies and Tribal governments to do more with fewer resources. Strong partnerships and accountability are more important than ever. EPA regional laboratories do their part by providing technical assistance, training, expertise and capacity to bolster state and tribal efforts. Some examples of Regional Laboratory efforts to support and bolster state and Tribal efforts include:

- **Work-Sharing to Support the States:** Regional laboratories work closely with its states and the EPA regional program offices each year to identify priority field and lab work that the regional lab can provide to support the states' environmental programs and fill gaps where the states are unable to conduct important monitoring or sampling work needed to protect human and ecosystem health. During FY10, this support has been particularly critical due to severe budget cuts in the states. On an ongoing basis, regional laboratories provide support to the states' air monitoring programs by conducting audits and other QA/QC activities. Some water program projects conducted during 2010 to support the states included aquatic toxicity testing for impacts of aircraft de-icing chemicals, characterization of sediment toxics for four impaired streams, flow measurement dye studies to support TMDLs, field sampling and lab analysis of metals of more than 100 samples for a state's probabilistic survey of wadeable streams, a sediment oxygen demand (SOD) study and bacteria analysis of 160+ samples as part of an extensive study of the Merrimack River for TMDL development, monitoring of coastal shellfish beds, dye injection studies in support of NPDES permits, field sampling at 17 stations for water and sediment quality components of the EPA National Coastal Condition Assessment for one state, microbial source tracking at beaches, dissolved oxygen surveys, and buffer width determinations and littoral habitat measurements in support of a lake habitat assessment project.
- Low Impact Development Studies: Grants were awarded to a number of local governments to implement low impact development (LID) practices aimed at designing, implementing, and studying sustainable stormwater management practices through a partnership effort with EPA, a state, and several local governments. As an example, one funded project involves the creation of a park and urban garden in a local community that incorporates pervious asphalt, rain gardens and a green roof in shoreline community of Puget Sound. Goals for this project include reducing stormwater runoff by as much as 70 percent, decreasing chemical contaminants introduced into treatment systems and adjacent water bodies, and removing potential biological contaminants completely. During the year, one of our regional laboratories analyzed over 900 samples from six local LID projects for a number of chemical and microbiological contaminants to help the local grant recipients assess the effectiveness of their LID projects at removing these contaminants.
- **Microbial Water Quality Test Using Quantitative Polymerase Chain Reaction or qPCR:** In a collaborative partnership with local New Jersey County Health Departments and the state, the regional laboratory conducted a multi-phase study using the rapid Quantitative Polymerase Chain Reaction (qPCR) method to assess e*nterococcus* data from marine recreational waters over a wide geographic range, including spatial, temporal, and instrument variability. Rapid qPCR can be used to identify and quantitate the concentration of certain

bacteria, including *enterococcus,* present in a water samples. The use of qPCR assays can provide results in less than four hours compared to using traditional methods which take at least 24 hours. The results from this collaborative study have regional and national application in EPA establishment of rapid test methods for real-time bacterial water quality assessment of recreational waters, including development of qPCR- based water quality criteria.

- **Analytical Assistance to New York State Department of Environmental Conservation (NYSDEC):** One of our regional laboratories provided analytical services to the NYSDEC RCRA Program in support of monitoring at a trial burn of a fixed box incinerator at a facility in New York State. The regional laboratory provided analysis for metals, volatiles, chloride, density and viscosity. Over 20 samples were processed including solvents, solids and aqueous matrices. The analytical support is part of a Region 2 initiative to provide technical support to critical environmental programs within NYSDEC and was in response to a request to the Region for technical assistance due to strains on their severely limited state budget.
- **Regional Laboratory Response Plans:** In 2007, in collaboration with representatives from public health and environmental labs, water utilities and other stakeholders, the EPA regional laboratories directed the effort to develop Regional Laboratory Response Plan (RLRP) for each of the ten regions. The purpose of developing these plans was to increase laboratory cooperation and coordination for response to drinking water emergencies. The networks that were established as a result of the completion of those plans continue to flourish. In 2010, one regional laboratory hosted an annual regional State/EPA Lab Meeting as a means of networking and information sharing between the state environmental and health laboratories, and EPA. Discussions included the RLRP as well as interstate cooperation and sharing of laboratory resources between states to reduce expenses for both emergency and non-emergency analytical services.

- **Nez Perce Tribal Support:** Water quality and quantity have important cultural and economic significance for the tribal nations. A regional laboratory provided support to the Nez Perce Tribe Water Resources Division's (WRD) total maximum daily load (TMDL) project. The mission of the WRD is to "provide a foundation for management of the water rights secured by the Treaties of 1855 and 1863, and for monitoring the quality of water resources vital to the long-term sustainability of the Nez Perce Tribe and its heirs" (Nez Perce Tribe Water Resources Division Plan of Work 1997). Long-term viability of this resource depends on the development of comprehensive management programs for watersheds located on the reservation and ceded lands. Partnering with the Tribe, the regional laboratory supported 290 sample analyses for nitrate-nitrite, total Kjeldahl nitrogen (TKN), ammonia, total phosphorus, dissolved phosphorus, and total suspended solids (TSS). These data will be used in the development and implementation of water quality standards for the Nez Perce Reservation, TMDL development, and to determine support of designated beneficial uses. They will also be used to support the Nonpoint-Source Assessment Project to identify water bodies impaired by nonpoint-source pollutants.

