



Good Chemistry through Cooperative Relationships

Supporting EPA Program Initiatives

presented by the Association of Public Health Laboratories'
Environmental Health Committee's Environmental Laboratory Subcommittee to the
US Environmental Protection Agency
Office of Water, Office of Ground Water and Drinking Water, Water Security Division

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Acronyms

AHRF	All Hazards Receipt Facility
APHL	Association of Public Health Laboratories
CDC	Centers for Disease Control and Prevention
ELS	Environmental Laboratory Subcommittee
EPA	U.S. Environmental Protection Agency
ERLN	Environmental Response Laboratory Network
NELAP	National Environmental Laboratory Accreditation Program
LRN	Laboratory Response Network
PHL	Public Health Laboratory
TNI	The NELAC Institute
WLA	Water Laboratory Alliance



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Executive Summary

In 2005 the Association of Public Health Laboratories (APHL) signed a cooperative agreement with the US Environmental Protection Agency (EPA), Water Security Division, Threats Analysis, Preparedness and Prevention Branch, to serve as the “Home Base” for state environmental laboratories. APHL was uniquely qualified because of its membership, consisting of more than 700 members from state and local public health and environmental laboratories, and because of its history of successful partnerships with federal agencies.

Since 2005, APHL has become the organizational hub of environmental laboratories, serving as their focal point for communication, training, policy and interactions with the federal government. The cooperative agreement provided the necessary financial and technical support to help APHL produce this formal “system” whereby state environmental laboratories interact, exchange information and articulate issues, concerns and solutions that ultimately strengthen EPA program activities.

APHL established the Environmental Laboratory Subcommittee (ELS) to spearhead the initiatives of the cooperative agreement. In its first task, ELS designed an APHL survey of state environmental laboratories to identify gaps that exist in emergency preparedness, specifically in chemical and radiological terrorism preparedness. The results reinforced the need for a national drinking water response plan and served as a starting point for addressing the weaknesses and strengths facing environmental laboratories.

Through the cooperative agreement with APHL, EPA is realizing its goals of establishing networks comprised of state public health and environmental laboratories with the analytical capability and capacity to respond in the event of a large-scale regional or national environmental incident. Using APHL’s access to the state environmental laboratories, EPA’s Water

Laboratory Alliance has developed and tested a Regional Laboratory Response Plan for Drinking Water, a major step in responding to water security incidents. In addition, ELS provided input not only to the development of the national Environmental Response Laboratory Network (ERLN) by the EPA Office of Solid Waste and Emergency Response but also to the modification of the Laboratory Compendium, a national registry of certified environmental laboratories and their analytical capability and capacity to respond to incidents.

APHL provides the venue for state environmental laboratory stakeholders to weigh in on federal processes and regulations as they are proposed and before they become promulgated. This arrangement enables federal agencies and state laboratories to exchange programmatic and scientific information to better inform decision making and future directions. In addition, APHL provides web-based technical training resources to aid environmental laboratories in implementing current and new methodology. In an effort to achieve consistency and enhance data quality, APHL and EPA are working together to standardize laboratory reporting requirements.

Activities are conducted through monthly ELS teleconferences with APHL and EPA representatives, and follow-up actions are facilitated using APHL’s expertise in communication, training and conferencing. Using APHL publications (as tools distributed to all state environmental laboratories), the ELS communicates emerging issues and program status reports to both member and non-member environmental laboratories. Since 2007, APHL has enhanced its Annual Meeting to jointly host the APHL State Environmental Laboratory Conference. This provides the needed forum for information exchange and the dissemination of newly emerging issues impacting federal and state environmental laboratories.

Aim of this Paper

This paper describes:

- APHL's historical involvement with the state environmental laboratories,
- The establishment of an EPA-APHL Cooperative Agreement through which APHL created a "Home Base" for environmental laboratories and established the Environmental Laboratory Subcommittee and
- Achievements under this cooperative agreement with EPA and future directions APHL can take to facilitate state/federal communication, interaction and cooperative technical exchange.

Partnership with US Environmental Protection Agency

In existence for more than 50 years, APHL is the premiere organization representing the nation's public health and environmental laboratories. It serves as the central hub for communication, training and policy for those laboratories and serves as a focal point for their interactions with the federal government.

