

CURRICULUM VITAE OF GEOFFREY CLIFFORD GRANVILLE

Summary of Work Experience:

- Strong (40+ yrs) background in health science and toxicology - excellent training to lead and facilitate discussions on health and environmental risks (including education/training, planning, perception, management and communication aspects);
- Extensive experience in identifying, understanding, managing and responding to community concerns including chemical hazards from air, water, soil under normal operating conditions and during emergency situations. Ability to work under conditions of differing expectations from company and external stakeholders. Experienced in regulatory panels, hearings, and advocacy with provincial, federal, and international regulatory agencies;
- 33 years as a scientist and manager in Shell (covering upstream, downstream and chemicals functions), resulting in extensive and detailed experience with a broad range of occupational and environmental (public) health issues, and how to manage them;
- Has regular and direct contact with members of the public, First Nations communities, non-governmental (environmental- and health-based) organizations, the media, regulators and politicians; sometimes in difficult or potentially adversarial situations
- Ability to work equally well at conceptual level (policy and strategy development, program creation and implementation, managing projects and multistakeholder processes), and with technical issues (regulatory clearance, health and environmental impact assessment, risk assessments); understands the importance of relationship-building;
- Strong track record of initiating and managing health and environmental projects, programs and training processes that become best-in-class; constantly striving to create and maintain best practices, and improve company and industry's behaviour and performance

DETAILED CURRICULUM VITAE

Residence : Calgary

Position : (2006-present) President/CEO, GCGranville Consulting Corp.

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Previous Positions: (1972-2006) A series of positions with the Royal Dutch/Shell group of companies, and from 1984-2006, as:
Manager Toxicology & Product Stewardship
Shell Canada Limited
Calgary, Alberta
T2P 2H5

Education/Titles:

2016+: Adjunct Professor, Department of Lab Medicine, University of Alberta

1999 - 2007: Affiliate, Division of Toxicology, University of Calgary

1987 – 2007; and 2015-present: Adjunct Professor, Department of Health Sciences, University of Alberta

1983 – 89; and 2003 - 2007: Adjunct Professor, Department of Public Health Sciences, University of Toronto

1968 - 72 University of Surrey, U.K.
Degrees: Joint B.Sc. (Hons) in Biochemistry and Toxicology

Professional Societies, Committees etc:

- Science Committee for the Federal governments Chemical Management Plan 2013-present (and Co-Chair from 2013-2019)
- Member, Challenge Advisory Panel for the (Canadian) Federal government's Chemical Management Plan (2006-close)
- Invited Industry Observer to IARC (International Agency for Research on Cancer) Working Group meeting on PAHs and Cancer (October 2005)
- Chair, Industry Co-ordinating Group (ICG) for CEPA (2003-2007)
- Chair, CAPP Air Issues Task Force (2000-2003)
- Member, Science Management Committee, Federal Toxic Substance Research Initiative (TSRI) (1999-2003)
- Member, Advisory Group to Environment Canada DSL Categorization/Screening Project (1998-2002)
- Member, Alberta Council for Research on Air and Health (ACRAH) (1997-2000)
- Alternate member, Alberta Ministerial Advisory Committee for Environmental Protection (1996-2000)

- Board of Directors, Major Industrial Accidents Council of Canada (MIACC) (1991-3)
- Member, Federal Ministers' Advisory Panel on the 2nd Priority Substances List under the Canadian Environmental Protection Act (CEPA)
- Board of Directors, Institute of Risk Research, U. of Waterloo (1988-present); and Member, Steering Committee, of Network for Environmental Risk Assessment & Management (NERAM)
- Chairman, Science and Technical Committee of the Styrene Industry Research Council (1988-91)
- National Sciences & Engineering Research Council (NSERC), strategic grants panelist (1986-8)
- Society for Risk Analysis
- Society for Toxicology of Canada
- Air and Waste Management Association
- Society for Environmental Toxicology and Chemistry
- Canadian Federation of Biological Sciences
- Occupational Hygiene Association of Ontario

Experience:

2006-present	Private consultant on health and environmental issues
1984-2006	Manager, Toxicology & Product Stewardship, Shell Canada Ltd.
1991-93	Associate Director, Bureau of Chemical Hazards, Health & Welfare Canada ¹
1981-84	Corporate Toxicologist, Shell Canada Ltd.
1974-81	Toxicologist, Shell International Petroleum Co. Ltd. (UK)
1972-74	Experimental Toxicologist, Shell Research Ltd. (U.K.)