- **Partnership with the State of Idaho and the Coeur d'Alene Tribe:** Lake Coeur d'Alene is a large (121 square kilometer surface area), complex ecosystem, with a long legacy of contamination that was introduced by historic mining and ore-processing activities upstream in the South Fork Coeur d'Alene River valley mining district (in which the 21 square mile Bunker Hill Metallurgical Complex Superfund site surrounding Kellogg, Idaho is located). The primary environmental concern in the lake is the potential for mobilization of contaminants such as arsenic, cadmium, lead and zinc present in its bed sediments if lake bottom waters become depleted in dissolved oxygen as a consequence of eutrophication. Previous studies have shown that about 85 percent of the lake bottom is highly enriched in mining-related metal contaminants that range in depth from a few centimeters to up to a meter. This phase of the Lake Monitoring Program began in 2007, and is a cooperative effort between the State of Idaho, the Coeur d'Alene Tribe and the EPA. Our Regional Laboratory has been providing significant support to the monitoring program since its inception. Analyses – over 1000 each year – provided by the EPA laboratory will establish the annual baseline for simulations and model refinement. A framework is being produced to guide the input for model simulations of various scenarios unique to the Coeur d'Alene Lake ecosystem (e.g., increased loading and reduced zinc). A total of 1,455 metals, hardness and chlorophyll analyses were performed by the Regional Laboratory in conjunction with this effort during the fiscal year. This support will continue into the next year.

International Priorities

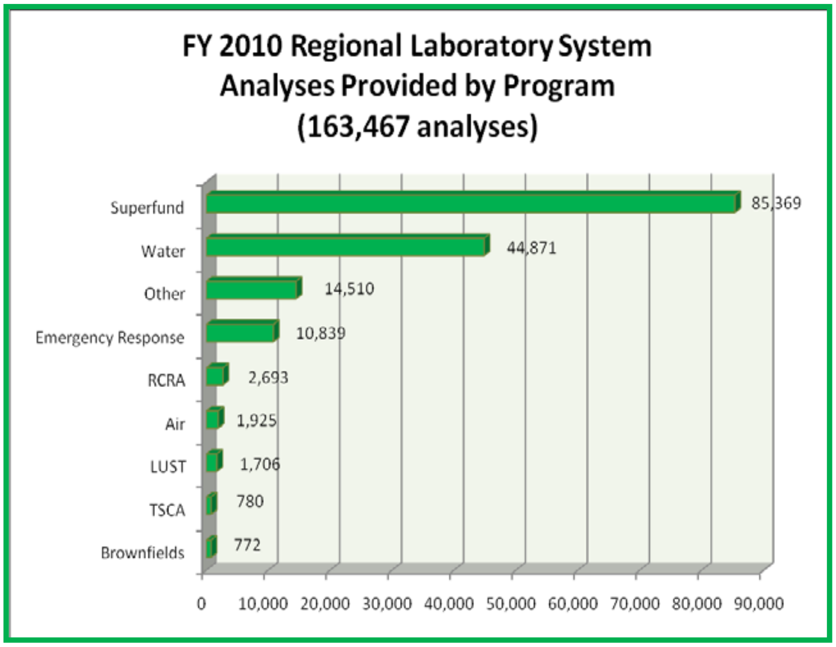
The U.S. Environmental Protection Agency is committed to facing environmental challenges both at home and around the world. The agency has a long history of international collaboration on numerous global environmental issues and regional laboratory staff is often called upon to provide support in various ways to the international scientific community. Some specific examples for 2010 include:

- **Advanced Integrated Wastewater Pond System Sampling Project**: Regional laboratory staff provided sampling and analytical support for the evaluation of an Advanced Integrated Wastewater Pond System (AIWPS). The data resulting from this study will be used to evaluate the feasibility of using the AIWPS to treat wastewater in treatment plants along the U.S.-Mexico border. AIWPS have numerous benefits including design and operational simplicity, low energy use and low maintenance because of limited mechanical equipment and minimal sludge production. Over a three week period, the regional lab collected and analyzed samples for organics: biological oxygen demand (BOD), total dissolved solids/total suspended solids, nutrients, chlorophyll, coliform bacteria (total & E. coli), and other physical/water quality measurements. The study was conducted in order to provide up-to-date performance data for this method for treating domestic wastewater. Additionally, the data will be used to evaluate the feasibility of using the AIWPS to treat wastewater in treatment plants along the U.S.-Mexico border.

- **Visit by International Scientists:** A large group scientists and pesticide regulators visited one of our regional laboratories in 2010. The visit was arranged by EPA Headquarters' Office of Pesticides Programs (OPP). A majority of the visitors were from India, North and Central Africa and are part of an International Food and Safety Workgroup. The visitors were provided with a tour and an overview of the various laboratory responsibilities for analyzing soil, water, and air samples.
- **North American Free Trade Agreement (NAFTA) Council for Environmental Cooperation (CEC) Biota Monitoring Workshop:** A regional laboratory biologist participated in a workshop on monitoring of Biota in Mexico City. The conference was sponsored and the trip was funded by the NAFTA CEC. The goal of the conference was to assist Mexico with input for the development of a national monitoring program that includes biological collections and analyses.

