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Dear Environment Sector members:

Climate change continues to dominate the news with more debate in Congress and discussion among the presidential candidates. It will also be front and center in several upcoming meetings hosted by the Bush Administration and the international community.

EPRI's Summer Seminar with the Board of Directors focused on the PRISM study, including the results of the MERGE economic analysis illustrating the benefits of a successful technology R&D program in reducing greenhouse gas emissions. In addition, EPRI and the National Resources Defense Council (NRDC) published two complementary studies on the environmental benefits of Plug-In Hybrid Electric Vehicles, capped off by a press briefing at the National Press Club. We also published the results of the economic assessment of California's climate change program, a project supported by Southern California Edison.

On another topic, we would like to call your attention to the upcoming advisory meetings in Cleveland. The focus of the meetings will be planning for the 2009 annual offering. The area councils and sector council will be asked to review and prioritize the proposed research program to ensure we have the most robust and responsive portfolio possible. Since only those in attendance will have the opportunity to weigh in, we strongly encourage you to participate.

We hope you had an enjoyable summer and look forward to seeing many of you in Cleveland the week of September 24.

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ENVIRONMENT SECTOR

Environment Sector Peer-Reviewed Literature Status Posted on epri.com

Spreadsheets showing the status of all articles submitted to third-party peer-reviewed publications are available on epri.com. The spreadsheets, available for each Environment Area, list articles that have been submitted or published, and give full citations for published articles. A link to the [Peer Literature](#) page is available from the Environment "Overview" page under "Portfolio." Note that EPRI membership does not include automatic web access to third-party publications, and that articles submitted to third-party publications are no longer owned by EPRI.

Program 42: Air Toxics Health and Risk Assessment

Wisconsin Mercury Seminar Presentations

The State of Wisconsin Natural Resources Board held a July 2007 Mercury Seminar in Stevens Point, WI. Among the presentations were the following:

- “Control Technology Options for Coal-Fired Electrical Generating Units,” by Ramsay Chang of EPRI,
- “Methylmercury Impacts on Loons in Wisconsin,” EPRI sponsored research reported by Michael Meyer of the Wisconsin Department of Natural Resources,
- and “Atmospheric Mercury Deposition,” a comparison of EPA and EPRI global and regional models, by Russell Bullock of the National Oceanic and Atmospheric Administration.

For more information, contact Leonard Levin, (650) 855-7929, llevin@epri.com.

Program 91: Assessment Tools for Ozone, Particulate Matter, and Haze

Results of EPRI-NRDC Study of Plug-In Hybrid Electric Vehicles Released

On July 19, EPRI and the National Resources Defense Council (NRDC) released results of their collaborative study of the impacts of plug-in hybrid electric vehicles (PHEVs) on global climate and U.S. air quality. The study is the first to develop detailed, comprehensive models of the U.S. electric system and transportation sector that simulate the evolution of both sectors into the future, including factors such as potential technological advances, load growth, capacity expansion, and environmental regulations. Because of differences in the methodologies and models used to evaluate these impacts, this assessment is reported in two separate volumes. The greenhouse gas emissions study results, summarized in the Global Climate Change section of this issue, are described in the report *Environmental Assessment of Plug-In Hybrid Electric Vehicles, Volume 1: Nationwide Greenhouse Gas Emissions* (1015325). The air quality study results, summarized below, are presented in the report *Environmental Assessment of Plug-In Hybrid Electric Vehicles, Volume 2: United States Air Quality Analysis Based on AEO-2006 Assumptions for 2030* (1015326). Both are available to the general public at www.epri-reports.org. Key results of the air quality study were as follows:

- In most regions of the United States, PHEVs result in small but significant improvements in ambient air quality and reduction in deposition of various pollutants such as acids, nutrients and mercury.
- On a population weighted basis, the improvements in ambient air quality are small but numerically significant for most of the country.
- The emissions of gaseous criteria pollutants (NO_x and SO₂) are constrained nationally by regulatory caps. As a result, changes in total emissions of these pollutants due to PHEVs reflect slight differences in allowance banking during the study's time horizon.
- Considering the electric and transportation sectors together, total emissions of VOC, NO_x and SO₂ from the electric sector and transportation sector decrease due to PHEVs. Ozone levels decreased for most regions, but increased in some local areas. When assuming a minimum detection limit of 0.25 parts per billion, modeling estimates that 61% of the population would see decreased ozone levels and 1% of the population would see increased ozone levels.
- Mercury emissions increase by 2.4% with increased generation needs to meet PHEV charging loads. The study assumes that mercury is constrained by a cap-and-trade program, with the option for using banked allowances, proposed by EPA during the execution of the study. The electric sector modeling indicates that utilities take advantage of the banking provision to realize early reductions in mercury that result in greater mercury emissions at the end of the study timeframe (2030).
- Primary emissions of particulate matter (PM) increase by 10% with the use of PHEVs due primarily to the large growth in coal generation assumed in the study.
- In most regions, particulate matter concentrations decrease due to significant reductions in VOC and NO_x emissions from the transportation sector leading to less secondary PM.

In summary, the air quality benefits from PHEVs are due to a reduction of vehicle emissions below levels required by current regulation (due to their non-emitting operation in all-electric mode), and to the fact that

most electricity generation emissions are constrained from increasing by existing regulatory caps. Any additional increase in the amount of all-electric vehicle miles traveled or further emissions constraints on the electric sector would tend to magnify these benefits. For more information, contact Eladio Knipping, (650) 855-2592, eknippin@epri.com, or Mark Duvall, (650) 855-2591, mduvall@epri.com.

Progress on Three Projects To Be Described at September Advisory Meetings

Results and plans for the following three projects will be among those discussed at the upcoming Environment Sector and Area Council Advisory Meetings, to be held Sep. 24–28 in Cleveland, OH:

- The Advanced Modeling System for Transport, Emissions, Reaction, and Deposition of Atmospheric Material (AMSTERDAM) combines the EPRI aerosol module, the APT plume-in-grid module, and components of the TEAM mercury model. AMSTERDAM will be used to model ozone, particulate matter, visibility, and deposition of mercury, nitrogen species, and sulfate for the year 2020. Researchers are finishing development of 2020 emissions for model evaluation, in preparation for selecting and running a series of scenarios for 2020. This work, also supported by Program 42, will allow calculation of relative response factors so that future impacts can be projected. Advisor input will be sought on which scenarios to simulate for 2020. For more information, contact Eladio Knipping, (650) 855-2592, eknippin@epri.com, Naresh Kumar (650) 855-2990, nkumar@epri.com, or Leonard Levin, (650) 855-7929, llevin@epri.com.
- EPRI, the Desert Research Institute, and Sonoma Technology are working on a project to evaluate different methodologies for using receptor models in order to illustrate the strengths and limitations of these models. A guidance document is planned to help standardize use and interpretation of receptor models in air quality applications. The research is part of a study supported in part by the EPA Science to Achieve Results (STAR) program. Progress on this project was recently presented at a STAR project update meeting and will be discussed with advisors. For more information, contact Eladio Knipping, (650) 855-2592, eknippin@epri.com or Naresh Kumar (650) 855-2990, nkumar@epri.com.
- Some initial toxicology results are available from the Secondary Particulate Health Effects Research (SPHERES) project, and these will be discussed with advisors. For more information, contact Eladio Knipping, (650) 855-2592, eknippin@epri.com, or Annette Rohr, (650) 855-2765, arohr@epri.com.

Program 92: Assessment of Air Quality Impacts on Health and the Environment

Texas ARIES Field Data Collection Extended Through 2007

The Texas ARIES field effort, originally scheduled to gather comprehensive aerometric data at the Hinton Street site in Dallas over an 18-month period (ending June 2007), has been extended through the end of 2007 primarily because of cost-saving measures implemented by the field contractor. Senior technical executive Ron Wyzga and senior project manager Alan Hansen decided to extend the data collection once it appeared to be feasible at little additional cost. The rationale is that data for a 24-month period will substantially increase the statistical robustness of the epidemiological analyses based on a combination of these data with health data from Dallas for the same period. This advantage was judged to outweigh the disadvantage of a commensurate delay in beginning the epidemiological analyses. For more information, contact Alan Hansen, (650) 855-2738, ahansen@epri.com.

