

**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION
National Center for Environmental Health/
Agency for Toxic Substances and Disease Registry**



**Board of Scientific Counselors Meeting
November 18-19, 2014
Atlanta, Georgia**

Record of the Proceedings

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Executive Summary

The U.S. Department of Health and Human Services and the Centers for Disease Control and Prevention (CDC) National Center for Environmental Health/Agency for Toxic Substances and Disease Registry (NCEH/ATSDR) convened a meeting of the Board of Scientific Counselors (BSC) on November 18-19, 2014 at the CDC Chamblee Campus in Atlanta, Georgia.

The Designated Federal Official (DFO) conducted the meeting in accordance with all rules and regulations of the Federal Advisory Committee Act. The DFO verified that the voting members and *ex-officio* members constituted a quorum for the BSC to conduct its business on both days of the meeting. The DFO announced that BSC meetings are open to the public and all comments made during the proceedings are a matter of public record.

The DFO reminded the BSC voting members of their individual responsibility to identify potential conflicts of interest with any of the published agenda items and recuse themselves from participating in or voting on these matters. None of the BSC voting members publicly disclosed any conflicts of interest for the record. The DFO called for public comment at all times noted on the published agenda for the November 18-19, 2014 BSC meeting.

The NCEH/ATSDR Acting Director covered the following topics in the Office of Director's (OD) report to the BSC.

NCEH/ATSDR OD Highlights

- NCEH/ATSDR's recent changes in leadership at the OD level
- NCEH/ATSDR's actions to respond to recent Congressional interest in its ongoing environmental public health (EPH) activities:
 - Participation on the Congressional Asthma and Allergy Caucus
 - A tour of the Environmental Health Laboratory to Senate Health, Education, Labor and Pensions staff during a site visit to CDC
 - Meetings with Senate staff to discuss the multi-agency response to the West Virginia MCHM chemical spill, lead and other important EPH topics
 - A teleconference with the House Energy and Commerce Subcommittee on Oversight and Investigations to discuss ongoing hydraulic fracturing activities
 - A meeting with Congressional members to discuss Lead Awards
 - A briefing to Senate staff on the cancer incidence study, soil vapor intrusion investigation and other activities at the Camp Lejeune site
- NCEH/ATSDR's new funding awards: \$13.9 million to 23 National Asthma Control Program grantees; \$11 million to 35 Childhood Lead Poisoning Prevention grantees; and \$21.4 million to 24 EPH Tracking Network grantees with first-time funding of \$1.2 million awarded to Kentucky and Michigan

- NCEH/ATSDR's release of a Community Assessment for Public Health Emergency Response (CASPER) Survey and provision of technical assistance on health surveillance and data collection in response to the West Virginia MCHM chemical spill
- NCEH/ATSDR's recent publications: (1) the first U.S. surveillance report of amyotrophic lateral sclerosis and (2) data to document lead screening and the prevalence of blood lead levels in children 1-2 years of age
- NCEH/ATSDR's other recent activities of interest: (1) extensive involvement in CDC's ebola response activities; (2) membership on the CDC-wide Laboratory Safety Improvement Workgroup; and (3) sponsorship of a Tribal Advisory Committee meeting
- The new requirement for CDC grantees to target their efforts to six conditions to achieve more efficient and effective public health-healthcare synergy: hypertension, tobacco, healthcare-associated infections, teen pregnancy, diabetes and asthma

Select NCEH/ATSDR Activities

- NCEH's recent release of the Model Aquatic Health Code as the nation's first free and science-based model code for pools
- Findings of ATSDR's recent polycythemia vera cancer cluster research investigation
- ATSDR's recent publication of the "Camp Lejeune Civilian Employees Mortality Study"

NCEH/ATSDR presented a comprehensive overview of the five phases and timeline of the CDC budget process from CDC's proposal of a new initiative requiring new funding (phase 1) to Congressional legislation and appropriation of the new initiative (phase 5). The overview also covered various sources of funds allocated to CDC and the difference between funding levels appropriated by Congress and the actual spending amount of CDC centers, institutes and offices.

NCEH/ATSDR OD and program staff presented an extensive set of responses to the BSC's overall guidance, input on key presentations and action items raised during the May 2014 meeting. The BSC was impressed by NCEH/ATSDR's detailed plans to implement some suggestions, the thoughtful rationale to take no action on other issues, and the enormous effort involved in providing all of the requested materials.

The ATSDR Division of Community Investigations (DCHI) presented an overview of its soil vapor intrusion (SVI) assessment at Camp Lejeune. ATSDR described the study design and methodology, data sources and accomplishments to date in this initiative, but noted several limitations in its approach: the use of historic data not collected or intended for the SVI assessment, modeled data, attenuation factors, and information on the Camp Lejeune buildings. In response to specific questions, the BSC provided guidance to ATSDR/DCHI to address the limitations and uncertainties in the Camp Lejeune SVI assessment.

ATSDR/DCHI presented an overview of its activities that currently are being conducted to address Strategic Plan priority 2, "protect children from the health risks of harmful exposures and conditions." The overview focused on interventions in three areas to achieve this goal: the new Safe Childcare Siting initiative, "Don't Mess with Mercury" Campaign, and innovative strategies for more rapid mitigation of exposure to children. In response to specific questions, the BSC provided guidance to ATSDR/DCHI to scale-up children's environmental health (EH) activities for national implementation and evaluation.

The NCEH Division of Laboratory Sciences (DLS) presented an overview of laboratory research and activities in two areas that have been prioritized since the May 2014 BSC meeting: (1) laboratory research on tobacco biomarkers and e-cigarettes and (2) and a more formal and stronger focus on laboratory safety issues. In response to specific questions, the BSC provided guidance to NCEH/DLS on approaches to better characterize exposures from e-cigarettes.

NCEH/ATSDR presented an overview of its response to the Elk River, West Virginia MCHM chemical spill. NCEH/ATSDR collaborated with multiple federal, state and local partners to conduct numerous activities from January to October 2014.

- Developed a short-term screening level of 1 ppm for water ingestion of MCHM
- Investigated and evaluated chemical exposures at the site
- Deployed a team to survey hospitals and review medical records of persons who presented to emergency departments with symptoms related to the chemical spill
- Offered technical support on health impacts to residents
- Conducted a CASPER survey with a representative sample of households across the nine-county area affected by the Elk River chemical spill
- Assessed the existing skills and expertise of the state health department in disaster epidemiology and issued public health recommendations to improve capacity in this area
- Identified actions for West Virginia to better monitor and track population health and environmental hazards and strengthen future responses to environmental events

The BSC advised NCEH/ATSDR to use the challenges, successes and lessons learned in the Elk River, West Virginia MCHM chemical spill as a model in improving the federal response to future EH emergencies.

A panel of staff described NCEH/ATSDR's role in CDC's agency-wide ebola response: (1) deployment of EPH staff both domestically and internationally; (2) site-specific ebola response activities in Sinoe County, Liberia; and (3) messaging and responses to 45 ebola-related EH inquiries submitted by concerned stakeholders in water and wastewater management, the food safety industry, cruise ship industry, and "other" category.

The BSC *ex-officio* members provided updates on recently completed or ongoing EPH activities of their respective agencies.

- The National Institute of Environmental Health Sciences highlighted key presentations that would be made during the meeting and simultaneous webcast of the National Toxicology Program Board of Scientific Counselors on December 9-10, 2014
- The National Institute for Occupational Safety and Health described two of its current priorities: (1) an occupational exposure assessment of lead, cadmium, chromium and noise among workers at U.S. electronic scrap recycling facilities and (2) activities to ensure the occupational safety and health of workers deployed to ebola response missions both domestically and internationally.
- The U.S. Department of Energy (DOE) noted that funding has been allocated to ATSDR to implement its public health assessment recommendations of the Mallinckrodt Chemical Works, Missouri site. The previous mortality study found an excess of kidney cancer among DOE workers. The history of the site included uranium ore production and processing operations. DOE is now funding ATSDR to conduct offsite activities to address persistent community concerns regarding contamination.

- The U.S. Environmental Protection Agency highlighted new focus areas and key activities that its six redesigned research programs will prioritize over the next year: Air, Climate and Energy Research Program; Safe and Sustainable Water Resources Research Program; Chemical Safety for Sustainability Research Program; Human Health Risk Assessment Program; Homeland Security Research Program; and Sustainable and Healthy Communities Research Program.

Over the course of the meeting, the BSC requested new action items, proposed future agenda items, and provided advice for NCEH/ATSDR's consideration and possible action. The BSC also provided input on the revised meeting format, commented on changes in its membership and NCEH/ATSDR leadership, and proposed additional guidance. The BSC was pleased that NCEH/ATSDR made a commitment to convey its most recent guidance to the new Director.



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Minutes of the Meeting

The U.S. Department of Health and Human Services (HHS) and the Centers for Disease Control and Prevention (CDC) National Center for Environmental Health/Agency for Toxic Substances and Disease Registry (NCEH/ATSDR) convened a meeting of the Board of Scientific Counselors (BSC). The proceedings were held on November 18-19, 2014 in Building 106, Conference Room 1A, of the CDC Chamblee Campus in Atlanta, Georgia.

The BSC is chartered to provide advice and guidance to the Secretary of HHS, Director of CDC, and Director of NCEH/ATSDR regarding program goals, objectives, strategies and priorities in fulfillment of the agencies' mission to protect and promote persons' health. The BSC provides advice and guidance to assist NCEH/ATSDR in ensuring scientific quality, timeliness, utility and dissemination of results. The BSC also provides guidance to help NCEH/ATSDR work more efficiently and effectively with its various constituents to fulfill its mission to protect America's health.

NOVEMBER 18, 2014

Welcome, Introductions and Agenda Review for Conflict-of-Interest Topics

William Cibulas, PhD, MS, CAPT USPHS

Acting Associate Director for Science, NCEH/ATSDR
BSC Designated Federal Official (DFO)

Dr. Cibulas opened the floor for introductions and confirmed that the 13 voting members and *ex-officio* members in attendance constituted a quorum for the BSC to conduct its business on November 18, 2014. He called the proceedings to order at 8:36 a.m. and welcomed the participants to day 1 of the BSC meeting.

Dr. Cibulas announced that BSC meetings are open to the public and all comments made during the proceedings are a matter of public record. He reminded the voting members of their individual responsibility to identify potential conflicts of interest for any of the published agenda items for November 18, 2014 and recuse themselves from participating in or voting on these matters. None of the BSC voting members publicly disclosed conflicts of interest for the record.

Melissa Perry, ScD, MHS

Chair, Department of Environmental and Occupational Health
George Washington University School of Public Health and Health Services
Acting BSC Chair

Dr. Perry also welcomed the participants to the BSC meeting. She announced that she would chair the meeting on behalf of Mr. Daniel Kass, the BSC Chair. Mr. Kass was unable to attend the meeting in person, but would be participating via teleconference.

NCEH/ATSDR Office of the Director's Updates

Robin Ikeda, MD, MPH, USPHS RADM

Acting Director, NCEH/ATSDR
Deputy Director, Office of Noncommunicable Diseases, Injury and Environmental Health
Centers for Disease Control and Prevention

Dr. Ikeda made an important announcement before presenting her update to the BSC. Dr. Hal Zenick is the BSC *ex-officio* member for the U.S. Environmental Protection Agency (EPA), but would be retiring from EPA in the near future. A certificate of appreciation was presented to Dr. Zenick in recognition of his longstanding role as the liaison between EPA and NCEH/ATSDR. The participants joined Dr. Ikeda in applauding Dr. Zenick for his distinguished career at EPA and also for his outstanding service and commitment to environmental public health (EPH).

Dr. Ikeda covered the following topics in the NCEH/ATSDR Office of the Director's (OD) report to the BSC.

NCEH/ATSDR OD Highlights. NCEH/ATSDR has undergone several changes in leadership at the OD level over the past few months. The new NCEH/ATSDR Director has been selected, but the official appointment would not be announced until the security, ethics and other mandatory aspects of the vetting process have been completed. Dr. James Stephens is serving as the Acting Deputy Director. Dr. William Cibulas is serving as the Acting Associate Director for Science. Mr. Christian Scheel is serving as the Acting Associate Director for the Office of Communication.

Mr. John Tibbs is serving as the Acting Associate Director/Management Officer for the Office of Financial, Administrative and Information Services. Ms. Sascha Chaney is serving as the Acting Associate Director for the Office of Policy, Planning and Evaluation. With Ms. Julie Fishman's recent departure as lead of the Office of Program Development, Ms. Chaney also currently directs this group.

Congressional Activities. NCEH/ATSDR has taken action to respond to recent Congressional interest in its ongoing EPH activities. NCEH/ATSDR participated on the Congressional Asthma and Allergy Caucus that was held in May 2014 to discuss the impact of climate change on air pollution, asthma and allergies. NCEH/ATSDR provided a tour of the Environmental Health Laboratory to Senate Health, Education, Labor and Pensions staff during a site visit to CDC in May 2014.