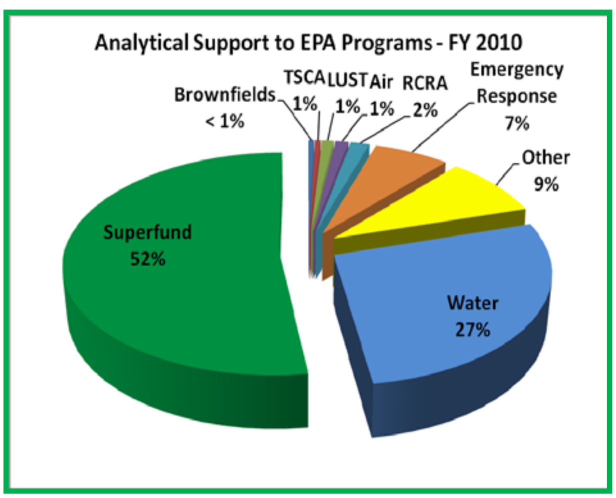
SECTION III: Regional Laboratory System - Key Accomplishments

Analytical Support



One of the primary functions of the regional laboratories is to supply quality analytical data to the Agency's programs in support of a broad range of regional initiatives that range from routine monitoring to criminal enforcement. The following charts represent the analyses performed for various EPA programs in FY 2010.

A total of 163,467 analyses were performed in support of EPA programs in FY 2010. An analysis is one analytical test through one instrument. The sample is run through the entire process and results are reported to the customer. For example, an analysis of a sample for 24 metals is counted as one analysis. An analysis of a sample for 65 volatile organic compounds also counts as one analysis. An analytical technique that averages 2 or 3 "burns" for one result is counted as one analysis. While some of these analyses may take only a few minutes; others may take several hours or days to complete. It should also be noted that the numbers reflected in the charts do not include analyses performed for quality assurance. Analyses for quality assurance purposes comprise an additional 30% of the laboratories' analytical effort.



The regional laboratories are increasingly engaged in the Emergency Response program. In FY 2010, the regional laboratories provided over nearly 11,000 time-critical analyses associated with response to environmental disasters, hazardous materials releases, priority contaminant removals, and inland oil spills that threatened human health and/or the environment.

In addition to fixed laboratory analytical support, the regional laboratories provide significant field sampling and field analytical support. In FY 2010, nearly 6% (9,181 field analyses) of the total number of analyses performed were field analyses in support of a variety of EPA programs. Some of the benefits to providing analyses in the field include quicker turnaround time for sample processing, real-time interaction between the analyst and the field staff for data interpretation, and acceleration of environmental decisions at the site.

Counting analyses is one way to measure the support that regional laboratories provide to EPA's programs. Another way to look at the contributions of regional laboratories to the work of the Agency is to look at the number of projects and/or site evaluations that laboratory data supports. The number of projects and sites supported by analytical data from the regional laboratories are listed in the table below by EPA program element. Multiple rounds of analytical work for the same site represent just one site supported. More than one round of work at the same site for a different purpose or client may be counted as two sites supported. Multiple sample site monitoring projects like REMAP are counted by water body. For example, all sampling locations at a single lake or stream count as one site, but different lakes or streams count as different sites, even though it may support only one project.

EPA Program Element	Number of Sites/Projects (% of Total)
Air – Enforcement	5 (<1%)
Air - Program Implementation (monitoring, permits, etc.)	50 (4%)
Brownfields	13 (1%)
Criminal Investigation	25 (2%)
Field Sampling (field sampling audits and events, etc,)	100 (8%)
LUST	31 (2%)
Pesticides	15 (1%)
RCRA - Corrective Action	27 (2%)
RCRA – Enforcement	40 (3%)
Superfund - Emergency Response	48 (4%)
Superfund - Pre-remedial/Remedial	357 (28%)
Superfund – Removal	139 (11%)
TSCA – Enforcement	23 (2%)
TSCA- Remedial	2 (< 1%)
Water - Drinking Water Compliance and Emergencies	62 (5%)
Water – Enforcement	149 (12%)
Water - Program Implementation (REMAP, TMDL, TOXNET, etc.)	153 (12%)
Other	14 (1%)
TOTAL	1,253

Joint Regional Project: Response to the BP Gulf Oil Spill

EPA regional laboratories often rely on each other when capability limitations or lack of sample capacity became an obstacle to providing support for a variety of projects. This was especially true in 2010 as EPA responded to massive BP oil spill in the Gulf of Mexico.

Due to the emergency resulting from the April 2010 BP oil spill into the Gulf of Mexico, regional laboratories were asked to provide analytical assistance to characterize the extent of the contamination. Many routine analyses were provided, such as VOAs, SVOCs, Metals, GRO/DRO/ORO, Oil and Grease, TPH, Air Toxics, TCLP, and Pesticides/PCBs, all with quick turnaround for the response. A new aquatic toxicity technique called Qwiklite® was utilized. This technique uses bioluminescence from phytoplankton dinoflagellates to quantitatively determine how toxic the water was from the oil spill contamination.