Hansen Serves on Three EPA Peer Review Panels

Senior project manager Alan Hansen was invited to serve on panels reviewing

- the science underlying possible amendments to secondary National Ambient Air Quality Standards for nitrogen oxides and sulfur oxides (NO_x/SO_x secondary standards),
- how the National Center for Environmental Research (NCER) can better engage the external scientific community in drafting requests for assistance (RFAs) to conduct research through its Science to Achieve Results (STAR) grants, and
- proposals submitted to address air monitoring and remote sensing under NCER's Small Business Innovative Research (SBIR) program.

The first panel is an *ad hoc* committee that met in July and is currently engaged in writing its report. The second, a standing subcommittee for NCER under the Board of Scientific Counselors for the Office of Research and Development, first met in July and is also still engaged in writing its report. The third, which met in August, is

reconstituted annually to provide the first level of review of proposals submitted to address specific needs under the SBIR program. For more information, contact Alan Hansen, (650) 855-2738, ahansen@epri.com.

GLOBAL CLIMATE CHANGE

[Visit the Global Climate Webpage](#)

Program 102: Global Climate Policy Costs and Benefits

Williams Presents EPRI Approach to AB 32 Implementation at Annual CCEEB Seminar

Larry Williams was an invited presenter at the 2007 Summer Issues Seminar of the California Council for Environmental and Economic Balance (CCEEB), held July 23–27 near Tahoe City, CA. The annual seminar brings together high-level regulators, state officials, and business executives for a week of presentations and discussions regarding environmental issues of importance to various industries, including air quality, waste and water quality, and climate change. The focus of the seminar was on issues related to AB 32, the [California Global Warming Solutions Act of 2006](#). Larry's presentation, "Cost-Effective Implementation: 'Getting the Rules Right,'" was part of a panel on "The Scoping Plan, Voluntary Early Actions, and Maximum Technologically Feasible and Cost-Effective Reductions." Other panelists were Eileen Tutt, Deputy Secretary for External Affairs at Cal/EPA, and Charles Shulock, Assistant Executive Officer of the California Air Resources Board. In an earlier session, Secretary of Cal/EPA Linda Adams discussed the effects of blending cap-and-trade programs with other mandatory requirements. Judson Jaffe (co-author of "[Too Good To Be True: An Examination of Three Economic Assessments of California Climate Change Policy](#)") also spoke on the economics of blending cap-and-trade with command-and-control approaches to GHG mitigation in California. EPRI's research results are described in the report [Program on Technology Innovation: Economic Analysis of California Climate Initiatives: An Integrated Approach](#) (1014641). For more information, contact Larry Williams, (650) 855-2695, ljwillia@epri.com.

Program 103: Greenhouse Gas Reduction Options

7th Annual EPRI-IEA-IETA Workshop on Greenhouse Gas Emissions Trading

The 7th Annual EPRI-IEA-IETA Workshop on Greenhouse Gas Emissions Trading will be held Oct. 8–9 in Paris, France. This event is organized jointly by EPRI, the International Energy Agency (IEA) and the International Emissions Trading Association (IETA). This invitation-only workshop will bring together more than 100 individuals—including senior officials from OECD countries, the European Union, and other nations; corporate executives from electric companies, energy-intensive industries, brokerage companies, and the financial community; and analysts and researchers from nongovernmental organizations and academia—to discuss current topics related to the evolution of greenhouse gas emissions trading programs around the world. The workshop will combine presentations of recent research with discussions on regulatory developments in specific countries; CO₂ market news; and GHG allowance allocation issues. New topics to be discussed this year include:

- developments in North America and their potential impact on international GHG markets,
- sectoral approaches,
- the role of GHG emissions trading in spurring new technology development, and
- the European Union Emissions Trading Scheme (EU ETS): status and next steps.

There is no fee for the workshop; however, registration is mandatory and seats are limited. To register, go to the [EPRI calendar listing](#) for this event and follow the link to the IEA website; use the username and password provided. For more information, contact Adam Diamant, (510) 260-9105, adiamant@epri.com.

Supplemental Project: Progress on Pilot Demonstration of CO₂ Capture and Storage

"[CO₂ Capture and Storage Pilot Demonstrations 1.7-MW Chilled-Ammonia Pilot](#)" (1013048). Development of an integrated test center capturing actual power-plant flue-gas CO₂ and storing it safely deep underground is a crucial step in commercializing technologies that curb CO₂ emissions. Construction has started on a large pilot for CO₂ capture using the chilled ammonia process at We Energies' Pleasant Prairie Power Plant, sponsored

by EPRI and by Alstom, developer of the chilled ammonia process. Later, EPRI plans to offer its members more CO₂ capture pilots using other technologies, and eventually to build a Test Center which will capture, store, and monitor the capture and injection of 0.5 M tonnes of CO₂ over a 10-year period (preferably greater than 10-MW equivalent). Startup should be in late 2007. In the interim, large lab-scale pilots have been built and operated in Menlo Park, California, to test the chilled ammonia process. EPRI hopes to accelerate testing of a number of processes at multiple scales and increase the number and scope of tests. Subsequent pilots may test other solvent approaches, solid sorption, and membrane processes, potentially in the 2008–2010 time frame. Additional opportunities for pilots are being developed. Please contact your EPRI Account Executive for your price to participate in this important project. For more information, contact George Offen (650-855-8942), goffen@epri.com, or Richard Rhudy, (650) 855-2421, rrhudy@epri.com.

Area News

Results of EPRI-NRDC Study of Plug-In Hybrid Electric Vehicles Released

On July 19, EPRI and the National Resources Defense Council (NRDC) released results of their collaborative study of the impacts of plug-in hybrid electric vehicles (PHEVs) on global climate and U.S. air quality. The study is the first to develop detailed, comprehensive models of the U.S. electric system and transportation sector that simulate the evolution of both sectors into the future, including factors such as potential technological advances, load growth, capacity expansion, and environmental regulations. Because of differences in the methodologies and models used to evaluate these impacts, this assessment is reported in two separate volumes. The greenhouse gas emissions study results, summarized below, are described in the report [Environmental Assessment of Plug-In Hybrid Electric Vehicles, Volume 1: Nationwide Greenhouse Gas Emissions](#) (1015325). The air quality study results, summarized in the Air Quality section of this issue, are presented in the report [Environmental Assessment of Plug-In Hybrid Electric Vehicles, Volume 2: United States Air Quality Analysis Based on AEO-2006 Assumptions for 2030](#) (1015326). Both are available to the general public at www.epri-reports.org.

For the GHG study, researchers created a series of scenarios to assess the impact of PHEVs over different possible energy and transportation futures. Three scenarios represented high, medium, and low levels of CO₂ intensity for the electric sector. (Intensity refers to the level of CO₂ emissions per unit of electricity produced; newer, cleaner generation technologies being installed today are much less CO₂ intense than older ones.) Three separate scenarios representing high, medium, and low penetration of PHEVs into the national vehicle fleet by 2050 were analyzed for each of the intensity scenarios. The resulting nine different cases covered the full range of potential long-term impacts of PHEV usage on CO₂ emissions.

Results showed large, statistically significant cumulative reductions in CO₂ emissions for each of the cases. PHEV fleet penetration, or the proportion of vehicle mileage that is powered by electrical energy, is the more significant of the two variables in influencing CO₂ reductions. Electric-sector CO₂ intensity—even with increased electricity use for PHEV charging—has a much less direct impact on CO₂ emissions. For more information, contact Mark Duvall, (650) 855-2591, mduvall@epri.com, or Eladio Knipping, (650) 855-2592, eknippin@epri.com.

