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## Professional Profile

Dr. Sheehan is an ecologist, toxicologist, and risk assessor with more than 30 years of experience conducting human health and ecological risk assessments. He has been recognized as an expert in exposure and risk assessment.

Dr. Sheehan has managed and conducted human health and ecological risk assessments at contaminated sites, industrial and commercial facilities, residences and for consumer products evaluating chemicals in air, surface water, groundwater, soils, soil vapors, and on the hands, packaging and food items. He specialized in assessing and quantifying potential historical, current and future exposures to chemicals in the environment, workplace and home, and associated health risks.

Dr. Sheehan has designed and directed studies to simulate and reconstruct historical exposures in occupational and residential settings to benzene, MTBE, TCE, PCE and other volatile chemicals in solvents, and asbestos in adhesives, roofing products, joint compound and talc, as well as lead, phthalates, formaldehyde and various other chemicals in consumer products. He has prepared and presented product risk assessments under California's Proposition 65 and U.S. Consumer Product Safety Commission regulations. He has also evaluated potential future chemical exposures associated with new facilities, combustion sources and products. He assists companies develop new products with testing and prospective risk assessment including assessment of allergic contact dermatitis risk from chemical allergens released from electronic wearable products.

Dr. Sheehan also has designed and directed wildlife population assessments, aquatic toxicity tests, toxicity identification evaluations, risk allocation evaluations, and probabilistic uncertainty analyses. Dr. Sheehan frequently interacts with local, state, and federal regulatory agencies, and has testified as an expert before government panels and in legal proceedings on toxicology, exposure and human health and wildlife risks from chemical exposures and has communicated risk issues in public, regulatory and legal forums.

## Academic Credentials & Professional Honors

Ph.D., Toxicology/Ecology, University of California, Davis, 1980

M.S., Ecology, University of California, Davis, 1975

B.S., Mechanical Engineering, Santa Clara University, 1968

## Prior Experience

Principal Scientist, McLaren Hart/ChemRisk, 1989-1998

Senior Scientist, Aqua Terra Technologies, 1985-1989

Assistant Professor, Duke University, 1984-1985

Research Scientist, National Research Council Canada, 1981-1984

Postdoctoral Research Associate, New York University, 1980-1981

## Professional Affiliations

American Industrial Hygiene Association

Society of Environmental Toxicology and Chemistry

Society for Risk Analysis

Society of Toxicology

## Publications

Lewis RC, Sheehan PJ, DesAutels CG, Watson HN, Kirman CR. Monitored and modeled ambient air concentrations of ethylene oxide: contextualizing health risk for potentially exposed populations in Georgia. *Int J Environ Res Public Health* 2022; 19, 3364.

Sheehan PJ, Lewis RC, Kirman CR, Watson HN, Winegar ED, Bus JS. Ethylene oxide exposure in populations residing near sterilization and other industrial facilities: context based on endogenous and total equivalent concentration exposures. *Int J Environ Res Public Health* 2021; 18, 607.

Kirman CR, Li AA, Sheehan PJ, Bus JS, Lewis RC, Hays SM. Ethylene oxide review: characterization of total exposure via endogenous and exogenous pathways and their implications to risk assessment and risk management. *J Toxicol Environ Health B Crit Rev* 2021; 24, 1-29.

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Berman DW, Borby GP, Sheehan PJ, Bogen KT, Holm SE. More on the dynamics of dust generation: The effects of mixing and sanding chrysotile, calcium carbonate and other components on the

characteristics of joint compound dusts. *Ann Occup Hyg* 2012; 56(7):852-867.

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Brorby GP, Sheehan PJ, Berman DW, Bogen KT, Holm SE. Potential artifacts associated with historical preparation of joint compound samples and reported airborne asbestos concentrations. *J Occup Environ Hyg* 2011; 8:271-278.

Bogen K, Brorby G, Berman D W, Sheehan P, Floyd M. Measuring mixed cellulose ester filters under variable humidity conditions. *Ann Occup Hyg* 2011; 55:485-494.

Sheehan P, Mowat F, Weidling R, Floyd M. Simulation tests to assess occupational exposure to airborne asbestos from artificially weathered asphalt-based roofing products. *Ann Occup Hyg* 2010; 54:880-892.