NCEH/ATSDR met with select Senate staff and attended the NCEH/ATSDR Partnership Council meeting to discuss lead and other important EPH topics. NCEH/ATSDR and its federal partners participated in a teleconference with the House Energy and Commerce Subcommittee on Oversight and Investigations to discuss ongoing hydraulic fracturing activities. NCEH/ATSDR and its partners met with Senate staff to discuss the multi-agency response to the West Virginia MCHM chemical spill. NCEH/ATSDR met with select Congressional members to discuss Lead Awards.

NCEH/ATSDR briefed Senate staff on the cancer incidence study, soil vapor intrusion investigation and other activities at the Camp Lejeune site. The most recent meetings with the Camp Lejeune Community Assistance Panel (CAP) were held in June and September 2014 to continue to obtain input from local residents on activities to date in addressing site-specific concerns. The next CAP meeting will be held in January 2015. Links to transcripts and videos of the CAP meetings are available on the CDC.gov website.

A meeting with the Camp Lejeune Cancer Incidence Panel was held in July 2014 with expertise and representation by CDC, the National Cancer Institute, Department of Veterans Affairs and academia. The meeting resulted in an extensive discussion of potential factors to include in the cancer incidence study protocol: an appropriate cohort size and comparison population, inclusion or exclusion of civilians, and a realistic timeline and capacity to access state cancer registry data. The next steps in this effort will be to develop and review the study protocol.

Funding Awards. NCEH/ATSDR initiated a new funding cycle for its asthma, lead and tracking grantees. Total funding of \$13.9 million was allocated to 23 National Asthma Control Program grantees (at an average award of \$604,188) to conduct comprehensive asthma control through evidence-based interventions and public health-healthcare collaboration.

Total funding of \$11 million was allocated to 35 Childhood Lead Poisoning Prevention (CLPP) grantees (at an average award of \$314,286) to conduct surveillance on this issue. Total funding of \$21.4 million was allocated to 24 EPH Tracking Network grantees (at an average award of \$889,843) to enhance and maintain existing tracking systems in their jurisdictions. An additional \$1.2 million was awarded to Kentucky and Michigan (at an average award of \$624,970) to implement the EPH Tracking Network for the first time in their states.

CDC grantees are now required to target their efforts to six conditions to achieve more efficient and effective synergy between public health and healthcare: hypertension, tobacco, healthcare-associated infections, teen pregnancy, diabetes and asthma. Grantees must implement a three-prong framework for all six conditions: (1) influence healthcare purchasing at the state level, (2) expand coverage, reimbursement and financing for priority clinical and community preventive services, and (3) approve accountability for coverage and quality through performance measurement and continuous quality improvement.

Select NCEH/ATSDR Activities. ATSDR released a health consultation in July 2014 to publicize findings of its polycythemia vera cancer cluster research investigation. Elevated radon gas levels were detected in some homes in the study area. Radon gas was detected in private well water of some homes. Slightly elevated radon levels were detected in soils in the study area. A determination could not be made on whether the cluster of polycythemia vera cancer cases in the study area was associated with observed radiological exposures. ATSDR advised all residents in the study area to test their homes for radon gas.

ATSDR published the “Camp Lejeune Civilian Employees Mortality Study” in *Environmental Health* in August 2014. The retrospective cohort study was designed to determine whether drinking water contaminants at Camp Lejeune were associated with an increased risk of death from specific cancers and other chronic diseases among persons employed at the base. The study found elevated risks for multiple causes of death, including several cancers, but uncertainties regarding actual risks were considerable due to the young age of the cohort, small sample size and wide confidence intervals. Most notably, 14% of the cohort had died by the end of the study period. A reference to the study is available on the CDC FTP site.

NCEH released the Model Aquatic Health Code in August 2014 as the nation’s first free and science-based model code for pools. NCEH extensively collaborated with colleagues in other CDC programs, state/local health departments and industry to achieve this goal. The model code includes voluntary guidelines and policies for the design, construction, management, operation and maintenance of aquatic facilities. NCEH/ATSDR released a Community Assessment for Public Health Emergency Response (CASPER) Survey in July 2014 and provided technical assistance (TA) in September 2014 on health surveillance and data collection in response to the West Virginia MCHM chemical spill.

NCEH/ATSDR recently published two articles in the *Morbidity and Mortality Weekly Report (MMWR)*. ATSDR compiled 2010-2011 data from the Amyotrophic Lateral Sclerosis Registry to publish the first surveillance report of this disease in the United States. NCEH compiled 1999-2010 data from the National Health and Nutrition Examination Survey (NHANES) and 2002-2010 data from the U.S. Blood Lead Surveillance System to document lead screening and the prevalence of blood lead levels (BLLs) in children 1-2 years of age.

NCEH/ATSDR’s other recent activities of interest include its (1) extensive involvement in CDC’s ebola response activities; (2) membership on the CDC-wide Laboratory Safety Improvement Workgroup; and (3) sponsorship of a Tribal Advisory Committee meeting in August 2014. Overviews of activities 1 and 2 would be presented to the BSC during the meeting.

The BSC discussed the following topics with Dr. Ikeda on the NCEH/ATSDR OD report.

- Available mechanisms for the BSC to be regularly informed of and participate in Camp Lejeune CAP meetings.
- Efforts to build EPH capacity in states that are not asthma, lead or tracking grantees (e.g., scale-up of the West Virginia model in which NCEH/ATSDR provided expertise and TA to a non-funded state in response to the MCHM chemical spill).
- The level and diversity of expertise engaged in the Camp Lejeune cancer incidence study, including cancer epidemiologists and community members.
- Approaches to assure the protection, confidentiality and privacy of state cancer registry data that will be used in the cancer incidence study.

The discussion resulted in the BSC proposing action items, agenda items and guidance for NCEH/ATSDR OD's consideration and possible action.

ACTION ITEMS	
Responsibility	Action Step
BSC DFO	<p>Schedule a future agenda item on common public health themes and/or generalized successes that could be compiled from the EPH Tracking Network to assist non-funded states in policy development or decision-making. Include a group of tracking grantees in the presentation to describe their experiences and successes in the field, such as:</p> <ul style="list-style-type: none"> • Creating a network of state epidemiologists who are dedicated to environmental surveillance. • Disseminating data with a common format and nationally consistent measures. • Building state infrastructures to respond to requests for information, inform public policy and strengthen outreach. • Developing best practices in sustaining tracking activities over time after federal funding ends.
NCEH/ATSDR Program Staff	<p>Distribute materials to the BSC for review:</p> <ul style="list-style-type: none"> • End-of-year reports for asthma, tracking and lead grantees in order for the BSC to identify additional opportunities for cross-grantee integration. • The membership of the Camp Lejeune Cancer Incidence Panel.
AGENDA ITEM	
Presenter	Topic
NCEH/ATSDR Program Staff	Update on NCEH/ATSDR's ongoing activities at Camp Lejeune, including experts and community members who will guide the cancer incidence study.
BSC GUIDANCE	
<ul style="list-style-type: none"> • NCEH/ATSDR is to be commended on including asthma as one of the six conditions that CDC grantees are now required to target to increase synergy between public health and healthcare. However, NCEH/ATSDR should be fully engaged with its colleagues in other CDC programs to ensure that environmental health (EH) is adequately represented in the other five conditions. NCEH/ATSDR should emphasize that EH strongly influences and underpins all six conditions. • NCEH/ATSDR provides its grantees with multiple opportunities to meet and discuss their EPH activities on a regular basis, including in-person meetings, site visits and end-of-year reports. However, NCEH/ATSDR should create a more systematic and formal process to compile and disseminate lessons learned, experiences and best practices from these initiatives to all grantees. 	

NCEH/ATSDR Budget Process

John Tibbs, MBA

Acting Associate Director/Management Officer

Office of Financial, Administrative and Information Services, NCEH/ATSDR

Mr. Tibbs presented an overview of the NCEH/ATSDR budget process. CDC focuses on budgets for three fiscal years at any one point in time because the entire process requires 18-20 months from initiation to completion. At this time, for example, CDC is implementing its FY2015 budget under a continuing resolution. CDC will submit its FY2016 budget to the President in the near future. CDC is in the early stages of developing its FY2017 budget.

CDC submits three different budget proposals for each fiscal year before a budget is enacted into law and appropriated with funding. The budget proposals are submitted to HHS, the Office of Management and Budget (OMB), and Congress. The five phases of the budget process are summarized below.

Phase 1 is CDC's idea for an initiative that requires new funding. From January to April, CDC centers, institutes and offices (CIOs) develop brief abstracts. CDC OD approves ~3-5 initiatives for the CIOs to further develop as business case proposals. The CDC Director approves 3 business case proposals for inclusion in the budget request process. Policy, program and finance staff collaborates with the CIOs to refine the initiative, develop narratives and collect performance data.

Phase 2 is the submission of the HHS Justification (HHSJ) budget proposal to HHS. From May to August, HHS poses questions during the Secretary's Budget Council meeting, selects initiatives to advance in the budget process, and sends written comments to CDC. Finance and program staff collaborates with the CIOs to revise the original HHSJ budget proposal based on HHS's comments and decisions.

Phase 3 is the submission of the OMB Justification (OMBJ) budget proposal to OMB. From September to January, CDC meets with OMB to discuss the budget proposal if requested. OMB approves the initiatives and determines funding levels for the Congressional phase. Budgetary decisions of the OMB Director can be passed back to CDC, but HHS/CDC may formally appeal these decisions. Finance, program and policy staff collaborates with the CIOs to revise the OMBJ budget proposal based on the OMB passback.

Phase 4 is the submission of the President's budget request to Congress. From February to September, Congress holds public hearings to discuss the budget request, listens to testimony from the CDC Director, and formally asks questions for the record. All phases of the budget process prior to this point are embargoed and cannot be shared with the public.

Phase 5 is Congressional reporting. CDC primarily receives funding from four Appropriations Committees: Defense; Interior and Environment; Labor, HHS and Education; and State and Foreign Operations. The House and Senate independently decide CDC's budget levels and submit separate reports outlining their guidance and other decisions. CDC can begin allocating funds to support its programs and activities after the President signs and Congress enacts an appropriations bill.

The federal fiscal year begins on October 1 and ends on September 30. After the House and Senate agree on a budget, the bill is submitted to the President for approval or veto within 10 days. The final appropriations bill and report are signed by the President and enacted into law by Congress. Because an appropriations bill typically is not enacted on October 1, CDC must operate under a continuing resolution and fund its programs and activities at the same level as the previous fiscal year. The government can shut down if the President and Congress do not agree on the continuing resolution.

Congress has established 12 budget line-items for NCEH and one for ATSDR. CDC virtually has no authority or flexibility to transfer funding between budget line-items that Congress has enacted into law. NCEH/ATSDR primarily receives funding from five budget line-items: Public Health Scientific Services; Chronic Disease Prevention and Health Promotion, Environmental Health; Public Health Preparedness and Response; and ATSDR.

CDC receives funding from various sources. The “budget authority” is directly appropriated to CDC from Congress to fund certain programs and activities. “Transfer funding” is allocated to CDC from other federal agencies through interagency agreements and the Prevention and Public Health Fund to conduct specific activities. “Supplemental funding” is appropriated to CDC from the President or Congress to address emergencies or priority issues (e.g., pandemic influenza, disease outbreaks or natural disasters).

CDC must submit a budget ceiling memorandum to each CIO within 30 days after receiving its Congressional appropriations. The memorandum outlines caps on funding and staff for each CIO. Mr. Tibbs presented a graph to illustrate NCEH/ATSDR’s FY2014 ceiling allocations for the EH Laboratory, EH activities, Asthma Program, CLPP Program, EPH Tracking Network and ATSDR. The EH activities budget line-item was ~\$36 million in FY2014 and virtually is the only area that provides NCEH/ATSDR with any level of flexibility in allocating funds.

CDC-wide taps are taken from budget line-items before the funding ceiling memoranda are submitted to the CIOs. For example, NCEH/ATSDR’s total budget was ~\$267 million in FY2014, but the actual spending amount was ~\$252 million due to ~\$15 million in CDC taps. Of NCEH/ATSDR’s FY2014 ceiling amount of ~\$252 million, ~\$187 million was allocated to NCEH and ~\$64 million was allocated to ATSDR.

CDC-wide taps are taken to fund four areas. The Working Capital Fund is used to support business services utilized by the CIOs (e.g., procurement, human resources, financial management and information technology). The U.S. Public Health Service Evaluation Set-Aside is used to support the evaluation of CDC programs. The HHS Secretary’s Transfer is used to support urgent and critical needs across HHS. Small Business Innovation Research funding is an additional CDC-wide tap that is taken from the CIOs.

Congress included directives and guidance to specific CDC CIOs in the final FY2014 appropriations bill and report. A funding commitment was not included for ATSDR to support the Navajo Nation, but this language is included in the FY2015 President’s budget. Language was included that authorized \$4.2 million to the NCEH EH Laboratory to develop standardized cardiovascular disease biomarkers. Language was included to realign volcanic emissions to the “All Other Environmental Health Activities” sub-budget line-item. Language was included to maintain intramural spending at \$2 million for CLPP activities. CDC must adhere to specific reporting requirements as part of the budget process.

The BSC discussed the following topics with Mr. Tibbs on the CDC budget process.