EPRI Plans Series of Meetings/Webcasts for Climate Area Funders; Sept. 13 Meeting Will Focus on GHG Offset Program Design

On July 24, EPRI presented the first of an anticipated series of meetings and webcasts intended to help funders of Programs 102 and 103 understand the possible implications of climate policy choices and explore ways to communicate key insights. The first meeting focused on the implications of emission taxes/fees versus cap-and-trade systems with various levels of free allocations. Experience with the Phase I EU Emission Trading Scheme (EU-ETS) has led many to reconsider the free allocation of permits, and U.S. federal legislative discussion will undoubtedly have to grapple with the issue. The purpose of the meeting was to facilitate a well-rounded, thorough discussion to help attendees understand how various policy options could affect their companies, and to provide a forum for attendees to exchange information with one another. Attendees also helped select the topic for the next meeting, which is scheduled for Sept. 13 in Washington, DC, at the St Gregory Hotel and will focus on GHG offset program design. The agenda will include:

- introduction and discussion of the policy context for the workshop,

- description of GHG offsets and discussion of market status and trends,
- discussion of the role of offsets in global climate policy and stabilization,
- discussion of key elements and issues in developing offset programs and policies, and
- discussion of the “supplementarity” debate (achieving GHG emission reductions first at home, augmented by relatively small amounts of offsets from abroad).

Attendees will also provide input concerning topics for future meetings. For more information, contact Vic Niemeyer, (650) 855-2744, niemeyer@epri.com; Adam Diamant, (510) 260-9105, adiamant@epri.com; or Tom Wilson, (650) 855-7928, twilson@epri.com.

LAND AND GROUNDWATER

Program 49: Coal Combustion Products—Environmental Issues

New Project Evaluates Cost-Effective Treatments for Boron in Wastewater and Groundwater

New research will identify cost-effective technologies for removing boron from power plant wastewater and groundwater. Fairly high levels of dissolved boron are found in FGD wastewater, ash leachate, and fly ash ponds, and are a common driver for groundwater remediation at ash disposal facilities. Increased regulatory attention to power plant water streams and high costs for boron remediation using current tools (\$8 million in capital costs for evaporation to treat a 200 MW FGD system) make this research a priority. Available industrial water treatments for boron include evaporation, ion exchange, and reverse osmosis—all of which are very expensive and prone to scaling issues. Promising new approaches include adsorption onto various natural clays or magnesium hydroxide. Researchers will evaluate these approaches in a series of laboratory screening and column tests. They will also consider vegetation that takes up boron and could be used in conjunction with constructed wetlands for wastewater remediation. This research is supported by EPRI’s Program on Technology Innovation with funding for groundwater research through Program 49 and wastewater research through Program 56. For more information, contact Ken Ladwig, (262) 754-2744, keladwig@epri.com, or Paul Chu, (650) 855-2812, pchu@epri.com.

Program 50: MGP Site Management

Persulfate In Situ Chemical Oxidation Demonstrated at Laurel Street MGP Site

In Situ Chemical Oxidation of MGP Residuals: Field Demonstration Report (1015411). This technical report describes the use of activated persulfate to oxidize residual contaminants at the Laurel Street former MGP site in Poughkeepsie, New York. Because activated persulfate remains stable and persists after subsurface application, it is a good choice for treating low-solubility MGP contaminants. In 2006, after a single application of alkaline-activated persulfate to a defined area at the Laurel Street site, before and after soil measurements showed the following:

- Polycyclic aromatic hydrocarbons (PAH)—total average concentration reduced by approximately 55 percent, mass reduced by 49 to 63 percent, leaching reduced by 62 percent.
- Aromatic hydrocarbons (BTEX: benzene, toluene, ethylbenzene and xylenes)—total average concentration increased by approximately 4 percent, no change in mass, leaching reduced by 26 percent.
- Total petroleum hydrocarbons (TPH)—total average concentration reduced by approximately 68 percent, mass reduced by 63 to 75 percent.

These results confirmed predictions based on bench-scale testing of site soils. They demonstrate that *in situ* chemical oxidation (ISCO) using activated persulfate is a feasible alternative to dig and haul at selected MGP sites. The report describes suitable sites in terms of soil type, hydraulic conductivity, soil heterogeneity, groundwater flow, geochemistry, and source contaminant levels. It offers general principles to guide MGP site managers who are considering ISCO and notes that treatment costs vary from \$100 to \$500 per cubic yard (2006 dollars) depending on site conditions. For more information, contact Andrew Coleman, (650) 855-2249, acoleman@epri.com.

Mid-Year MGP Workshop Results Summarized

A “[Summary of Mid-Year MGP Workshop Results](#)” is now posted on epri.com. For more information, contact Andrew Coleman, (650) 855-2249, acoleman@epri.com or James Lingle, (414) 355-5559, jlingle@epri.com.

EPRI MGP 2007 Symposium Booklet and CD Available

[EPRI MGP 2007 Symposium Advances in Manufactured Gas Plant Site Remediation](#) (1015346). The booklet and CD from the EPRI MGP 2007 Symposium held in January in Atlanta are now available as an assembled package. For more information, contact Andrew Coleman, (650) 855-2249, acoleman@epri.com or James Lingle, (414) 355-5559, jlingle@epri.com.

Program 59: PISCES—Plant Multimedia Toxics Characterization

Using Ontario Hydro as a Reference Method for Continuous Mercury Measurement

[Guidelines for Mercury Measurements Using the Ontario Hydro Method](#) (1014081). This technical update offers guidance on using the Ontario Hydro (OH) method to certify the relative accuracy of continuous mercury measurement technologies installed at coal-fired power plants. The Clean Air Mercury Rule requires technologies—such as continuous mercury monitors and sorbent trap—to pass initial certification and yearly relative accuracy test audits to ensure credible measurement of mercury emissions. As a reference method for field certification and audit, the wet-chemistry-based OH method requires a high level of quality assurance and quality control. This update provides an overview of the method and detailed information on techniques that leading researchers have used to improve the quality of mercury emission data collected for compliance testing. Included are OH method checklists, a section on measurement program design, and discussions of issues such as pretest preparations, field sampling protocols, and analytical laboratory performance. The update presents the views of one organization active in mercury measurement testing since the mid 1980s. The original intent of this report was to prepare a “consensus” perspective; however, EPRI was unable to obtain responses from other stack testing organizations regarding their perspectives on the OH method. For more information, contact Paul Chu, (650) 855-2812, pchu@epri.com.

Wisconsin Mercury Seminar Presentations

The State of Wisconsin Natural Resources Board held a July 2007 Mercury Seminar in Stevens Point, WI. Among the presentations were the following:

- “[Control Technology Options for Coal-Fired Electrical Generating Units](#),” by Ramsay Chang of EPRI,
- “[Methylmercury Impacts on Loons in Wisconsin](#),” EPRI sponsored research reported by Michael Meyer of the Wisconsin Department of Natural Resources,
- and “[Atmospheric Mercury Deposition](#),” a comparison of EPA and EPRI global and regional models, by Russell Bullock of the National Oceanic and Atmospheric Administration.

For more information, contact Leonard Levin, (650) 855-7929, llevin@epri.com.

WATER AND ECOSYSTEMS

Program 54: Fish Protection at Steam Electric Power Plants

Second Thermal Ecology and Regulation Workshop

More than 100 participants have registered for EPRI’s Second Thermal Ecology and Regulation Workshop, to be held in Westminster, CO, on Oct. 2–3. The workshop, intended for industry representatives, researchers, consultants, regulators, attorneys, and other professionals interested in thermal issues, will provide an opportunity to discuss new thermal-related issues that have emerged since EPRI’s first workshop in 2003, including more-stringent thermal discharge requirements and the interrelationships between 316(a) and 316(b) requirements. There is no fee for the workshop, but those wishing to participate must register and registration is limited. For more information or a registration form, contact Robert Goldstein, (650) 855-2593, rogoldst@epri.com, or Doug Dixon, (804) 642-1025, ddixon@epri.com.

