

MICHAEL R. AMES, Sc. D.

EDUCATION:

1995. Sc.D. Nuclear Engineering. Massachusetts Institute of Technology, Cambridge, MA
Designed and implemented air sampling and analytical program for the study of ambient atmospheric mercury. Apportioned point and regional sources of particulate-phase mercury and other trace metals by receptor modeling. Studies in: atmospheric chemistry and physics, nuclear waste technology, environmental transport, nuclear reactor design, health physics.

1986. M.S. Nuclear Engineering. Massachusetts Institute of Technology, Cambridge, MA
Characterized thermal and mechanical property changes of irradiated alloys for fusion first wall applications. Studies in: physical metallurgy, fracture mechanics.

1984. B.S. Nuclear Engineering. Massachusetts Institute of Technology, Cambridge, MA
Studies in: nuclear and mechanical engineering, physics, nuclear plasma diagnostics.

PROFESSIONAL EXPERIENCE:

2004-Present. Senior Engineer, Cambridge Environmental Inc., Cambridge, MA.

2000-2004. Associate Engineer, Cambridge Environmental Inc., Cambridge, MA.

1998-2000. Research Scientist, M.I.T. Center for Environmental Health Sciences, Cambridge, MA.

1995-1998. Postdoctoral Associate, M.I.T. Nuclear Reactor Laboratory, Cambridge, MA.
Performed and supervised the sampling and elemental analysis of environmental materials by Instrumental Neutron Activation Analysis (INAA). Identified and apportioned sources of measured components by receptor modeling in a variety of environmental and source media.

1986-1990. Research Engineer, M.I.T. Nuclear Reactor Laboratory, Cambridge, MA.
Designed, constructed, and operated in-core coolant corrosion testing loops to support worker dose reduction and corrosion control.

PROFESSIONAL ASSOCIATIONS:

Air & Waste Management Association
Sigma Xi

SELECTED PROJECT EXPERIENCE:

Multi-pathway human health risk assessment

- Performed modeling of direct and multi-pathway (*i.e.*, food chain-related) human exposures and potential health risks and hazards due to emissions from cement kilns that combust hazardous waste fuel, and from municipal solid waste combustors. Used facility, pollutant, and site-specific data to model food chain concentrations of mercury and dioxin more accurately than if default data were used. Models included the use of detailed speciated emission profiles, pollutant-specific atmospheric deposition parameters, and site-specific food chain bioaccumulation factors.

Ambient air quality assessment

- Designed multi-faceted monitoring program for assessing the impact of various operations at a large industrial facility on local ambient dust levels. Program included collection of filter samples for gravimetric and chemical analysis, semi-continuous monitoring of fine particulate levels, chemical analysis of source materials, collection of meteorological data, assessment of state-wide ambient data, and analyses of long-range atmospheric back-trajectories.
- Evaluated elemental and Volatile Organic Compound (VOC) data collected for a multi-year air toxics monitoring program. Examined long-term trends, seasonal variations, temporal correlations between concentrations of different compounds and meteorological data, and urban and background concentrations. Compared Federal Reference data for ambient lead in Total Suspended Particulate Matter (TSP) to data for lead in PM₁₀ and PM_{2.5}.
- Identified and apportioned the contributions of both natural background and long-range anthropogenic sources to measured ambient PM_{2.5} concentrations relative to the impact of specific local sources.

Exposure distributions for Monte Carlo risk assessment

- Developed datasets and frequency distributions of personal exposure parameters for use in Monte Carlo (*i.e.*, probabilistic) risk assessments. Parameter distributions have been developed for the frequency, amount, duration, and type of fish and other wildlife consumed by anglers, hunters, and their families (based on site-specific survey data); frequency and amount of ready-to-eat and partially cooked foods consumed nation-wide (based on national survey data); age-dependent length of exposure parameters (based on national and regional geographic mobility data); and time spent on various personal activities (*e.g.*, time spent at home/work/in car) for assessment of exposures to mobile and other urban air toxics.

Hot-mix asphalt plant emissions

- Performed emission and dispersion modeling of stack, fugitive VOC, and fugitive dust emissions from hot-mix asphalt plants. Modeling of fugitive dust emissions included use of site-specific properties for surface and bulk materials, and the use of facility operating schedule and wind speed-dependent emissions modeling. Developed improved operating procedures and management practices to reduce fugitive dust emissions to meet stringent limitations on off-site PM_{2.5} impacts. Attended public meetings and responded to a wide variety of technical questions from local residents.

Landfill-related emissions

- Performed emission, dispersion, and human health impact modeling of compounds in uncaptured fugitive landfill gas, landfill gas combustion products, and windblown landfill cover materials. Assessed the odor and potential health effects of using processed Construction and Demolition (C&D) wastes as daily cover materials and the near field air quality impacts of small landfill gas combustion units.

