



**Stella M. Swanson**

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- Education** B.Sc. (Honours), Biology, University of Saskatchewan, 1973  
Ph.D. Limnology, University of Saskatchewan, 1978  
Post-Doctoral Fellowship, Radioecology, Saskatchewan Research Council, 1978-81
- Affiliations** Member, Society of Environmental Toxicology and Chemistry  
Member, Society for Mining, Metallurgy, and Exploration
- Experience**
- 2007-present **Swanson Environmental Strategies Ltd. Fernie, British Columbia**  
*Owner/operator*
- Provides senior strategic advice and technical assistance regarding environmental impact assessment, ecological and human health risk assessment, cumulative effects assessment, and environmental risk management. Provides planning and facilitation services for public engagement and risk communication. Serves as expert reviewer on panels and boards.
- 1993 to 2007 **Golder Associates Calgary, Alberta**  
*Senior Aquatic Scientist, Appointed Principal in 2002*  
Responsible for aquatic biology, aquatic toxicology and radiobiology with emphasis on environmental effects monitoring, risk assessment and environmental impact assessment.
- 1990 to 1993 **SENTAR Consultants Ltd. Calgary, Alberta**  
*Senior Aquatic Biologist*  
Responsible for design, implementation, management and reporting of large multi-disciplinary environmental monitoring projects. Provided advisory services. Participated in a variety of projects requiring expertise in aquatic toxicology.
- 1987 to 1990 **Saskatchewan Research Council Saskatoon, Saskatchewan**  
*Manager and Senior Research Scientist, Aquatic Biology Program*  
Supervised a group of scientists and technical staff in aquatic biology. Major projects included the development of technology for the advancement of aquaculture in Saskatchewan; environmental impact assessments; the development of a toxicity testing facility; and several radionuclide pathway studies.
- 1981 to 1987 **Saskatchewan Research Council Saskatoon, Saskatchewan**  
*Research Scientist*  
Participated in environmental impact assessments and research projects at uranium and gold mines. Assisted with projects in general water quality.
- 1973 to 1978 **University of Saskatchewan Saskatoon, Saskatchewan**  
*Laboratory Demonstrator (Part-time)*  
Introductory Biology, Limnology, Honours Field Biology.

**PROJECT RELATED EXPERIENCE**

**COMMUNITY ENGAGEMENT, FACILITATION, STRATEGIC PLANNING, EXPERT PANELS**

**Nuclear Waste Management Organization**

**2020-Present**

Member of the NWMO Advisory Council which is an independent and arms-length body comprised of individuals knowledgeable in the management of used nuclear fuel, and in working with people and communities on difficult public policy issues. The role of the council is to ensure that the views of the public and communities of interest are considered and reflected in a thoughtful, balanced way and to assist the NWMO in ensuring that its processes are of good quality, and are open, transparent, thorough and sound. The NWMO is expecting to announce the final site selection for a used fuel repository in 2023 following a selection process that began with 22 communities which stepped forward. As this milestone approaches, there will be significantly greater scrutiny and pressure on the NWMO, governments and the two remaining potential siting areas.

**Suncor Energy Inc.**

**2020 Calgary, AB**

Represent the Suncor Reclamation and Closure team in a collaborative co-reclamation project with the Fort McKay First Nation and personnel from the University of Calgary and the University of Waterloo. Participate in the development of mutually agreed-upon goals and objectives. Follow the Code of Conduct for the project which is based upon a Cycle of Respect developed with the assistance of co-researchers and elders from the Fort McKay First Nation.

**Oil Sands Monitoring Program**

**2018-2020 Alberta**

Served as Science Coordinator under the direction of Alberta Environmental Protection and Environment Canada and Climate Change. Planned and provided scientific facilitation for seven Integration Workshops for Terrestrial Biological Monitoring, Groundwater, Surface Water and Aquatic Biology, Atmospheric Deposition, Geospatial Science, Predictive Modelling and Mercury OSM Themes. The workshops were designed to ensure that all future monitoring addresses the OSMP goals and objectives such that there can be a direct connection between monitoring results and decision-making by federal and provincial governments and Indigenous communities. Duties included preparation of a Conceptual Framework designed to promote integration among scientific disciplines as well as between western science and Indigenous knowledge. A Workshop Summary Report and a Recommendations Report focussed on increasing integration were submitted in March, 2019, after which duties changed to the Lead for the Terrestrial Biological Monitoring (TBM) team and head of the Technical Advisory Committee for TBM. Duties included: managing the preparation of a fully integrated workplan which incorporated a new study design based on spatial and temporal stratification; and, facilitation of team workshops involving industry, academia, institutes, and Indigenous representatives; reporting to the OSMP management structure.

**District of Sparwood**

**2018 Sparwood, British Columbia**

On behalf of the District of Sparwood, conducting a review of a Socio-Community and Economic Effects Management Plan (SCEEMP) prepared by Teck in fulfillment of a Condition for the permit for the Baldy Ridge extension of the Elkview Coal Operations. Participating in a strategic planning workshop regarding

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the management of socio-community and economic impacts and assisting with the preparation of a revised SCEEMP prepared jointly by Teck and the District.

**Ktunaxa Nation Council** **2018 Cranbrook, British Columbia**  
Planning, facilitating and reporting an open house and a workshop on the results of the Elk Valley Cumulative Effects Management Framework assessment of cumulative effects on selected Valued Components.

**North Coal Ltd.** **2017-June 2018**  
Senior advisor with respect to water quality (with emphasis on selenium), aquatic biology, strategic approaches to mine design, and public engagement.

**BC Liquefied Natural Gas Environmental Stewardship Initiative 2017: Victoria, BC**  
Planning, facilitating, and reporting a workshop on cumulative effects of human activities, with a focus on LNG development in the North Coast region of British Columbia. Cumulative effects on the natural environment, human health and well-being, and social and cultural values were all discussed. Workshop participants represented five First Nations, indigenous agencies, provincial ministries and federal departments and agencies.

**BC Ministry of Environment “Bio Advanced Bootcamp Training” – Communicating Risk** **2017: Victoria, BC**  
Interactive presentation to BC Ministry of Environment staff on basic principles of risk communication. Specific topics included : the causes of outrage associated with environmental risks; how to reduce outrage and engage with communities regarding tolerable risk; what is meant by “meaningful engagement” with indigenous peoples; and, making science accessible.

**Canadian Energy Research Institute** **2017: Calgary, AB**  
Invited presentation to the annual Symposium regarding engagement with Indigenous peoples.

**Royal Society of Canada Expert Panel on Impacts of Crude Oil Spills** **2015-2016: Ottawa, Ontario**  
Member of an expert panel on the Behaviour and Environmental Impacts of Crude Oil Released into Aqueous Environments. Duties included stakeholder consultation, compilation and review of information related to oil spill case studies, and review of risk assessments and impact assessments which addressed environmental impacts of theoretical oil spills from tankers and pipelines. .

**Ktunaxa Nation Council** **2016: Cranbrook, British Columbia**  
Facilitation of workshops and internal meetings regarding the development of a Strategic Plan for the Ktunaxa All Living Things initiative. Preparation of a draft Strategic Framework, including a Communication Plan for engagement with Ktunaxa communities.

**CanAus Coal Ltd. (now North Coal Ltd.)** **2015-2016: Sparwood, British Columbia**  
Senior advisor to the Communication Team with emphasis on engagement with regulatory agencies, elected officials, the Ktunaxa Nation, and community groups. Strategic advice regarding communication planning and management of issues related to social license. Assistance with public consultation and preparation of written materials. Facilitator of Environmental Assessment team technical meetings. Lead and facilitator for the Water Advisory Group – a third-party group of experts in mine design, closure planning and water quality.

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### **BC Hydro**

**2015-2017: British Columbia**

#### **Analysis of Entrainment Caused by the Aberfeldie Generating Station and Selection of Offsetting Option**

Facilitation of a series of workshops regarding determination of the effects of entrainment of fish caused by the Aberfeldie hydroelectric facility and the subsequent determination of the nature and extent of habitat compensation requirements. Involves stakeholders from provincial and federal government agencies as well as the Ktunaxa Nation Council.