- Key factors involved in CDC’s approval or disapproval of a new initiative for inclusion in the budget process (e.g., proposed funding level and public health importance).
- The frequency at which NCEH/ATSDR Division Directors submit abstracts to CDC OD at the initiation of the budget process.
- The extent to which collaboration, coordination and innovation are limited across NCEH/ATSDR programs due to restrictions in budget line-items.

ACTION ITEM	
Responsibility	Action Step
Mr. John Tibbs	Distribute materials to the BSC for review: <ul style="list-style-type: none"> • NCEH/ATSDR’s active interagency funding agreements with partners. • A summary of trends in the NCEH/ATSDR budget over the past five years.

NCEH/ATSDR Program Responses to BSC Guidance and Action Items

William Cibulas, PhD, MS, CAPT USPHS
 Acting Associate Director for Science, NCEH/ATSDR
 BSC Designated Federal Official (DFO)

Dr. Cibulas explained that NCEH/ATSDR intends to supplement this agenda item in the future with a spreadsheet of responses by OD and individual programs. The spreadsheet will be circulated to the BSC members in advance of each meeting. Dr. Cibulas presented NCEH/ATSDR OD’s responses to action items and guidance the BSC proposed during the May 2014 meeting.

BSC ACTION ITEMS AND GUIDANCE	
BSC Request	NCEH/ATSDR OD Response
1. Distribute materials to the BSC for review: <ul style="list-style-type: none"> • NCEH/ATSDR Diverse Workforce in an Inclusive Workplace Strategic Plan (2013-2015) • ATSDR Social Vulnerability Index • Camp Lejeune Birth Defects Study and Retrospective Mortality Cohort Study • NCEH Environmental Assessment of Foodborne Illness Outbreaks E-Learning Tool 	NCEH/ATSDR provided the BSC with the actual materials, links or access to all of these documents on the FTP site. At the BSC’s request, NCEH/ATSDR programs would present an overview or update on any of these activities during a future meeting.

BSC ACTION ITEMS AND GUIDANCE

BSC Request	NCEH/ATSDR OD Response
<ul style="list-style-type: none"> • NCEH/ATSDR's key outcome and process performance indicators, including those in CDC's quarterly program reviews (QPRs) and Funding Opportunity Announcements (FOAs) • New language in the EPH Tracking Network and the National Asthma Control Program FOAs requiring grantees to collaborate with the healthcare system 	
2. Schedule "NCEH/ATSDR Responses to BSC Guidance" as a routine agenda item earlier in the meeting with a longer discussion period.	NCEH/ATSDR developed the current agenda and will draft future agendas in response to the BSC's request.
3. Provide regular updates on implementation of the 2014-2016 NCEH/ATSDR Strategic Plan.	NCEH/ATSDR leadership will convey the BSC's request to the new Director.
4. Invite Dr. Thomas Frieden, Director of CDC, to the next meeting to provide his perspectives on the alignment between agency-wide EPH priorities and those of NCEH/ATSDR.	NCEH/ATSDR will invite Dr. Frieden to future BSC meetings to address this issue. Dr. Frieden was unable to attend the current meeting.
5. Convene a teleconference for the BSC to formally vote on establishing a new Childhood Lead Poisoning Prevention Subcommittee.	NCEH/ATSDR held a teleconference with the BSC on August 11, 2014. The BSC took a formal vote and unanimously approved two items: (1) establishment of a new Lead Subcommittee to the BSC and (2) adoption of the structure, scope, duties and outcomes/deliverables in the draft charge as revised by the BSC members. The next steps in this process will be for the new NCEH/ATSDR Director and other leadership to appoint a chair and 8-10 members of the Lead Subcommittee. NCEH/ATSDR has received a list of ~15 potential candidates from BSC members and program staff.
6. Establish a new BSC Fracking Workgroup.	NCEH/ATSDR will support the BSC's formal approval to establish a new Fracking Workgroup. Dr. Kristina Thayer, the BSC <i>ex-officio</i> member for the National Institute of Environmental Health Sciences, drafted a charge for the workgroup that has been distributed to NCEH/ATSDR OD and internal

BSC ACTION ITEMS AND GUIDANCE

BSC Request	NCEH/ATSDR OD Response
	subject-matter experts for review. NCEH/ATSDR plans to table further action on the workgroup until the new Director is officially appointed.
7. Explore the feasibility of offering NCEH/ATSDR's internal Clear Writing Summit to external partners.	NCEH/ATSDR recognizes that budget and staff constraints will limit the extent to which the Clear Writing Course can be offered to external partners. However, NCEH/ATSDR hopes to leverage existing opportunities to support this effort, such as offering the course during national meetings or at select sites with large community groups.

Dr. Cibulas introduced the panel of NCEH/ATSDR program staff that would present responses to the BSC's input on key presentations made during the May 2014 meeting.

- Helen Schurz Rogers, PhD; Associate Director for Science (for Dr. Sharunda Buchanan) NCEH Division of Emergency and Environmental Health Services (EEHS)
- Judith Qualters, PhD; Director NCEH Division of Environmental Hazards and Health Effects (EHHE)
- Lorraine Backer, PhD, MPH; Senior Scientist NCEH Division of Environmental Hazards and Health Effects
- Jennifer Van Skiver, MPA; Management and Program Analyst NCEH/ATSDR Office of Policy, Planning and Evaluation
- Mark Keim, MD, MPH; Associate Director for Science NCEH Office of Environmental Health Emergencies

BSC INPUT ON KEY PRESENTATIONS

BSC Suggestion	NCEH/ATSDR Program Response
<i>CDC's Food Safety Winnable Battle</i>	
1. Increase the focus on the relationship between extreme weather events and/or water restrictions and foodborne illness outbreaks.	NCEH/ATSDR intends to take specific actions in response to the BSC's suggestion when funds become available. A series of questions will be added to the National Voluntary Environmental Assessment Information System (NVEAIS). The Environmental Assessment of Foodborne Illness Outbreaks E-Learning Tool will be updated with guidance on investigating the

BSC INPUT ON KEY PRESENTATIONS

BSC Suggestion	NCEH/ATSDR Program Response
	potential association between extreme weather events and/or water restrictions and foodborne illness outbreaks.
2. Administer a survey to determine private-sector interest in participating in NVEAIS.	NCEH/ATSDR has identified creative strategies to respond to the BSC's suggestion because the use of NVEAIS is limited to federal and state partners. For example, food safety training programs that currently are available in the private sector will be included in NCEH/ATSDR's future meetings with the U.S. Food and Drug Administration (FDA), Council for Food Protection and other organizations. NCEH/ATSDR also plans to leverage its existing partnership with the National Restaurant Association to more extensively engage the private sector.
3. Collaborate with partners to widely publicize and promote the new food safety tools.	NCEH/ATSDR's broad promotion of its food safety tools includes extensive collaboration with the National Environmental Health Association; existing relationships with public health, food safety and education organizations; and outreach to public health professionals. NCEH/ATSDR is finalizing a brief video for partners and other groups to use in presentations of its food safety tools in the field. The video was presented to the BSC. NCEH/ATSDR's other promotional efforts include displays on the websites and listserves of partners, outreach to Schools of Public Health, and initial collection of evaluation data from >1,200 registered users of the e-learning tool to date in 43 different countries.
4. Translate the e-learning tool in languages other than English to increase private-sector involvement.	NCEH/ATSDR plans to offer the e-learning tool in Spanish when funds become available for translation.
5. Offer an e-learning "mini-course" or a shorter standalone version.	NCEH/ATSDR is exploring the feasibility of creating a 20-minute module that would serve as an "at-the-moment" refresher course or a "just-in-time" version for food industry workers.
6. Use social media to identify and prevent	NCEH/ATSDR will review open data to

BSC INPUT ON KEY PRESENTATIONS

BSC Suggestion	NCEH/ATSDR Program Response
potential foodborne outbreaks prior to their occurrence.	support informed decision-making regarding foodborne outbreaks in restaurants.
<i>NCEH/ATSDR's Water Safety Priority</i>	
7. Engage in ongoing federal efforts to address adverse health outcomes from the disposal of medications in sewer systems. Serve on the new federal steering committee that was established to address pharmaceuticals in water.	NCEH/ATSDR represents CDC on the federal workgroup that was formed to address pharmaceuticals in the environment. The major goals of the workgroup are for the federal partners to exchange information and identify potential collaborative research opportunities. In 2013, the workgroup primarily focused on creating a framework for a research agenda on pharmaceuticals in the environment. The workgroup currently is identifying specific roles and responsibilities of each federal partner in terms of collecting data and providing scientific expertise for the research agenda. NCEH/ATSDR is utilizing existing Safe Drinking Water Cooperative Agreements with health departments to better understand and identify complex drinking water issues, such as the presence of pharmaceuticals and personal care products in septic tank effluents. For example, New York State is conducting a project to examine the concentrations and types of various chemicals released from onsite septic systems. The project also will increase knowledge of potential exposures to local communities that use groundwater for drinking water.
8. Develop guidelines or a standardized checklist for well water testing codes.	NCEH/ATSDR will review well water construction standards that have been developed by the American National Standards Institute and the National Groundwater Association. The standards include a section on sampling and analysis, but NCEH/ATSDR will determine the need for additional guidance. NCEH/ATSDR, the National Groundwater Association and other partners currently are assessing programs that are targeted toward private well owners. The outcome of the assessment will be to generate profiles of these programs,

BSC INPUT ON KEY PRESENTATIONS

BSC Suggestion	NCEH/ATSDR Program Response
	including their methods to successfully reach private well owners, increase private well testing and maintain treatment systems. The effectiveness of individual programs and their dissemination methods will be tested as part of the assessment.
9. Expand the EPH Tracking Network database with data from a broader range of sources to improve the surveillance system.	NCEH/ATSDR is collaborating with the U.S. Geological Survey (USGS) to add groundwater contamination data from the National Water Quality Assessment Program. NCEH/ATSDR is designing an interactive USGS-based dataset for inclusion in the EPH Tracking Network.
10. Conduct research on the potential ability of hydraulic fracturing liquids to contaminate surface groundwater and drinking water.	NCEH/ATSDR will solicit advice and guidance from the new BSC Fracking Workgroup. In the interim, NCEH/ATSDR will continue with its ongoing hydraulic fracturing activities. NCEH/ATSDR is a member of the Technical Subcommittee of the Multi-Agency Collaboration on Unconventional Oil and Gas (UOG) Research. NCEH is not conducting hydraulic fracturing research at this time, but ATSDR's activities are in two major areas: (1) an evaluation of site-specific EH risks in communities related to hydraulic fracturing and (2) collaborative research with other agencies on the health impacts of UOG development.
11. Collaborate with partners to create and widely disseminate a case study of the West Virginia MCHM chemical spill.	NCEH/ATSDR is not planning to conduct a formal case study of the West Virginia MCHM chemical spill at this time. NCEH/ATSDR will publish a two-part <i>MMWR</i> article covering the following areas: an evaluation of potential preparedness activities in West Virginia; an assessment of health outcomes from the incident; and findings from a community needs assessment highlighting community resilience and preparedness. A detailed overview would be presented on the following day, including the NCEH/ATSDR response, recovery efforts and after-action reports related to the event.

BSC INPUT ON KEY PRESENTATIONS

BSC Suggestion	NCEH/ATSDR Program Response
<i>NCEH/ATSDR Strategic Plan and Priorities</i>	
12. Include CLPP in the implementation of Strategic Plan priority 1 or 2.	NCEH/ATSDR will incorporate CLPP into priority 2 (protect children from the health risks of harmful exposures and conditions).
13. Convene an interagency meeting with EPA and other federal partners to assure consistency of EPH priorities across the U.S. government.	NCEH/ATSDR will convey the BSC's suggestion to the new Director. In the interim, NCEH/ATSDR will enhance its existing relationships with EPA and other federal partners that have common EPH priorities and goals. Most notably, ATSDR and EPA will resume their interagency manager's meetings to routinely discuss EPH issues that are important to both agencies.
14. Use the CDC QPR process to determine the Strategic Plan priorities that will be easiest to implement and identify specific barriers to implementation.	NCEH/ATSDR utilizes the QPR process to identify priorities, accomplishments and challenges at both center and division levels. NCEH/ATSDR currently is drafting its FY2015 QPR documents to assure consistency and alignment with the center-wide and division-level strategic plans. NCEH/ATSDR will present its draft FY2015 QPR documents to CDC leadership in January 2015. NCEH/ATSDR provided the CDC Search Committee with its Strategic Plan and priorities to consider during the selection process for the new Director.
15. Replace the terminology of "priorities" with "focus areas" in implementation of the Strategic Plan.	NCEH/ATSDR will not make this change in the current Strategic Plan documents, but the BSC's suggestion might be revisited in the future.
16. Merge Strategic Plan priorities 1 and 2 during implementation: "protect children from the health risks of harmful exposures and conditions, including asthma."	NCEH/ATSDR will not make this revision at this time. However, the BSC's suggestion will be reconsidered when the Strategic Plan priorities are periodically reviewed and updated as needed.
17. Expand Strategic Plan objective 1.1 to enhance workforce capacity at the broader systems level.	NCEH/ATSDR will address this gap in future iterations of the Strategic Plan. NCEH/ATSDR will inform the new Director of the BSC's other suggestions on this topic: (1) monitor progress in building workforce capacity; (2) determine alignment between national and state strategic plan priorities for

BSC INPUT ON KEY PRESENTATIONS

BSC Suggestion	NCEH/ATSDR Program Response
	<p>EPH; and (3) engage state EH directors in future BSC meetings. In the interim, NCEH/ATSDR will continue to regularly participate in teleconferences and other activities hosted by the National Association of County and City Health Officials and the Association of State and Territorial Health Officials. These relationships have been tremendously helpful in facilitating NCEH/ATSDR's ongoing communication and outreach to state, local, territorial and tribal EH officials in the field.</p>
<i>CDC's New Radiation Emergency Preparedness (REP) Projects</i>	
18. Provide an update on progress with the REP projects.	<p>NCEH/ATSDR drafted a detailed Emergency Operations Plan with 22 strategic objectives and goals as well as 301 individual activities that will be assigned to 29 responsible parties. NCEH/ATSDR will use the plan as a planning and preparedness tool to perform drills, conduct exercises, test readiness, and assess current capacity in meeting expectations established by federal partners. As a part of this effort, an analysis was performed to determine gaps in NCEH/ATSDR's epidemiology, laboratory, communication and health physics capacity.</p>

The BSC was impressed by NCEH/ATSDR's comprehensive and informative responses to its previous guidance, particularly the detailed plans to implement some suggestions and the thoughtful rationale to take no action on other issues. The BSC also thanked the program staff for its enormous efforts in providing links to all of the requested materials. The BSC proposed new guidance for NCEH/ATSDR's consideration and possible action.