Sheehan P, Bogen K, Hicks J, Goswami E, Brorby G, Lau E. Benzene inhalation by parts washers: New estimates based on measures of occupational exposure to solvent coaromatics. *Risk Anal* 2010; 30(8):1249-1267.

Richter RO, Finley BL, Paustenbach DJ, Williams PDR, Sheehan PJ. An evaluation of short-term exposures of brake mechanics to asbestos during automotive and truck brake cleaning and machining activities. *J Exp Sci Environ Epidemiol* 2009; 19:458-474.

Martin R, Malzahn D, Hicks J, Sheehan P. Energy-saving thermal insulation — Industrial hygiene and occupational health considerations. *Indust Heating* 2008; 75:54-57.

Brorby GP, Sheehan PJ, Berman DW, Greene JF, Holm SE. Re-creation of historical chrysotile-containing joint compounds. *Inhalation Toxicol* 2008; 20:1043-1053.

Sheehan P, Malzahn D, Goswami E, Mandel JH. Simulation of benzene exposure during use of a mineral spirits solvent to clean elevator bearing housings. *Human Ecol Risk Assess* 2008; 14(2):421-432.

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Tsuji J, Williams P, Edwards M, Allamneni K, Kelsh M, Paustenbach D, Sheehan P. Evaluation of mercury in urine as an indicator of exposure to low levels of mercury vapors. *Environ Health Perspect*

2003; 111(4):623630.

Williams P, Cushing C, Sheehan P. Data available for evaluating the risks and benefits of MTBE and ethanol as alternative fuel oxygenates. *Risk Anal* 2003; 23(5):1085-1115.

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Williams PRD, Sheehan PJ. Overview of MTBE and TBA exposures and human health risks in the U.S. *Contam Soil Sed Water*, 2002; July/August 93-103.

Williams PRD, Sheehan PJ. A better perspective on the incidence and implications of MTBE in California's drinking water. *Contam Soil Sed Water*, MTBE special issue 2001; 23-27.

Williams PRD, Scott PK, Sheehan PJ, Paustenbach DJ. A probabilistic assessment of household exposures to MTBE from drinking water. *Hum Ecol Risk Assess* 2000; (5):827-849.

Fuchsman PC, Barber TR, Sheehan PJ. Sediment toxicity evaluation: Spiked sediments tests with *Leptocheirus plumulosus*, *Hyalella azteca*, and *Chironomus tentans*. *Arch Environ Toxicol Chem* 1998; 35:573-579.

Iannuzzi TJ, Bonnevie NL, Huntley SL, Wenning RJ, Truchon SP, Tull JD, Sheehan PJ. Comments on the use of equilibrium partitioning to establish sediment quality criteria for nonionic chemicals. *Environ Toxicol Chem* 1995; 14(8):1257-1259.

Sheehan PJ, Loucks DL. Effects characterization. In: *Ecological Risk Assessment Issue Papers*. EPA 6301 R-94-009. U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC, 1994.

Falerios M, Sheehan PJ, Schild K, Paustenbach DJ. Airborne concentrations of total and hexavalent chromium from contaminated soils at unpaved and partially paved commercial/industrial sites. *Air Waste Manage Assoc J* 1992; 42(1):40-48.

Paustenbach DJ, Sheehan PJ, Paull JM, Wisser LM, Finley BL. Review of the allergic contact dermatitis hazard posed by chromium contaminated soil: Identifying a "safe" concentration. *J Toxicol Environ Health* 1992; 37:177-207.

Paustenbach DJ, Meyer D, Sheehan PJ, Lau V. An assessment and quantitative uncertainty analysis of the health risks to workers exposed to chromium contaminated soils. *Toxicol Ind Health* 1991; 7(3):159-196.

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microcosms. pp. 178-188. In: Aquatic Toxicology and Hazard Assessment, 12th Volume. ASTM STP 1027, American Society of Testing and Materials, Philadelphia, PA, 1989.

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Grue CE, DeWeese LR, Mineau P, Swanson GA, Foster JR, Arnold PM, Huckins JN, Sheehan PJ, Marshall WK, Ludden AP. Potential impacts of agricultural chemicals on waterfowl and other wildlife inhabiting prairie wetlands: An evaluation of research needs and approaches. In: Trans. 51st N.A. Wildlife and National Research Conference, Wildlife Institute, Washington, DC, 1986.