Finding a test method for the dispersant materials being used to break up the oil spill required rapid basic method development since there were no EPA methods available for these compounds. A test was quickly developed based on application notes from the internet and method 8260 to test for propylene glycol, 2-butoxyethanol, and di(propylene glycol) butyl ether using direct injection GC/MS by one Regional Laboratory. This method was shared with EPA and contract laboratories across Regions. Another method was developed using a modified method 8240 heated purge and trap for ethylhexanol.

The most difficult, and possibly the most important component, dioctylsulfosuccinate, sodium salt (DOSS) required much more extensive research with more sophisticated equipment and the cooperative work of several Regional laboratories working in unison. This analytical method quantified seawater DOSS concentrations to a reporting limit of 20 µg/L, and a practical detection limit of 10 µg/L. This reporting limit is below the United States Environmental Protection Agency's (U.S. EPA) 40 µg/L DOSS Aquatic Life Benchmark. The method utilized to analyze these water samples was by direct-injection reversed-phase liquid chromatography tandem mass spectrometry (LC/MS/MS). Other components of the dispersant (2-butoxyethanol and di(propylene glycol) butyl ether) were also added to this method because of its ability to achieve much lower detection limits. This method was also shared with the public laboratory community and other EPA Laboratories.

Over 600 water samples total from the Gulf were analyzed on a highest priority basis with very short turnaround time for the DOSS component of the dispersant. This was accomplished through the sharing of laboratory resources between two Regional laboratories, clearly demonstrating the spirit of "One EPA" through this cooperative and highly interactive effort.

Another regional laboratory analyzed 228 ambient air samples collected from on-shore fixed monitoring stations. Air samples were analyzed for volatile organic compounds (VOCs) using EPA Method TO-15 and preliminary data was provided within 48 hours, final verified data within 7 days. In addition, regional laboratories provided analysis of environmental samples for metals, VOCs, semivolatile organic compounds (SVOCs), total organic carbon (TOC) and pesticides/PCBs to determine baseline conditions and post well closure impact of the spill.

Emergency Preparedness

Regional laboratories play a critical role with regard to ensuring that the nation is prepared for environmental emergencies. The ability to provide consistent analytical capabilities, capacities, and quality data is an important aspect of the EPA's emergency response responsibilities. In order to enhance regional capability to respond to emergencies, whether from natural causes or terrorist activity, the regional laboratories worked on several significant development projects which are described below.

- **Partnership**: The regional lab community always stands ready to provide accurate environmental data in support of EPA's emergency response programs. To enhance the accessibility of their services the regional labs have placed a priority on joining the Office of Emergency Management's (OEM) Environmental Response Laboratory Network (ERLN) and within that network also serving as members of the Water Security Division's (WSD) Water Laboratory Alliance (WLA). Nine out of the ten regional labs have already joined both networks. All ten regional labs helped support the conversion of regional WLA Response Plans into a single national plan and during the past year have been working with OEM and WSD to adapt that plan into an all hazards ERLN response plan. Within that broadened framework regional labs will preserve their "regional hub" role in working with State and local ERLN labs to coordinate analytical support services in any given region.
- **Analytical Capability & Capacity**: In 2010, the regional labs continued efforts to address a shortfall in analytical capability and capacity to analyze for chemical warfare agents in environmental samples associated with terrorist events. A third of the planned five regional labs capable of analyzing for CWA finished putting necessary infrastructure and procedures in place and received ultra-dilute CWA standards to begin their program. A fourth lab started remodeling needed to house their program. Method development work continued and two throughput studies to test lab capacity were conducted.
- **Practice**: Good execution requires practice. In 2010 regional labs participated in variety of exercises that tested various components of response activities against several different scenarios. Three of the most significant were:
    1. <u>Full Scale Laboratory Exercise</u>: The U.S. Environmental Protection Agency (EPA) and the Centers for Disease Control and Prevention (CDC) conducted a Laboratory Full Scale Exercise (FSE) on August 20-27, 2010 to practice a coordinated laboratory response to a major environmental and public health incident in the western United States. EPA's Environmental Response Laboratory Network (ERLN) and Water Laboratory Alliance (WLA), as well as CDC's Laboratory Response Network (LRN) were mobilized to respond to immediate environmental and clinical laboratory needs.

        The FSE involved multiple concurrent incidents that required the capacity of multiple laboratory networks for chemical and biological analyses of water, soil, air, and clinical samples. The exercise was designed to test the full spectrum of a laboratory response, from sample collection and shipment, to laboratory analysis, data generation, data validation, and reporting to the incident management team (IMT).

        The FSE was initiated notionally on August 20, 2010 when a terrorist group sprayed a college stadium in Seattle, Washington with chemical agent and then crashed into a building containing organic chemicals. Laboratory activities, which commenced on Monday, August 23, 2010, were integrated with regional emergency response personnel, OEM, WSD, and other federal agencies such as CDC and the Federal Bureau of Investigation. Twenty-five laboratories, representing the full spectrum of WLA, ERLN, and LRN partners, participated in the FSE with excitement and commitment. Participants included EPA regional, state environmental and public health, county, public water utility, and commercial laboratories. At least one laboratory from each of the states in EPA's Regions 9 and 10 participated.