The traditional home for public health laboratories (PHLs), APHL also was the home for those environmental laboratories that were organizationally located within the PHL. In January 2003, APHL, the Centers for Disease Control and Prevention (CDC), EPA and the Department of Defense hosted a meeting of the 50 state environmental laboratories. During the meeting, the disparity in access to federal agencies between the two groups of state environmental laboratories (those located within the state PHL and those that were separate from the PHL) was quickly recognized and identified as an issue that needed to be rectified. Following this meeting, APHL initiated discussions on opening the association's membership to all state environmental laboratories, with the subsequent revision to the by-laws occurring in September 2004.

Early in 2005, APHL and EPA signed a cooperative agreement. Up to this point, environmental laboratories did not have a formal support system where they could interact with each other and exchange information. The lack of a common network or association made it difficult for environmental laboratories to form relationships with colleagues so that lessons learned could be shared. The cooperative agreement provided the necessary financial and technical support to enable APHL to enhance its membership's activities related to environmental laboratory issues.

The cooperative agreement also provided a formal support system whereby state environmental laboratories could interact, exchange information and provide a unified voice for articulating issues and concerns impacting the state environmental laboratories' ability to fulfill EPA program activities.

APHL had the experience to succeed for several reasons. APHL had co-founded the Laboratory Response Network (LRN) with CDC and the Federal Bureau of Investigation. The LRN was designed to ensure that the nation would be able to respond to a biological attack through rapid identification of the agents using validated laboratory protocols. It was also designed to ensure that test results would withstand court scrutiny in any litigation ensuing from investigations. APHL played a critical role in the expansion of the LRN to include identification of chemical threat agents in clinical samples and is currently involved with CDC's preliminary discussions on the expansion of the LRN to include radiological threat agents.

Additionally, APHL members had already supported and participated in national programs

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to improve the quality of the nation's environmental testing laboratories through participation in The NELAC Institute (TNI), the National Environmental Laboratory Accreditation Program (NELAP) and the EPA Safe Drinking Water Act laboratory accreditation program. APHL members have been involved with TNI/ NELAP since its inception and have contributed to its development over the years. The membership is committed to providing high quality environmental data for both regulatory compliance and emergency response purposes, as well as supporting an effective accreditation program that meets the needs of both the users of the data and the environmental laboratories.

APHL as 'Home Base' for Environmental Laboratories

APHL's cooperative agreement with the EPA calls for APHL to serve as "Home Base" for environmental laboratories, enabling APHL to serve as the central hub of communication, training and policy for environmental laboratories across the country and to improve interactions among these laboratories and both the federal government and the private sector.

Action Plan

To fulfill the terms of the cooperative agreement and begin the process of strengthening the ties between the environmental laboratories and the EPA, APHL formed the ELS under the direction of the Environmental Health Committee. The ELS consists of environmental laboratory directors, program managers, federal representatives, chemists and others from both state public health and environmental agencies, who work together to enhance the capabilities and capacities of the nation's state environmental laboratories.

The subcommittee serves as a forum to exchange information about important issues to

state environmental laboratories and provide opportunities for all environmental laboratories to share and brainstorm about ideas and training needs, surge testing capacity and other relevant topics. Activities are conducted through monthly teleconferences with APHL and EPA representatives. Follow-up actions are facilitated by APHL's expertise in communication, continuing education and conferencing.

Communications Plan

In 2004, APHL compiled a list of all state environmental laboratory directors, the only such list that exists in the US. With the contacts from this list, APHL created (and continues to update) an environmental laboratory directors listserv to facilitate the exchange of information among environmental and public health laboratories. Participants can post technical questions, requests on policy issues and common management concerns. In addition, APHL built a list of more than 500 individuals interested in receiving communications from APHL regarding environmental laboratory news and issues.

APHL and the ELS are able to disseminate emerging issues and program status reports to both member and non-member state environmental laboratories by using a plethora of diverse communication tools:

- **Lab Matters**—a quarterly magazine distributed to APHL members and partners,
- **E-Update**—a weekly electronic newsletter distributed to APHL members and partners,
- **Bridges: Connecting the Nation's Environmental Laboratories**—a semi-annual newsletter distributed to environmental laboratories and APHL partners and
- **Environmental Laboratory Electronic Newsletter**—a bi-monthly electronic newsletter distributed to environmental laboratories and partners.