Review of Experimental work/Publications

1. Publications

- 1.1 Wiseman, A. and Granville, G.C. (1973) γ Radiation Inactivation of Yeast Alcohol Dehydrogenase in the Presence of Oxidized Nicotinamide-Adenine Dinucleotide. *Biochem Soc. Trans.* **1**, 606-608.
- 1.2 Wiseman, A., Leslie, P.H. and Granville, G.C. (1973) Ultrasonic Inactivation of Yeast Alcohol Dehydrogenase: Protection by Oxidised Nicotinamide-Adenine Dinucleotide. *Biochem. Soc. Trans.* **1**, 604-606.
- 1.3 During my two years at the Toxicology Laboratory of Shell Research Limited in the U.K., I authored a number (14) of internal reports dealing with the results of toxicological studies

¹ Temporary assignment under the "Business/Government Executive Exchange Program"

on various industrial and agricultural chemicals. These reports are confidential to Shell Research Limited, but titles of the reports can be obtained if needed.

- 1.4 Granville, G.C. (1979) Mutagenic Effect of Aromatic Epoxy Resins. *Nature*. **279** 352.
- 1.5 Lington, A.W., Lewis, S.C., Thomas, F.B., Granville, G.C., Cragg, S.C. and Spencer, P.S. The Neuropathic Activity of Commercial Hexane Mixtures in the Male Rat: Part I. Presented at 1983 meeting of the Society of Toxicology.
- 1.6 Lington, A.W., Lewis, S.C., Thomas, F.B., Granville, G.C., Cragg, S.C. and Spencer, P.S. The Neuropathic Activity of Commercial Hexane Mixtures in the Male Rat: Part II. Presented at 1983 meeting of the Society of Toxicology.
- 1.7 Granville, G.C. (1983) Selected Problems Encountered in Assessing Petroleum Neurotoxicity. The Toxicology Forum 1983 Annual Winter Meeting pp. 72-90.
- 1.8 Granville, G.C. (1985), Hazard Communications In Other Jurisdictions: A Possible Canadian System. ASTM.
- 1.9 Sowinski, E.J., Broecker, P., et al (1987) Criteria for Identifying and Classifying Carcinogens, Mutagens & Teratogens. *Regul. Toxicol & Pharmacol.* **7**, 1-20.
- 1.10 Ibbotson, B.G., et al (1989). A Site Specific Approach for the Development of Soil Cleanup Guidelines for Trace Organic Compounds. In: Kostecki & Calabrese (Authors): Remediation Techniques, Environmental Fate & Risk Assessments, Vol 2 (Lewis Pub. Inc).
- 1.11 Granville, G.C., and Toft, P., (1992). Comments on Zero discharge/Virtual Elimination. Great Lakes Sea Grant Network Biennial Conference, June 1992.
- 1.12 Cruzan, G., Cushman, J., Andrews, L.S., Granville, G.C., Miller, R.R., Hardy, C.J., Coombs, D.W. & Mullins, A. (1997). Subchronic Inhalation Studies of Styrene In CD Rats and CD-1 Mice. *Fund & Appl. Toxicol.* **35**, 152-165.
- 1.13 Cruzan, G., Cushman, J., Andrews, L.S., Granville, G.C., Johnson, K.A., Hardy, C.J., Coombs, D.W. & Mullins, A. (1998). Chronic toxicity/Oncogenicity Studies of Styrene In CD Rats by Inhalation Exposure for 104 Weeks. *Toxicol. Sci.*, **46**, 266-281.
- 1.14 Cruzan, G., Cushman, J., Andrews, L.S., Granville, G.C., Johnson, K. A., Bevan, C., Hardy, C.J., Coombs, D.W., Mullins, P. A. & Brown, W. R. (1999). Chronic toxicity/Oncogenicity Studies of Styrene In CD-1 Mice by Inhalation Exposure for 104 Weeks. *J. Applied Toxicol.* **21**, 185-198
- 1.15 Granville, G. Environmental and Health Concerns of Hydrogen Sulfide: An Industry Perspective (1999). *Environ. Epi. & Toxicol.*, **1**, 231-235
- 1.16 Granville, G. Risk Assessment of Chemical Substances: View of Industry (2000). Paper Presented at national conference on Endocrine Disruption. Submitted for Publication
- 1.17 Krewski, D., Snyder, R., Beatty, P., Granville, G., Meek, B. & Sonowane, B. (2000). Assessing the Health Risks of Benzene: A Report on the Benzene State-of-the-Science