Report Published on Geiger Multi-Disc Screening System

Latent Impingement Mortality Assessment of the Geiger Multi-Disc™ Screening System at the Potomac River Generating Station (1013065). This report presents the results of a field study evaluating the injury and survival of fish exposed to a Geiger Multi-Disc™ (Geiger) modified traveling water screen designed to protect juvenile and adult fish. Information in this report provides the first performance database for this technology. Also, for the species tested, the data presented provide a basis on which to estimate the potential biological benefit associated with impingement mortality reduction. Researchers installed a Geiger screen with features to protect juvenile and adult fish in screen bay 1A at Mirant Potomac River's Potomac River Generating Station. They then evaluated injury and survival of fish exposed to the impingement and collection process. Researchers assessed approximately 3,000 fish for latent impingement mortality (LIM). Survival varied by species and ranged from 0 to 100%. For the most numerous species, 95% of the bluegill survived in 2005 and 100% in 2006, 94% of the channel catfish survived in 2005 and 50% in 2006; 95% of the spottail shiner survived in 2005 and 54% in 2006; and 56% of the white perch survived in 2005 and 30% in 2006. For more information, contact Doug Dixon, (804) 642-1025, ddixon@epri.com.

Report Published on Evaluation of CWIS Area of Influence for Ohio River Facilities

Cooling Water Intake Structure Area-of-Influence Evaluations for Ohio River Ecological Research Program Facilities (1015322). This report presents the results of a combination of desktop calculations and field measurements used to estimate the cooling water intake structure (CWIS) area of influence (AOI) for 12 power stations on the Ohio River that are participating in EPRI's Ohio River Ecological Research Program (ORERP). The report presents a cost-effective method for providing AOI calculations in support of EPA's Clean Water Act §316(b) Phase II Rule requirements. The AOI for each plant was determined using a phased analytical approach. Phase 1 involved a desktop calculation of the approximate area within a 0.5-ft/s (0.15-m/s) velocity contour—EPA's *de minimis* value at which a fish can swim freely in a flow and ostensibly avoid impingement—as well as at 1.0 ft/s (0.3 m/s) for each facility under design flow and under the normal, annual river stage. Phase 2 included field velocity measurements at a subset of the stations using an acoustic Doppler velocity profiler with a data logger; the primary purpose was to confirm the desktop calculations for facilities having different local hydraulic conditions. Finally, Phase 3 involved further characterization of the AOI based on computational fluid dynamics (CFD) computer modeling. Results from this effort were further used to verify Phase 1 and 2 results. Results demonstrated that river flows obscured flow vectors that result from CWIS withdrawals and that the AOI is limited to a narrow band of upstream shoreline area proximal to the CWIS. For more information, contact Doug Dixon, (804) 642-1025, ddixon@epri.com.

Program 55: Watershed and Water Resource Management

Report Published on Energy/Water Sustainability Research Program for the Electric Power Industry

Program on Technology Innovation: An Energy/Water Sustainability Research Program for the Electric Power Industry (1015371). This report presents a research plan, based on business and economic as well as technical considerations. The research plan recommends the development and testing of new technology and science to overcome present and future constraints on thermoelectric generation resulting from limited freshwater availability. The project team reviewed EPRI technical reports and other documents, conducted interviews with electric power company senior managers and strategic planners, framed key areas of opportunity for research based on technical potential and expressed member interest, and estimated potential cost savings from reducing water use through development and use of new technologies. The resulting ten-year, \$37.5 million planned research program consists of five major elements: engineering and economic analysis, improving dry and hybrid cooling, reduction of water losses in cooling towers, use of degraded water sources, and water resource forecasting and management. Based on a 10% market penetration for new technologies developed and tested by this program, potential cumulative savings for the industry are estimated to be in the hundreds of millions of dollars. The program's coverage is not intended to be comprehensive; instead, it focuses on promising lines of research that were given high priority by key utility executives and their staffs, and the research elements were chosen for their potential to yield significant short- to intermediate-term results. The report will be of value to power company strategic planners, environmental managers, and generation managers as well as regulators, water resource managers, and environmental advocates. For more information, contact Robert Goldstein, (650) 855-2593, rogoldst@epri.com.

Progress on Water Quality Trading Feasibility Analysis

EPRI has made substantial progress in its feasibility analysis for a water quality trading (WQT) project in the Ohio River Basin. Researchers have narrowed the potential project site to an area including many watersheds spanning several states. The large area is intended to ensure enough participants to generate a robust market; smaller trading districts may be proposed within the larger program. Work so far has served the dual purpose of gathering information to complete a detailed analysis of the potential WQT pilot project, including an economic analysis and input on the geographic focus for WARMF modeling. The Muskingum watershed in Ohio will be used for initial modeling. Researchers will begin collecting information to develop a business case for each of the two utilities involved (AEP and Duke Energy) to help them decide when engaging in trading becomes a good business decision from a financial perspective. Information to be collected includes existing air pollution control equipment, additional equipment planned, and a variety of cost information. For more information, contact Jessica Fox, (650) 855-2138, jfox@epri.com.

Phase 2 of Project on Management of Non-Cooling-Water Waste Streams Under Way

The second phase has begun in EPRI's assessment of the efficacy and cost of water management practices to help power companies address environmental issues associated with stormwater and non-cooling-water releases. Phase 1 of the project identified the waste management practices that will be addressed in this phase. This phase will summarize how water releases are being handled by the electric power industry, summarize compliance effectiveness for procedural and physical best management practices (BMPs), and identify low-cost BMPs for stormwater and non-cooling water releases. Effectiveness for control of mercury, selenium, total suspended solids, phosphorus, ammonia, and temperature will be considered, and the role and importance of source water will be addressed. For stormwater releases, BMPs for rights-of-way, substations, pole yards, and service centers will be identified, along with design, construction, maintenance, and expected performance considerations. A literature review will be conducted to select the most effective BMPs and rank them for cost-effectiveness. For more information, contact Robert Goldstein, (650) 855-2593, rogoldst@epri.com.

Article in EPRI Journal Discusses Utility Efforts Toward Water Sustainability

The Summer 2007 issue of the *EPRI Journal* contains an article on water sustainability entitled, "[Running Dry at the Power Plant](#)." Securing sufficient supplies of fresh water for societal, industrial, and agricultural uses while protecting the natural environment is becoming increasingly difficult in many parts of the United States. Climate variability and change may exacerbate the situation through hotter weather and disrupted precipitation patterns that promote regional droughts. Achieving long-term water sustainability will require balancing competing needs effectively, managing water resources more holistically, and developing innovative approaches to water use and conservation. Utility companies—which use substantial amounts of water for plant cooling and other needs—are doing their part by pursuing water-conserving technologies, innovative recycling schemes, and alternative sources of water to deal with the squeeze on freshwater availability. For more information, contact Robert Goldstein, (650) 855-2593, rogoldst@epri.com.

Recognition for EPRI's Leadership on Water Sustainability Issues

A recent news release by DOE's National Energy Technology Laboratory and Sandia National Laboratories discussed potential partners for the two labs' research on energy-water issues. Among the dozens of possibilities, EPRI was the only organization called out by name. EPRI's leadership on these issues is also evidenced by invitations to Bob Goldstein to speak at several recent meetings, including those of the Ecological Society of America in San Jose, CA, and of the National Rural Electric Cooperative Association's Cooperative Research Network in Denver. Bob also spoke on these issues at EPRI's Western Environment Conference in August and will discuss them further at the Environment Advisory Council meetings in September. For more information, contact Robert Goldstein, (650) 855-2593, rogoldst@epri.com.