ACTION ITEM

Responsibility	Action Step
Dr. Judith Qualters	Provide the BSC with the link to "Crisis and Emergency Risk Communication: Lessons from the Elk River Spill" that was published in <i>Environmental Health Perspectives</i> in August 2014.

BSC GUIDANCE

- NCEH should include undergraduate public health programs as an additional target audience in outreach and promotion efforts to publicize its new food safety tools.
- CDC selected healthcare-associated infections as one of the six conditions for grantees to target to improve public health-healthcare synergy. NCEH/ATSDR's expertise on the relationship between EH and infectious diseases would be tremendously valuable in this effort. Most notably, NCEH/ATSDR should place more emphasis on antimicrobial resistance and environmental practices that are contributing to virtually untreatable infections in healthcare settings, particularly the overuse of antibiotics in food production.
- The new NCEH/ATSDR Director and other OD leadership should ensure that the draft charge for the new BSC Fracking Workgroup is revised to reflect the current climate and evolution of hydraulic fracturing. A well-defined charge for the workgroup will be extremely important, particularly since public health has played a limited role in hydraulic fracturing activities to date.

Soil Vapor Intrusion

Richard Gillig, MCP

Central Branch Chief

ATSDR Division of Community Health Investigations (DCHI)

Mark Evans, PhD

Senior Scientist & Environmental Geologist

ATSDR Division of Community Health Investigations (DCHI)

Advice Requested from the BSC by ATSDR/DCHI:

1. What additional limitations has ATSDR not identified in the Camp Lejeune soil vapor intrusion (SVI) assessment?
2. What recommendations can the BSC propose to reduce uncertainty in the Camp Lejeune SVI assessment?
3. What additional aspects should ATSDR consider in the Camp Lejeune SVI assessment?

Mr. Gillig and Dr. Evans presented an overview of the ATSDR SVI assessment at Camp Lejeune. ATSDR has a long history of conducting site-specific activities at Camp Lejeune. A public health assessment was completed in 1997. A historic reconstruction of drinking water contaminant levels from the Terrawa Terrace, Hadnot Point and Holcomb Boulevard water distribution systems was completed in 2013.

“Soil vapor intrusion” is defined as gaseous vapors from contaminated soil or groundwater that migrate to soil or into buildings and potentially cause exposure to individuals. ATSDR currently is using estimates of exposure levels in drinking water to update the 1997 drinking water evaluation. Water modeling data also are being used to perform a new SVI assessment in response to a petition request from the Camp Lejeune CAP. However, ATSDR is aware of the limitations in its approach, such as the use of historic data not collected for the SVI assessment, modeled data, attenuation factors, and information on the Camp Lejeune buildings.

The SVI pathway was not consistently evaluated until EPA released federal guidelines in 2001 and defined two types of vapor-producing contaminants associated with vapor intrusion (VI). “Chlorinated” or dense vapors degrade anaerobically without oxygen, while “petroleum” or light vapors degrade aerobically with oxygen. Groundwater plumes of both types of vapor-producing contaminants have been detected at Camp Lejeune and are included in the SVI assessment. ATSDR and EPA expect to publish their revised VI guidelines over the next year.

ATSDR’s approach will include several steps that are required to evaluate past, present and future VI-related exposures. Buildings of concern must be identified, including building-specific air contaminants and building characteristics affecting VI. Exposure factors must be defined for building occupants, including the exposed population and the frequency and duration of their exposure. Contaminant concentrations from current and historic VI into buildings must be evaluated. A determination must be made on whether potential VI exposures could have occurred in the past or might be occurring in the present at levels of health concern.

ATSDR will use this methodology to design its approach for the Camp Lejeune SVI assessment. Contaminant sources relative to building locations will be evaluated, including subsurface contaminant sources and migration as well as ambient or background sources of air contaminants. Air sampling data will be evaluated, including indoor, outdoor/ambient and subsurface soil gas levels for different seasons. Historic groundwater data will be used to estimate historic indoor air concentrations.

ATSDR will use multiple data sources to inform the Camp Lejeune SVI assessment. Data from 2007 to the present will be compiled from the base-wide VI investigation. This dataset will include an identification of all buildings within 100 feet of contaminated groundwater; a compilation of soil gas and indoor air measurements; and calculations of building-specific soil gas levels to indoor air attenuation factors. Modeling will be performed for light non-aqueous phase liquid (LNAPL) saturation and groundwater contaminants for Hadnot Point Fuel Farm. This dataset will include historic concentrations and distributions of groundwater contaminants.

A data discovery process will seek to identify additional groundwater, air and other historic environmental data to inform the historic VI evaluation. The data discovery process will be used to organize all available files from ATSDR, EPA, the Camp Lejeune CAP and other sources to produce an index of document titles. Files will be searched to identify environmental sampling data that would be relevant to the SVI assessment. A searchable database will be created with VI environmental sampling data.

Dr. Evans presented a series of schematics to illustrate several data points: (1) building-specific data collected from the current VI studies at Camp Lejeune; (2) estimates of LNAPL distribution and saturation in the Camp Lejeune buildings based on modeling data; (3) groundwater contamination results, including those for the dry cleaning building, based on historic modeling data over time; and (4) the integration of measured and modeled groundwater and indoor air data. However, the building-specific data are non-quantitative overall and will not be particularly useful in performing a quantitative exposure assessment.

ATSDR identified several VI variables and types of attenuation factors that will influence the SVI assessment (e.g., building construction variables, geological/climatic variables, the sub-slab gas-to-indoor air ratio, groundwater-to-indoor air ratio, and near-slab gas-to-indoor air ratio). However, these measurements are associated with a great deal of uncertainty and variation.

ATSDR will use average values of groundwater concentrations under buildings over time at the Camp Lejeune site to calculate concentrations of indoor air for both civilian worker and Marine-in-training populations based on specific factors. The exposure factors (e.g., daily exposure durations, length of service, body weight and inhalation rates) for both the civilian worker and Marine-in-training populations will be the same as the pending drinking water public health assessment.

ATSDR will focus on three major contaminants for the Camp Lejeune SVI assessment: benzene, tetrachloroethylene and trichloroethylene (TCE). However all potential exposures above health screening values will be evaluated. Because ATSDR's screening values are based on continuous residential exposures, adjustments will be made to apply the comparison values to occupational exposures of workers. ATSDR is refining the SVI assessment by addressing challenges related to current and future exposures and the shortage of historic indoor air data.

The BSC obtained clarification from Dr. Evans on specific scientific aspects of the Camp Lejeune SVI assessment and provided guidance in response to the three questions posed by ATSDR/DCHI.

BSC GUIDANCE

Question 1: Additional Limitations of the SVI Assessment

- ATSDR should specify the advantages and disadvantages of each sampling assumption to qualitatively and quantitatively determine sources of error in the SVI assessment and improve scenario modeling. For example, specific buildings in the catchment area have been identified and prioritized, but a broader approach of including all of the Camp Lejeune buildings should be considered to collect additional data. A more focused evaluation also should be conducted with a small sample of <20 buildings to determine other efficiencies.

Question 2: Approaches to Further Reduce Uncertainty

- ATSDR should ensure that three issues are well communicated to the Camp Lejeune community and broader public in the final report of the SVI assessment: (1) a clear explanation of the level of uncertainty in the modeling data; (2) the best- and worst-case scenarios identified in the sensitivity analyses based on available data; and (3) actual use of the SVI assessment data (e.g., summarizing exposures to building occupants and workers over time and describing potential health hazards to these populations).
- ATSDR should publish its challenges, experiences and lessons learned in addressing uncertainties in the Camp Lejeune SVI assessment. This guidance would be extremely valuable in strengthening capacity at other sites and training the next generation of the EPH workforce.

Question 3: Other Aspects to Consider

- ATSDR did not include seasonable/temporal variability of ambient and indoor air concentrations in the SVI assessment due to multiple uncontrolled factors. ATSDR should gather data on HVAC system parameters in the Camp Lejeune buildings to fill this gap.
- ATSDR currently is focusing on addressing difficult qualitative and quantitative issues in the SVI assessment. In the near future, however, ATSDR will need to direct its attention to public health translation and communication. The SVI assessment is a scientifically complex initiative, but ATSDR must synthesize, distill and disseminate the findings in an appropriate

manner, language and format for the Camp Lejeune CAP, affected community and broader public.

- ATSDR is conducting the SVI assessment with an environmental geologist and other EH experts, but a broader pool of professionals should be extensively engaged in the initiative at this time (e.g., cancer epidemiologists, toxicologists and risk assessors). For example, cancer epidemiologists will play a major role in designing the protocol for the Camp Lejeune cancer incidence study and should have knowledge of both the EH and healthcare aspects of the SVI assessment. This approach will ensure that SVI assessment data can be translated to and utilized by multiple audiences in the future, including the EH, occupational health, public health and healthcare communities.

Children's Environmental Health

Tina Forrester, PhD

Acting Director

ATSDR Division of Community Health Investigations (DCHI)

Advice Requested from the BSC by ATSDR/DCHI:

1. What recommendations can the BSC propose to ensure successful implementation of a policy-focused intervention (e.g., the Safe Childcare Siting initiative)?
2. What additional components or activities could be used to expand the utility, scope and reach of the "Don't Mess with Mercury" Campaign?
3. What additional actions can be taken to ensure that children are protected by more rapid exposure mitigation?

Dr. Forrester presented an overview of NCEH/ATSDR's current children's EH activities. NCEH/ATSDR identified four priorities to guide the implementation of its 2014-2016 Strategic Plan: reduce asthma morbidity and mortality (priority 1); ensure safe drinking water (priority 3); and use innovative laboratory methods to detect, diagnose and prevent environmental disease (priority 4).

Dr. Forrester explained that her presentation would focus on priority 2, "protect children from the health risks of harmful exposures and conditions." NCEH/ATSDR identified six focus areas to achieve this goal:

- Safe siting of childcare and early learning centers
- "Don't Mess with Mercury" (DMWM) Campaign
- Innovative strategies and interventions for more rapid exposure mitigation
- Data collection and analysis
- Education to pediatric healthcare providers
- Child-focused land-use and transportation decisions

NCEH/ATSDR selected this topic as one of its Strategic Plan priorities because children are particularly susceptible to and are at greater risk of exposure compared to adults due to their physiology, rapid development and behaviors (e.g., mouthing objects). Women of childbearing age who are exposed to chemicals or contaminants of concern are at risk of infertility, miscarriage and adverse birth outcomes.

ATSDR has expanded its focus from responding to site-specific chemical releases at >6,000 different sites over the past 30 years to developing national strategies across the entire continuum of prevention, intervention and policies related to mitigating exposures. ATSDR's achievements to date in three of the focus areas for priority 2 are highlighted below.

Focus area 1 is safe siting of childcare and early learning centers. Findings of ATSDR's site-specific activities have demonstrated EH risks to children due to unsafe siting of childcare centers (e.g., close proximity of nail salons, drycleaning establishments, landfills or industrial areas to childcare centers). The 2013 Axelrad, *et al.* study and other published data also have documented significant opportunities for EH exposures in childcare settings. Children and workers can spend up to 10 hours per day over a five-day week in a childcare center. Childcare/early learning centers account for the care of 11 million children ≤ 5 years age each week. Women, particularly those of childbearing age, account for 94% of the childcare workforce.