- 1.18 Maynard, R., Krewski, D., Burnett, R., Samet, J., Brook, J., Granville, G., and Craig, L. 2003a. Health and Air Quality Directions for Policy-Relevant Research. *Journal of Toxicology and Environmental Health* 66: 16-20.
- 1.19 Woodall, G., Smith, R & Granville, G., (2005). Proceedings of the Hydrogen Sulfide Research and Risk Assessment Symposium, October 31- November 2, 2000. *Inhalation Toxicology* **17**(11), 593-639.
- 1.20 (IARC Monograph Series, Volume 92, 2010. Some Non-heterocyclic Aromatic Hydrocarbons and some Related Exposure: GCG referenced as an invited industry observer)

2 Lectures/Presentations/Non Peer-Reviewed Publications:

- 2.1 Paper to British Occupational Hygiene Society, 1980 Annual Meeting entitled, "A Toxicological Basis for Establishing Hygiene Standards of Solvent Mixtures".
- 2.2 Paper to International Conference of Health Effects from Paints (1980) held in Copenhagen and Stockholm, entitled Toxicology of Epoxy Resins and Solvents.
- 2.3 Paper to IUPAC Symposium on Solvents (1982), on Neurotoxic Activity of Hydrocarbons.
- 2.4 Numerous educational and introductory lectures to students (University of Surrey and University of London, U.K. University of Toronto) and to non-experts becoming involved in the field of occupational health (sponsored by OYEZ International 1981-83).
- 2.5 Since 1981, within Canada, presentations to undergraduate, graduate and continuing education programs at the Universities of Toronto, Calgary and Alberta, and McMaster University dealing with various aspects of toxicology.
- 2.6 Course organizer of "Occupational Toxicology" given to students working towards a diploma in Occupational Health Nursing from Grant MacEwan College Edmonton (1985-86).
- 2.7 Paper to Occupational Medical Association of Canada (1985) entitled "Toxicology of Oil Sands and their Synthetic Fuel Products".
- 2.8 Paper to American Society of Lubrication Engineers (1986) entitled "Uses of and Concepts for Material Safety Data Sheets".
- 2.9 Lecture to Calgary Public Health Office (1987), entitled "Toxicology Concepts".
- 2.10 Paper to American Industrial Hygiene Association (1987), entitled "Hazcomm in Canada: Introduction to WHMIS".
- 2.11 Paper to Hazmat '87 Conference (1987) entitled "How Clean is Clean? On Decommissioning an Oil Refinery".