Even though the ERLN laboratories were unaware of what sample analyses would be required prior to the start of the exercise, they provided quick turnaround timeframes (24-48 hrs) and complied with specific data quality and electronic data deliverable requirements. These requirements also allowed EPA to test a new Web-based Electronic Data Review (WebEDR) product. Thirteen of the sixteen environmental laboratories were fully successful in uploading their data into the beta test version of WebEDR; the other three were partially successful. WebEDR was then used by the quality assurance team to validate the data in real time (Level 2 validation – includes review of blanks, spikes, and holding times) and to upload the data into the SCRIBE database to generate GIS maps for the Incident Command. The maps were available at lunch time on Thursday, August 26, 2010 - less than two and a half days after sample receipt. By all measures, this FSE was a great success and learning opportunity for EPA and our laboratory partners.

2. Liberty RadX: A National Tier 2 Full-Scale Radiological Dispersion Device Exercise was conducted in Philadelphia, Pennsylvania during the week of April 26-30, 2010. Liberty RadX was a national exercise sponsored and designed by the US Environmental Protection Agency (EPA) to practice and test federal, state and local assessment and cleanup capabilities in the aftermath of a radiological dispersion device (also known as a RDD or "dirty bomb") incident in an urban environment. Liberty RadX was unique in that participants practiced their "post-emergency" phase responsibilities and coordination. Coordination was tested between many agencies including, Pennsylvania Department of Environmental Protection (PADEP), City of Philadelphia, US Department of Health and Human Services (HHS), US Department of Energy (DOE), US Coast Guard (USCG), US Army Corps of Engineers (USACE), and many other federal, state, and local agencies. EPA Regional Laboratory management and staff participated in various incident command units including field operations, data management, and operations.

3. ICLN Cyanide Confidence Building Exercise: The EPA Office of Emergency Management (OEM), Centers for Disease Control and Prevention (CDC), and Food and Drug Administration (FDA) conducted a Joint Confidence Building Exercise (Joint CB Exercise) during the week of August 9, 2010. This exercise tested the ability of the Environmental Response Laboratory Network (ERLN), Chemical Laboratory Response Network (LRN-C), and Food Emergency Response Network (FERN) laboratories to analyze samples containing the same analyte (cyanide) in

matrices required by their respective networks and report data according to their processes and procedures. As ERLN members, several regional laboratories successfully participated in the exercise.

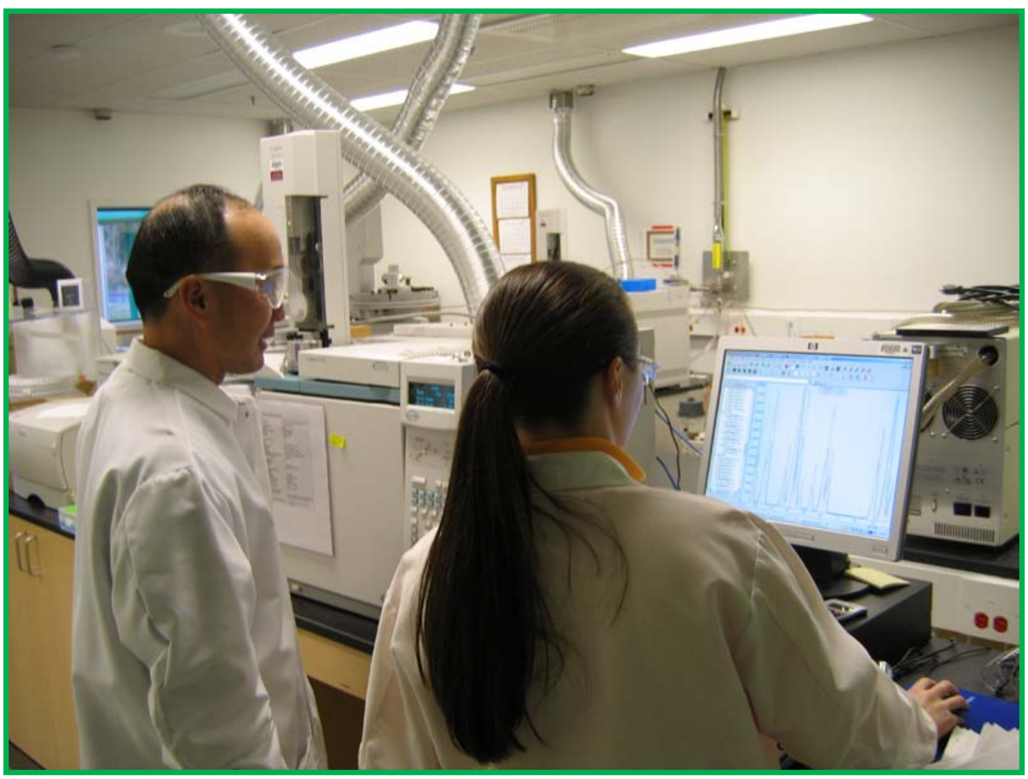
- **Putting it all to the Test:** In June 2010, a commercial fishing vessel was dragging for clams near Long Island when it dredged up eight canisters of World War I era mustard agent. One of the canisters was accidently broken open aboard the vessel. After the vessel offloaded its catch and two affected crew members in New Bedford Harbor and local emergency responders became aware of the incident a U.S. Coast Guard led response action to the vessel contamination swung into gear with EPA support. The responding EPA laboratory with CWA capability analyzed approximately seventy samples confirming decontamination of the Fishing Vessel ESS Pursuit and a commercial warehouse, warehouse equipment and 16 refrigerated trailers that came in contact with the vessels catch of 250 tons of clams.