### **Elk Valley Cumulative Effects Management Framework**

**2012-2015: British Columbia**

Facilitator of a collaborative, multi-stakeholder initiative with the goal of producing a practical, workable framework that supports decision related to assessment, mitigation and management of cumulative effects in the Elk Valley, BC. Participants include Teck, the Province of BC, the Ktunaxa Nation Council, federal agencies, municipal representatives, and NGOs. Activities included a number of multi-stakeholder workshops where formal consensus on key decision items was achieved.

### **Elk River Alliance**

**2012-present: Fernie, British Columbia**

Facilitator of community meetings regarding the selenium issue in the Elk River as well as flood planning and mitigation. Duties included presentation of technical materials in lay language. Presentations on aquatic ecology and water quality to junior high school and high school students. Instructor at a “Know Your Watershed” Teacher’s Institute.

### **Chair, Joint Review Panel**

**2012-2015: Ottawa, Ontario**

#### **Joint Review Panel for Deep Geologic Disposal of Low and Intermediate Level Nuclear Waste in Canada.**

Duties included chairing two environmental hearings with broad stakeholder, First Nations, and Métis involvement, including elected officials, federal, provincial and municipal representatives, NGO’s, user groups, the Saugeen Ojibway Nations, the Mindoo Mmissing, the Historic Saugeen Métis and the Métis Nation of Ontario.

### **Teck Coal Strategic Advisory Panel on Selenium Management**

**2010-2012: British Columbia and Alberta**

Chair of Panel. Panel Goal was to provide independent, expert advice and assistance by producing a strategic plan for the sustainable management of selenium at Teck Coal operations. Included facilitation of a number of workshops in the Elk Valley of BC and the Hinton area of Alberta, including federal, provincial and municipal representatives, elected officials, the Ktunaxa Nation Council, the Alexis Nakota Sioux, NGO’s, fish and game associations, and other user groups.

### **Teck Coal**

**2012: British Columbia**

#### **Facilitation of Workshop on HSI Curve Validation**

Duties included assistance with agenda preparation and assistance with facilitation. The workshop involved representatives of Teck (including consultants), provincial and federal regulators, and the Ktunaxa Nation Council.

### **Diavik Closure Panel:**

**2010-2013: Northwest Territories**

Advisor to Diavik Diamond Mines Inc regarding closure plans for a diamond mine located on Lac De Gras, NWT. Responsibilities included preparation of advisory reports.

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### **Syncrude Canada Ltd. SLRTAP Alberta**

**2002-2009: Fort McMurray,**

Member of Syncrude Land Reclamation Technical Advisory Panel. Provided ecotoxicological, risk assessment and aquatic biological expertise to the deliberations of the panel. Responsibilities included regular attendance at panel meetings and contributions to panel recommendations reports.

### **Syncrude Canada Ltd. Base Mine Lake Project**

**2008-2010: Alberta**

Senior strategic assistance with the Base Mine Lake Project, which is the first demonstration of the water-capping of mixed fine tails in the Alberta oil sands region. Services included advice and assistance with public consultation strategy and facilitation of large, multi-disciplinary team workshops.

### **Ktunaxa Nation Council**

**2013: Cranbrook, British Columbia**

#### **All Living Things Workshop**

Co-facilitator of an All Living Things Workshop for the Ktunaxa Nation Council which focused on Species at Risk work happening on the Ktunaxa Traditional Territory. Duties included: agenda preparation, assistance with the coordination and facilitation of the workshop, and workshop outputs.

### **Teck Coal**

**2012-2014: British Columbia and Alberta**

#### **Data Quality Objectives Workshops**

Design and facilitation of technical DQO Workshops for the following projects in order to ensure that data collected were appropriate and sufficient in terms of answering key questions posed by senior management:

1. Calcite monitoring program: internal Teck workshop
2. Westslope cutthroat trout population study: a series of workshops involving Teck, regulators, Ktunaxa and an external academic advisor; also assisted with planning and preparation for a public information session
3. Aquatic Effects Monitoring Program: initial DQO workshop with Teck personnel
4. Kilmarnock Diversion project: internal Teck workshop
5. Confidential Remediation Pilot Project: internal Teck workshop
6. Use of DQO in Cumulative Effects Assessment: workshop with Wildsight, Ktunaxa, Elk River Alliance
7. DQO Training Workshop: Internal Teck workshop

### **Energy Alberta Corporation**

**2007: Alberta**

#### **Proposed Nuclear Power Plant**

Senior strategic advice regarding siting of a proposed nuclear power plant in Alberta. Duties included: planning for and conduct of public consultation meetings; meetings with federal and provincial regulators; interactions with elected officials; and, consultations with First Nations and Métis people.

### **External Review of Sudbury Soils Study and Associated Ecological Risk Assessment**

**2007-2009: Ontario**

External scientific reviewer of an ecological risk assessment of smelter-related emissions from Inco and Falconbridge operations in Sudbury. Duties included preparation of materials (e.g. "Ask the Expert" handouts) and participation in public meetings and open houses.

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### **Relative Risks of Offshore Oil and Gas Exploration in the Queen Charlotte Basin** **2005: British Columbia**

A review and assessment of the relative risks to marine ecosystem health of the Queen Charlotte Basin from possible oil & gas exploration using scientific information and stakeholder knowledge. Included facilitation of multi-disciplinary workshops and workshops involving First Nations, user groups (e.g. commercial fishermen) and academic researchers. The final report presented an assessment of effects on specific inshore & offshore marine habitats and a range of marine birds, mammals, fish and invertebrates.

### **Assembly of First Nations Workshop on High Level Nuclear Fuel Waste** **2005: Ottawa, Ontario**

One-day workshop on technical issues related to the long-term storage and/or disposal of high-level nuclear fuel waste. Participants were First Nation environmental coordinators from various regions across Canada.

### **A Review of Scientific Studies and Environmental Impacts Related to Lake Wabamun** **2004: Alberta**

Served on a Scientific Panel chaired by Dr. David Schindler that reviewed all past scientific studies of Lake Wabamun and evaluated evidence for impacts and current health of the lake.

### **De Beers Mining Canada Inc.** **2003-2004: Northwest Territories**

Communication of results of aquatic impact assessments and human health risk assessments to regulators and to communities, including Indigenous communities.

### **Risk Assessment Workshop for Aboriginal Representatives on Environmental Quality Committees** **2002: Saskatchewan**

One of the instructors at a one-day workshop presenting risk assessment principles in an accessible manner in northern Saskatchewan. Funded by Areva and Cameco Corporation.

### **Approach for Categorization of UVCBs on the DSL** **2000: Ottawa, Ontario**

Organized consultations with stakeholders and provided technical expertise in the development of the major steps of an approach for categorization of Unknown or Variable Composition Complex Reaction Products and Biological (UVCB) substances on Environment Canada's Domestic Substances List (DSL).

### **TransAlta Utilities: Coordination and Facilitation of Community Engagement Regarding Effects of Coal-Fired Power Plants** **1996-2000: Wabaman Lake, Alberta**

Work with the utility and a public advisory group to design and implement community engagement regarding the effects of two coal-fired power plants at Wabamun Lake. Duties included: facilitation of technical workshops, public workshops, and meetings of the community advisory group; preparation of technical materials in accessible language; and design of interactive workshops to demonstrate the biological characteristics of the lake.

### **Proctor and Gamble (later Weyerhaeuser Canada) 1990-1994: Grande Prairie, Alberta**

#### **Effects of Pulp Mill Discharges into the Wapiti River**

Director of a multi-year, multi-disciplinary study of the effects of pulp mill discharge on the Wapiti River. Duties included extensive consultation with regulators and community members and preparation of lay language materials.

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### **Council of Yukon Indians**

**1993: Whitehorse, Yukon**

#### **Ecological Risk Assessment Training Workshop**

A week-long training workshop for representatives of several Yukon First Nations. Duties included preparation of materials, and teaching in an outdoor workshop setting.

### **Northern River Basins**

**1992-1993: Edmonton, Alberta**

#### **Management Committee for the Northern Rivers Basins Human Health Study**

Member of the Management Committee. Duties included: technical review of information; provision of information in accessible language; and participation in public workshops in several communities in the Athabasca and Peace River basins.