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Siegfried CA, Sheehan PJ, Knight AW. The adults of *Oroperla barbara* (Needham). Pan Pac Entomol 1977; 53:125-128.

### **Books Edited**

Sheehan PJ, Klein W, Bourdeau P, Forte F (eds). Appraisal of Tests to Predict the Environmental Behavior of Chemicals. SCOPE 25. John Wiley & Sons, New York, NY, 1985.

Sheehan PJ, Miller DR, Butler GC, Bourdeau P (eds). Effects of Pollutants at the Ecosystem Level. SCOPE 22. John Wiley & Sons, New York, NY, 1984.

Vouk VB, Sheehan PJ (eds). Methods of Assessing the Effects of Chemicals on Reproductive Functions. SCOPE 20. John Wiley & Sons, New York, NY, 1983.

### **Book Chapters**

Sheehan P. Product risk assessment overview. In. Professional Practices of Product Stewardship. Hart GA (ed), Product Stewardship Society, Falls Church, VA, 2018.

Adams P, Goldman R, Hellerstein J, Jones A, Lori A, Lowe J, Roy R, Sheehan P, Walton J. Product exposure assessment. In. Professional Practices of Product Stewardship. Hart GA (ed), Product Stewardship Society, Falls Church, VA, 2018.

Hart G, Sheehan P, Lori A, Hellerstein J, Lowe J, Jones A, Roy R, Goldman R, Walton J, Adams P. Product risk characterization. In. Professional Practices of Product Stewardship. Hart GA (ed), Product Stewardship Society, Falls Church, VA, 2018.

Singhal A, Posson M, Kalmes R, Gauthier A, Lewis R, Schenk J, Goswami E, Sheehan P. Proposition 65 risk assessment. In: Professional Practices of Product Stewardship. Hart GA (ed), Product Stewardship Society, Falls Church, VA, 2018.

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Richter RO, Sheehan PJ. Modeling of health risks associated with combustion emissions. In: Air Quality Modeling- Theories, Methodologies, Computational Techniques, and Available Databases and Software. Zannetti P (ed), The EnviroComp Institute and Air and Waste Management Association, Pittsburgh, PA, 2005.

Sheehan PJ, Warmerdam J, Feng SS. Using probabilistic risk assessment methods to predict the effects of pesticides on aquatic systems and waterfowl that use them. In: Health Risk Assessment. Paustenbach DJ (ed), John Wiley & Sons, Inc., New York, NY, 2002.

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Sheehan PJ. Ecotoxicological considerations. In: Fundamentals of the Management of Toxic Chemicals. George Allen Unwin, London, 1991.

Sheehan PJ. Functional processes of ecosystems: Their use in assessing the effects of mixtures of chemicals. pp. 691-707. In: Methods for Assessing the Toxicology of Mixtures of Chemicals. SCOPE 30. John Wiley & Sons, New York, NY, 1986.

Korte F, Sheehan PJ, Klein W. The need for appraisal of environmental testing methods. pp. 1-11. In: Appraisal of Tests to Predict the Environmental Behavior of Chemicals. SCOPE 25. John Wiley & Sons, New York, NY, 1985.

Peakall DB, Calamari D, Crose H, Hackaber JW, Kozlowski TT, Lander V, Moustafa L, Sheehan P, Tucker RK, and Waldichuk M. Approaches to measuring chemical injury to non-human biota and ecosystems. pp. 85-106. In: Methods for Estimating Risk of Chemical Injury: Human and Non-Human Biota and Ecosystems. SCOPE 26. John Wiley & Sons, New York, NY, 1985.

Sheehan PJ. Effects on community and ecosystem structure and dynamics. pp. 51-100. In: Effects of Pollutants at the Ecosystem Level. SCOPE 22. John Wiley & Sons, New York, NY, 1984.

Sheehan PJ. Effects on individuals and populations. pp. 23-50. In: Effects of Pollutants at the Ecosystem Level. SCOPE 22. John Wiley & Sons, New York, NY, 1984.

Sheehan PJ. Functional changes in the ecosystem. pp. 101-145. In: Effects of Pollutants at the Ecosystem Level. SCOPE 22. John Wiley & Sons, New York, NY, 1984.