In 2013, >100,000 new childcare centers were licensed nationally, but requirements for indoor and outdoor EH issues of these facilities are minimal and greatly vary among states. At the national level, no federal standards have been established for the siting of childcare facilities. At the state level, New Jersey and New York have implemented legislation to prevent childcare centers from being located near or on hazardous sites. Connecticut and Pennsylvania have created voluntary programs that focus on preventing childcare centers from being located near or on hazardous sites.

Connecticut developed the "Day Care Screening Awareness for Environmental Risk" (SAFER) Program that includes referrals for assessments, training and outreach, and voluntary tools used in the licensure process (e.g., a property history questionnaire, inspection checklist and visual cues, and comparison of the EPA and Connecticut Department of Energy and Environmental Protection databases). Connecticut has proudly reported that 100% of licensed daycare centers in the state are participating in the SAFER Program.

ATSDR currently is scaling-up the Connecticut SAFER Program for all of its grantees to implement the new "Safe Childcare Siting" initiative. The mission of the new initiative will be to ensure that childcare and early learning centers are located where chemical and physical hazards have been considered, addressed and mitigated to best protect children's health. Grantees will be advised to consider several important issues in designating a facility as a "safe site," such as former uses of the potential site, nearby properties or infrastructure, naturally occurring substances, and access to safe drinking water.

ATSDR will aim to achieve a number of outcomes with the safe siting initiative. A manual will be developed for safe siting of childcare and early learning centers. Safe siting considerations in childcare and learning facilities will be included in licensing processes at the state level, federally-supported childcare programs and commercial childcare chains. Accreditation organizations and large-scale operators will implement safe siting considerations on a voluntary basis.

ATSDR drafted an implementation strategy with a series of action steps to launch the safe siting initiative as a national program. ATSDR was pleased that 200-300 persons participated on its recent webinar to introduce the initiative. Based on this level of interest, ATSDR expects that grantees in at least 25 states will implement the safe siting initiative in years 1-2.

Focus area 2 is the DMWM Campaign. Mercury is the most common substance involved in chemical-related incidents in schools. Poison Control Centers received 37,000 calls over a five-year period involving mercury exposure to children. The Nuclear Regulatory Commission received reports over a six-year period of >50 mercury spills of more than one pound in schools. The consequences of mercury spills include cleanup costs ranging from \$1,000-\$200,000, health assessment of children, and evacuation, lockdown and closure of schools. A recent school cleanup of an accidental mercury spill cost \$1.5 million.

ATSDR created the DMWM Campaign due to the danger of elemental mercury as well as hospitalizations and deaths of children caused by mercury exposure. The goals of the DMWM Campaign are to raise awareness about the danger of mercury among middle school students 9-13 years of age; engage school teachers, nurses and administrators in identifying and removing mercury; and reduce mercury spills among children. The DMWM Campaign includes a public service announcement and a website with educational tools, games, guidance on mercury spills, and a sample mercury policy for schools.

ATSDR is proud that its DMWM website and educational tools have received five national awards for educational merit. Efforts are underway to more broadly publicize and advertise the DMWM Campaign to the general public. ATSDR and EPA are collaborating to convene a “National Mercury Take Back Day” to assist schools and private citizens in properly disposing of mercury in certified landfills.

Focus area 3 is innovative strategies and interventions for more rapid mitigation of exposure to children. TCE is a legacy chemical that remains in the environment and poses health risks for the most sensitive populations of developing fetuses and children. TCE is the second most commonly detected contaminant at ATSDR sites. ATSDR recently investigated and rapidly mitigated high levels of TCE at two sites in Massachusetts and Missouri.

ATSDR and EPA significantly lowered health-based values for TCE for the most sensitive health endpoint of fetal heart malformations that may occur with exposure of only a few weeks during the first trimester of pregnancy. Other health endpoints associated with TCE exposure that may impact children include nausea, decreased thymus weight and other immune effects, and nerve, liver and kidney damage.

ATSDR devised new strategies to more rapidly take action to protect children from exposure. The evaluation process was streamlined to more quickly provide health conclusions and recommendations regarding health risks from chemicals to the community and risk management partners. Dialogue was initiated with EPA and state partners to reach consensus on when mitigation strategies are needed.

ATSDR also is focusing on lead to more rapidly mitigate exposure to children. CDC adopted a policy to lower the BLL of concern from ≥ 10 $\mu\text{g}/\text{dL}$ to a reference value of ≥ 5 $\mu\text{g}/\text{dL}$. The most significant challenge in this effort will be for EPA to match the lower reference value with its existing models for cleanup of lead.

ATSDR is implementing several strategies to overcome this barrier. Discussions are continuing to be held with EPA and state partners to use models to more realistically characterize exposures. More exposure assessments and investigations are being conducted on lead to better identify high-risk populations at sites. Education on lead exposure is being enhanced.

For example, 10-15 “Soil Kitchens” have been conducted to date at sites across the country in partnership with EPA and local health departments.

The key interventions of the Soil Kitchens include screening of lead and other metals in urban garden soil, an educational campaign on safe gardening, and lead screening of children. Results of a large population-based lead exposure survey that recently was conducted in Philadelphia will be used to drive critical decision-making on lead cleanup. ATSDR is exploring the possibility of implementing an additional strategy in the future in which polluters would be educated on their environmental practices that cause harm, particularly to children.

The BSC provided guidance in response to two of the three questions posed by ATSDR/DCHI.

ACTION ITEM	
Responsibility	Action Step
Dr. Tina Forrester	<ul style="list-style-type: none"> • Provide the BSC with ATSDR’s implementation strategy for the Safe Childcare Siting Initiative for review and comment
BSC GUIDANCE	
Question 1: Safe Childcare Siting Initiative	
<ul style="list-style-type: none"> • ATSDR should encourage its grantees to offer incentives to childcare centers that participate in the new safe siting initiative. Because the safe siting initiative will be voluntary, incentives will play a valuable role in increasing the participation rate across states. The North Carolina Star Rated License System for childcare centers should be considered as a model in this effort. • ATSDR will use its grantees to implement the safe siting initiative. Grantees can leverage their existing relationships with state and local environmental programs to sample sites and remove chemical or physical hazards at no cost. However, ATSDR should conduct an economic impact analysis of the safe siting initiative to determine new costs that potentially could be incurred by childcare centers, particularly small, independent facilities with limited resources. The economic impact analysis also should be designed to estimate cost-savings of the safe siting initiative. • ATSDR currently is focusing on the further development, refinement and initial launch of the safe siting initiative, but attention should be given to the evaluation design at this time. The evaluation should be conducted at a meta-level rather than at an individual childcare center level. In step 1 of the evaluation, ATSDR should determine the baseline by identifying childcare centers in all states that currently are sited in close proximity to hazardous exposures. In step 2 of the evaluation, ATSDR should assess improvements and positive impacts of the safe siting initiative between participating grantees (the intervention states) and non-participating grantees (the control states) after a specified period of time post-implementation. ATSDR should disseminate the evaluation findings nationally and include non-participating grantees and non-funded states in this process. • ATSDR should initiate dialogue with the U.S. Department of Education to determine its potential partnership role in the safe siting initiative. • ATSDR should administer a national survey to communities, parents, healthcare practitioners and other stakeholders at sites across the country. The survey should be featured as a portal on the CDC.gov website for stakeholders to express their concerns regarding the proximity of 	

local childcare centers to hazardous substances and provide information on specific facilities. ATSDR should pilot the survey for a period of at least 3 months to determine whether information submitted by the public would be viable and useful for the safe siting initiative.

Question 2: DMWM Campaign

- ATSDR should create a new version of the DMWM Campaign with simpler messages and age-appropriate interventions for children <9 years of age. For example, Minnesota's presentations to young children in elementary schools included a dog that was trained to detect mercury. This intervention was extremely successful in communicating the dangers of mercury to children as young as 6 years of age. ATSDR should administer a survey to identify other state and local strategies that could be scaled-up nationally for inclusion in the DMWM Campaign.

Tobacco Biomarkers and E-Cigarettes/Short Update on CDC Laboratory Safety

James Pirkle, MD, PhD

Director, NCEH Division of Laboratory Sciences (DLS)
Centers for Disease Control and Prevention

Advice Requested from the BSC by NCEH/DLS:

1. What steps should DLS take to balance the competing demands for analyses of addictive toxic substances in cigarettes with the pressing requirements of characterizing exposures from e-cigarettes?
2. What strategies should DLS implement to address the multiple forms and settings of tank e-cigarettes in analyses of addictive and toxic substances?

Dr. Pirkle's update to the BSC covered laboratory research and activities in two areas that DLS has prioritized since the May 2014 meeting.

Priority 1 is DLS's laboratory research on tobacco biomarkers and e-cigarettes. The DLS Tobacco Laboratory conducts science to reduce population and individual exposure to addictive and toxic substances in tobacco products. The science is designed to achieve five major outcomes. Trends in tobacco use and secondhand smoke exposure are identified and tracked. Scientific measurements are developed that are critical to FDA's tobacco regulations.

Exposures to >100 harmful constituents of tobacco smoke are identified. Harmful and addictive exposures from novel, smokeless and modified tobacco products are identified. Harmful and addictive constituents in e-juice and e-cigarette vapors are measured. Exposures in e-cigarette users and persons exposed to e-cigarette vapor are characterized.

DLS created biomarkers to identify patterns in specific types of tobacco product users: cigarette smokers, smokeless tobacco users, e-cigarette users, persons exposed to environmental tobacco smoke (ETS), and non-users not exposed to ETS. The biomarkers provide much more accurate information than traditional self-reported questionnaires. DLS measures background/low, medium and high levels of various compounds in tobacco product users. The measured compounds include serum cotinine, urine nicotine equivalents, tobacco-specific nitrosamines (TSNAs), trace metals, propylene oxide, volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons, and aromatic amines.

DLS studies have shown that exposures to carcinogenic and toxic compounds are much higher in tobacco smokers compared to non-smokers and smokeless tobacco users. Cigarette smoking leads to the death of >400,000 Americans annually. Other DLS studies have reported higher serum cotinine and carcinogenic NNAL levels in smokeless tobacco users compared to smokers.

DLS has expanded the scope of its tobacco research and activities to include e-cigarettes. "Cigarette-like" products are disposable, can be refilled in some cases, and use a cartridge. "Non-cigarette-like" products are cigar-shaped, can be modified, and use tanks and water pipes. New design features of e-cigarettes include two heating coils, tunable voltage, and no visible mist or vapor in second-generation products. Dr. Pirkle presented a schematic to illustrate the design, anatomy and individual components of an e-cigarette.

DLS has collected market data that show a sharp increase in e-cigarette use based on the tremendous growth of sales from \$20 million in 2008 to \$10 billion in 2013. E-cigarette sales in 2014 are estimated at \$2.5 billion with non-cigarette-like products accounting for \$1.5 billion and cigarette-like products accounting for \$1 billion. E-cigarettes are classified as a tobacco product by the FDA, but currently are unregulated in the United States. At this time, >400 brands are on the market with all major tobacco companies manufacturing these products. DLS will be extremely challenged in collecting standardized data on non-cigarette-like products due to the ability of users to modify e-juice (*i.e.*, flavored nicotine solutions) and adjust voltages in tanks.

Market share data as of May 2013 showed that the NJOY and blu brands accounted for ~70% of all e-cigarette sales in U.S. convenience stores. Unlike tobacco products, e-cigarettes do not have advertising restrictions. The major tobacco manufacturers have greatly increased their advertising dollars and other efforts for the e-cigarette market.

DLS is conducting laboratory research to address public health concerns regarding e-cigarettes. The e-cigarette literature includes only a small number of studies at this time. No data have been generated to date to make definitive conclusions on the benefits and adverse consequences of e-cigarettes: a cessation tool for current smokers versus a gateway device for new users, particularly youth, to initiate tobacco cigarette smoking.

Other public health concerns include the appeal of highly flavored products to youth and the ability to easily purchase e-cigarettes online. Moreover, the toxicant levels of e-cigarettes, effects of secondhand vapor and health risks of nicotine refillable cartridges are unknown. The quality of products greatly varies as well. NCEH published an *MMWR* article on March 31, 2014 that documented a tremendous increase in the number of calls to Poison Control Centers related to e-cigarettes from September 2010 to June 2013.

DLS conducted a small study to evaluate the characteristics of four brands of e-cigarettes in an effort to strengthen the existing evidence base. DLS designed a series of adapters for the study because e-cigarettes are not sized for a standardized smoking machine. The study included analyses of e-juice and e-cigarette refill cartridges to determine the pH and nicotine levels, alkaloids and flavors for all four brands. DLS will conduct future analyses focusing on TSNAs and VOCs.

The study showed that nearly all nicotine was in free-base form with pH levels ranging from 8.4 to 9.2 across the four brands. Results of individual analyses greatly varied among the four

brands: from unprotonated/free nicotine to protonated nicotine, from a vapor phase to a particulate phase, from readily to slowly absorbed nicotine, and from a harsh to a less harsh impact on mucous membranes. Labeled nicotine concentrations of e-juice for the four brands often were higher than values measured by other laboratories. Minor alkaloids detected in e-juice indicated that these products are tobacco extracts. Flavored e-juice was found to contain a range of additives.