Accomplishments of the APhL–EPA Cooperative Agreement

Venue for Stakeholders to Weigh in on Federal Processes

Environmental laboratory stakeholders often use the ELS to submit recommendations and review federal documents related to laboratory enhancement and emergency preparedness.

Laboratory Enhancement

At the request of the subcommittee, APhL coordinated the submission¹ of comments on the Federal Register notice, “Expedited Approval of Test Procedures for the Analysis of Contaminants under the Safe Drinking Water Act; Analysis and Sampling Procedures,” in 2007². APhL encouraged development of any process that will expedite approval of methods for the determination of environmental contaminants in order to produce data of reliable and consistent quality. The subcommittee also requested that EPA develop an additional process to expedite agency acceptance of alternate test methods such as the two methods listed in the notice, EPA Method 200.5 and Standard Method 6610-04.

Emergency Preparedness

ELS reacted to several new initiatives introduced to them by both the EPA Water Security Division, Office of Groundwater and Drinking Water and the Office of Emergency Management in the Office of Solid Waste and Emergency Response.

When the ELS formed, EPA was in the preliminary stages of developing their counterpart to the CDC LRN, the ERLN. This network of environmental laboratories will be a resource to the nation for responding to environmental emergencies. Since 2005, the ELS has played an active role in providing constructive feedback on the development of the ERLN and its proposed

program standards. Discussions aimed at understanding the role that state, county, city and utility environmental laboratories will play in responding to national incidents. During these discussions the ERLN identified gaps in the national laboratory capability and capacity to respond to national incidents. In addition to the gap in capability and capacity for Chemical Warfare Agent testing, it became evident that the national and state laboratories’ capacity and capability for radiological testing of environmental samples were also deficient.

The ELS “test drove” the updated EPA Laboratory Compendium database and provided comments on its ease of use and functionality before it was reintroduced to state public health and environmental laboratories. The Laboratory Compendium is currently in use and has become an important tool in regional laboratory response plans for identifying laboratories having the capability and capacity to respond to specific incidents.

The ELS also provided comments on the latest version of the Standard Analytical Methods for Environmental Restoration Following Homeland Security Events (SAM) Document 4.0. Reviews by the ELS were made from the viewpoint of the state laboratories’ ability to use the document and implement the method guidance provided in the document. Because the SAM document is considered by the ELS to be an important tool for laboratories considering participation in the ERLN, the ELS ensured other laboratories had the opportunity to provide input through open house conference calls and sessions at the APhL Annual Meeting.

State environmental laboratories continue to assist the Water Security Division in the development of the Water Laboratory Alliance (WLA) and the Regional Laboratory Response Plans. The ELS provided feedback to EPA on this initiative and continues to provide a forum for the dissemination of program information through

APHL Annual Meetings, live webcast seminars and association publications.

Survey of State Environmental Laboratories

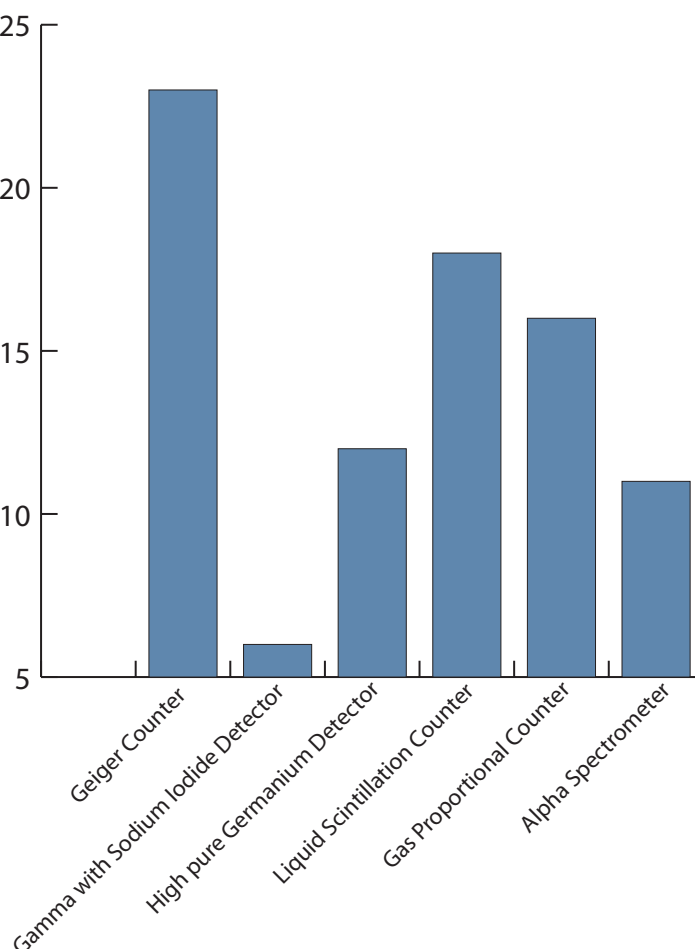
Although conducted outside the cooperative agreement with EPA, APHL's environmental laboratory survey served as a starting point for addressing the strengths and weaknesses facing environmental laboratories. Survey results identified gaps in emergency preparedness, specifically in chemical and radiological preparedness and reinforced the need for a national level response plan. EPA's development of the Water Laboratory Alliance, Regional Laboratory Response Plans for Drinking Water and the Emergency Response Laboratory Network has been a major step toward filling these gaps.