PRESENTATIONS:

Armstrong, S.R., Ames, M.R., and Green, L.C. (2004). Is ambient hydrogen sulfide a risk to human health? Paper presented at the Water Environment Foundation and Air & Waste Management Association Odors and Air Emissions Speciality Conference, Bellevue, Washington.

Ames, M.R., Zemba, S.G. (2003). HWC risk assessments: ruled by uncertainty. Paper presented at the Hazardous Waste Combustors Specialty Conference and Exhibition: "Adopt a MACT", Charleston, South Carolina.

Zemba, S.G., Ames, M.R., Alvarado, M.J., Gossman, D., Woodford, J., and Chrispell, C. (2001). Evaluating the local impacts of mercury emissions from a point source, or What happens when you do an EPA multipathway risk assessment for mercury. Paper presented at the Air & Waste Management Association Specialty Conference on Mercury Emissions: Fate, Effects and Control, Chicago, Illinois.

ORIGINAL REPORTS:

Ames, M.R., Zemba, S.G. and Lester, R.R. (2008). Method 3 risk characterization, Penske Truck Leasing Facility, 407 Mystic Avenue, Medford, Massachusetts, RTN 3-18081, 3-18163, 3-23427, 3-22908, and 3-25815. Cambridge Environmental Inc.

Adilman, D., Ames, M.R., Armstrong, S.R., Copley, L.G., Green, L.C., Hartzel, R., Holmén, B., Klens-Caprio, J., Lester, R.R., Roy, S.P., Swift, R., Tyler, M., Zeeb, P. and Zemba, S.G. (2008). An assessment of the environmental and public health impacts of Omya's operations in Florence, Vermont: Integrated report. Cambridge Environmental Inc. and Geosyntec Consultants, Inc.

Zemba, S.G. and Ames, M.R. (2007). Evaluation of impacts to soils and vegetation due to emissions from the Detroit HOUP. Cambridge Environmental Inc. and Horizon Environmental Corporation.

Zemba, S.G. and Ames, M.R. (2007). Ecological screening evaluation for the Proposed Detroit Heavy Oil Upgrade Project. Cambridge Environmental Inc.

Ames, M.R., Zemba, S.G., Shifrin, A., Lester, R.R., and Green, L.C. (2007). Risk Assessment for the evaluation of multi-pathway and ecological impacts of emissions from the Harrisburg Materials Energy, Recycling and Recovery Facility, Harrisburg, Pennsylvania. Cambridge Environmental Inc.

Zemba, S.G., Adilman, D., Ames, M.R., Armstrong, S.R., Copley, L.G., Green, L.C., Klens-Caprio, J., Lester, R.R., Roy, S.P., Shifrin, A., and Zeeb, P. (2007). Final phase I report, Omya Verpol Facility - Florence, Vermont. Cambridge Environmental Inc. and Geosyntec Consultants, Inc.

Ames, M., Zemba, S.G. and Green, L.G. (2005). Results of an emission and air dispersion modeling study and public health evaluation of the Virginia Paving Company Facility, 5601 Courtney Avenue, Alexandria, Virginia. Cambridge Environmental Inc.

Green, L.C., Crouch, E.A.C., Zemba, S.G., Ames, M.R., Satterstrom, K. and Linkov, I. (2004). MATES-II: a review and analysis for the staff of the Federal Highway Administration. Cambridge Environmental Inc.

Ames, M.R. and Zemba, S.G. (2004). Facility impact assessment of the Proposed Cell 5 of the Taunton Sanitary Landfill. Cambridge Environmental Inc.

Zemba, S.G., Ames, M.R., and Green, L.C. (2004). Risk assessment protocol for the evaluation of multi-pathway impacts of emissions from the Maine Energy Recovery Company Facility in Biddeford, Maine. Cambridge Environmental Inc.

Ames, M. and Zemba, S.G. (2003). Interim risk evaluation and cumulative impact assessment of the proposed phased landfill development of the Town of Bourne Integrated Solid Waste Management Facility. Cambridge Environmental Inc.

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Crouch, E.A.C., Zemba, S.G., Ames, M.R., and Green, L.C. (2002). Comments on *Proposed Methodology for Particulate Matter Risk Analyses for Selected Urban Areas*, by Abt Associates, January 2002. Cambridge Environmental Inc.

Green, L.C. and Ames, M.R. (2002). Comments on the *Draft Energy Plan* written by the North Carolina Energy Policy Working Group, September 2002. Cambridge Environmental Inc.

Ames, M. and Zemba, S.G. (2002). Interim risk evaluation and cumulative impact assessment of the proposed vertical expansion of the Granby Sanitary Landfill. Cambridge Environmental Inc.

Zemba, S.G., Ames, M.R., and Green, L.C. (2002). Particulate (composition) matter(s). Cambridge Environmental Inc.

Alvarado, M.J., Ames, M.R., and Zemba, S.G. (2002). Risk evaluation of the proposed section 4 expansion of the Shrewsbury Ash Residue Landfill. Cambridge Environmental Inc.