FDA informed DLS of the need to conduct a much larger study to better characterize e-cigarettes for the regulatory process. DLS is using a portion of CDC's \$22 million interagency agreement with FDA to conduct the new "CDC/FDA E-Cigarette Project." Over the course of the six-month study, configurations of 25 products by 9 different manufacturers will be analyzed, including voltages, tank configurations, vapors and e-juice for each product. Phase 1 of the study will focus on an evaluation of two smoking regimens for 3-5 e-cigarette products (e.g., puff volume, interval and duration, air flow, and total puffs per product).

The e-cigarette vapor and e-juice analyses will include a qualitative scan of contents in liquid and vapor for each product and an evaluation of a wide variety of addictive and toxic substances. DLS's development of a standardized protocol to test e-cigarettes will be one of the key outcomes of the study. DLS's new protocol will serve as a cornerstone for FDA to issue regulations to e-cigarette manufacturers.

Priority 2 is DLS's more formal and stronger focus on laboratory safety issues as a result of two laboratory incidents that occurred at CDC in June and July 2014. First, CDC laboratory staff potentially was exposed to anthrax due to mishandling of a live rather than an inactivated sample. Second, a laboratory specimen contaminated with the H5N1 influenza virus was inadvertently shipped from CDC.

Dr. Frieden established a new Laboratory Safety Improvement Workgroup for all parts of CDC to play a role in addressing these problems and promoting an agency-wide culture of laboratory safety. The workgroup proposed several recommendations to Dr. Frieden in its initial review of gaps in CDC's laboratory safety practices.

- Place a moratorium on the transfer of pathogens from Biosafety Level (BSL)-3 and BSL-4 laboratories
- Designate a single point person for accountability of CDC laboratory safety issues who should have a high level of expertise, play a strong role in advancing laboratory science, and directly report to the CDC Director
- Use a standardized checklist to maintain a written record of required laboratory procedures that were completed and approved by a bench laboratorian and supervisor
- Ensure adherence to approved laboratory protocols, particularly those specified for highly pathogenic substances
- Broadly increase the use of laboratory quality systems
- Enhance core and specialized training for specific agents used by BSL-3 and BSL-4 laboratories

Dr. Pirkle emphasized that DLS has made tremendous progress in improving the safety, quality and efficiencies of its laboratory research and other activities. For example, he presented a video to demonstrate safer and more efficient handling and analyses of laboratory samples by

an automated robotic system rather than by individual staff. The robotic system has increased the laboratory throughput of DLS's most complex analyses by 800%.

The BSC provided guidance in response to one of the two questions posed by NCEH/DLS.

ACTION ITEM	
Responsibility	Action Step
Dr. James Pirkle	Provide the BSC with links to early studies that have documented the health effects of flavored e-juice in order for the members to identify research gaps in this area
BSC GUIDANCE	
Question 1: Exposure Characterization of E-Cigarettes	
<ul style="list-style-type: none"> • DLS's research will serve as the scientific underpinning for FDA to develop, justify and issue regulations to e-cigarette manufacturers. As a result, DLS should leverage its leadership in laboratory science to also play an important role in risk communication of e-cigarettes. DLS should encourage its public health partners to use explicit, specific and scientific language rather than euphemistic or "gimmicky" slang advertised by industry to attract users to their products. For example, the terminology of "flavored nicotine solutions" always should be used in public health materials and messaging instead of "e-juice." More specific public health messaging will inform the public that e-juice contains nicotine and is not inherently safe. • DLS should systematically scan and monitor online chat rooms to rapidly gather real-time data; better describe the trends, patterns and changes in habits of e-cigarette users; and quickly disseminate web-based surveillance data to build the evidence base. DLS also should subscribe to existing e-cigarette listserves to further aid in the rapid collection and distribution of data on e-cigarette use. • DLS is conducting research at this time to inform FDA's development, justification and release of regulations for e-cigarette manufacturers. Due to the lengthy timeline of the federal regulatory process, several states and localities already have passed and enacted legislation to regulate e-cigarette marketing, advertising and age-based sales. CDC and FDA should explore strategies to issue interim guidance to assist all states in implementing e-cigarette legislation while the federal regulatory process is underway. 	

Public Comment Period

Dr. Cibulas opened the floor for public comments; no participants responded.

With no further discussion or business brought before the BSC, Dr. Cibulas recessed the meeting at 4:33 p.m. on November 18, 2014.

NOVEMBER 19, 2014

Welcome-BSC Meeting Convenes

William Cibulas, PhD, MS, CAPT USPHS

Acting Associate Director for Science, NCEH/ATSDR
BSC Designated Federal Official (DFO)

Dr. Cibulas opened the floor for introductions and confirmed that the 12 voting members and *ex-officio* members in attendance constituted a quorum for the BSC to conduct its business on November 19, 2014. He reconvened the proceedings at 8:34 a.m. and welcomed the participants to day 2 of the BSC meeting.

Dr. Cibulas announced that BSC meetings are open to the public and all comments made during the proceedings are a matter of public record. He reminded the voting members of their individual responsibility to identify potential conflicts of interest for any of the published agenda items for November 19, 2014 and recuse themselves from participating in or voting on these matters. None of the BSC voting members publicly disclosed conflicts of interest for the record.

West Virginia Water Contamination

Christian Scheel, MS

Acting Associate Director for Communication
NCEH/ATSDR Office of Communication

Mr. Scheel presented an overview of the NCEH/ATSDR response to the Elk River chemical spill that occurred in West Virginia.

January 9-21, 2014: The leakage of ~10,000 gallons of MCHM from industrial storage tanks into the Elk River affected ~300,000 customers of West Virginia American Water. After state officials confirmed the leakage of crude MCHM from tanks, the governor declared a state of emergency and the water company issued a “do not use” order for a nine-county area for a period of 5-8 days.

NCEH/ATSDR responded to West Virginia’s request for assistance and developed a short-term screening level for water ingestion of MCHM. NCEH/ATSDR and an interagency workgroup of its federal partners reviewed and approved the short-term screening level of 1 ppm for MCHM. President Obama’s declaration of Elk River as a federal disaster area allowed federal assets to be mobilized for the emergency response, including rapid delivery of water to residents.

NCEH/ATSDR responded to West Virginia’s request to investigate and assess chemical exposures at the site by deploying a team to review medical records, survey hospitals, evaluate disaster epidemiology capacity, and provide public health recommendations. An EH advisor was deployed to provide technical support on health impacts to residents at the site as well. These activities resulted in the detection of propylene glycol phenyl ether (PPH) that also was released during the MCHM chemical spill. A screening level of 1.2 ppm for PPH was validated and approved by the federal interagency workgroup.

February 4-10, 2014: NCEH/ATSDR participated in a press conference with the West Virginia governor and other state, local and federal officials involved in the response. The governor established the West Virginia Testing Assessment Project (WVTAP) as an independent panel of environmental engineering and research experts to test water in homes, initiate an in-depth analysis to determine the odor threshold of MCHM, and evaluate safety factors used in calculating the MCHM screening level.

April 1-23, 2014: The WVTAP panel released preliminary results of its activities and concluded that NCEH/ATSDR used traditional methods and reasonable assumptions to calculate the MCHM screening level. The WVTAP panel agreed with key toxicity data and safety factors that NCEH/ATSDR used for MCHM, but not those used for PPH. The WVTAP panel decided to calculate values based on the most highly exposed population (e.g., formula-fed infants).

NCEH/ATSDR responded to West Virginia's request to conduct a CASPER survey with a representative sample of households across the nine-county area affected by the Elk River chemical spill. The CASPER survey was administered to 171 households to provide the state health department with household-based information in the following areas: the perceived impact of the chemical spill on individual households; use of household tap water; and practices before, during and after the "do not use" water order was issued. The CASPER survey also was used to assess communications to identify effective approaches for current and future events.

NCEH/ATSDR reviewed hospital records of persons who presented to emergency departments with symptoms related to the chemical spill (e.g., nausea/vomiting, rash, abdominal pain and diarrhea). Of 584 medical records abstracted and reviewed from 10 hospitals, 96% of patients were treated and released. Of the remaining 4% of patients who were admitted to hospitals, 92% had at least one underlying chronic medical condition.

July 7-23, 2014: NCEH/ATSDR released the CASPER survey results that showed of 171 households interviewed, ~35% reported using water for drinking and ~98% reported using water for other purposes (e.g., handwashing and showering) at the time of the survey. Prior to the chemical spill, 74% of households reported not having a three-day alternative water supply for each household member or pet. Within <1 day of the release of the "do not use" order, >80% of households had obtained an alternative water source. The National Toxicology Program (NTP) outlined its short-term toxicity studies that would be conducted on MCHM and other chemicals known to be involved in the Elk River chemical spill.

August 18-October 2014: NCEH/ATSDR issued an addendum to the Assessment of Chemical Exposures with a series of recommendations based on an evaluation of existing disaster epidemiology capacity at the state health department:

- Plan for responses to different types of disasters that potentially could occur in West Virginia
- Strengthen epidemiologic capacity to respond to chemical and radiological incidents and other emergency EH issues
- Partner with other states that already have expertise in disaster epidemiology
- Train epidemiologists in disaster epidemiology

NCEH/ATSDR met with state and local public health officials in West Virginia. The site visit focused on a discussion of actions to further monitor population health and environmental hazards and strengthen future responses to environmental events. During the site visit, NCEH/ATSDR reiterated its commitment to provide TA to West Virginia as a non-funded state of the EPH Tracking Network.

EPA released the MCHM air screening level and collected air sampling data from seven locations around the Freedom Industries site to establish baseline levels for comparison during soil remediation. The multi-agency response included a number of federal, state and local agencies and Congressional staff.

The NCEH/ATSDR response to the Elk River chemical spill was influenced by several factors. Information on MCHM and PPH was limited to proprietary animal studies by manufacturers and only two studies on the water pathway of concern. Efforts to coordinate response activities were challenging due to multiple lines of communication among federal, state and local stakeholders.

NCEH/ATSDR's after-action review demonstrated the difficulty in maintaining and releasing consistent messaging due to multiple points of entry. Most notably, direct answers could not be given on when the water system would be safe. NCEH/ATSDR's standard risk assessment raised questions regarding the calculations and assumptions that guided the recommendations. However, NCEH/ATSDR documented several successes in the after-action review despite these challenges.

The independent WVTAP panel determined that NCEH/ATSDR used traditional methods and reasonable assumptions to develop MCHM and PPH screening levels. Collaboration with the federal interagency workgroup was effective in leveraging additional TA and scientific support to determine, validate and publicize screening level calculations and methods. Opportunities were identified to provide TA at the state level and help build state capacity to better respond to future incidents. Areas of improvement in NCEH/ATSDR's internal operations were identified to respond more effectively to future events at the federal level.

The BSC provided guidance for NCEH/ATSDR to consider in improving the federal response to future EH emergencies.

AGENDA ITEM	
Presenter	Topic
Dr. Scott Deitchman	Overview of NCEH/ATSDR's new Emergency Operations Plan, including coordination of resources across divisions to support a large chemical spill response; engagement of internal experts, external partners and the broader public in this public health effort; and drills or exercises of EH emergency preparedness and response scenarios
BSC GUIDANCE	
<ul style="list-style-type: none"> • NCEH/ATSDR should use the response to the Elk River chemical spill, particularly the 	

effective deployment of staff, as an opportunity to showcase its expertise and talents that are unique from any other agency. Lessons learned from the Elk River chemical spill recently were published in the peer-reviewed literature, but NCEH/ATSDR should explore other venues to highlight its role as the “Marines” of immediate and reliable preparedness and response to EH emergencies.

- NCEH/ATSDR should initiate dialogue with state and local officials in West Virginia to explore the feasibility of creating a new registry or surveillance system specifically for the Elk River chemical spill. A registry would serve as a valuable tool to address the fears and concerns of residents regarding potential long-term health effects from exposure to the chemical spill.
- NCEH/ATSDR should focus on two specific areas to improve all aspects of the response to future EH events, including planning, communications and preparedness. First, multiple lines of communications among federal, state and local stakeholders are one of the most significant obstacles to emergency response. Second, uncertainties often impede or impair the ability to effectively and rapidly respond, address questions or make decisions during an event. Challenges related to planning, communications and preparedness for the Elk River chemical spill response should be replicated in rigorous drills and training exercises that will be conducted as part of NCEH/ATSDR's new Emergency Operations Plan. Experiences and lessons learned also should be systematically included in these tabletop exercises to broadly inform future responses to both EH and non-EH events.
- NCEH/ATSDR's after-action review and other activities focused on communications among federal, state and local stakeholders during the response to the Elk River chemical spill. However, communications of future events should extensively engage and involve the community as actual partners at the outset of the response.

NCEH/ATSDR Ebola Response Activities

RADM Scott Deitchman, MD, MPH

Associate Director for Environmental Health Emergencies
NCEH/ATSDR Office of the Director

Dr. Deitchman explained that the CDC Emergency Operations Center (EOC) is responsible for the agency-wide ebola response, but NCEH/ATSDR is contributing its EPH expertise in response to requests from multiple CDC programs. As of November 5, 2014, 67 NCEH/ATSDR employees have participated in the ebola response; 29 employees currently are involved through EOC, Liberia, Guinea, quarantine station or normal office activities; and 28 employees are on standby for assignments if needed.