In 2006, APHL conducted the first-ever survey of state environmental laboratories to assess

capability and capacity, identify needs of responding laboratories and establish benchmarks for future comparison. Previous APHL surveys evaluated the capability and capacity of state *public health* laboratories to analyze *clinical* specimens for the presence of chemical agents; capacity and capability to analyze *environmental* samples for chemical and radiological agents had not been established.

The survey was distributed to 71 environmental laboratories from all 50 states and the District of Columbia. Of the 71 laboratories, 58 responded from 37 states. The results of this survey identified gaps in emergency preparedness, specifically, chemical and radiological terrorism preparedness. For example, 47% of responding states reported the capability to screen for the presence of radioactivity; however, they reported limited availability of detector systems required for identification of specific radioisotopes (Figure 1).

Figure 1: Radiological Agent Detection Instruments Reported by 37 States in 2006



Key findings of the assessment revealed opportunities for laboratory improvement:

- A laboratory certification program operated by a credible authority is a critical need for state environmental laboratories. Such a program would ensure consistency and reliability of environmental analysis data.
- Analysis methods for potential chemical warfare agents in environmental samples are needed.
- The communication of electronic data in a uniform format is a challenge that must be resolved.
- Funding sources for emergency response testing, instrumentation, staff, electronic data handling and communication systems are needed.

Survey results were analyzed and shared with relevant stakeholders via several mechanisms. APHL hosted a conference call and invited the 72 surveyed laboratories to discuss the results. APHL published, distributed and posted on its website an issue brief summarizing the main findings of the survey³. Lastly, results of the survey were presented at the 2007 APHL Annual Meeting and State Environmental Laboratory Conference and the 2008 NELAC Institute Annual Meeting.

Outreach to, and Training for, the Environmental Laboratory Community

The ELS provides outreach to non-member and member environmental laboratories including those involved in food safety testing, agricultural experiment stations and environmental protection or management. Outreach efforts hinge on promoting new APHL membership and educating laboratories on the mission of bringing APHL, federal agencies and environmental laboratories together to work on critical initiatives and projects.

Working closely with APHL's Environmental Laboratory Program, ELS

communicates frequently with member and non-member laboratories through the quarterly magazine *Lab Matters*, the semi-annual environmental laboratory newsletter *Bridges*, emails to the environmental laboratory distribution list, the bi-monthly electronic environmental laboratory newsletter and the weekly APHL *E-Update* newsletter.

Several articles from EPA appeared in each issue of *Bridges*. For example the articles below appeared in the summer 2008 edition⁵:

- "EPA Announces Phase 1 of the Environmental Response Laboratory Network" (Schatzi Fitz-James, Homeland Security Laboratory Response Center),
- "EPA Collaborates with Water Sector on Water Contamination Response" (Latisha Mapp, Water Security Division) and
- "EPA Introduces NEMI-CBR: A Tool to Enhance Water Sector Response to Contamination Events" (Karen Milam, Water Security Division).

In addition to these communication efforts, ELS and APHL's Department of Continuing Education and Training develop and promote training opportunities for the environmental laboratory community. To date well over 2,000 laboratorians took advantage of these environmental laboratory training opportunities.