The regional lab response supported the rapid clearance and release of the fishing vessel and other contaminated items for return to commercial use. It also put all of our CWA protocols and practice to use on a real event for the first time. The regional labs captured many lessons learned from this accidental release of CWA to improve our ability to respond to any future events.

Ensuring Quality of Data

The policy of the regional laboratories is to conduct all business with integrity and in an ethical manner. It is the basic and expected responsibility of each staff member and each manager to adhere to EPA's Principles of Scientific Integrity, dated November 24, 1999. This policy statement has been incorporated into the quality management plans of all the regional laboratories. It provides the foundation for the inclusion of ethics and ethics training into the quality systems to insure the production of data that is scientifically sound and defensible.

Evaluation and accreditation of the regional laboratories is crucial to ensuring the quality of environmental data. Nine out of ten of the EPA regional laboratories have received and are currently maintaining accreditation through the National Environmental Laboratory Accreditation Program (NELAP) for the analysis of samples in one or more of the following matrices: drinking water, non-potable water, solid and chemical materials, and air and emissions. NELAP is the program that implements the quality system standards adopted by the National Environmental Laboratory Accreditation Conference (NELAC). Both the NELAC standards and the NELAP program fall under the NELAC Institute (TNI.) TNI is a non-profit organization whose mission it is to foster the generation of environmental data of known and documented quality through an open, inclusive, and transparent process that is responsive to the needs of the community. In FY 2010, one of the regional laboratories began the process of replacing NELAP accreditation with accreditation under ISO 17025.



APPENDIX A

Regional Laboratories Core Capabilities

Appendix A: Regional Laboratories Core Capabilities

I. CHEMISTRY

ANALYTE / GROUP NAME	SAMPLE MEDIA	ANALYTICAL TECHNIQUE	REGIONAL CAPABILITY									
			1	2	3	4	5	6	7	8	9	10
INORGANIC CHEMISTRY:												
Acidity	Water	Titrimetric		X	X	X	X			X		
Alkalinity	Water	Titrimetric	X	X	X	X	X	X	X	X	X	X
Asbestos	Solids/Bulk material	PLM	X						X	X	X	X
	Soil/Sediment	PLM	X							X		X
Chloride	Water	Colorimetric							X			
	Water	IC	X	X	X	X	X	X	X	X	X	X
	Water	Titrimetric		X	X							
Chromium, Hexavalent (Cr+6)	Water	Colorimetric		X		X		X	X			X
	Soil/Sediment	Colorimetric		X		X						X
	Water	IC			X		X				X	
	Soil/Sediment	IC			X		X					
Cyanide, Amenable	Water	Colorimetric	X	X		X	X	X	X	X	X	X
	Soil/Sediment	Colorimetric	X	X		X		X	X	X		X
Cyanide, Total	Water	Colorimetric	X	X	X	X	X	X	X	X	X	X
	Soil/Sediment	Colorimetric	X	X	X	X	X	X	X	X		X
	Waste	Colorimetric	X	X	X	X	X	X		X		X

Appendix A: Regional Laboratories Core Capabilities

ANALYTE / GROUP NAME	SAMPLE MEDIA	ANALYTICAL TECHNIQUE	REGIONAL CAPABILITY									
			1	2	3	4	5	6	7	8	9	10
Fluoride	Water	ISE	X	X		X	X		X			
	Water	IC	X	X	X	X		X	X	X	X	X
Hardness	Water	Colorimetric										X
	Water	Titrimetric		X	X			X			X	
	Water	ICP/Calculation	X	X	X	X	X	X	X	X	X	X
Mercury, Total	Water	CVAA	X	X	X	X	X	X		X	X	X
	Soil/Sediment	CVAA	X	X	X	X	X	X		X	X	X
	Tissue (fish &/or plant)	CVAA	X	X	X	X				X	X	X
	Waste (oil, drum, etc..)	CVAA	X	X	X	X	X	X		X	X	X
Mercury (TCLP)	Soil/Waste (oil, drum, etc..)	CVAA	X	X	X	X	X	X		X	X	X
Metals, Total	Water	ICP /AES	X	X	X	X	X	X	X	X	X	X
	Soil /Sediment	ICP /AES	X	X	X	X	X	X	X	X	X	X
	Tissue (fish &/or plant)	ICP /AES	X	X	X	X			X	X	X	X
	Waste (oil, drum, etc..)	ICP /AES	X	X	X	X	X	X	X	X	X	X
Metals (TCLP)	Soil/Waste (oil, drum, etc..)	ICP /AES	X	X	X	X	X	X	X	X	X	X
Metals, Total	Water	GFAA	X				X	X				X
	Soil/Sediment	GFAA	X				X	X				X
	Tissue (Fish &/or plant)	GFAA	X									X
	Waste (oil, drum, etc..)	GFAA	X				X	X				X