Program 56: Effluent Guidelines and Water Quality Management

EPRI Provides FGD Wastewater Reports to EPA for Effluent Guidelines Study

In response to EPA's request, EPRI earlier this year provided the Agency with a number of EPRI reports to help EPA in its two-year study to determine whether to proceed with a formal rulemaking to update the effluent guidelines for the steam electric industry. EPRI recently provided four more reports to EPA summarizing EPRI's R&D work on FGD wastewater:

- [Flue Gas Desulfurization \(FGD\) Wastewater Characterization: Screening Study \(1010162\)](#)
- [EPRI Technical Manual: Guidance for Assessing Wastewater Impacts of FGD Scrubbers \(1013313\)](#)
- [The Fate of Mercury Absorbed in Flue Gas Desulfurization \(FGD\) Systems \(1009955\)](#)
- [Update to 1009955: Update on Enhanced Mercury Capture by Wet FGD: Technical Update. EPRI and the U.S. Department of Energy National Energy Technology Laboratory \(1012673\)](#)

Along with the reports, EPRI provided its perspectives on the results and their usefulness and limitations. EPRI believes that because of the R&D nature of the studies and because of recent technological changes in FGD systems, these studies are likely not representative of FGD systems across the industry as a whole. However, lessons were learned in these studies in the areas of wastewater sampling and analysis, including the potential importance of field (as compared with laboratory) filtration. The EPRI perspective document will be published in the future as a technical update. For more information, contact Paul Chu, (650) 855-2812, pchu@epri.com.

Second Workshop on Impact of FGDs on Wastewater Scheduled for October

As a follow-up to last year's workshop in Atlanta, a second workshop on the impact of FGDs on wastewater will be held Oct. 29–30 in St. Louis, MO. The objectives are to hear the latest on EPRI FGD wastewater R&D, to provide members an opportunity to share information and ideas, and to identify common data needs that should be addressed. Members are encouraged to present their perspectives and the operating experience of their FGD wastewater treatment system(s). The workshop is open only to funders of Program 56 or Program 75 (Integrated Environmental Controls in the Generation Sector); there is no charge to attend. For more information, contact Paul Chu, (650) 855-2812, pchu@epri.com.

Update on TI- Funded FGD Wastewater R&D

Many power plants have installed or are planning to install FGDs for SO₂ control. One potential result of FGD installation is that the wastewater stream may contain levels of trace metals, such as mercury, selenium, and boron, that may require wastewater treatment. Program 56 has four projects dealing with this issue funded by EPRI's Program on Technology Innovation (TI):

- **Wastewater Treatment for Selenium.** This project is evaluating an elemental iron technology for selenate removal from coal-fired power plant wastewaters. EPRI data suggest that the FGD wastewater may contain ppm levels of selenium, of which a large fraction may be in the selenate oxyanion form. Selenate is very difficult to remove via traditional chemical treatment; only anaerobic reactors have shown promise for selenate removal. Laboratory studies with metallic iron were able to achieve >90% selenium (as well as selenate) removal from three FGD wastewaters. A summary report is planned for this fall, and plans are to further evaluate this elemental iron approach in a pilot slipstream at a full-scale power plant in 2008. A supplemental project notice will be issued with more details for companies interested in supporting this effort.
- **FGD Wastewater Treatment for Mercury.** This project is evaluating a number of promising technologies for very low level part-per-trillion (ppt) mercury removal from coal-fired power plant wastewaters. Recent EPRI data suggest that the FGD wastewater may contain ppb levels of dissolved mercury. There are no commercially available technologies to achieve 1-10 ppt Hg levels, which some states are requiring. If successful, this project would lead to the identification of new technologies that could cost-effectively treat wastewaters containing mercury to extremely low levels.
- **Understanding and Managing Selenite Oxidation in Wet FGDs.** Selenium concentrations in the wastewater from many wet FGD systems may require some wastewater treatment. Selenite (Se+4) is believed to be oxidized (over 90%) to selenate during the forced oxidation process of oxidizing sulfite to sulfate. Selenate is difficult to treat using traditional precipitation technologies, while selenite is not. Organic acid additives for SO₂ removal enhancements may also impact the selenium speciation. This proposal would evaluate selenium chemical kinetics (e.g., oxidizing selenite to selenate) and develop approaches, through understanding of the chemistry, that prevent this oxidation. If successful, this project would lead to the identification of new technologies that could cost-effectively manage the selenium to produce the best form of selenium for wastewater management while retaining the scrubber's ability to remove SO₂ and produce gypsum.
- **Wastewater and Groundwater Treatment for Boron.** New research will identify cost-effective technologies for removing boron from power plant wastewater and groundwater. Fairly high levels of dissolved boron are

found in FGD wastewater, ash leachate, and fly ash ponds, and are a common driver for groundwater remediation at ash disposal facilities. Increased regulatory attention to power plant water streams and high costs for boron remediation using current tools (\$8 million in capital costs for evaporation to treat a 200 MW FGD system) make this research a priority. Available industrial water treatments for boron include evaporation, ion exchange, and reverse osmosis—all of which are very expensive and prone to scaling issues. Promising new approaches include adsorption onto various natural clays or magnesium hydroxide. Researchers will evaluate these approaches in a series of laboratory screening and column tests. They will also consider vegetation that takes up boron and could be used in conjunction with constructed wetlands for wastewater remediation. This research is supported by EPRI's Program on Technology Innovation with funding for groundwater research through Program 49 and wastewater research through Program 56.

For more information, contact Paul Chu, (650) 855-2812, pchu@epri.com.

Program 58: Hydropower Environmental Issues

Report Published on Behavior of Eels on Angled Louver Array

*Movement Behavior of American Eel (*Anguilla rostrata*) on an Angled Louver Array at a Hydroelectric Project* (1012559) is now available. Hydroelectric projects may expose downstream moving and migrating fish to injury and mortality during passage through the project's turbines. Angled bar racks and louvers in hydroelectric project forebays are increasingly being considered as one technology for guiding these fish to safe passage routes. This report presents the results of a field evaluation that examined the behavior of American eels along a louver array. Results suggest that the louver acts more as a physical barrier to downstream migrants than as a behavioral guidance device, a finding contrary to suggestions by other researchers that fish alter their behavior because of water velocity, turbulence, and pressure fields across the face or leading edge of the louver. The report provides hydropower and other water intake operators with information on how angled louvers may influence the downstream movement behavior of American eels at an actual field installation. The information presented will be particularly valuable for hydropower projects undergoing licensing or other environmental assessments and where resource agencies have made a preliminary identification of louvers as a fish protection measure. For more information, contact Doug Dixon, (804) 642-1025, ddixon@epri.com.

T&D ENVIRONMENTAL ISSUES

Program 51: T&D Facilities & Equipment: Environmental Issues

MOSES Leak Tool Now Available

Mineral Oil Spill Evaluation System (MOSES) Leak Tool Version 1.0 (1014055). This stand-alone software helps users accurately estimate the footprint of a mineral oil leak from a transformer. When incorporated into MOSES-MP, the resulting information improves the overall accuracy of predictions about the extent of oil migration from leaks. The MOSES Leak Tool performs Monte Carlo simulations for key parameters to show how a given leak will spread in a horizontal radius from its source. It considers leaks caused by lightning strike, internal faulting with seam rupture, smooth puncture, blunt puncture, and bullet holes. "Given users' questions over the years, we decided that development of this software was the best way to improve MOSES-MP predictions," says Mary McLearn. The MOSES Leak Tool, which will be described in an Appendix to the MOSES-MP manual, runs on the Windows-based personal computer where it is installed. For more information, contact Mary McLearn, (650) 855-2487, mmclearn@epri.com.

Program 60: EMF Health Assessment and RF Safety

[Visit the EMF Health Assessment and RF Safety Public Webpage](#)

Report Summarizes Clinical Effects of Electric Shock

Clinical Effects of Electric Shock (1014940). This technical report surveys the large body of literature on clinical effects of electric shock and provides the first comprehensive characterization and summary of findings. Better understanding of the extent and severity of clinical effects directly related to electric shock can guide the application of safety measures in work and home environments and may lead to more effective treatment of initial effects and prevention of delayed effects. This review is based on information published in more than 100 articles in 60 medical and engineering journals from the 1800s to the present. Effects in neural tissue are most often cited, but other tissue may also be involved. Enumeration of comparable cases in the literature is complicated by incomplete patient histories, overlap between primary and secondary reports of the same cases, variations in terminology, and absence of a well-defined system to classify long-term effects. For more information, contact Rob Kavet, (650) 855-1061, rkavet@epri.com.