### **Saskatchewan Water Corporation**

**1995: Regina, Saskatchewan**

#### **Evaluation of Human and Livestock Risks from Groundwater**

Investigation of a complaint that groundwater had become contaminated by a city sewage lagoon. Included expert testimony and interaction with the complainant and his family members to explain the technical information and involve a family physician who assisted with identifying possible causes of their concerns.

### **Imperial Oil Ltd.**

**1993: Calgary, Alberta**

#### **Human Health and Ecological Risks Associated with a Natural Gas Plant**

Director of a risk assessment associated with releases to groundwater at a natural gas plant. Duties included engagement with neighbouring community members potentially affected by the discharge.

### **Scientific Review Group: High-Level Nuclear Waste**

**1989-1993: Ontario**

Member of Scientific Review Group evaluating Atomic Energy of Canada Ltd.'s proposal for deep geological disposal of high-level nuclear waste, 1990 - 1996. Included consultation with a wide variety of stakeholders, preparation of materials in accessible language, and appearance at the Seaborne Panel hearings into the Deep Geologic Disposal of High-Level Nuclear Waste.

## **ENVIRONMENTAL IMPACT ASSESSMENT**

### **RECENT**

### **Impact Assessment Agency of Canada**

**January, 2020 -present, Ottawa, Ontario**

Preparation of a "mock chapter" illustrating the application of the requirements for sustainability assessment under the Impact Assessment Act. The mock chapter was written in accordance with the Interim Framework for Implementation of the Sustainability Guidance provided to support practitioners. Tasks included selection of illustrative examples of applying the sustainability principles presented in the Act.

### **Alberta Energy Regulator**

**March 2019-present, Alberta**

Provision of subject matter expert services to the Grassy Mountain Coal Project Joint Review Panel regarding aquatic toxicology, aquatic biology, human health and wildlife health risk assessment. Duties included review of the EIA and subsequent Addenda, preparation of information requests, hearing preparation,

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assisting the Panel and legal counsel during the hearing, and contributions to the decision report (due in June 2021).

### **North Coal Ltd.**

**2017-June 2018**

Senior advisor with respect to water quality (with emphasis on selenium), aquatic biology, human health and ecological risk assessment, strategic approaches to mine design, and public engagement.

### **Kefer Ecological Services Ltd. for the Ulkatcho First Nation and Lhoosk'uz Dene First Nation.**

**2016-2018 Anahim, British Columbia**

Review of the New Gold Blackwater Mine Environmental Assessment, including EA methodology, surface water flow, surface water quality, fish and fish habitat, wetlands, human health assessment, accidents and malfunctions, and cumulative effects assessment. Duties include preparation of summary materials in lay language.

### **CanAus Coal Ltd.**

**2015-2016: Sparwood, British Columbia**

Senior advisor to the Environmental Assessment team regarding water quality and ecological risk. Leader and facilitator of the Water Advisory Group – a third-party group of experts in mine design, closure, and water quality.

### **Chair, Joint Review Panel**

**2012-2015 Ottawa, Ontario**

Chair of the Joint Review Panel for Deep Geologic Disposal of Low and Intermediate Level Nuclear Waste in Canada. Operated under the authority of the Canadian Nuclear Safety Commission and the Canadian Environmental Assessment Act. Responsible for the review of the Environmental Impact Statement under the CEAA process, preparation of a report to the Minister of Environment, and the licensing of the site preparation and construction phases of the project under the CNSC regulations. Duties included chairing two environmental hearings with broad stakeholder, First Nations, and Métis involvement, including elected officials, federal, provincial and municipal representatives, NGO's, user groups, the Saugeen Ojibway Nations, the Mindoo Mmissing, the Historic Saugeen Métis and the Métis Nation of Ontario.

## **OIL SANDS**

**NOTE: All of the following EIAs included provision of aquatic health and/or human health and ecological risk assessment services.**

### **Petro-Canada Meadow Creek Project**

**2001: Alberta**

Senior review of aquatic health component of an environmental impact assessment for the proposed Meadow Creek Project in Northern Alberta.

### **OPTI Canada Inc. Long Lake Project**

**2005: Alberta**

Senior review of aquatic health component of an environmental impact assessment for the proposed Long Lake In-Situ Oil Sands Project in Northern Alberta.

### **Suncor Energy Inc., Steepbank Mine**

**1995-1997: Fort McMurray, Alberta**

Aquatic health component of the environmental impact assessment of the proposed Steepbank Mine on the aquatic ecosystems of the Athabasca and Steepbank rivers.



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**Syncrude Aurora Mine** **1996-1997 : Fort McMurray, Alberta**  
Senior review of aquatic health component of the environmental impact assessment of the proposed Aurora Mine on the aquatic ecosystem in the Muskeg River system.

**Canadian Natural Resources Ltd. Horizon Mine****2003-2004: Fort McMurray, Alberta**  
Senior review and hearings presentation regarding aquatic health component of the environmental impact assessment of potential impacts of the Horizon Mine.

**Shell Canada Limited Jackpine Mine - Phase 1 EIA** **1997: Fort McMurray, Alberta**  
Senior review of the aquatic health component of the environmental impact assessment completed for Shell's Jackpine Mine – Phase 1 EIA.

**Suncor Energy Inc. Project Millennium** **1997-1998: Fort McMurray, Alberta**  
Senior review of the aquatic health component of the environmental impact assessment completed for Suncor's Project Millennium.

**Suncor Energy Inc. Voyager Project** **2005-2005: Fort McMurray, Alberta**  
Senior review of aquatic health component of the environmental impact assessment for Suncor's Voyager Project, which included the North Steepbank Expansion Mine and the Voyager Upgrader.

**Suncor Energy Inc., Oil Sands South Tailings Pond Project** **2004: Fort McMurray, Alberta**  
Senior review of the aquatic health component of the environmental impact assessment for Suncor's South Tailings Pond Project.

**Imperial Oil Kearl Oil Sands Project** **2004-2005: Fort McMurray, Alberta**  
Senior review of the human health, wildlife health and aquatic health components of the environmental impact assessment initiated for the proposed Kearl Oil Sands Project.

### **MINING, NUCLEAR, PETROCHEMICAL, AGRICULTURE, POLICY**

**De Beers Mining Canada Inc.** **2002-2004: Northwest Territories**  
Aquatic health component of the environmental assessment for a proposed underground diamond mine at Snap Lake, Northwest Territories. Included communication of results to regulators and to communities, as well as testimony at hearings.

**Telus Corporation** **2002: British Columbia**  
Senior review of environmental impact assessments of several fibre-optic cable installations in marine habitats offshore of the lower mainland of British Columbia and Vancouver Island.

**Companhia Vale do Rio Doce** **2003: Brazil**  
Senior review of environmental impact assessment prepared for CVRD for a proposed steel manufacturing complex on the coastline of Brazil.

**Voisey's Bay Nickel Project** **1999: Labrador**  
Participated in a decision analysis and performance assessment of various tailings storage and treatment options.

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### **Approach for Categorization of UVCBs on the DSL**

**2000: Ottawa**

Project manager and key technical specialist in the development of an approach for categorization of Unknown or Variable Composition Complex Reaction Products and Biological (UVCB) substances on Environment Canada's Domestic Substances List (DSL). Organized consultations with stakeholders and provided technical expertise in the development of the major steps of the framework.

### **Ontario Power Generation**

**2002-2003: Ontario**

Environmental assessment of the Return to Service of the Pickering A Nuclear Generating Station: Aquatic environment section.

### **Amoco Canada Ltd.**

**1995: Alberta**

Assessment of potential human health impacts from a proposed petrochemical plant using risk assessment methods. Communicating the results to the public.

### **Alberta Agriculture and Rural Development**

**1999: Alberta**

A study of the potential effects of growth in intensive livestock operations (hog facilities, cattle feedlots) on air quality, soil quality, groundwater, surface water and public health in Alberta.

### **Diavik Diamond Mines Inc.**

**1998-1999 : Lac de Gras, Northwest Territories**

Senior review of aquatic impacts components of the EIA for a proposed diamond mine in the N.W.T.