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ANALYTE / GROUP NAME	SAMPLE MEDIA	ANALYTICAL TECHNIQUE	REGIONAL CAPABILITY									
			1	2	3	4	5	6	7	8	9	10
Metals (TCLP)	Soil/Waste (oil, drum, etc.)	GFAA	X				X	X				X
Metals, Total	Water	ICP/MS	X	X	X	X	X	X	X	X	X	X
	Soil/Sediment	ICP/MS	X	X	X	X		X	X	X		X
	Tissue (Fish &/or plant)	ICP/MS		X	X	X			X	X	X	X
	Waste (oil, drum, etc..)	ICP/MS			X	X		X	X	X		
Metals (TCLP)	Soil/Waste (oil, drum, etc..)	ICP/MS				X		X	X	X		
Nitrogen (Ammonia)	Water	Colorimetric		X	X	X	X	X	X	X	X	X
	Soil/Sediment	Colorimetric			X	X	X					X
	Water	Electrode		X								
Nitrogen (NO3 &/or NO2)	Water	Colorimetric		X	X	X	X	X	X	X	X	X
	Soil	Colorimetric				X	X		X			X
	Water	IC	X	X	X	X	X		X	X	X	X
	Soil	IC	X		X	X	X		X		X	
Nitrogen, Total Kjeldahl	Water	Colorimetric		X	X	X	X	X	X		X	X
	Soil	Colorimetric			X	X	X	X	X			X
Perchlorate	Water	IC					X		X		X	
	Soil	IC							X		X	
	Water	IC with LC/MS confirm			X		X		X			X
	Water, Soil/Sediment	LC/MS			X							X

Appendix A: Regional Laboratories Core Capabilities

ANALYTE / GROUP NAME	SAMPLE MEDIA	ANALYTICAL TECHNIQUE	REGIONAL CAPABILITY									
			1	2	3	4	5	6	7	8	9	10
	Water	LC/MS/MS	X							X	X	
Phosphorus, Ortho	Water	Colorimetric	X	X		X		X	X	X		X
	Water	IC	X	X	X	X	X		X	X	X	X
Phosphorus, Total	Water	Colorimetric	X	X	X	X	X	X	X	X	X	X
	Soil	Colorimetric	X		X	X	X					X
Sulfate	Water	IC			X	X			X	X	X	X
	Soil	IC			X	X			X	X	X	
	Water	Turbidimetric	X	X		X	X	X	X			
	Soil	Turbidimetric	X			X	X					
Sulfide	Water	Colorimetric		X		X	X		X			X
	Soil	Colorimetric				X	X					
	Water	IC, Turbidimetric						X				
	Water	Titrimetric		X			X				X	X
ORGANIC CHEMISTRY:												
BNA	Water	GC/MS	X	X	X	X	X	X	X	X	X	X
	Soil/Sediment	GC/MS	X	X	X	X	X	X	X	X	X	X
	Waste (oil, drum, etc..)	GC/MS	X	X	X	X		X	X	X	X	X
	Tissue (fish &/or plant)	GC/MS				X						X
BNA (TCLP)	Solid/Waste	GC/MS	X	X	X	X	X	X	X	X	X	X

Appendix A: Regional Laboratories Core Capabilities

ANALYTE / GROUP NAME	SAMPLE MEDIA	ANALYTICAL TECHNIQUE	REGIONAL CAPABILITY									
			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
BNA (TPH)	Water	GC/MS or GC				X	X	X	X	X	X	X
	Soil/Sediment	GC/MS or GC				X	X	X	X	X	X	X
BOD	Water	Membrane Electrode		X	X	X	X	X	X	X	X	X
COD	Water	Photometric						X				
	Water	Colorimetric		X	X		X		X	X		
EDB & DBCP	Water	GC/ECD	X			X	X	X	X	X	X	X
Herbicides	Water	GC/ECD; GC/NPD		X		X		X	X			X
	Soil/Sediment	GC/ECD; GC/NPD				X		X	X			X
	Waste (oil, drum, etc..)	GC/ECD; GC/NPD				X			X			X
	Tissue (fish &/or plant)	GC/ECD; GC/NPD							X			
Herbicides (TCLP)	Solid/Waste	GC/ECD		X		X		X	X			X
	Solid/Waste	HPLC/UV Detection			X							
Oil & Grease	Water	Gravimetric		X	X	X	X	X	X			X
	Soil/Sediment	Gravimetric		X			X		X	X		
Pesticides / PCBs	Water	GC/ECD	X	X	X	X	X	X	X	X	X	X
	Soil/Sediment	GC/ECD	X	X	X	X	X	X	X	X	X	X
	Waste (oil, drum, etc..)	GC/ECD	X	X	X	X	X	X	X	X	X	X
	Tissue (fish &/or plant)	GC/ECD	X	X		X			X	X		X
Pesticides (TCLP)	Solid/Waste	GC/ECD	X	X	X	X	X	X	X	X	X	X