- 2.12 Paper to Chalk River Symposium on Toxicology & Environmental Health (1987), entitled "Future trends in Toxicology".
- 2.13 Paper to American Society of Construction Engineers (1988). entitled "Decommissioning an Oil Refinery".
- 2.14 Paper to Banff Conference on Regulatory Agenda in Canada (1988).entitled "WHMIS Update: Right to know in Canada".
- 2.15 Paper to Banff Conference on Regulatory Agenda in Canada (1988), entitled: "WHMIS: Industry's perspective".
- 2.16 Technical Advisor and Co-author, Alberta Health (1988). Toxicity of Hydrogen Sulphide.
- 2.17 Chairman of session in International Conference on H₂S toxicity, Banff, (1989).
- 2.18 Paper to The Air & Waste Management Association (1990), entitled "On an Acceptable Environmental Exposure to Benzene".
- 2.19 Paper to Saskatchewan Public Health Association (1990), on "An Industrial Toxicologist's View on the Use of Chemicals In Today's Society".
- 2.20 Advisor and Coauthor of Canadian Standards Report, 1991. Risk Analysis Requirements and Guidelines. CAN/CSA-Q634-91.
- 2.21 Paper to International Conference on Health & Environmental Risk Assessment, June 1993, (Ottawa), entitled "Priority Setting of Health and Environmental Issues".
- 2.22 Paper to Canadian Association of Petroleum Producers (Feb 1996), entitled "Health Risks of Benzene and Implication to the Upstream Petroleum Industry".
- 2.23 Chairman of Human Health Session in Acidifying Emissions Conference, Red Deer (1996).
- 2.24 Paper to Calgary Environmental Conference, October 1996, entitled: "Toxics and Particulates: Possible Management Strategies".
- 2.25 Advisor and Coauthor of Canadian Standards Report, 1997. Risk Management: Guidelines for Decision Makers. CAN/CSA-Q850-97.
- 2.26 Presentation on behalf of the American Petroleum Institute (API), to the Environmental Quality Science Advisory Board for Michigan State, entitled "Toxicology of Hydrogen Sulfide and Implications for Ambient Standards", December 1998.
- 2.27 Member of Advisory Group to Environment Canada on categorization and screening of the substances on the national Domestic Substances List (DSL). 1998-present
- 2.28 Presentation to "5NR" (The 5 Federal natural resources departments) Huntsville workshop on the Science around Endocrine Disruptors, entitled "Risk Assessment of Chemical substances: View of Industry", Feb 2000. (Also reported as a paper in the workshop's

Proceedings).

- 2.29 Panelist at AWMA meeting, Prairie Chapter, Banff, April, 2000, talking about health hazards from flaring sour gas.
- 2.30 Invited paper to International H₂S Research Symposium, Oct/2000: Review of Alberta Experience with H₂S.
- 2.31 Invited paper to AWMA Clean Air Policy conference, November 2001: "Clean Air and Fuels: an Industry Perspective."
- 2.32 Organizing Committee and Session Chair for International Symposium on Occupational Health - Scientific Committee on Occupational Toxicology's 5th International Symposium on biological Monitoring, Banff, Alberta, Canada; 19-21 September 2001. (See: Toxicology Letters, 134, 2002)
- 2.33 Invited paper to SETAC annual meeting, November, 2002: "The Precautionary Principle".
- 2.34 Invited paper to AWMA conference on "Air Quality, Health and Economics", Ottawa, November 2002: "Petroleum Industry view on Economic Valuation for Health Impacts of Air Quality".
- 2.35 Poster at NERAM/Airnet conference, Rome, November 2003: "The CASA process for Implementation of the PM and Ozone Canada Wide Standards".
- 2.36 Invited paper to AWMA "Canadian Clean Air Policy Conference", November 2003, entitled: "Air Pollution Linkages to Health: Science Needs to Fill the Gaps"
- 2.37 Invited paper to AWMA conference on Sustainable Development and the Importance of Chemicals Management, December 2004, entitled: "Industry Perspectives and Practice in Making Decisions on Chemicals".
- 2.38 Article in National Post entitled "Fear Not Man-Made Chemicals", 21st Dec. 2009.
- 2.39 Invited paper on H₂S toxicology and health effects to a 2010 International AWMA conference on Sour Gas and Health, held in Calgary.
- 2.40 Invited paper on the Toxicology of Bisphenol A to a McMaster University symposium on "Bisphenol A and Human Health", May 2012.