Sheehan PJ, Winner RW. Copper gradient studies in stream systems. pp. 255-271. In: Effects of Pollutants at the Ecosystem Level. SCOPE 22. John Wiley & Sons, New York, NY, 1984.

## **Presentations**

Sheehan P, Bus J, Lewis R, Winegar E, Li A. An assessment of historical occupational and non-occupational ethylene oxide exposure questions the applicability of EPA's Implied 10-6 increase in cancer risk at an exposure level of 0.1 ppt. Presented at Society of Toxicology 59th Annual Meeting (virtual). Anaheim CA. March 15-19, 2020.

Hellerstein J, Sheehan P, Kalmes R. Product exposure assessment: modeling vs measuring user exposures. Presented at Product Stewardship 2019, Columbus, OH, September 9-12, 2019.

Li A, Sheehan P, Valdez-Flores C, Bogen KT. Updated modeling indicates historical sterilization worker ethylene oxide exposures were higher than assumed in the US EPA IRIS assessment. Presented at the Society of Toxicology 58th Annual Meeting, Baltimore, MD March 10-14, 2019.

Sheehan P, Hellerstein J. Consumer exposure model (CEM). Presented at Product Stewardship 2018. Washington, DC September 27-29, 2018.

Lewis R, Bogen K, Singhal A, Sheehan P. Novel method for estimating dermal contact with hand-applied cleaning solutions. Presented at the American Industrial Hygiene Conference and Expo. Philadelphia, PA May 21-23, 2018.

Sheehan P, Kalmes R, Posson M, Singhal A, Lewis R, Gauthier A. Challenges in assessing health risks from exposure to bisphenol-A (BPA) in consumer products. Presented at the Society of Toxicology 57th Annual Meeting. San Antonio, TX March 11-15, 2018.

Lewis R, Winegar E, Bogen KT, Singhal A, Sheehan P. Exposures to an ethanol based cleaning product. Presented at the American Industrial Hygiene Conference and Expo. Seattle, WA June 4-7, 2017.

Winegar E., Bogen KT, Lewis RC, Singhal A, Sheehan P. A use simulation study of a denatured alcohol cleaning product to assess potential worker exposure. Presented at the 56th Annual Meeting of the Society of Toxicology. Baltimore MD, March 12-15, 2017

Sheehan P, Kalmes K. Assessing exposure from consumer product use: Methods to address manufacturer, consumer and agency concerns. Presented at Society for Risk Analysis Annual Meeting, San Diego, CA December 11-15, 2016.

Singhal A, Posson M, Jones A, Lewis R, Gauthier A, Schenk J, Kalmes R, Sheehan P. Assessing risk for consumer products under California's Proposition 65 regulations. Presented at SETAC North America 37th Annual Meeting, Orlando, FL November 6-10, 2016.

Sheehan P, Singhal A, Kalmes R, Bogen KT. Formaldehyde emissions from Chinese manufactured laminate flooring: Is there a Proposition 65 Exposure Issue? Presented at the America Industrial Hygiene Conference and Expo, Baltimore, MA May 21-26, 2016.

Sheehan P, Bogen K, Singhal A, Kalmes R. Evaluating the Proposition 65 health significance of formaldehyde exposures from Chinese manufactured laminate flooring. Presented at 55th Annual Meeting of the Society of Toxicology, New Orleans, LA March 13-17, 2016.

Sheehan P, Lowney Y, Kalmes, R, Bogen K, Posson M, Glomski M, Singhal A, Volberg V, Beckerman B, Goswami E. Assessing user exposure to consumer products: Methods specific to product use and exposure route to assess consumer health risks. Presented at SETAC North America 36th Annual Meeting, Salt Lake City, UT November 1-5, 2015.

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Bogen K, Sheehan P, Singhal A, Kalmes R, Volberg V, Garry M. Wearable technology products and allergic contact dermatitis: Chemical exposure and risk assessment challenges & developments. Presented at SETAC North America 36th Annual Meeting, Salt Lake City, UT November 1-5, 2015.

Sheehan P, Bogen KT, Singhal A, Kalmes R, Robert M, Fedoruk MJ. Wearable products and allergic contact dermatitis: a new risk assessment challenge. Presented at the 54th Annual Meeting of the Society of Toxicology, San Diego, CA March 22-26, 2015.