### **Kennecott Corp.**

**1996-1997 : Lac de Gras, Northwest Territories**

Study Director of multi-disciplinary baseline study including: water quality; fisheries; wildlife; vegetation; soils and terrain; historical resources; hydrology. Responsible for integration with Engineering Pre-Feasibility studies, and responsible for planning process for impact assessment.

### **Teck Corp.**

**1997: Panama**

Study Director for Phase I environmental studies (Preliminary Evaluation) for a copper mine development in Panama. Includes issues scoping and provision of a summary document on existing environmental data for the area. Evaluation of potential sites for management of tailings for a proposed nickel mine at Voisey's Bay, Newfoundland.

### **Uranium Mine/Mill Impacts**

**1982-1995: Ontario/Saskatchewan**

- Review of biophysical effects of uranium mine tailings in Canada, 1994-95.
- Analysis and Interpretation of radionuclide data from the former Port Radium site in the N.W.T.; communication of findings to the community of Deline, N.W.T.
- Aquatic environment portion of the Environmental Impact Assessment of the Dominique-Janine Extension to Cluff Mining's uranium operations in northern Saskatchewan, 1990-91.
- Amok Cluff Lake Phase II EIS (uranium mine), 1982.
- Midwest Lake Uranium Test Mine monitoring program, 1988.
- Overview of abandoned uranium mines in northern Saskatchewan, 1981.

### **Gold Mine/Mill Impacts**

**1987; 1990-1991: Saskatchewan**

Aquatic environment portion of the Environmental Impact Assessment of the Seabee gold mine in northern Saskatchewan, Claude Resources, Saskatoon, 1990-91. Aquatic impacts from gold mill effluents, 1987.

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### **Status of the Environment Report**

**1990-1991: Saskatchewan**

Preparation of a Status of the Environment Report for Amok Ltd. regarding its Cluff Mining operations, comparing predicted impacts with actual impacts seen in monitoring, 1990-91.

## **RISK ASSESSMENT/PERFORMANCE ASSESSMENT / RISK-BASED ANALYSIS OF ENVIRONMENTAL ISSUES**

### **Millennium EMS Ltd.**

**2019-2020 Calgary, AB**

Senior advisor for ecological risk assessment of a reclaimed oil sands tailings storage facility

### **Millennium EMS Ltd.**

**2018 Calgary, AB**

Senior risk assessment specialist providing advice and review regarding the establishment of risk-based triggers for management of seepage from an oil sands tailings storage facility.

### **Andrew Lees Trust**

**2018 London, UK**

Review of the release of naturally occurring radioactive materials from an Ilmenite mine in Madagascar, with emphasis on incremental radiation doses received by the general public living in the vicinity of the mine.

### **Syncrude Canada Ltd. Base Mine Lake Project**

**2008-2010: Calgary, Alberta**

Senior strategic assistance with the Base Mine Lake Project, which is the first demonstration of the water-capping of mixed fine tails in the Alberta oil sands region. Services include advice and assistance with environmental management planning, literature reviews, compilations of relevant science, regulatory strategy, public consultation strategy, risk analysis and decision analysis

### **Energy Alberta Corporation**

**2007: Alberta**

Senior strategic advice regarding siting of proposed nuclear power plant in Alberta. Planning for the federal environmental assessment process and assistance with required submissions to the Canadian Nuclear Safety Commission

### **Confidential Client**

**2008: Calgary, Alberta**

Prepare for, conduct and report on a Workshop to prepare for an ecological risk assessment of a reclaimed tailings facility. Ensure that the accumulated knowledge regarding the tailings area was reviewed and used effectively within the risk assessment framework. Ensure that risk assessment was appropriately framed.

### **Federal Contaminated Sites Action Plan (FCSAP)**

**2010-2011: Ottawa, Ontario**

Evaluate and recommend third party review processes for projects within the FCSAP program.

### **Confidential Client Ecological Risk Assessment of Contaminated Water**

#### **And Sediments in a National Historic Site**

**2009: British Columbia**

Senior review of sampling plans, problem formulation and risk assessment.

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### **Conservation Council of New Brunswick**

**2009: New Brunswick**

Review ecological risk assessment component of Environmental Impact Assessment conducted for proposed refinery in Saint John, NB

### **Tetres Consultants**

#### **Peer Review of Remediation Work**

**2009: Manitoba**

Expert review of ecological risk assessment performed in support of remediation of the East Tailings Management Area, Lynn Lake, Manitoba by Viridian Inc. and Manitoba Mines Branch

### **Confidential Client**

#### **Ecological Risk Assessment of Mine Tailings**

**2009: Northwest Territories**

Expert review of ecological risk assessment of tailings deposits in a river in the NWT. Mentoring of staff involved in the risk assessment.

### **Teck Resources Ltd.**

**2000-2007: Trail, British Columbia**

#### **Ecological Risk Assessment**

Project Director for a landscape-scale aquatic and terrestrial ecological risk assessment. This multi-year project used a new approach for the development of a weight of evidence for risk assessment. The lines of evidence included several field studies in the aquatic and terrestrial environment, laboratory toxicity testing and biophysical habitat mapping. Responsibilities included strategic co-ordination of risk assessment activities with the Columbia River Integrated Environmental Monitoring Program (CRIEMP) and liaison between the client, risk assessment team, regulatory authorities and the public.

### **Kerr-McGee Chemical Worldwide, Western Nuclear Inc. and Fremont Lumber Co.**

#### **White King/Augur Creek**

**2003-2004: Oregon, USA**

#### **Ecological Risk Assessment at Flooded Uranium Open Pit Mine**

Aquatic ecological risk assessment at flooded uranium open pit mine. Included caged mussel study for uptake of metals and radionuclides, benthic invertebrate community field study, exposure modelling for aquatic and terrestrial receptors, and full risk assessment report. Also included follow-up monitoring plan and consultation with US EPA and Oregon Department of Environmental Quality

### **New Brunswick Power**

**2001-2002: New Brunswick**

#### **Comparative Ecological Risk Assessment**

#### **Related to a Change of Fuels at a Power Plant**

Conducted a comparative ecological risk assessment of the proposed conversion of the New Brunswick Power Coleson Cove power plant to Orimulsion® fuel. Included risks to a wide range of marine birds, mammals, fish, plants and invertebrates from selected spill scenarios involving transportation of Bunker C versus Orimulsion® in the Bay of Fundy. Served as a senior risk assessor on a multi-disciplinary team from USA and Canada.

### **British Columbia Ministry of Environment**

**2001: Victoria, British Columbia**

#### **Guidance for Conducting Human Health and**

#### **Ecological Risk Assessments for the Mining Industry**

Developed key steps and general guidance for use by the mining industry when performing human health or ecological risk assessments. Funded by British Columbia Ministry of Environment and Teck Cominco.

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### **Department of Indian Affairs and Northern Development**

**2006: Northwest Territories**

Senior review for the human health and ecological risk assessment to assist in prioritizing areas of the former Tundra Gold Mine for remediation and reclamation. Areas were identified by historical activities on the site and ranked according to the magnitude of risk estimated for human, wildlife and aquatic receptors.

### **Kinross Gold Corporation**

**2006: Nunavut**

Senior review for a quantitative ecological risk assessment in support of Kinross' closure plans for the Lupin Gold Mine. Risks to ecological health resulting from the tailings containment area were assessed.

### **Encana Corporation Risk-based Remediation Plan for the Inactive Lorado Uranium Tailings**

**2004: Uranium City, Saskatchewan**

Senior risk assessor for the risk-based remediation of the inactive Lorado uranium tailings site near Uranium City, Saskatoon. Includes study design, senior review, public consultation and regulatory workshops.

### **Trans Canada Pipeline Corporation Management of Environmental Risks**

**2004: Calgary, Alberta**

Participation in the development of a risk-based model which identified high-priority environmental and regulatory risk locations along pipeline routes.

### **Public Works Canada**

**2001: Yukon**

Senior review for the wildlife health risk assessment component for an airport site and former military base in Watson Lake, Yukon.