Paper Describes Meta-Analysis of Magnetic Field Exposure and Childhood Brain Cancer

Mezei G. et al. "Meta-analysis of childhood brain tumors and magnetic fields." Presented as a poster at the Bioelectromagnetics Society Annual Meeting, June 10–14, 2007 in Kanazawa, Japan, and also submitted for publication. This paper describes an up-to-date meta-analysis of results from 13 studies of magnetic field exposure and childhood brain tumor development. According to combined effects estimates, there was no significant increase in childhood brain cancer risk associated with any individual measure of residential magnetic field exposure—including distance to power lines, wire code, measured fields, or calculated fields. Each of these exposure measures yielded homogeneous results with respect to brain tumor development. (An exception was wire code: two older studies showed elevated risk, two newer ones did not.) Sensitivity analyses revealed that results were not driven by any individual study, or by publication bias. For measured or calculated exposures above 0.3 to 0.4 μT , the summary effect estimate had an odds ratio of 1.68 (95% confidence interval 0.83–3.43), suggesting moderately increased—but not statistically significant—risk. To investigate this result further, the authors are arranging to conduct a pooled analysis using individual data points from the 13 studies to obtain more statistical power than meta-analysis affords. Meta- and pooled analyses have documented an epidemiologic association between magnetic field exposure and childhood leukemia at exposures above 0.3 to 0.4 μT . One hypothesis says that this association is an artifact resulting from selection bias. Therefore, it will be important to determine in a pooled analysis whether the moderately increased risk of brain tumor development seen at higher exposure levels in the present study is robust, or is an artifact resulting from small number bias—too few studies available for analysis and/or too few cases in the highest exposure category. For more information, contact Gabor Mezei, (650) 855-8908, gmezei@epri.com.

EPRI Comments on an Analysis of Nighttime Magnetic Field Exposure and Childhood Leukemia

Schüz J, et al. "Nighttime exposure to electromagnetic fields and childhood leukemia: an extended pooled analysis." *American Journal of Epidemiology*, advance online publication, 7 May 2007; doi:10.1093/aje/kwm080. This analysis of residential nighttime exposure to magnetic fields and childhood leukemia tested the hypotheses that:

- magnetic field exposures measured during the night, when children are in their rooms, represent actual exposures more accurately than round-the-clock measurements, and
- nighttime magnetic field exposure might increase cancer risk by reducing normal nocturnal production of melatonin, a hormone that may protect against cancer development.

The present investigation was based on data from epidemiologic case-control studies included in the 2000 pooled analysis by Ahlbom et al., which showed a doubling of leukemia risk among children with residential magnetic field exposures $\geq 0.4 \mu\text{T}$. It included 1842 cases aged 0–14 years diagnosed with leukemia (90.6% acute lymphoblastic leukemia) between 1988 and 1996, and 3099 controls. Study populations were drawn from Germany, Canada, the United Kingdom, and the United States. Nighttime was defined as the 8 hours between 10:00 PM and 6:00 AM, and exposure categories were $<0.1 \mu\text{T}$, 0.1 to $<0.2 \mu\text{T}$, 0.2 to $<0.4 \mu\text{T}$, and

$\geq 0.4 \mu\text{T}$. Analyses were adjusted for sex, age, socioeconomic status, and country. Good agreement was found between nighttime and round-the-clock (24- or 48-hour) exposures. Risk estimates for nighttime and round-the-clock exposures showed the same approximate doubling of risk for exposures $\geq 0.4 \mu\text{T}$ originally reported by Ahlbom et al. Dose-response trends were also similar for nighttime and round-the-clock exposures, showing a statistically significant monotonic increase in risk with increasing magnetic field exposure. The authors conclude: “Overall, our data provide no support for the hypothesis that nighttime measurement is a more appropriate measure of ELF EMF exposure than 24-hour measurement.”

As EPRI notes, if round-the-clock measurements are less accurate than nighttime measurements and more susceptible to exposure misclassification, then use of nighttime measurements should show a stronger association between residential magnetic field exposure and childhood leukemia. This effect was not seen: increases in childhood leukemia risk in relation to nighttime exposure ($\geq 0.4 \mu\text{T}$, odds ratio 1.93, 95% confidence interval 1.11–3.35) were virtually identical to increases in risk observed when round-the-clock measurements ($\geq 0.4 \mu\text{T}$, odds ratio 1.98, 95% confidence interval 1.18–3.35) were used in the analyses. EPRI concludes: “. . . the association between residential magnetic field exposure and childhood leukemia remains unexplained.” These comments ([1015230](#)) are available to Program 60 members on [epri.com](#). For more information, contact Gabor Mezei, (650) 855-8908, gmezei@epri.com.

Public Webpage Updated

The EMF Health Assessment and RF Safety [public webpage](#) was recently updated. It now includes a dynamic EMF news section where *EMF Research News*, the program’s newsletter for stakeholders, is posted, along with brief summaries of key, new non-EPRI studies. To emphasize that studies vary in quality, an accompanying piece describes how study quality is evaluated. The webpage is scheduled for redesign later this year. For more information, contact Gail Lundell, (650) 855-7956, glundell@epri.com.

OCCUPATIONAL HEALTH AND SAFETY

Program 62: Occupational Health and Safety

New Science Advisory Committee Holds First Meeting

A new Science Advisory Committee (SAC) met August 16–17 in Palo Alto to offer scientific input to EPRI’s Occupational Health and Safety Program that will complement current input from sponsoring members. “This is a new effort to have a different set of views to provide further guidance in developing a valuable program for our members,” says Gabor Mezei. The meeting provided perspectives on industry concerns and relevant, recent and upcoming regulations. It also featured descriptions of ongoing research, including the injury surveillance database project, the ergonomics project, and the crystalline silica project, as well as other work in occupational ELF EMF and RF safety. Results and/or recommendations from the SAC meeting will be reported back to sponsoring members at the next regular business advisory meeting on September 24 in Cleveland. The following distinguished professionals presently serve on the SAC:

- Dr. Harvey Checkoway, Chair—Professor of Environmental and Occupational Health Sciences, School of Public Health, University of Washington
- Dr. Katharine Hammond—Professor of Environmental Health Sciences, School of Public Health, University of California, Berkeley
- Dr. Louis Hoseney—Manager, Industrial Hygiene, American Electric Power
- Dr. Charles Kelly—Director, Occupational Safety and Health, Edison Electric Institute
- Dr. Leeka Kheifets—Professor of Epidemiology, School of Public Health, University of California, Los Angeles
- Dr. Jack Sahl—Director, Environment and Safety, Southern California Edison

For more information, contact Gabor Mezei (650) 855-8908, gmezei@epri.com.

EPRI Participation at Edison Electric Institute (EEI) Environment Meetings

Bryan Hannegan, Vice President – Environment sector, and John Novak – Executive Director of Federal and Industry Activities for Environment and Generation, participated in the EEI environment meetings held in Portland, Oregon from July 18 – 20. John Novak participated in the meetings of the CO₂ Capture and Storage Working Group, The Global Climate Change Subcommittee, the Clean Air Strategy Group, and the Environment Executive Advisory Committee (EEAC). Bryan Hannegan spoke to the EEAC about new EPRI activities in the areas of climate change, plug-in hybrid electric vehicles (PHEV), and fish protection. On climate change, Bryan reported the results of the EPRI economic analysis demonstrating the benefits of a full portfolio of climate technologies in substantially reducing the costs of achieving climate goals. Next, Bryan presented the results of the EPRI/NRDC study released on August 19 showing that the use of PHEV would provide air quality benefits and reduced emissions of greenhouse gases. Finally, Bryan provided an overview on a new EPRI project to assess the environmental and economic impacts of closed cycle cooling systems. The EEAC chairman, Skiles Boyd of DTE Energy, stressed the importance of providing sound technical information on closed cycle cooling that could be used by EPA in revised the 316 (b) Phase II rule and urged EEAC members to consider funding the EPRI project.