Past webcasts and audio conferences featured topics such as:

- National Environmental Methods Index-- Chemical, Biological and Radiological
- Radiological Preparedness Options for State Laboratories
- Chain of Custody and Evidence Preservation
- EPA's Water Laboratory Alliance
- EPA's Regional Laboratory Preparedness Plan Functional Exercises

To address the nation's gaps in radiological preparedness, APHL collaborated with EPA to sponsor a *Training Course for Radioanalytical Laboratory Personnel*. This week-long course was

held three times at EPA's National Air and Radiation Environmental Laboratory in Montgomery, AL. Topics ranged from principles of radiochemical separation to applied principles of radiochemistry drinking water analysis during an incident of national significance.

The ELS developed the concept and the curriculum for a new data quality evaluation workshop sponsored by APHL. The training workshop, "Conducting Data Review for State

The National Biomonitoring Plan will serve as a framework for biomonitoring program activities at the state and national level, covering topics such as trainings, standards, state legislation and equipment and technology.

Drinking Water Programs," was held in conjunction with the Association of State Drinking Water Administrators at their annual conference in Colorado Springs, CO, in October 2008. The

ELS designed the workshop to help close gaps it identified in the ability of environmental health programs to evaluate the quality of environmental laboratory data routinely reported to them.

The training workshop was attended by public water utility and drinking water program administrators from cities, counties and states across the US. Participant feedback was overwhelmingly positive.

Continued efforts to identify other training needs are essential to programs that rely on environmental laboratory data to support public and environmental health decision making and policy.

Support of Biomonitoring Capacity Building for Environmental Laboratories

APHL works to inform environmental laboratories about ongoing efforts with biomonitoring in PHLs, as well as to help make connections between environmental laboratories and environmental public health tracking programs. The association's Environmental Laboratory Program and Environmental Health

Program work in concert to achieve this goal, along with the Biomonitoring Subcommittee and the LRN-C Biomonitoring Workgroup.

The ELS, working with EPA, the APHL Biomonitoring Subcommittee, CDC and the New England states, helped coordinate EPA Regions 1 and 9's Water Laboratory Alliance exercises with CDC. Such coordination allowed states to test clinical laboratory preparedness (biomonitoring) in addition to environmental laboratory preparedness, creating a more realistic emergency response scenario and testing the relationships and communication mechanisms between these entities.

Several other activities occurred through funding from CDC. The APHL Biomonitoring Subcommittee worked on a National Biomonitoring Plan, guidance on developing state legislation and success stories from other laboratories. The National Biomonitoring Plan will serve as a framework for biomonitoring program activities at the state and national level, covering topics such as trainings, standards, state legislation and equipment and technology. APHL will work with the National Council of State Legislatures to design a best practices guide for state legislators interested in developing legislation for biomonitoring projects. Finally, the APHL Biomonitoring position statement received APHL Policy Committee approval in 2008.

APHL staff, as well as a representative from the APHL Biomonitoring Subcommittee, are on the Planning Committee for the CDC National Environmental Health Conference. APHL plans to ensure that there is a biomonitoring track during the meeting as well as laboratory-related sessions on chemical threats and biomonitoring. APHL Environmental Health (EH) staff is also participating on the Environmental Health Coalition, a group initiated by the American Public Health Association to bring together stakeholders in environmental health. EH staff

will participate on the workgroup for Toxics, whose focus includes biomonitoring activities.

Together with the Biomonitoring Subcommittee, APHL is updating the 2004 report *Biomonitoring: Measuring Chemicals in People*. The report will highlight federal biomonitoring efforts, state success stories and the potential health effects of chemicals.

As part of a Workgroup on Biomonitoring, APHL is facilitating an online biomonitoring database to help laboratories better collaborate on biomonitoring projects and methods. APHL is also collaborating with the Toxicology Workgroup to plan a toxicology training course in Arkansas that will cover the basics of toxicology, laboratory methods and how to testify in a court of law.

APHL will continue to invite environmental laboratories and EPA to participate in all of its biomonitoring work, since biomonitoring acts as an important link between environmental and health data.

Web-Based Resources for Sharing Technical Information

APHL developed and maintained web-based resources to encourage sharing of technical information. ELS uses Microsoft Office SharePoint to share documents, contact information, an RSS feed on environmental topics and a discussion thread. Members access monthly call agendas, minutes and other documents on this site. By tracking changes, members can check out documents for editing and save them under the same name using version history to allow rejection or acceptance of suggested changes.