### **Defence Construction Canada**

**2002: Yukon**

Senior review for the wildlife health risk assessment component for a Distant Early Warning (DEW-Line) Site in Shingle Point, Yukon. The results were used to assist with decisions regarding remediation activities for the site.

### **Syncrude Canada Limited**

**2002-2003: Alberta**

Project Director and senior review and regulatory liaison for a wildlife and aquatic risk assessment using a weight of evidence approach to evaluate exposure to process water. Results were communicated with provincial regulators.

### **Low-Level Nuclear Waste**

**2002: Ontario**

Design of a performance assessment methodology for evaluation of low-level radioactive waste disposal facilities.

### **High-Level Nuclear Waste**

**1989-1993: Ontario**

Member of Scientific Review Group evaluating Atomic Energy of Canada Ltd.'s proposal for deep geological disposal of high-level nuclear waste, 1990 - 1996. Included consultation with a wide variety of stakeholders and appearance at the Seaborne Panel hearings into the Deep Geologic Disposal of High-Level Nuclear Waste.

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### **BHP Billiton Diamonds Inc. 1997-1998: Lac de Gras, Northwest Territories**

Senior review for a quantitative ecological risk assessment in support of BHPB's reclamation and abandonment plan research. BHPB's plan is to stabilize processed kimberlite with vegetation and the risk assessment evaluated the potential risks associated with wildlife foraging on the vegetation. Human health risks associated with eating game meat were also evaluated. Also acted as project manager.

### **Public Works Canada 1999-2000: Northwest Territories/Nunavut**

Senior review for the wildlife health risk assessments for several former military sites throughout the NWT and Nunavut with historical fuel contamination.

### **Miramar Hope Bay Ltd. 2000: Nunavut**

Senior review of the wildlife health components of an environmental assessment for a proposed gold mine at Hope Bay, Nunavut. A risk assessment framework was used to evaluate the potential impacts that disposal of mine tailings underwater might have on human, wildlife and aquatic health.

### **De Beers Mining Canada Inc. 2005-2006: Northwest Territories**

Senior review of the wildlife and human health components of an environmental assessment for a proposed underground diamond mine at Snap Lake, Northwest Territories. A risk assessment framework was used to evaluate the potential impacts that the mine might have on human and wildlife health. As part of the assessment, an environmental sampling program for snow, soil and lichen was designed and implemented. Results of the environmental assessment were presented to regulators and to communities.

### **Rio-Alto Exploration 2001: Alberta**

Senior review of the human health and wildlife health components of an environmental impact assessment for the proposed Kirby Project in Northern Alberta.

### **TransAlta Utilities: Risk-Based Evaluation of Environmental Impacts and Mitigation Options at a Coal-Fired Power Plant**

**1996-2000: Wabamun Lake, Alberta**

Work with the utility and a public advisory group to design environmental studies, conduct the studies and evaluate the results in order to develop recommendations for mitigation options that were in accordance with environmental risk as well as benefits to the community. Duties included: facilitation of technical workshops, public workshops, and meetings of the community advisory group; preparation of technical materials in accessible language; and design of interactive workshops to demonstrate the biological characteristics of the lake.

### **Remediation at a Former Military Base 1996-1997: Alberta**

Develop risk-based criteria for contaminants in soil and water in support of establishment of remediation measures.

### **Risk Management at an Operating Petrochemical Plant Site 1994: Alberta**

Develop risk-based criteria for screening contaminant levels in soil and groundwater. Use screening results to determine requirements for remediation and risk management.

### **Risk-Based Reference Concentrations 1999: Northwest Territories**

Development of risk-based reference concentrations in support of the assessment of impacts on wildlife at a proposed diamond mine.

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### **Utility Company Risk Management**

**1998-1999: Alberta**

Provide instruction and assistance with environmental issues management, public consultation, risk communication and risk assessment.

### **Zinc Smelter/Fertilizer Plant Site Risk Assessment**

**1998: Illinois, U.S.A.**

Provide input to ecological risk assessment of the site, including scoping memoranda and study designs for the RI/FS (Resource Inventory / Feasibility Study).

### **Ecological Risk Assessment at the Inactive Blackbird Copper/Cobalt Mine**

**1998: Idaho, U.S.A.**

An assessment of the risks to the riparian community from mine-related deposits in the floodplain of Panther Creek, Idaho, a Superfund site. The assessment evaluates the vegetation community as well as small mammals, passive bird, ungulate, and raptor receptors.

### **Industrial or Commercial Site Risk Assessments**

**1994-1999: Alberta/Northwest Territories**

Screening-level ecological risk assessment of contaminant issues at an operating wood treatment facility.  
Screening-level ecological and human health risk assessment of salt contamination from an oil well site.  
Screening-level human health risk assessment of BTEX contamination from an oil well site.  
Screening-level human health risk assessment: historical contamination from an oil refinery.  
Risk assessment at the site of a spill of petroleum product.  
Screening - level risk assessment of human health implications from an incident involving PCBs.  
Human Health Risk Assessment of air emissions and water discharges from a petrochemical plant.  
Risk management of a site with soil and groundwater contamination resulting from operations of a commercial testing laboratory.  
Human health risk assessments of several commercial properties with historic petroleum hydrocarbon contamination.  
Human health risk assessment of dry-cleaning compounds in a commercial property.

### **Risk Assessment of 27 Sites Affected by Diesel Spills**

**1998-1999: Northwest Territories**

An assessment of the risks to human health from historic diesel spills.

### **Natural Gas Plant Risk Assessment**

**1994: Alberta**

Human Health and Ecological Risk Assessment at a natural gas processing plant with historical groundwater contamination.

### **River Crossing Risk Assessment**

**1998: Alberta**

An ecological, geotechnical and human health risk assessment of a waterman involving a site with high ecological sensitivity and existing contamination with hazardous waste.

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**MULTI-DISCIPLINARY ENVIRONMENTAL  
MONITORING/ENVIRONMENTAL EFFECTS MONITORING**

**Environment Canada and Climate Change; Alberta Environment and Parks**

**2018-2019 Calgary, AB**

Science Coordinator for the Oil Sands Monitoring Program with emphasis on increasing the level of integration among the various scientific disciplines currently conducting monitoring OSMP monitoring. Duties include: provision of an overarching Conceptual Framework based upon the principles of Adaptive Management which will be used as the basis for all future OSMP projects; planning and facilitating seven workshops; and, preparation of workshop reports and recommendations.

**Total Corporate Environmental Monitoring Strategy**

**2012-2013: Alberta**

Review and assess monitoring, reporting and data management practices for the mining, in-situ and upgrading business units of Total's oil sands operations. Prepare a holistic monitoring and reporting strategy that considers community engagement, long range planning and feedback of operational data back into the planning system.

**Kerr-McGee Chemical Worldwide, Western Nuclear Inc. and Fremont Lumber Co  
White King/Augur Creek**

**2003-2004: Oregon, USA**

Study design, supervision, regulatory liaison and senior review of reports related to monitoring studies at a closed uranium mine site designated as a Superfund site.

**Ontario Ministry of Environment**

**2004: Ontario**

**Moira River Study**

A study of the effects of elevated metal concentrations in the Moira River system in Ontario as a result of 100 years of mining and refining at the Deloro Mine Site. The study included: analysis of water and sediment quality; assessment of effects on benthic invertebrates and fish; a Preliminary Quantitative Human Health Risk Assessment; and, predictive modelling to examine the long-term effects on water and sediment quality resulting from clean-up of the Deloro Mine Site.

**Imperial Oil Ltd**

**2000: Northwest Territories**

**Norman Wells Aquatic Effects Monitoring**

An investigation of effects of discharges to the MacKenzie River from Imperial Oil's Norman Wells facility. Includes water and sediment quality, toxicity tests and effects on invertebrates and fish in the river.

**Sproat Lake Toxicity Evaluation**

**1999: British Columbia**

An investigation of the toxicity of run-off water at a log sorting facility on Vancouver Island.

**Regional Aquatic Monitoring**

**1999: Alberta**

Senior review of design for a long-term regional aquatic monitoring program on behalf of oil sands companies in northeastern Alberta.

**Government of the NWT**

**1997: Yellowknife, NWT**

**Aquatic Effects Monitoring**

Expert reviewer of draft AEM Guidelines for the N.W.T.