Environment Sector Supplemental Projects

Air Quality***Program 42: Air Toxics Health and Risk Assessment***

- “Global Pollutant Challenge.” For more information, contact Leonard Levin, (650) 855-7929, llevin@epri.com.
- [Health Research to Inform the Revision of the Arsenic Cancer Potency Factor](#)
- [Measurement of Mercury in Power Plant Plumes: An Intensive Field Study](#)
- “*MercSyn*—The Mercury Synoptics Experiment.” For more information, contact Leonard Levin, (650) 855-7929, llevin@epri.com.
- [Mercury Experiment to Assess Atmospheric Loading in Canada and the United States \(METAALICUS\): Phase II, Evaluating the Effects of Loadings](#)

Program 91: Assessment Tools for Ozone, Particulate Matter, and Haze

- [Secondary Particulate Health Effects Research \(SPHERES\): Exploring the Influence of SO₂, NO_x and Acids on the Chemistry and Health Effects of PM-2.5](#)
- [Regional PM Characterization to Enable Source-Receptor Modeling: Data Collection](#)
- [Theoretical, Experimental, and Ambient Studies of Particulate Oligomers and Organic-Nitrogen Species \(TEASPOONS\): A Health Impact Perspective](#)

Program 92: Assessment of Air Quality Impacts on Health and the Environment

- [Secondary Particulate Health Effects Research \(SPHERES\): Exploring the Influence of SO₂, NO_x and Acids on the Chemistry and Health Effects of PM-2.5](#)
- [Integrated Chamber and Panel Study \(ICAPS\)](#)
- [Tri-City Concentrated Ambient Particle Study \(Tri-City CAPS\)](#)
- [Children’s Air Pollution Asthma Study: Part of the ARIES Program](#)
- [Detroit Cardiovascular Health Study](#)
- [Health Effects of Air Pollution and Particulate Matter Components: Texas ARIES](#)
- [Reanalysis of Key PM-Health Dataset](#)
- [Sources and Composition of Particulate Exposures \(SCOPE\) Study](#)
- [Toxicological Evaluation of Realistic Emissions of Source Aerosols \(TERESA\)](#)

Global Climate Change

Program 102: Global Climate Policy Costs and Benefits

- Developing GHG Emissions Offsets by Reducing Nitrous Oxide (N₂O) Emissions in Agricultural Crop Production
- Enhanced Assessment of Costs and Benefits of Climate Policy Proposals

Program 103: Greenhouse Gas Reduction Options

- Collaborative Analysis of CO₂ Policy Impacts on Western Power Markets
- Corporate Climate Change Policy Risk Assessment
- Greenhouse Gas Risk Assessment
- CO₂ Capture and Storage Pilot Demonstrations 1.7-MW Chilled-Ammonia Pilot
- Developing GHG Emissions Offsets by Reducing Nitrous Oxide (N₂O) Emissions in Agricultural Crop Production
- Enhanced Assessment of Costs and Benefits of Climate Policy Proposals
- Strategic Responses to Climate Policy

Land and Groundwater Issues

Program 49: Coal Combustion Products—Environmental Issues

- MANAGES Forum – Support for Compliance Managers: Groundwater Monitoring, Data Management, and Site Management
- Agricultural Uses of Gypsum and Other Products from Flue Gas Desulphurization (FGD) Systems

Program 50: MGP Site Management

- “In-Situ Thermal Stabilization of Coal Tar.” For more information, contact Andrew Coleman, (650) 855-2249, acoleman@epri.com.
- Reactive Capping for NAPL-Impacted Sediments: An In-Situ Evaluation of Effectiveness and Ease of Implementation
- MGP Odor Measurement, Prediction and Control
- Multi-Criteria Decision Analysis Model for Brownfields Development

Program 59: PISCES—Plant Multimedia Toxics Characterization

- LARK-TRIPP User’s Group 2008
- Mercury Characterization & Control Interest Group (MerCCIG)

Water and Ecosystems

Program 53: Water Quality Criteria Development and Assessment

- Health Research to Inform the Revision of the Arsenic Cancer Potency Factor
- Scientific Evaluation of Arsenic Water Quality Criteria: Speciation and Bioaccumulation Issues
- Mercury Experiment to Assess Atmospheric Loading in Canada and the United States (METAALICUS): Phase II, Evaluating the Effects of Loading
- Development of Site-Specific Water Quality Criteria

Program 54: Fish Protection at Steam Electric Power Plants

- Full Range of 316(b) Phase II Compliance Support
- Environmental and Economic Effects of a Potential National Retrofit of Closed-Cycle Cooling Systems

Program 55: Watershed and Water Resource Management

- Western Region Research Consortium on Energy/Water Sustainability
- Watershed Management for TMDLs, Water Quality Trading, and Hydro Relicensing
- Water Demands and Availability for Power Generation

Program 56: Effluent Guidelines and Water Quality Management

- Water Utilization in Cooling Systems: Recycling, Re-use, and Dry Cooling

- [Biogeochemical Management of Ash Pond Sediments](#)

Program 58: Hydropower Environmental Issues

- [Development & Deployment of an Environmentally Enhanced Hydroelectric Turbine](#)

T&D Environmental Issues

Program 51: T&D Facilities & Equipment: Environmental Issues

- [In-Situ Fixation and Sequestration of Metallic Contaminants](#)
- [Bioavailability of Arsenic in Contaminated Soils](#)
- [Remanufacturing Out-of-Service Treated Wood Poles](#)
- [Field Investigation of Changes to PCB Spills](#)

Program 57: ROW: Siting, Vegetation Management, and Avian Issues

- [Collaborative, Long-Term Vegetation Management Field Studies on Power Line Corridors in North America](#)
- [Assessing Performance of Integrated Vegetation Management on Electric Transmission Rights-of-Way](#)

Program 60: EMF Health Assessment and RF Safety

- Currently no supplemental projects

Occupational Health and Safety

Program 62: Occupational Health and Safety

- “Ergonomics Assessment of Vegetation Management.” For more information, contact Gabor Mezei (650) 855-8908, gmezei@epri.com.
- [Occupational Health and Safety Trends Database: Customized Analysis](#)
- [Ergonomics of In-Plant Tasks](#)

Upcoming Events

Environment Sector

Environment Sector and Area Council Advisory Meetings

Sep. 24–28, Cleveland, OH. Contact: Bryan Hannegan, (650) 855-2858, bhannegan@epri.com.

Environment Sector and Area Council Advisory Meetings

Feb. 11–13, 2008, Scottsdale, AZ. Contact: Bryan Hannegan, (650) 855-2858, bhannegan@epri.com.

Air Quality

Air Quality VI Conference

Sep. 24–27, Arlington, VA. Contact: Leonard Levin, (650) 855-7929, llevin@epri.com.

This conference is jointly sponsored by EPRI, EERC, EPA, and DOE. More information is available at the [event website](#).

Environment Sector and Area Council Advisory Meetings

Sep. 24–28, Cleveland, OH. Contact: Bryan Hannegan, (650) 855-2858, bhannegan@epri.com.

International Aerosol Modeling Algorithms (IAMA) Conference

Dec. 4–7, Davis, CA. Contact: Eladio Knipping, (650) 855-2592, eknippin@epri.com.

This conference is sponsored by the UC Davis Air Quality Research Center and the California Air Resources Board. More information is available at the [event website](#).

Environment Sector and Area Council Advisory Meetings

Feb. 11–13, 2008, Scottsdale, AZ. Contact: Bryan Hannegan, (650) 855-2858, bhannegan@epri.com.