Green, L.C., Crouch, E.A.C., Ames, M.R., and Lash, T.L. (2002). What's wrong with the National Ambient Air Quality Standard (NAAQS) for fine particulate matter (PM_{2.5})? *Regulatory Toxicology and Pharmacology* 35:327-337.

Ames, M.R., Zemba, S.G., Yamartino, R.J., Valberg, P.A., and Green, L.C. (2002). Comments on "Using CALPUFF to Evaluate the Impacts of Power Plant Emissions in Illinois: Model Sensitivity and Implications." *Atmospheric Environment* 36:2263-2265.

Alvarado, M.J., Ames, M.R., and Zemba, S.G. (2002). Risk evaluation of the proposed Final Development Phase (FDP) of the CMW Landfill. Cambridge Environmental Inc.

Green, L.C., Ames, M.R., and Crouch, E.A.C. (2001). Comments on "Mortality Risk Reductions and Economic Benefits of Alternative SAMI Air Quality Strategies." Cambridge Environmental Inc.

Crouch, E., Ames, M., and Green, L.C. (2001). A quantitative health risk assessment for the Kalamazoo River PCB site. Cambridge Environmental Inc.

Prospero, J.M., Olmez, I., and Ames, M.R.. (2001). Al and Fe in PM 2.5 and PM 10 suspended particles in South-Central Florida: the impact of the long range transport of African mineral dust. *Water, Air and Soil Pollution* 125:291-317.

Ames, M.R., Gullu, G., Beal, J., and Olmez I. (2000). Receptor modeling for elemental source contributions to fine aerosols in New York State. *Journal of the Air & Waste Management Association* 50(5):881-8.

- Gone, J., Olmez, I., and Ames, M.R. (2000). Size distribution and probable sources of trace elements in submicron atmospheric particulate material. *Journal of Radioanalytical Nuclear Chemistry* 244(1):133-139.
- Olmez, I., Ames, M.R., and Gullu, G. (1998). Canadian and U.S. sources impacting the atmospheric particulate mercury concentrations across New York State. *Environmental Science & Technology* 32:3048-3054.
- Hughes, L., Cass, G.R., Gone, J., Ames, M.R., and Olmez, I. (1998). Physical and chemical characterization of atmospheric ultrafine particles in the Los Angeles area. *Environmental Science & Technology* 32:1153-1161.
- Ames, M.R., Gullu, G., and Olmez, I. (1998). A comparison of atmospheric mercury in the vapor-phase, and in fine and coarse particulate matter at Perch River, New York. *Atmospheric Environment* 32:865-872.
- Olmez, I. and Ames, M.R. (1997). Atmospheric mercury: how much do we really know? *Pure and Applied Chemistry* 69:35-40.
- Olmez, I., Ames, M.R. and Aras, N.K. (1993). Mercury Determination in Environmental Materials: Methodology for Instrumental Neutron Activation Analysis. *Conference proceedings: The Measurement of Toxic and Related Air Pollutants*, U.S. Environmental Protection Agency, Durham, NC.
- Kohse, G.E., Sanchez, R.G., Driscoll, M.J., Ames, M.R. and Harling, O.K. (1991). In-Pile PWR Loop Coolant Chemistry Studies in Support of Dose Reduction. *Conference proceedings: The Second JAIF International Conference on Water Chemistry*, Fukui City, Japan.
- Harling, O.K., Grant, N.J. Kohse, G.E., Ames, M.R., Lee, T.-S. and Hobbs, L.W. (1987). Neutron Irradiation Scoping Study of Twenty-five Copper-Base Alloys. *Journal of Materials' Research* 2, No. 5.
- Kohse, G.E., Ames, M.R. and Harling, O.K. (1986). Progress in Developing DBTT Determinations from Miniature Disk Bend Tests. *Journal of Nuclear Materials* 141-143:513-517.
- Lee, T.-S., Hobbs, L.W., Kohse, G.E., Ames, M.R., Harling, O.K. and Grant, N.J. (1986). Microstructural Evolution and Swelling of High Strength, High Conductivity RS-PM Copper Alloys Irradiated to 13.5 dpa with Neutrons, *Journal of Nuclear Materials* 141-143:179-183.

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BOOKS AND BOOK CHAPTERS:

Olmez, I., Ames, M.R., Che, J., Meier, S. and Galvin, P. (1994). Elemental Composition of Charcoal Sorbents. *Managing Hazardous Air Pollutants: State of the Art*, Eds. W. Chow and K. K. Conner, Lewis Publishers, Boca Raton, FL.

Ames, M., Olmez, I., Meier, S., and Galvin, P. (1994). A methodology for determining vapor phase mercury by instrumental neutron activation analysis. *Managing Hazardous Air Pollutants: State of the Art*, Eds. W. Chow and K. K. Conner, Lewis Publishers, Boca Raton, FL.