Dr. Deitchman presented an organizational chart to illustrate the management and coordination functions of the ebola response by the CDC EOC. He introduced the panel of speakers who would present overviews of NCEH/ATSDR's activities in CDC's ebola response.

Kevin Chatham-Stephens, MD

Epidemic Intelligence Service Officer
NCEH Division of Environmental Hazards and Health Effects

Dr. Chatham-Stephens presented an overview of NCEH/ATSDR's ebola response activities in Sinoe County, Liberia. The demographic factors of Liberia include a 61% literacy rate, an 85%

unemployment rate, an infant mortality rate of 69 per 1,000 population, and a life expectancy of 58 years. Dr. Chatham-Stephens provided TA, training and support to the Sinoe County Health Team during his deployment to Liberia on September 14-30, 2014.

Sinoe County is a rural area in southern Liberia with a population of ~100,000 residents. All healthcare facilities are functioning, but only two physicians serve the entire county. Dr. Chatham-Stephens presented a series of photographs from Sinoe County: the FJ Grante Hospital in Greenville; the Sinoe County Health Team Office; a truck to transport medical materials and waste from ebola patients for proper destruction and burial; and an “ambulance-like” vehicle to transport ebola patients. The photographs illustrated the difficulties in basic operations and transportation due to rural roads.

Dr. Chatham-Stephens made a series of presentations during his deployment to Sinoe County to provide training on several important topics, including the epidemiology of ebola, an ebola case definition, infection prevention and control measures for ebola, and treatment of ebola patients. The presentations were well attended by diverse audiences: 15 FJ Grante Hospital staff, 49 Sinoe County outreach team members, 27 United Nations staff, 25 local palm oil corporation staff, and 49 community leaders and traditional healers. In addition to these audiences, 79 healthcare workers (HCWs) also attended a demonstration of proper donning and doffing of personal protective equipment (PPE).

In addition to making ebola presentations to various groups, Dr. Chatham-Stephens also provided assistance and played a key role in activities that were conducted by NCEH/ATSDR’s partners in the field.

- Presentations by the World Health Organization (WHO) and Ministry of Health (MOH)
- Establishment of an isolation unit in the hospital and a separate holding tent for patients
- Design of an ebola screening system for the FJ Grante Hospital
- Creation of a quick reference guide for hospital staff on the care of ebola patients
- Evaluation of sites for the Ebola Community Care Center (ECCC)
- Supervision of the burning/burial process of medical waste from ebola patients
- Development of draft reference materials to rapidly provide guidance on reopening schools following the decline of the ebola epidemic
- Meetings with local non-governmental organizations to discuss plans in building and staffing the Ebola Treatment Unit
- Collaboration with WHO and local stakeholders on developing an ECCC gap analysis and supply list
- Involvement in the organized placement of ebola educational posters at video clubs (*i.e.*, small, informal movie theaters in Liberia) throughout the Greenville community

Dr. Chatham-Stephens presented a series of photographs of the isolation unit in the FJ Grante Hospital, the holding center for ebola patients, a potential ECCC site, and a medical waste burning site. He described his involvement in conducting and analyzing data from a knowledge-attitude-practice (KAP) survey that was designed to determine the reach of ebola messaging by the MOH to the community. The KAP survey respondents included 68 community members and 23 HCWs in Sinoe County. Preliminary results of the KAP survey are outlined below.

- 100% of respondents agreed that ebola could be obtained from bodily fluids.
- 100% of respondents agreed that handwashing could prevent ebola.

- 91% of respondents agreed that ebola could be obtained from bush meat.
- 64% of respondents agreed that ebola could be obtained from a spell.
- 100% of respondents agreed that ebola is a real disease.
- 90% of respondents expressed concern about developing ebola.
- 76% of respondents agreed that fever is a symptom of ebola.
- 26% of respondents expressed fear of ebola survivors.

Low community acceptance of and resistance to the global ebola response have presented major challenges in Liberia, Sierra Leone and Guinea. For example, residents of Sinoe County villages expressed a great deal of opposition to placing an ECCC in their community. Residents near burial sites of deceased ebola patients were concerned of potential contamination to their water supply. HCWs refused to treat ebola patients due to worries about their personal safety. Groups of angry village residents confronted two Sinoe County outreach teams during their efforts to conduct contact tracing in the field.

Other site-specific barriers to the ebola response in Sinoe County included low cell phone coverage, the absence of base radio communications in peripheral areas, an 8- to 10-hour walk to access communities with no radio communication, and extremely poor road conditions for vehicle travel.

Helen Rogers, PhD

Associate Director for Science

NCEH Division of Emergency and Environmental Health Services

Dr. Rogers summarized NCEH/ATSDR's messaging and responses to 45 ebola-related EH inquiries that were submitted by concerned stakeholders from September 10 to October 31, 2014. The stakeholders included CDC colleagues, federal and international partners, national professional societies and private citizens. NCEH/ATSDR grouped the stakeholder inquiries into four broad categories.

Water and wastewater management accounted for 13 of the 45 ebola-related EH inquiries. NCEH/ATSDR collaborated with CDC colleagues and external partners to address inquiries related to safe handling of ebola in water and wastewater as well as protection from ebola for the following occupational scenarios: wastewater workers at water treatment plants, plumbing system workers, onsite wastewater systems, and private drinking water wells.

NCEH/ATSDR's responses were featured on the CDC.gov website with interim guidance on ebola-related occupational issues. NCEH/ATSDR also participated in the Border Environment Federation webinar in November 2014. Key outcomes from this initiative included guidance for wastewater treatment plant workers to properly use PPE and implement sound hygiene practices.

The food safety industry accounted for 7 of the 45 ebola-related EH inquiries. NCEH/ATSDR collaborated with CDC colleagues and external partners to address inquiries related to potential ebola exposure among employees returning from Africa, possible food transmission of ebola, and management of ill workers. NCEH/ATSDR and its infectious disease partners at CDC jointly developed a question/answer document to collect and maintain data on the food pathway as a potential route for ebola transmission.

The cruise ship industry accounted for 11 of the 45 ebola-related EH inquiries. NCEH/ATSDR collaborated with CDC colleagues and external partners to address inquiries related to passenger lists and disease reporting during cruise ship travel, management of suspect cases, use of PPE, and cleaning procedures of cruise ships. NCEH/ATSDR and its global quarantine partners at CDC explored strategies to identify and flag cruise ship passengers with a recent travel history to or from ebola-affected parts of Africa.

The other category accounted for 14 of the 45 ebola-related EH inquiries. NCEH/ATSDR collaborated with CDC colleagues and external partners to participate in conference calls and make presentations regarding PPE, medical waste management, cleanup and decontamination of non-healthcare facilities, and mortuary services.

ACTION ITEM	
Responsibility	Action Step
Dr. Scott Deitchman	Provide the BSC with a larger and more readable version of the “2014 Ebola slide” (<i>i.e.</i> , the organizational chart) that illustrates the management and coordination functions of the ebola response by the CDC EOC
BSC GUIDANCE	
<ul style="list-style-type: none"> • NCEH/ATSDR should conduct the following EH activities in the ebola response: <ul style="list-style-type: none"> ○ Rapidly disseminate guidance to U.S. hospitals that are receiving ebola patients, but are encountering difficulties in purchasing CDC’s recommended PPE specifically for ebola. ○ Compile and widely distribute EH guidance based on ebola lessons learned in the field (e.g., cleanup protocols, worker protection and potential environmental contamination). • CDC generically refers to “West Africa” in its ebola response activities. However, CDC’s public health communications and messaging should clearly distinguish between the 15 West African countries that are and are not affected by ebola due to the high level of stigma. For example, West African immigrants who are U.S. citizens or residents are experiencing a great deal of ebola-related stigma in U.S. communities regardless of their countries of origin. 	

Updates by the BSC *Ex-Officio* Members

Kristina Thayer, PhD
 Director, NTP Center for the Evaluation of Risks to Human Reproduction
 National Institute of Environmental Health Sciences (NIEHS)

Dr. Thayer reported that NIEHS would convene a meeting and host a simultaneous webcast of the NTP Board of Scientific Counselors on December 9-10, 2014. The draft agenda, slide sets, other meeting materials, and instructions for registration were available on the NTP/NIEHS website. Dr. Thayer highlighted the key presentations that would be made by the NTP Toxicology Branch and other programs.

- Overviews on mold, cell phones, black cohosh, sunscreens and *Ginkgo biloba*

- A case study using estrogen pathway signaling to assess the biological relevance of *in vitro* data
- Results of a formal systematic review of immunotoxicity associated with exposure to perfluorooctanoic acid and perfluorooctane sulfonate
- An update on the West Virginia chemical spill
- An update on ongoing studies conducted by the National Institute for Occupational Safety and Health that are funded by an interagency agreement with NTP:
 - “Occupational Exposure Assessment of Manganese Fractions in Welding Fume”
 - “Industry-wide Exposure Assessment Study of Workers Exposed to Carbon Nanotubes and Carbon Nanofibers”
 - “Occupational Exposure to Bisphenol A in the United States”
 - “Assessment of Exposure to Coal Tar Pitch Volatiles Containing PAHs in Coal Tar Sealant Applications”
 - “Assessment of Occupational Exposure to Flame Retardants”
- Results of recent NTP technical report peer reviews, including animal bioassays and two-year cancer bioassays for green tea extract, indole-3-carbinol, CIMSTAR 3800 and bromodichloroacetic acid
- Results of a recent *Report on Carcinogens* peer review of TCE
- A case study on hexavalent chromium to assess NTP’s effectiveness

Dr. Thayer noted that during the May 2014 meeting, the BSC requested an update on NTP’s green chemistry projects and current occupational exposure assessments. Because these studies are in the early stages of development, her update on these topics would be presented during the next BSC meeting in 2015.

Dr. Viji Potula

Scientific Program Official, Research and Training Program Administration
National Institute for Occupational Safety and Health (NIOSH)

Dr. Potula served as the alternate *ex-officio* member for NIOSH and presented the update to the BSC on behalf of Dr. John Decker who was unable to attend the meeting. She reported that the NIOSH Health Hazard Evaluation Program measured occupational exposure to lead, cadmium, chromium and noise among workers at electronic scrap recycling facilities across the United States. The exposure evaluations showed overexposure to lead, cadmium and other toxic metals among workers in both production and non-production areas of facilities that process cathode ray tube glass.

NIOSH is planning to evaluate occupational exposures to metal and flame retardants in electronic scrap recycling facilities. Ineffective engineering controls and poor work practices, particularly dry sweeping of dust containing toxic metals, were found to be the primary cause of exposure to workers. NIOSH currently is recruiting five facilities to participate in the exposure assessment.

NIOSH has or will soon deploy 59 staff to various ebola response missions in West Africa and the United States. NIOSH’s key activities in the ebola response to date are highlighted below.

- Development and dissemination of ebola guidance and informational materials for West Africa HCWs and U.S. HCWs, airport staff, sewage and wastewater employees and mortuary staff

- Evaluations of the effectiveness of different types of PPE
- Provision of responses to numerous ebola-related inquiries
- Leadership of the CDC-EOC Worker Health and Safety Team
- Membership on the CDC Rapid Ebola Preparedness Team that closely collaborates and coordinates activities with state and local health departments to support hospital preparedness for ebola patients
- Participation in WHO meetings to develop the Rapid Advice Guideline for PPE that will be used by HCWs

Bonnie Richter, PhD, MPH

Senior Epidemiologist, Office of Health and Safety
U.S. Department of Energy (DOE)

Dr. Richter reported that DOE published a retrospective cohort mortality study in 2000 of workers employed at the Mallinckrodt Chemical Works, Missouri site in 1942-1966. The history of the site included uranium ore production and processing operations. The mortality study found an excess of kidney cancer among DOE workers at the site. The Mallinckrodt site eventually was designated as a DOE Formerly Utilized Sites Remedial Action Program site due to persistent community concerns regarding contamination.

ATSDR's public health assessment found that offsite exposures from the Mallinckrodt site did not pose a threat to the community in terms of cancer clusters or excess cancers with a potential association to radiation. However, areas of contamination were detected at the site. DOE has allocated funding to ATSDR to implement the recommendations in its public health assessment of the Mallinckrodt site.

- Characterize surface water and groundwater both onsite and offsite to identify chemical contamination in sediment and soil
- Evaluate offsite surface soil and air levels to identify radiological contamination
- Assess offsite dust levels
- Determine and address current community concerns by participating in meetings and distributing educational materials

Dr. Richter concluded that this DOE-funded initiative is expected to generate four ATSDR publications in 2015.

Wayne Cascio, MD

Director, Environmental Public Health Division
U.S. Environmental Protection Agency (EPA)

Dr. Cascio presented his first update to the BSC as the new *ex-officio* member for EPA. He reported that EPA redesigned its research portfolio into six research programs.