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### **Public Works Canada**

**1997: Edmonton, Alberta**

#### **Rayrock Pre and Post - Reclamation Monitoring**

Design of multi-disciplinary monitoring study at an abandoned uranium mine/mill site in the NWT.

### **Proctor and Gamble (later Weyerhaeuser Canada Ltd.) 1990-1994: Grande Prairie, Alberta**

#### **Wapiti/Smoky Ecosystem Study**

Director of a multi-disciplinary study of the effects of effluent from a bleached kraft pulp mill, 1990-92. Follow-up monitoring for contaminant concentrations. Follow-up research on ecosystem effects, 1992-94.

### **Alberta Pacific Forest Company**

**1991-1992: Athabasca, Alberta**

#### **Athabasca River Environmental Baseline**

Pre-operational monitoring study to establish baseline aquatic environment information and implement a long-term monitoring program for the operational phase of a new bleached kraft pulp mill, 1991-94. Fisheries, water quality, sediment chemistry, aquatic invertebrates.

### **Environmental Effects Monitoring for Pulp Mills**

**1990-1998: Alberta/Saskatchewan**

- Environmental Effects Monitoring Cycle 2 Design at Weyerhaeuser Prince Albert Pulp Mill, Saskatchewan, 1998.
- Environmental Effects Monitoring Pre-Design at Weyerhaeuser Grande Prairie Pulp Mill, 1993-94. Includes plume delineation, habitat inventory and classification, interpretation of historical water quality, sediment chemistry, invertebrate and fisheries data, and design of the formal EEM program on adult fish and invertebrates.
- Environmental Effects Monitoring Pre-Design at Alberta Newsprint, Whitecourt Pulp Mill. Includes study design, regulatory liaison and assistance with report preparation, 1993.
- Environmental Effects Monitoring Pre-Design at Daishowa Peace River Pulp Mill. Input to study design, 1993.
- Environmental Effects Monitoring Pre-Design at Weldwood Hinton pulp mill, 1994. Includes plume delineation, habitat inventory and classification, interpretation of historical water quality, sediment chemistry, invertebrate and fisheries data, and design of the formal EEM program on adult fish and invertebrates.

### **Weyerhaeuser Canada Ltd.**

**1991-1992: Saskatchewan**

#### **North Saskatchewan River Ecosystem Monitoring**

Weyerhaeuser Canada river study for Prince Albert Pulp and Paper to implement ecosystem-level monitoring downstream of a bleached kraft pulp and paper mill 1991-92. Fisheries biology, water quality, plume delineation.

### **Suncor Oil Sands Expansion EIA Design**

**1994: Northern Alberta**

Environmental Impact Assessment methods review, identification of data gaps, baseline study design: aquatic biology, 1994.

### **BHP Risk-Based Wildlife Monitoring Plan**

**1998: Northwest Territories**

A risk-based monitoring plan for wildlife for a diamond mine in the N.W.T. The plan integrates ecological, social and aboriginal issues.

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### **Natural Resources Canada EEM for Mining**

**1998: Various Canadian Locations**

A field study at four Canadian mine sites to investigate the validity, practicality and cost-effectiveness of aquatic monitoring tools.

## **EXPERT WITNESS**

### **Canadian Natural Resources Ltd.**

**2003: Alberta**

Provided expert testimony to Joint Federal/Provincial Panel hearings regarding application for a licence for an oil sands operation.

### **De Beers Canada Mining Ltd.**

**2002: Northwest Territories**

Provided expert testimony and technical presentations to Mackenzie Valley Environmental Impact Review Board hearings, Water Board hearings and Technical Sessions regarding applications for licences for a diamond mine.

### **TransAlta Utilities Corporation**

**2001: Alberta**

Provided expert testimony at two Alberta Environment Appeal Board Hearings regarding licence renewals for a coal-fired power plant on Wabamun Lake.

### **Ontario Ministry of the Environment**

**2002: Ontario**

Provided expert testimony in the court case of the Sierra Legal Defence Fund versus the Ontario Ministry of the Environment. The case was regarding the effects of long-term metal contamination of a river system.

### **Saskatchewan Water Corporation**

**1995: Saskatchewan**

Testified to the Saskatchewan Water Appeal Board to the cause of bacteriological illness reported by a farming family allegedly linked to groundwater and surface water quality.

### **Alberta Wilderness Association**

**1994: Alberta**

Provided expert testimony on behalf of the Alberta Wilderness Association at the Natural Resources Conservation Board. The focus was on water quality related to a large golf course and condominium development in the Bow River valley.

### **Canadian Nuclear Safety Commission Hearings**

**1994: Ontario**

Participated in public hearings regarding high level nuclear waste disposal under the Canadian Environmental Assessment Act (CEAA). As member of the scientific review group, commented on radiation exposure modelling for the biosphere component of the assessment.

### **Joint Panel Hearings – CEAA and Saskatchewan Environment**

**1996: Saskatchewan**

Provided scientific information regarding the potential effects of the proposed MacLean Lake/Midwest Lake Uranium Mines on the ecosystem.

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### **TOXICOLOGY REVIEW**

**Teck Coal** **2010-2013: Calgary, AB**  
Senior review and advice regarding the assessment and management of impacts from metallurgical coal operations in British Columbia and Alberta. Duties included maintaining a current understanding of the toxicological literature, with emphasis on selenium but including consideration of other constituents of concern.

**Confidential Client** **2007-2008: Edmonton, Alberta**  
**Review of the Toxicity of Naphthenic Acids**  
Literature review of all available information on the aquatic toxicity of naphthenic acids. Comparison of water quality objectives and criteria that would be developed from these data using different regulatory methods and approaches (Canada, Alberta, Australia).

**Water Environment Research Foundation** **2004: United States**  
**Multiple Stressors: Risk-based Framework and Experimental Design for Cause/Effect Relationships**  
Literature review and study design for Water Environment Research Foundation involving a multi-disciplinary team of academic, government and industry scientists. Duties included participation in a technical workshop and preparation of communication materials for WERF members.

**Confidential Client** **2004: Saskatchewan**  
**Review of Toxicity of Rare Earth Elements**  
Senior review of a literature review of the origin, use and toxicity of rare earth elements as part of an information package for a potential rare earth mine.

**Review of Toxicity Data Related to Discharges to the Marine Environment** **2003: Brazil**  
Senior review of toxicity test data conducted on various treatments of oily waste discharges in order to assess treatment effectiveness. Conducted for Petrobras.

**Environment Canada** **1990: Ottawa, Ontario**  
**Recommendations of Species for Testing of Non-Target plant Toxicity of Pesticides**  
A review of the suitability of plant species for use in standardized tests for toxicity of pesticides in Canada. Prepared for the Commercial Chemicals Branch of Environment Canada.

**Environment Canada** **1990: Ottawa, Ontario**  
**Guidelines for Testing for Non-Target Plant Toxicity of Pesticides**  
A review of test requirements, test protocols and testing results regarding pesticide toxicity to non-target plant species. The review encompassed European, North American, Australian and Japanese literature and experience.

**Toxicity of Diclofop-Methyl to Aquatic Organisms** **1989-1991: Canada**  
Supervised a Master's student in a study of diclofop-methyl toxicity using laboratory microcosms. The study included examination of effects on several trophic levels, as well as degradation and uptake into food chains.

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### **Manager of Aquatic Toxicity Testing Laboratory 1985-1990: Saskatchewan**

Managed an aquatic toxicity testing laboratory at the Saskatchewan Research Council, including establishment of standard operating protocols, training and certification procedures, document control and data auditing procedures.

### **Confidential Client Review of the Eco-toxicology of Nonylphenol Ethoxylates: 1998**

A review of all available eco-toxicity data for this group of compounds, including evaluation of the quality of the data and identification of data gaps.

### **Confidential Client Review of the Eco-toxicology of Various Compounds Used in Plastics Manufacturing Confidential 1998-1999**

A review of all available eco-toxicity data for several compounds used in plastics manufacturing, including evaluation of data quality, identification of data gaps and recommendations for further testing.