Sheehan P, Cooper M, McNulty J, White K. Wearable technology - trends, design & risk considerations. Presented at the SFAI Thought Leadership Webinar. Sports Fitness Industry Association. November 18, 2014.

Sheehan P, Bogen K, Posson M, Singhal A, Glomski M, Hellerstein J. Assessing anthraquinone (AQ) exposure from food packaging: a product stewardship challenge in Europe. Presented at the American Industrial Hygiene Conference and Expo, San Antonio, TX May 31-June 5, 2014.

Sheehan P, Bogen KT, Singhal A. Estimating an acceptable intake of anthraquinone (AQ) in food packaging. Presented at the 53rd Annual Meeting of the Society of Toxicology, Phoenix AZ March 23-27, 2014.

Sheehan P, Kalmes R, Turnham P, Anderson E. Simulation study of potential historical user asbestos fiber exposure from cosmetic body talc use. Presented at the American Industrial Hygiene Conference and Expo, Montreal, Canada May 18-23, 2013.

Sheehan P, Bogen K, Posson M, Hellerstein J. Characterizing potential chemical exposures and associated risks from food packaging: A product stewardship challenge. Presented at the American Industrial Hygiene Conference and Expo, Montreal, Canada May 18-23, 2013.

Sheehan P, Heilman J, Bogen K. An evaluation of the Human Carcinogenic Potency of Methyl tert-butyl ether (MTBE): Considering new data and mode of action. Presented at the 52nd Annual Meeting of the Society of Toxicology, San Antonio TX March 10-14, 2013.

Sheehan P. Proposition 65 exposure assessment: Compliance considerations for foods. Presented at the Northwest Food Processors Expo and Conference 2013, Portland, OR January 14-15, 2013

Sheehan P, Bogen K. Cumulative Chrysotile Fiber Exposures from Sanding Historical Joint Compound formulations: Inter- vs. Intra-individual Variability. Presented at the Society for Risk Analysis Annual Meeting, San Francisco, CA December 9-12, 2012.

Sheehan P, Bogen K, Brorby G, Holm S. Considering mode of action in estimating a NSRL for 3-MCPD. Presented at the Society of Toxicology 51st Annual Meeting & Tox Expo, San Francisco, CA March 11-15, 2012.

Sheehan P, Mowat F. Simulation tests of occupational asbestos exposure from removal of artificially weathered roof coatings and cements. Presented at the American Industrial Hygiene Conference and Expo, Portland, OR May 14-19, 2011.

Sheehan P, Brorby G, Bogen K, Berman DW, Holm S. New basis for interpreting historical exposures to dust from chrysotile-containing joint compound. Presented at the American Industrial Hygiene Conference and Expo, Portland, OR May 14-19, 2011.

Brorby G, Boelter F, Jones R, Simmons C, Berman W, Sheehan P. Spiraling consequences of poor data quality. Professional Conference of Industrial Hygienists 2010, Fort Worth, TX, October 9-12, 2010.

Sheehan P, Bogen K, Brorby G, Goswami E. Improved estimates of worker exposure to benzene during



parts washing based on a new approach analyzing solvent and air data for other aromatic constituents. Presented at the American Industrial Hygiene Conference and Expo, Denver, CO May 22-27, 2010.

Brorby GP, Sheehan PJ, Berman DW, Holm SE. Re-interpreting historical exposure data associated with the use of chrysotile-containing joint compound. Society of Toxicology 2010 Annual Meeting, Salt Lake City, UT, March 7-11, 2010.

Sheehan P, Dahlstrom D. Green building: Finding a better way to assure indoor air quality. Presented at the American Industrial Hygiene Conference and Expo, Denver, CO May 22-27, 2010.

Sheehan P, Bogen K, Brorby G, Goswami E. Worker inhalation exposure to benzene from solvents during parts washing. Society for Risk Analysis 2009 Annual Meeting, Baltimore, MD, December 6-9, 2009.

Sheehan P, Goswami E, Hicks J, Barrie M. An assessment of historical benzene exposures of printing press operators. Presented at the American Industrial Hygiene Conference and Expo, Minneapolis, MN, May 31-June 5, 2008.