- Air, Climate and Energy Research Program
- Safe and Sustainable Water Resources Research Program
- Chemical Safety for Sustainability Research Program
- Human Health Risk Assessment Program
- Homeland Security Research Program
- Sustainable and Healthy Communities Research Program

Dr. Cascio highlighted new focus areas and key activities that EPA's redesigned research programs will prioritize over the next year.

- Mandate chemical exposures in the environment
- Provide tools for decision-making and research at the community level
- Apply findings from animal toxicology studies to evaluate emissions from various types of cookstoves used in international communities
- Collect and analyze results from university-based research projects to assess inflammatory biomarkers of blood spots based on the placement of cookstoves in international communities
- Shift from single- to multi-pollutant research in animal models, human challenge studies, and population-based epidemiologic studies
- Strengthen the focus on effect modifiers of air pollution (e.g., social factors, stress, community characteristics, epi-genetics and genetics)
- Identify adverse outcome pathways to define specific biochemical pathways that lead to observed health effects
- Use the EPA Healthy Hearts Program to promote EH literacy, publicize potential adverse consequences of inhaling particulate matter, and provide education to existing heart disease patients to mitigate exposure (e.g., modification of routine behaviors based on a review of the daily air quality index)
- Continue to collaborate with partners to conduct multi-agency studies on wildland fire emissions due to changes in three major areas: (1) the tripling of U.S. fires per acre since 1985; (2) the role of biomass burning in 30% of particulate matter in the country; and (3) the enormous public health and economic impact of U.S. wildland fires

Public Comment Period

Dr. Cibulas opened the floor for public comments; no participants responded.

Discussion of Future BSC Agenda Topics

Melissa Perry, ScD, MHS

Chair, Department of Environmental and Occupational Health
George Washington University School of Public Health and Health Services
Acting BSC Chair

Dr. Perry pointed out that NCEH/ATSDR made robust and thoughtful presentations over the course of the meeting. She also noted the remarkable accomplishments and continued dedication of NCEH/ATSDR's public servants, particularly in light of its reorganization, transition to new leadership, and responses to emergencies. She thanked NCEH/ATSDR for its diligent efforts in continuing to advance the EPH field at the national level.

Dr. Perry moderated the BSC's discussion on future agenda topics and other meeting issues.

Topic 1: Revised Meeting Format

The BSC expressed strong support of the revised meeting format. Several members noted that changes in three areas would be particularly helpful to the BSC in strengthening its capacity to provide guidance on the NCEH/ATSDR EPH portfolio. First, NCEH/ATSDR revised the meeting agenda with shorter presentations and longer discussion periods. This change provided the BSC with more time to reflect and provide thoughtful input to NCEH/ATSDR.

Second, NCEH/ATSDR programs asked the BSC to address specific questions at the end of their presentations. This change allowed the BSC to focus its discussions on providing advice that would be most responsive, useful and helpful to individual NCEH/ATSDR programs.

Third, NCEH/ATSDR included its “Program Responses to BSC Guidance and Action Items” as a routine agenda item. During the current meeting, this change allowed NCEH/ATSDR to respond to the BSC’s previous advice with detailed action steps for implementation or a strong rationale for not taking action. This agenda item and the upcoming spreadsheets will serve as excellent tracking and monitoring tools for the BSC to hold NCEH/ATSDR accountable to responding to its guidance over time.

Topic 2: Changes to the BSC Membership and NCEH/ATSDR Leadership

Dr. Ikeda announced that the terms of four BSC members expired in June 2014 and extensions of their terms would expire before the next meeting. She asked the participants to join her in applauding the excellent service of the four outgoing members to NCEH/ATSDR and their outstanding contributions to the broader EPH field.

- Daniel Kass, MSPH: Deputy Commissioner, Division of Environmental Health
New York Department of Health and Mental Hygiene
- Michael Kleinman, PhD: Professor of Occupational and Environmental Medicine
Department of Medicine, University of California-Irvine
- Shannon Márquez, PhD, MEng: Academic Dean & Director of Global Health Initiatives
Drexel School of Public Health
- Sacoby Wilson, PhD, MS: Assistant Professor, Maryland Institute for
Applied Environmental Health & Department of Epidemiology and Biostatistics
School of Public Health, University of Maryland-College Park

The participants took a final opportunity to extend their warm wishes to Dr. Zenick in his retirement from EPA. Several BSC members and NCEH/ATSDR staff noted that Dr. Zenick’s leadership and longstanding support greatly contributed to EPA’s stronger focus on public health and environmental justice issues. Dr. Zenick emphasized that his role as the BSC *ex-officio* member for EPA was one of the highlights of his career.

The participants applauded Dr. Ikeda for her outstanding leadership and accomplishments as the Acting Director of NCEH/ATSDR during the transition to new leadership. Several BSC members recalled that one of the priorities she established for NCEH/ATSDR at the beginning

of her appointment as the Acting Director was to finalize and implement the Strategic Plan. The participants commended Dr. Ikeda on achieving this major goal.

Topic 3: Future Agenda Topics

Dr. Perry confirmed that she made notations of the extensive advice the BSC provided to NCEH/ATSDR after each presentation. She opened the floor for the members to propose additional agenda items.

FUTURE AGENDA ITEMS	
Presenter	Topic
NCEH/ATSDR OD & BSC	Discussion of potential opportunities for the BSC to provide input at the outset when NCEH/ATSDR proposes and submits new initiatives for CDC OD to consider for inclusion in the budget request process
NCEH/ATSDR OD & BSC	Discussion of the final charges, memberships and activities of the BSC's new Lead Subcommittee and Fracking Workgroup
NCEH/ATSDR Program Staff	Brief overview of the NCEH/ATSDR Strategic Plan for new BSC members and a progress report on select activities that specifically address the Strategic Plan goals, objectives and priorities. (ATSDR's overview during the current meeting of its new activities to address the Strategic Plan priority of children's EH should be considered as a model in scheduling this agenda item.)
NCEH/ATSDR Program Staff	Overview of outcomes in which NCEH/ATSDR communicated lessons learned, improvements, gaps or other results to the community of its response to an EH event. (NCEH/ATSDR should highlight community acceptance of the MCHM screening level in West Virginia and the impact of ebola in U.S. communities in this presentation.)
NCEH/ATSDR Program Staff	Overview of activities by CDC grantees that are funded to increase public health-healthcare synergy
NCEH/EHHE	Follow-up to the BSC's suggestion for NCEH to focus more on antimicrobial resistance and overuse of antibiotics in food production that are resulting in virtually untreatable infections in healthcare settings
NCEH/EEHS	Update on activities to achieve goals established for the CDC Food Safety Winnable Battle
NCEH/DLS	Update on the role of DLS's laboratory research in changes to FDA's policy-, regulatory- and decision-making processes
NCEH/DLS	Overview of DLS's laboratory research to analyze the association between exposure to harmful contaminants in marijuana and respiratory health effects, particularly since several states have passed new legislation for medical or recreational use of marijuana

FUTURE AGENDA ITEMS

NCEH/DLS	Overview of DLS's laboratory efforts to expand the current NHANES panel of environmental contaminants to include human exposure to neonicotinoid pesticides
ATSDR/DCHI	Update on the Camp Lejeune Soil Vapor Intrusion Assessment, particularly ATSDR's plans to respond to the BSC's guidance

Adjourn

Dr. Perry thanked the BSC members for their continued service and commitment to providing scientific counsel to improve NCEH/ATSDR's EPH portfolio. Drs. Cibulas and Ikeda also thanked the BSC for providing extremely rich and productive input to NCEH/ATSDR over the course of the meeting.

The participants applauded Dr. Perry for her excellent role as the Acting BSC Chair. The BSC noted that her excellent skills in moderating and focusing the discussions on specific issues were instrumental in the members providing useful and relevant guidance to NCEH/ATSDR over the course of the meeting. The participants applauded the efforts of Ms. Sandra Malcom, Ms. Shirley Little and other NCEH/ATSDR OD staff for planning and organizing a successful BSC meeting and providing outstanding logistical and administrative support.

With no further discussion or business brought before the BSC, Dr. Cibulas adjourned the meeting at 11:44 a.m. on November 19, 2014.

I hereby certify that to the best of my knowledge, the foregoing Minutes of the proceedings are accurate and complete.

Date

Melissa Perry, ScD, MHS
Acting Chair, NCEH/ATSDR
Board of Scientific Counselors



Participants' Directory

BSC Members Present

Mr. Daniel Kass, Chair
Dr. Melissa Perry, Acting Chair
Dr. Lisa Alvarez-Cohen
Dr. Hillary Carpenter
Dr. Julia Gohlke
Mr. Himanshu Jani
Dr. Ewa King
Dr. Shannon Márquez
Dr. Matthew Strickland
Dr. Phillip Williams

BSC Members Absent

Dr. Rebecca Head
Dr. Michael Kleinman
Dr. Kenneth Ramos
Mr. Sanjay Ranchod
Dr. Sacoby Wilson
Dr. Robert Wright

BSC Ex-Officio Members Present

Dr. Wayne Cascio (Incoming Member)
U.S. Environmental Protection Agency

Dr. Viji Potula
(Alternate for Dr. John Decker)
National Institute for Occupational Safety
and Health

Dr. Bonnie Richter
U.S. Department of Energy

Dr. Kristina Thayer
National Toxicology Program, National
Institute of Environmental Health Sciences

Dr. Hal Zenick (Outgoing Member)
U.S. Environmental Protection Agency

BSC Ex-Officio Member Absent

Dr. John Decker
National Institute for Occupational Safety
and Health

Designated Federal Official

Dr. William Cibulas
Acting Associate Director for Science,
NCEH/ATSDR

CDC/NCEH/ATSDR Representatives

Lorraine Backer
Barry Brooks
Sharunda Buchanan
Tonia Burk
Sascha Chaney
Kevin Chatham-Stephens
Ekta Choudhary
Burt Cooper
Scott Deitchman
Timothy Dignam
Stephanie Doan
Mary Anne Duncan
Mark Evans
Carolina Fernandez
Tina Forrester
Larry Furphy
Demetria Gardner
Richard Gillig
James Gooch
Robert Halverson
Olivia Harris
James Holler
Joy Hsu
Robin Ikeda
Yulia Iossifova

Diane Jackson
Maria Jolly
Craig Kassinger
Mark Keim
Chinaro Kennedy
Caroline Lagoy
Lauren Lewis
Shirley Little
Sandra Malcom
Josephine Malilay
Mary Mortensen
Moiz Mumtaz
Edward Murray
Whitney Neal
Jona Ogden
James Pirkle
Judith Qualters

Fauzia Rashid
Patricia Richter
Von Roebuck
Helen Rogers
Lourdes Rosales-Guevara
John Sarisky
Christian Scheel
James Stephens
Jerry Thomas
John Tibbs
Jenny Van Skiver
Padmaja Vempaty
Laura Warner
Pam Wigington
Lynn Wilder
David Williamson
Angela Wilson



Glossary of Acronyms

BLLs	Blood Lead Levels
BSC	Board of Scientific Counselors
BSL	Biosafety Level
CAP	Community Assistance Panel
CASPER	Community Assessment for Public Health Emergency Response
CDC	Centers for Disease Control and Prevention
CIOs	Centers, Institutes and Offices
CLPP	Childhood Lead Poisoning Prevention
DCHI	Division of Community Health Investigations
DFO	Designated Federal Official
DLS	Division of Laboratory Sciences
DMWM	Don't Mess With Mercury
DOE	U.S. Department of Energy
ECCC	Ebola Community Care Center
EEHS	Emergency and Environmental Health Services
EH; EPH	Environmental Health; Environmental Public Health
EHHE	Environmental Hazards and Health Effects
EOC	Emergency Operations Center
EPA	U.S. Environmental Protection Agency
ETS	Environmental Tobacco Smoke
FDA	U.S. Department of Food and Drug Administration
FOAs	Funding Opportunity Announcements
HCWs	Healthcare Workers
HHS; HHS J	U.S. Department of Health and Human Services; HHS Justification
KAP	Knowledge-Attitude-Practice
LNAPL	Light Non-Aqueous Phase Liquid
MMWR	<i>Morbidity and Mortality Weekly Report</i>
MOH	Ministry of Health
NCEH/ATSDR	National Center for Environmental Health/ Agency for Toxic Substances and Disease Registry
NHANES	National Health and Nutrition Examination Survey
NIEHS	National Institute of Environmental Health Sciences

NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
NVEAIS	National Voluntary Environmental Assessment Information System
OD	Office of the Director
OMB; OMBJ	Office of Management and Budget; OMB Justification
PPE	Personal Protective Equipment
PPH	Propylene Glycol Phenyl Ether
QPRs	Quarterly Program Reviews
REP	Radiation Emergency Preparedness
SAFER	Screening Awareness for Environmental Risk
SVI; VI	Soil Vapor Intrusion; Vapor Intrusion
TA	Technical Assistance
TCE	Trichloroethylene
TSNAs	Tobacco-Specific Nitrosamines
UOG	Unconventional Oil and Gas
USGS	U.S. Geological Survey
VOCs	Volatile Organic Compounds
WHO	World Health Organization
WVTAP	West Virginia Testing Assessment Project