### **Northern River Basins Study 1999: Edmonton, Alberta Human Health Monitoring Program**

Preparation of a report summarizing the results of a human health monitoring study in the Northern River Basins area of Alberta. This included summarizing existing contaminant data relevant to human health concerns, describing epidemiology and risk assessment methods, presentation of the health monitoring data results, and recommending further research and monitoring.

### **Imperial Oil Ltd. 1994-1995: Calgary, Alberta Toxicity of Two Process Chemicals Used in Sour Gas Plants**

A review of the toxicity (human and ecological) of sulfolane and diisopropanolamine. Design of toxicity tests to fill data gaps. Interpretation of new information.

### **Indian Affairs and Northern Development Canada 1994-1995: Northwest Territories**

#### **Port Radium Data Interpretation**

Interpretation of contaminant levels at an abandoned radium/silver mine.

### **Natural Gas Plant Sludge Toxicity 1991: Alberta**

Development of tiered toxicity test schemes to be used in the evaluation of disposal options for natural gas plant sludges, 1991.

### **Coordination of Human Health-Related Risk Information 1991: Alberta**

Coordinate toxicological information of three companies operating petrochemical plants in the same geographical area.

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### **FOOD CHAIN AND WATER QUALITY MODELLING**

#### **Food Chain Transfer of Radionuclides**

**1981-1987: Saskatchewan**

Development of a food chain model for the bioaccumulation of uranium-series radionuclides in aquatic food chains of northern Saskatchewan.

Development of probability density distributions of bioaccumulation factors for uranium-series radionuclides for use in Atomic Energy Canada Ltd's LIMCAL food chain model

Review of the AECL food chain and dosimetry models developed for use in the Environmental Impact Assessment of Canada's High-Level Nuclear Waste Disposal Concept

#### **Water Quality Modelling**

**1991-2007: Saskatchewan and Alberta**

Contribution to the development of predictive water quality models for organic and inorganic chemical contaminants in freshwater systems for use in environmental impact assessments and risk assessments. Development of conceptual models, determination of critical assumptions, review and selection of empirical data for use in the modelling; review of model output; training in MINTEQ2 modelling of metal speciation and transport; review of fugacity model output for organic contaminants downstream of pulp mills.

### **AQUATIC TOXICOLOGY/ RADIOECOLOGY**

#### **Assembly of First Nations**

**2005: Ottawa, Ontario**

##### **Workshop on High Level Nuclear Fuel Waste**

Presented a one-day workshop on technical issues related to the long-term storage and/or disposal of high-level nuclear fuel waste. Participants were environmental coordinators from various regions across Canada.

#### **Shield Source Inc.**

**2001-2002: Peterborough, Ontario**

##### **Environmental Monitoring Plan and Ongoing Environmental Support for a Nuclear Process Facility**

Air dispersion modelling and design of an environmental monitoring plan for measurement of tritium in the vicinity of the Shield Source Inc. plant.

#### **Canadian Nuclear Safety Commission**

**1996: Ottawa, Ontario**

##### **Biophysical Effects of Uranium Mining**

A review of documented biophysical effects of uranium mines in Canada. Includes a detailed literature review of the effects of radiation on non-human biota, as well as a review of the toxicity of nickel and arsenic.

#### **Western Co-operative Fertilizers**

**1995: Calgary, Alberta**

##### **Assessment of a Former Uranium Processing Facility**

Senior review of Phase I and Phase II site assessments of the former Earth Sciences Inc uranium processing facility in Calgary. Conducted for Western Co-operative Fertilizers.

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### **Saskatchewan Water Corporation** **1995: Regina, Saskatchewan** **Evaluation of Human and Livestock Risks from Groundwater**

Investigation of a complaint that groundwater had become contaminated by a city sewage lagoon. Included expert testimony and interaction with the complainant and his family members.

### **Cameco Corp.** **1988-1989: Saskatoon, Saskatchewan** **Uranium Mine Effluent Toxicity**

Effects of a mine water spill at a uranium mine, 1989.  
Bioassays of two uranium mine effluents, 1988.  
Species battery tests of uranium mill effluents, 1988.

### **Ambient River Water Quality & Toxicity** **1988-1989: Saskatchewan** Species battery toxicity tests of South Saskatchewan River mixing zones, 1988. Bioassessment of the South Saskatchewan River using toxicity tests, 1989.

### **Saskatchewan Environment** **1989: Regina, Saskatchewan** **Acid Precipitation Effects**

Maximum acidifying potentials for the protection of sensitive Saskatchewan lakes, 1989.

### **Gold Mine/Mill Impacts** **1986-1987: Canada**

Cyanide and arsenic fate and effects in gold mining operations, 1986.  
A review of gold mine/mill effluents impacts on aquatic ecosystems in Canada, 1987.

### **Radionuclides in the Environment** **Various Funders**

#### **Northern Saskatchewan, Northwest Territories, Northern Ontario**

- Literature review of radionuclides in benthos, sediments and water, 1985.
- Bioaccumulation of radionuclides with reference to coal-fired power plants, 1982.
- Overview of uranium mine impacts, 1990.
- Natural uranium series radionuclides in upland vegetation of northern Saskatchewan and adjacent Northwest Territories, 1988.
- Food chain transfer of radionuclides downstream of uranium mines, 1982-84 - Saskatchewan.
- Effects of uranium mill effluents on wild fish physiological parameters and population parameters, 1984-1985, Saskatchewan.
- Accumulation of radionuclides in sediments and invertebrates at uranium mine sites in Saskatchewan and Ontario, 1985.
- Evaluation of the LIMCAL food chain model used in the Canadian high-level nuclear waste disposal program, 1988.
- Port Radium NWT: review of data on radionuclides in water, soil and biota, 1995.

### **Uranium Refinery Site** **1988-1989: Alberta** Phase I and II audits and identification of issues at a uranium refinery site. Conceptual design for decommissioning.

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### **Oily Wastes Toxicity**

**1988: Saskatchewan**

Toxicity to aquatic biota of oily wastes from the heavy oil industry, 1988. Bioassays to determine degree and source of toxicity.

## **APPLIED AQUATIC BIOLOGY**

### **Aquaculture**

**1986-1989: Saskatchewan**

Supervision of aquaculture program, Saskatchewan Research Council, 1986-89.  
Algae control in farm ponds, 1988-89.

### **Sewage Treatment**

**Saskatchewan**

Review of sewage treatment options, 1987.

### **Maintenance of Water Quality**

**Saskatchewan**

Evaluation of a pond oxygenation device, 1988.

### ADVISORY POSITIONS, ACADEMIC PROJECTS AND VOLUNTEER ACTIVITIES

#### Current

- Nuclear Waste Management Organization Advisory Council: 2020-Present. The Advisory Council is required by the Nuclear Fuel Waste Act and is comprised of individuals knowledgeable in the management of used nuclear fuel and in working with people and communities on public policy issues.
- Elk River Alliance Board of Directors: 2012-present. Member of the Board of Directors Elk River Alliance is a non-profit community-based organization focussing on watershed-scale planning, education, and research.
- Canadian Rivers Institute. Member of the Management Board. 2016-present. The CRI is a collaborative group of researchers in aquatic sciences with a focus on advancing knowledge of aquatic systems, forging industrial partnerships and government collaborations, and building the infrastructure to train and deliver the next generation of water resource scientists in Canada and abroad.
- Canadian Adaptive Network. 2018-present. Chair of the Board of Directors. The Canadian Adaptive Network is a non-profit organization with a vision of being a catalyst for creation of an inclusive society where people with disabilities have equal opportunity to participate in activities of their choosing and be defined by who they are, rather than by what they can or cannot do.
- Expert advisor to Andrew Lees Trust: 2019-present. Volunteer advice regarding human health and ecological risks associated with mining.