Appendix A: Regional Laboratories Core Capabilities

ANALYTE / GROUP NAME	SAMPLE MEDIA	ANALYTICAL TECHNIQUE	REGIONAL CAPABILITY									
			1	2	3	4	5	6	7	8	9	10
Phenolics	Water	Colorimetric		X	X	X			X	X		X
	Soil/Sediment	Colorimetric			X				X	X		
PAHs	Water	GC/MS	X	X	X	X	X	X	X	X	X	X
	Soil/Sediment	GC/MS	X	X	X	X	X	X	X	X	X	X
	Air	GC/MS	X			X			X			X
	Tissue (fish &/or plant)	GC/MS	X			X			X			X
	Waste (oil, drum, etc..)	GC/MS	X	X	X	X		X	X	X		X
TOC	Water	Combustion / IR		X	X	X	X		X	X	X	X
	Soil	Combustion / IR		X	X	X	X		X	X		X
	Water	Combustion/Oxidation								X		
	Water	UV/Persulfate			X		X	X		X	X	X
VOA	Water	GC/MS	X	X	X	X	X	X	X	X	X	X
	Soil/Sediment	GC/MS	X	X	X	X	X	X	X		X	
	Air	GC/MS	X	X	X	X	X	X	X	X	X	X
	Waste (oil, drum, etc..)	GC/MS	X	X		X		X	X	X	X	X
	Water	GC				X						X
	Soil/Sediment	GC				X						X
	Waste (oil, drum, etc..)	GC	X		X	X	X					X
VOA (TCLP)	Solid/Waste	GC/MS		X		X		X	X	X		

ANALYTE / GROUP NAME	SAMPLE MEDIA	ANALYTICAL TECHNIQUE	REGIONAL CAPABILITY									
			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
VOA (TPH)	Water	GC/MS or GC				X	X		X	X	X	X
	Soil/Sediment	GC/MS or GC				X	X		X	X	X	

II. PHYSICAL & OTHER DETERMINATIONS

ANALYTE / GROUP NAME	SAMPLE MEDIA	ANALYTICAL TECHNIQUE	REGIONAL CAPABILITY									
			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Conductivity	Water	Specific Conductance	X	X	X	X	X	X	X	X	X	X
Flash Point	Aqueous/Liquid Waste (oil, drum, etc.)	Pensky-Marten or Seta	X	X	X	X	X	X	X		X	
Ignitability	Soil/Sediment	Pensky-Marten or Seta Closed Cup	X	X		X	X	X	X			X
	Waste (oil, drum, etc..)	Pensky-Marten or Seta Closed Cup	X	X	X	X	X	X	X	X	X	X
pH	Water	Electrometric	X	X	X	X	X	X	X	X	X	X
	Soil/Sediment	Electrometric	X	X	X	X	X	X	X	X	X	X
	Waste (oil, drum, etc..)	Electrometric	X	X	X	X	X	X	X	X	X	X
Solids, Non-Filterable	Water	Gravimetric	X	X	X	X	X	X	X	X	X	X
Solids, Percent	Soil/Sediment	Gravimetric	X	X	X	X	X	X	X	X	X	X

Appendix A: Regional Laboratories Core Capabilities

ANALYTE / GROUP NAME	SAMPLE MEDIA	ANALYTICAL TECHNIQUE	REGIONAL CAPABILITY									
			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Solids, Total	Water	Gravimetric	X	X	X	X	X	X	X	X	X	X
Solids, Total Dissolved	Water	Gravimetric	X	X	X	X	X	X	X	X	X	X
Solids, Total Volatile	Water	Gravimetric	X	X		X	X	X	X	X	X	X
Turbidity	Water	Nephelometric	X	X	X	X		X	X	X	X	X

Appendix A: Regional Laboratories Core Capabilities

III. BIOLOGY

ANALYTE / GROUP NAME	SAMPLE MEDIA	ANALYTICAL TECHNIQUE	REGIONAL CAPABILITY									
			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Coliform, Total	Water, Soil &/or Sludge	Various	X	X	X			X	X	X	X	X
Coliform, Fecal	Water, Soil &/or Sludge	Various	X	X	X			X	X	X	X	X
E. coli	Water, Soil &/or Sludge	Various	X	X	X			X	X	X	X	X
Toxicity (Acute & Chronic)	Water	Fathead, Ceriodaphnia	X	X	X			X		X	X	X
Heterotrophic Plate Count	Water	Various			X			X	X		X	

Appendix A: Regional Laboratories Core Capabilities

ABBREVIATIONS

BNA	Base/Neutrals and Acids Extractable Organics
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
CVAA	Cold Vapor Atomic Absorption Spectrometry
DBCP	Dibromochloroproprane
EDB	Ethylene dibromide
GC	Gas Chromatography
GC/ECD	GC/Electron Capture Detector
GC/NPD	GC/Nitrogen - Phosphorus Detector
GC/MS	GC/Mass Spectrometry
GFAA	Graphic Furnace Atomic Absorption Spectrometry
IC	Ion Chromatography
ICP	Inductively Coupled (Argon) Plasma
ICP/AES	ICP/Atomic Emission Spectrometry
ICP/MS	ICP/Mass Spectrometry
IR	Infrared
ISE	Ion Selective Electrode
LC/MS	Liquid Chromatography/Mass Spectrometry
LC/MS/MS	Liquid Chromatography/Dual MS
NO_3	Nitrate
NO_2	Nitrite
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	Polychlorinated biphenyls
PLM	Polarized Light Microscopy
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total Organic Carbon
VOA	Volatile Organic Analytes/Analyses