Brorby G, Kalmes R, Goswami E, Mowat F, Sheehan P. Evaluating exposures to consumer products. Presented at the Society for Risk Analysis, Baltimore, MD, December 3-6, 2006.

Sheehan P, Malzahn D, Goswami E, Kalmes R, Hicks J, Mandel J. Use of a simulation to estimate benzene exposure from degreasing elevator parts. Presented at the Society for Risk Analysis Meeting, Baltimore, MD, December 3-6, 2006.

Goswami E, Malzahn D, Richter R, Sheehan P. Simulation and modeling techniques to reconstruct historical benzene exposures. Presented at the Society for Risk Analysis Meeting, Baltimore, MD, December 3-6, 2002.

Sheehan P, Mowat F, Weidling R. Simulation of asbestos release from asphalt-based roofing products. Presented at the American Industrial Hygiene Conference and Expo, Chicago, IL, May 13-18, 2006.

Sheehan P, Hicks J, Goswami E, Lau E, Greene J, Fedoruk MJ. Assessment of mechanics' exposure to benzene in mineral spirit solvents during parts washing activities. Presented at the American Industrial Hygiene Conference and Expo, Chicago, IL, May 13-18, 2006.

Mowat FS, Sheehan PJ. Estimating asbestos exposures from historical products: Issues related to industrial hygiene and toxicology. Presented at the Andrews Asbestos Litigation Conference, San Antonio, TX, April 26-27, 2006.

Goswami E, Greene J, Sheehan P, Hicks J. Analysis of exposure to benzene in mineral spirit solvents during parts washing and degreasing operations. Presented at the Society of Toxicology Meeting, San Diego, CA, March 5-9, 2006.

Richter RO, Sheehan PJ, Bouse E. Potential environmental impact of mercury emissions from Portland cement kilns. Presented at the 2005 IEEE Cement Industry Technical Conference, Kansas City, MO, 2005.

Sheehan P, Brorby G, Kalmes R, Mowat F, Richter R, Finley B. Characterization of the cumulative asbestos exposures of U.S. automobile brake mechanics. Presented at the American Industrial Hygiene Conference and Expo, Anaheim, CA, May 23-26, 2005.

Finley B, Mowat F, Richter R, Brorby G, Craven B, Sheehan P. Evaluation of proposed threshold doses for chrysotile exposure and respiratory disease. Presented at the Society of Toxicology 2005 Annual Meeting, New Orleans, LA, March 6-10, 2005.

Finley B, Richter R, Mowat F, Mlynarek S, Paustenbach D, Warmerdam J, Sheehan P. Cumulative occupational asbestos exposures of U.S. brake repair mechanics. Presented at the Society for Risk Analysis 2004 Annual Meeting, Palm Springs, CA, December 5-8, 2004.

Paustenbach D, Richter R, Finley B, Williams P, Sheehan P. Evaluating asbestos exposure with vehicle brake cleaning and machining activities using short-term and TWA measurements. Presented at the Society for Risk Analysis 2004 Annual Meeting, Palm Springs, CA, December 5-8, 2004.

Sheehan P, Warmerdam J, Humphrey D, Patenaude S. Aquatic toxicity testing: Assessing the safe use of scrap tires as roadbed fill. Presented at the Fourth Society of Environmental Toxicology and Chemistry World Congress, Portland, OR, November 14-18, 2004.

Sheehan P. Environmental and occupational health hazards associated with the presence of asbestos in brake linings and pads (1900 to present): A state of the art review. Presented at the SAE Brake Colloquium and Exhibition, Detroit, MI, March 7-10, 2004.

Yost L, Greene J, Hays S, Kelsh M, Li A, Sheehan P. Derivation of a range of interim inhalation slope factors for TCE using physiologically based pharmacokinetic modeling. Presented at the Society of Toxicology 43rd Annual Meeting, Baltimore, MD, March 2004.

Williams P, Cushing C, Sheehan P. Evaluating the risks and benefits of MTBE and ethanol as alternative fuel oxygenates. Presented at the Society for Risk Analysis 23rd Annual Meeting, Baltimore, MD, December 7-10, 2003.

Richter R, Paustenbach D, Sheehan P. An evaluation of historical exposures of mechanics to asbestos from brake repair. Presented at the Society for Risk Analysis 23rd Annual Meeting, Baltimore, MD, December 7-10, 2003.

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