#### Past

- Diavik closure advisory panel. Advising on human health and ecological risks associated with closure and reclamation of the Diavik Diamond Mine in the NWT. 2008-2010.
- Advisor to Department of Indian Affairs and Northern Development regarding new aquatic effects monitoring requirements in the Northwest Territories. 1996-97
- Member of the Scientific Review Group to the FEARO Panel on the Disposal of High-Level Nuclear Waste in Canada, 1990-1996.
- Advisor to the FEARO Panel on the proposed Kiggavik uranium mine, 1990
- Supervisor to a M.Sc. study in Aquatic Toxicology (effects of an herbicide in aquatic microcosms 1988-1991; and, a Ph.D. student in Radioecology 1989-1993 (transfer of polonium-210 and lead-210 in two arctic food chains) and a Ph.D. student in Aquatic Toxicology 1996-2000 (nickel and molybdenum toxicity). All at University of Saskatchewan.
- Instructor in Ecological Risk Assessment:
  - Banff School of Management 1993;
  - Council of Yukon Indians 1993;
  - British Columbia Council of Forest Industries 1994.



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- Memorial University 1995, 1996.
- Member of the Management Committee for the Northern River Basins Human Health Study. Alberta, 1994-1999.
- Co-Chairman, Aquatic Toxicity Workshop 1996, Calgary, Alberta
- Invited Participant: Society of Environmental Toxicology and Chemistry Workshop on Predicting Ecological Impacts from Laboratory Toxicity Tests. May 1999.
- Member of the Natural Sciences & Engineering Research Council Multidisciplinary Review Committee. Reviewed proposals to NSERC for multidisciplinary research. 2003-2004.
- Research Grants: Natural Sciences & Engineering Research Council 1997-1999 (nickel & molybdenum toxicity).
- Water Environment Research Foundation 2000-2002. (Multiple stressor effects in river systems in the United States).
- Wabamun Science Panel. 2006. Member of scientific panel reviewing available scientific information on the status of Wabamun Lake. Chaired by Dr. David Schindler of the University of Alberta.
- Syncrude Land Reclamation Technical Advisory Panel. 2002-2009
- Invited Participant: Society of Environmental Toxicology and Chemistry. Debate on Decision Making in the Face of Uncertainty. SETAC Annual Meeting. Milwaukee. 2008.
- Co-Instructor for Course on Climate Change Effects on Fish and Fish Habitat in the Arctic. Kugluktuk, Nunavut. January 2009. Funded by Nasavik through a grant to the University of New Brunswick. Grantee: Heidi Swanson.

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### PUBLICATIONS

Bayne, E., J. Dennett, J. Dooley, M. Kohler, J. Ball, M. Bidwell, A. Braid, J. Chetelat, E. Dilligeard, D. Farr, J. Fisher, M. Freemark, K. Foster, C. Godwin, C. Hebert, D. Huggard, D. McIsaac, T. Narwani, S. Nielsen, B. Pauli, S. Prasad, D. Roberts, S. Slater, S. Song, S. Swanson, P. Thomas, J. Toms, C. Twitchell, S. White, F. Wyatt, L. Mundy. 2021 (DRAFT). A before-after dose-response (BADR) terrestrial biological monitoring framework for the oil sands. (OSM Technical Report Series). Not finalized for release.

Swanson, S. 2019. Oil Sands Monitoring Program: Integration Workshop Reports (Part 1 of 2). OSM Technical Report Series No. 7(1). <https://open.alberta.ca/publications/9781460144947>

Swanson, S. 2019. Oil Sands Monitoring Program: Recommendation Report (Part 2 of 2). OSM Technical Report Series No. 7(2). <https://open.alberta.ca/publications/9781460144954>

Swanson, S. 2019. Review of the release of radioactive material from the Rio Tinto/QM mine, Madagascar. Report Commissioned by the Andrew Lees Trust (ALT UK). [www.andrewleestrust.org](http://www.andrewleestrust.org).

Swanson, S, G. Gilron and J. Dias. 2017. When only zero risk is acceptable – why science is not enough. *Journal of Integrated Environmental Assessment and Management*. 13: 448-449.

Lee, Kenneth, Michel Boufadel, Bing Chen, Julia Foght, Peter Hodson, Stella Swanson, Albert Venosa. 2016. High-priority research needs for oil spills in Canada: Summary of a Royal Society Expert Panel report on the behaviour and environmental impacts of crude oil released into aqueous environments. Proceedings of the 39<sup>th</sup> Annual Arctic and Marine Oil Spill Program (AMOP) Technical Seminar. June 7-9, 2016, Halifax, NS. Environment and Climate Change Canada, Ottawa ON.

Lee, Kenneth (*chair*), Michel Boufadel, Bing Chen, Julia Foght, Peter Hodson, Stella Swanson, Albert Venosa. 2015. Expert Panel Report on the Behaviour and Environmental Impacts of Crude Oil Released into Aqueous Environments. Royal Society of Canada, Ottawa, ON. ISBN: 978-1-928140-02-3  
Swanson, Stella M., R. Abbott, L. Kirk, G. McKenna, and H. Ohlendorf. 2012. Alternative Futures: collective action to manage selenium in the Elk and McLeod Watersheds. Report prepared by the Strategic Advisory Panel on Selenium Management. Available at [www.teck.com](http://www.teck.com)

Swanson, S. 2011. What type of lake do we want? Stakeholder engagement in planning for beneficial end uses of pit lakes. In *Mine Pit Lakes: Closure and Management*, C.D. McCullough (Ed.). 29-42. Australian Centre for Geomechanics, Perth.

Swanson, S., R. Abbott, W. Funk, L. Kirk, G. McKenna, H. Ohlendorf, and T. Sandy. 2011 Building stakeholder engagement in sustainable solutions- the strategic advisory panel on selenium management. In *Mine Closure 2011. Proceedings of the Sixth International Conference on Mine Closure Volume 2, 18-21 September, Alberta, Canada*, A.B. Fourie, M. Tibbett and A. Beersing (eds.), 189-196. Australian Centre for Geomechanics, Perth.

Swanson, Stella M., R. Abbott, W. Funk, L. Kirk, G. McKenna, T. Sandy, and H. Ohlendorf. 2010. The Way Forward: A Strategic Plan for Selenium Management at Teck Coal Operations. Report prepared by the Strategic Advisory Panel on Selenium Management. Available at [www.swansonenviro.ca](http://www.swansonenviro.ca) or [www.teck.com](http://www.teck.com).

Swanson, Stella M. 2011. A review of mine pit lakes: physical, chemical and biological characteristics. Report submitted to Syncrude Canada Ltd.

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Swanson, Stella. 2009. Maximizing effectiveness of ERA: Know your goals and act accordingly. Presented at National Orphaned/Abandoned Mines Initiative Workshop. Nov 13-14, 2008, Vancouver, BC. Proceedings published by NOAMI.

Swanson, Stella M. 2007. A process for focusing cleanup actions at contaminated sites: lessons learned from remote northern sites in Canada. Pp201-214 IN: Strategies to enhance environmental security in transition countries. NATO Security through Science Series – C:Environmental Security. Ruth N. Hull, Constantin-Horia Barbu and Nadeshda Goncharova (Eds). Springer in Cooperation with NATO Public Diplomacy Division. Dordrecht, The Netherlands.

Hull, Ruth and Stella Swanson. 2006 *Sequential Analysis of Lines of Evidence – An Advanced Weight-of-Evidence Approach for Ecological Risk Assessment*. Integrated Environmental Assessment and Management 2: 302-311.

Swanson, Stella and Katherine Gerein. 2006 *Risk-Based Closure of Uranium Mill Tailings: How to Get From Theory to Practice: Risk Assessment in Support of Closure Planning*. pp. 293-301 In: Proceedings of the International Atomic Energy Agency Symposium on Uranium Production and Raw Materials for the Nuclear Fuel Cycle, June 2005. IAEA Publication STI/PUB/1259, Vienna.

Andrew D McGoey-Smith, Brian J Griffin, Stella M. Swanson, Alvaro Buoro and Rosana C Moraes, *Risk and Uncertainty Analysis of Contamination of the Food Supply due to Sudden Release of Radionuclides from a Nuclear Facility*, International Conference on Monitoring, Assessment and Uncertainties for Nuclear and Radiological Emergency Response, Rioconf2005, Rio de Janeiro, November 2005

Wabamun Science Panel 2004. *Lake Wabamun: A Review of Scientific Studies and Environmental Impacts*. Prepared for Alberta Environment. Panel chaired by Dr. D. Schindler.

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