The member section of the APHL website is also available for broader sharing of technical information. For example, the APHL Environmental Health Committee posted documents and templates regarding EPA's Region 1 Functional Exercises for use by other members

in their regional exercises. Also posted on the APHL web site for public access is EPA's "Radiological Laboratory Sample Analysis Guide for Incidents of National Significance—Radionuclides in Water," released January 2008⁴.

Exchange of Programmatic and Scientific Information

The ELS holds monthly teleconferences that are attended by EPA staff. Topics focus on furthering the initiatives of the ELS and the EPA Cooperative Agreement as well as those of the ERLN Program Office. Twice annually the ELS meets in person, once at the APHL headquarters in Silver Spring, MD, and once at the annual State Environmental Laboratory Conference.

The subcommittee also continues to expand the association's list of environmental laboratories through networking, building relationships with EPA regional laboratory directors and using the EPA Laboratory Compendium.

APHL used the Environmental Laboratory Directors listserv frequently. State environmental laboratory directors responded to an inquiry from Scott Becker, APHL executive director, on the effect of the economic climate on their operation. Ten states responded with accounts of how their laboratory was faring given the economy.

State Environmental Laboratory Conference

Prior to 2007, a national conference for state environmental laboratory professionals did not exist. Since 2007, APHL has enhanced its annual conference by jointly hosting the APHL State Environmental Laboratory Conference.

The subcommittee also continues to expand the association's list of environmental laboratories through networking, building relationships with EPA regional laboratory directors and using the EPA Laboratory Compendium.

APHL also held the Water Laboratory Alliance Forum at the 2008 meeting. This provided the needed forum for information exchange by both state and federal environmental laboratory programs and the dissemination of newly emerging issues and concerns impacting federal and state environmental laboratories.

The ELS actively participated in planning the First State Environmental Laboratory Conference, which took place in June 2007 alongside the APHL Annual Meeting. The Second Annual Environmental Laboratory Conference was held May 18-21, 2008, in St. Louis, MO. A half day on May 17, 2008, was devoted to the WLA Forum. More than 350 people attended the 2008 meeting. Michael Shapiro, deputy administrator of EPA's Office of Water, gave a plenary address, "Drinking Water Preparedness in the World of Water Security." The conference had more than 15 environmental sessions, including:

- EPA's Water Laboratory Alliance Forum
- Drinking Water Preparedness in the World of Water Security
- Integration of an All Hazard Receipt Facility into the Laboratory
- Case Study of an Interagency Regional All Hazard Lab Response
- EPA Homeland Security Laboratory Initiatives for Water Security and Other Media
- Climate Equilibration Impact upon the Laboratory
- The State Environmental and Public Health Laboratory of the Future
- 2020: What is Your Vision for the Radiochemistry Laboratory of the Future?

The ELS also organized a breakout session, "EPA Homeland Security Laboratory Initiatives for Water Security and Other Media." EPA representatives presented the ERLN and the WLA Program components to the broader APHL membership. The breakout session "Case Study of an Interagency Regional All Hazard Lab

Response" enabled laboratories and EPA program representatives to share their experiences and lessons learned from participating in simultaneous Regional Laboratory Response Plans and CDC regional laboratory response plan functional exercises. APHL state member participants in the functional exercises shared their institutional and personal experiences, providing insight, lessons learned and constructive feedback for improving future functional laboratory response and joint exercises.

All of these sessions had excellent attendance and received positive feedback. The 2009 conference was also well received, prompting the hopes of the ELS to hold the Fourth Annual State Environmental Laboratory Conference in 2010.

In all, the APHL annual conferences serve public health laboratories, state environmental laboratories, EPA and CDC, as well as the Department of Homeland Security's Integrated Consortium of Laboratory Networks, by covering a broad collection of topics encompassing EPA, CDC, US Food and Drug Agency and US Department of Agriculture emergency response initiatives designed to strengthen national laboratory response to incidents.

Future Directions

Address Environmental Laboratory Needs

The ELS hopes to focus on developing new ways of soliciting environmental laboratory feedback in an effort to ensure major concerns are communicated to the EPA. Specifically, ELS will work closely with EPA to:

- Identify gaps in laboratory knowledge and technical standards,
- Assist in the dissemination of technical standards and guidance,
- Identify training needs and
- Provide consultation on programs affecting environmental laboratories.