9th International Conference on Mercury as Global Pollutant

Jun. 7–12, 2009, Guiyang, China. Contact: Leonard Levin, (650) 855-7929, llevin@epri.com.

Global Climate Change

Environment Sector and Area Council Advisory Meetings

Sep. 24–28, Cleveland, OH. Contact: Bryan Hannegan, (650) 855-2858, bhannegan@epri.com.

EPRI / IEA / IETA 7th Annual Greenhouse Gas Emissions Trading Workshop

Oct. 8–9, Paris, France. Contact: Tom Wilson, (650) 855-7928, twilson@epri.com.

Environment Sector and Area Council Advisory Meetings

Feb. 11–13, 2008, Scottsdale, AZ. Contact: Bryan Hannegan, (650) 855-2858, bhannegan@epri.com.

Land and Groundwater Issues

Air Quality VI Conference

Sep. 24–26, Arlington, VA. Contact: Leonard Levin, (650) 855-7929, llevin@epri.com.

This conference is jointly sponsored by EPRI, EERC, EPA, and DOE. More information is available at the [event website](#).

Environment Sector and Area Council Advisory Meetings

Sep. 24–28, Cleveland, OH. Contact: Bryan Hannegan, (650) 855-2858, bhannegan@epri.com.

Fall Sediment Management Work Group Meeting

Sep. 25–27, Berkeley, CA. Contact: Andrew Coleman, (650) 855-2249, acoleman@epri.com.

Air & Waste Management Association Conference on Vapor Intrusion: Learning from the Challenges

Sep. 26–28, Providence, RI. Contact: James Lingle, (414) 355-5559, jlingle@epri.com. EPRI will be represented by a paper coauthored by James Lingle with Rich Rago and Rosemary McCafferty of Haley and Aldrich entitled “A comparison of indoor air background data and residential indoor air data obtained from soil vapor intrusion assessments at former manufactured gas plant sites in New York.” More information is available at the [event website](#).

Wisconsin MGP Remediation Workshop

Oct. 2, Kimberly, WI. Contact: James Lingle, (414) 355-5559, jlingle@epri.com. Sponsored by the Wisconsin Department of Natural Resources and We Energies, the workshop will review current trends at Federal and State levels and provide a forum for open dialogue on MGP topics. James Lingle will speak to invited participants about “Improvements to Perimeter Air Monitoring Methods.”

Joint ECOR-4 and EC-DNAPL-2 Conference

Oct. 15–16, Amsterdam, the Netherlands. Contact: Andrew Coleman, (650) 855-2249, acoleman@epri.com. This conference combines meetings of the Fourth European Conference on Oxidation & Reduction Technologies for In-Situ Treatment of Soil and Groundwater (ECOR-4) and the Second European Conference on DNAPL Characterization & Remediation (EC-DNAPL-2). More information is available at the [event website](#).

FGD Gypsum Workshop

Oct. 23–25, Atlanta, GA. Contact: Ken Ladwig, (262) 754-2744, keladwig@epri.com. This conference is jointly sponsored by EPRI, ACAA, EPA, USDA, DOE, and The Ohio State University. More information is available at the [event website](#).

Sediment Remediation Short Course

Oct. 29–31, Atlanta, GA. Contact: Andrew Coleman, (650) 855-2249, acoleman@epri.com or James Lingle, (414) 355-5559, jlingle@epri.com. This course is sponsored by the Hazardous Substance Research Center/South and Southwest in cooperation with EPA and the Sediment Management Work Group (SMWG).

DNAPL-2 “Source Zone Characterization & Remediation”

Nov. 14-15, Long Beach, CA. Contact: Andrew Coleman, (650) 855-2249, acoleman@epri.com. Dr. Coleman is an invited speaker at this symposium presented by the Groundwater Resources Association of California. More information is available at the [event website](#).

Optimizing Decision-Making and Remediation at Complex Sediment Sites

Jan. 8–10, 2008, New Orleans, LA. Contact: Andrew Coleman, (650) 855-2249, acoleman@epri.com. This conference is jointly sponsored by U.S. EPA, the U.S. Army Corps, the U.S. Navy, and the Sediment Management Work Group (SMWG). More information is available at the SMWG [website](#).

Environment Sector and Area Council Advisory Meetings

Feb. 11–13, 2008, Scottsdale, AZ. Contact: Bryan Hannegan, (650) 855-2858, bhannegan@epri.com.

MGP 2008

Mar. 4–6, 2008, Dresden, Germany. Contact: Andrew Coleman, (650) 855-2249, acoleman@epri.com or James Lingle, (414) 355-5559, jlingle@epri.com. More information is available at the [event website](#).

6th International Conference on Remediation of Chlorinated and Recalcitrant Compounds

May 19–22, 2008, Monterey, CA. Contact: Andrew Coleman, (650) 855-2249, acoleman@epri.com. Dr. Coleman will be speaking at the conference. More information is available at the [event website](#).

9th International Conference on Mercury as Global Pollutant

Jun. 7–12, 2009, Guiyang, China. Contact: Leonard Levin, (650) 855-7929, llevin@epri.com.

Water and Ecosystems

Environment Sector and Area Council Advisory Meetings

Sep. 24-28, Cleveland, OH. Contact: Bryan Hannegan, (650) 855-2858, bhannegan@epri.com.

Second Thermal Ecology and Regulation Workshop

Oct. 2–3, Westminster, CO. Contact: Robert Goldstein, (650) 855-2593, rogoldst@epri.com.

Impacts of FGDs on Wastewater

Oct. 20-30, St. Louis, MO. Contact Paul Chu, (650) 855-2812, pchu@epri.com.

Environment Sector and Area Council Advisory Meetings

Feb. 11–13, 2008, Scottsdale, AZ. Contact: Bryan Hannegan, (650) 855-2858, bhannegan@epri.com.

9th International Conference on Mercury as Global Pollutant

Jun. 7–12, 2009, Guiyang, China. Contact: Leonard Levin, (650) 855-7929, llevin@epri.com.

T&D Environmental Issues

Environment Sector and Area Council Advisory Meetings

Sep. 24–28, Cleveland, OH. Contact: Bryan Hannegan, (650) 855-2858, bhannegan@epri.com.

MOSES Webcast

Oct. 5. Contact: Mary McLearn, (650) 855-2487, mmclearn@epri.com. Participants in the webcast will review EPRI's Mineral Oil Spill Evaluation System (MOSES) software and will learn about the new MOSES Leak Tool (see item in program 51).

5th International EMF Seminar—Electromagnetic Fields and Biological Effects

Oct. 16–19, Zhangjiajie, China. Contact: Rob Kavet, (650) 855-1061, rkavet@epri.com. More information is available at the [event website](#).

Arsenic Working Group

Nov. TBD, Dallas, TX. Contact: Mary McLearn, (650) 855-2487, mmclearn@epri.com. This will be a joint meeting with Sandia National Laboratories.

Environment Sector and Area Council Advisory Meetings

Feb. 11–13, 2008, Scottsdale, AZ. Contact: Bryan Hannegan, (650) 855-2858, bhannegan@epri.com.

The Bioelectromagnetics Society 30th Annual Meeting

Jun. 8–12, 2008, San Diego, CA. Contact: Rob Kavet, (650) 855-1061, rkavet@epri.com. More information is available at the [event website](#).

12th International Congress of the International Radiation Protection Association

Oct. 19–24, 2008, Buenos Aires, Argentina. Contact: Rob Kavet, (650) 855-1061, rkavet@epri.com. More information is available at the [event website](#).

Occupational Health & Safety

Environment Sector and Area Council Advisory Meetings

Sep. 24–28, Cleveland, OH. Contact: Bryan Hannegan, (650) 855-2858, bhannegan@epri.com.

Environment Sector and Area Council Advisory Meetings

Feb. 11–13, 2008, Scottsdale, AZ. Contact: Bryan Hannegan, (650) 855-2858, bhannegan@epri.com.