For example, EPA recently published the All Hazards Receipt Facility (AHRF) Screening Protocol, a critically-needed document outlining the sample screening procedures for public health and environmental laboratories to follow when handling samples of unknown and potentially hazardous character prior to laboratory analysis. This document provides technical guidance on the screening facility design and screening protocols to be followed when receiving these samples. In support of this protocol, two pilot screening facilities have been constructed and have completed testing at one state and one federal environmental laboratory facility. State environmental laboratories have requested more detailed information on the minimum specifications for both analytical screening equipment and also required personal protective equipment. In addition, the ELS wishes to support the development and implementation of a training program available to all governmental laboratories. Finally, the ELS noted that not all laboratories can implement the AHRF screening program as currently written and is working with EPA and the Department of Homeland Security on a staged implementation of the protocol.

With respect to the EPA's continued development of the Regional Laboratory Response Plans and the ERLN, the ELS proposes to continue providing technical consultation on issues such as:

- Program development and rollout,
- Identifying data reporting weaknesses (such as data qualification) and possible solutions,
- Methods of electronic data transfer,
- Data interpretation issues that may be experienced by local Incident Commanders and
- Outreach to water supply systems and water utility laboratory directors.

Other areas of concern to the environmental laboratories:

- The nation needs a biomonitoring program that integrates environmental data with

human exposure data and health outcomes. For example, in one central US community a significant number of local residents recently developed brain tumors. Environmental testing of water and soil near an industrial plant previously operating in the community revealed the presence of potentially harmful substances. However, to date there have been no reports of clinical specimens being tested for the presence of these materials to see if they are being absorbed into the bodies of the residents.

- Communication of environmental testing data from environmental laboratories to the EPA advanced significantly due to EPA efforts, but many areas require additional attention. Future efforts should focus on integrating the information with biomonitoring and health outcome data. Such integration will allow scientists to better assess the contribution of the environment to chronic health problems.

Environmental laboratories face a workforce shortage as fewer undergraduate students pursue a career in chemistry. The majority of students graduating with a major in chemistry are pursuing graduate studies in medicine or research in areas unrelated to environmental science. A fellowship program placing graduates in environmental laboratories could encourage development of the future workforce.

The mission of the majority of state environmental laboratories does not include research and development because their services are solely dedicated to the support of current state environmental programs. Environmental research is performed by the EPA. Expansion of EPA programs to include research projects in environmental health with participation of state environmental laboratories and state health laboratories should be considered.

Outreach to Broader Audiences

The ELS plans to look at alternate ways of

broadening its audience in an attempt to create increased awareness of employment opportunities in environmental laboratories (e.g., expand circulation of *Bridges* to colleges and universities with environmental programs).

Through the constant efforts of EPA and the ELS, environmental laboratories should con-

In the event of an emergency, the relationships formed by working toward common goals will ensure a successful integration of the partners into a team.

tinue to benefit from improved program communications, training opportunities and the ability to communicate issues and concerns to the federal government.

Conversely, EPA's access to the environmental laboratory community will be greatly enhanced through cooperative program development and implementation.

Conclusions

The cooperative agreement between APHL and EPA led to a well-established relationship in support of environmental laboratories and their efforts to protect the public. The agreement allowed environmental laboratories to more

easily provide insights to EPA and allowed EPA to more easily communicate with environmental laboratories. APHL is uniquely qualified to play this role and needs continued resources to serve as the home base for state environmental laboratories and to continue to attract additional partners and audiences (such as local government environmental laboratories).

As EPA launches the Water Laboratory Alliance and continues to develop the ERLN, the relationships with partners in the states formed through APHL and its activities will become increasingly important. In the event of an emergency, the relationships formed by working toward common goals will ensure a successful integration of the partners into a team. Such planning and exercising can mean the difference between an efficient and effective response and an uncoordinated one.

APHL continues to be the premiere organization representing the nation's state environmental and public health laboratories and is the best vehicle for EPA to advance the goal of integrating state response capabilities in a national response plan.

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The Association of Public Health Laboratories (APHL) is a national nonprofit dedicated to working with its members to strengthen governmental laboratories with a public health mandate. By promoting effective programs and public policy, APHL strives to provide public health laboratories with the resources and infrastructure needed to protect the health of US residents and to prevent and control disease globally.

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