

APPENDIX G-1

Comments on *File No: 1003*
Environmental Assessment of Northern Pulp's Proposed Effluent
Treatment Facility

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February 2019

Executive Summary

Overall, the material provided in *Section 9.0: Human Health Evaluation* of the environmental assessment is lacking, and additional content is required in order to provide a fully informed assessment. The information provided falls short and does not include an exposure assessment, toxicity assessment or thoughtful risk characterization. The scoping or screening level approach to the human health evaluation is superficial. The content is missing supporting evidence for the claims that are made, its reference materials are dated and rely heavily on the Toxikos (2006) report, and there is misinterpretation of key concepts throughout.

Unfortunately, it is not possible to fully assess the potential health impacts of the proposed effluent as Northern Pulp states that “various project details [are] under development and/or in the process of being refined” and specific effluent chemistry characteristics “will not be known with certainty until the project is operational” (p. 489, 491). This lack of detailed information about the proposed effluent is problematic, it provides an inaccurate and ultimately incomplete environmental assessment and makes it difficult to truly assess its content and to comment on risks and potential hazards without additional information. It is very concerning that the environmental assessment did not include existing reference material available on Pictou Landing (e.g., Pictou Landing Native Women’s Group et al., 2016; Castleden et al., 2016). There was no formal consultation by Northern Pulp and/or its consultants with Pictou Landing First Nation, and no information has been provided regarding consultation that may have occurred or is in progress with the Province.

There is only a single study identified as having a similar method/approach to the Northern Pulp project, a proposed elemental chlorine free kraft pulp mill in Bell Bay, Tasmania. The human health evaluation is largely dependent upon the Toxikos (2006) report, *Marine Impact Assessment – Bell Bay Pulp Mill Effluent* from Bell Bay, Tasmania. Perhaps most concerning about the reliance on the Tasmania project is that it is not explicitly clear that this data comes from a proposal rather than an operational pulp mill. It is not reassuring that Northern Pulp has relied so heavily on a singular proposed pulp mill and cannot point to another example of the proposed work that would provide evidence of successes and/or failures, as well as lessons learned.

The information provided in Northern Pulp’s environmental assessment is insufficient in addressing the potential health risks associated with the proposed work. Ultimately, by not providing information on the treated effluent itself, the environmental assessment is incomplete which makes it difficult to truly assess its content and to comment on risks and potential hazards without additional information. The information provided in the human health evaluation does not provide sufficient evidence to support its claims. This project would benefit from a complete risk assessment process, including complete information and evidence about the treated effluent, and a consultation with Pictou Landing First Nations and other community members. The assessment should apply sex- and gender-based analysis and incorporate an in-depth understanding about the limitations of threshold values in accounting for low dose cumulative exposures, as well as a hazard assessment which accounts for the intrinsic hazard or intrinsic toxicity of the substance(s) and the potential to cause harm.

Introduction

I am writing in regard to the Environmental Assessment of Northern Pulp's proposed effluent treatment facility in Pictou County, Nova Scotia. I have been asked to comment on this environmental assessment which will be reviewed by the Minister of Environment, the Honourable Margaret Miller. I hope the Minister will carefully consider the feedback received as part of the public comment period of the environmental assessment in making her decision.

My research background has resulted in experience and expertise across broad disciplines, such as environmental health, population health and sex- and gender-based analysis, and in specific areas such as breast cancer, occupational health and cancer prevention. I completed a PhD at York University in the only interdisciplinary Environmental Studies doctoral program Canada. My dissertation research examines the body of Canadian law, policy and practice which encompasses Canada's regulatory regime for toxic substances. It demonstrates that these approaches are not inherently precautionary and do not enact a primary prevention approach to women's health, and breast cancer in particular. I have translated this research into a book chapter, four peer-reviewed articles, 13 local, national and international presentations, as well as contributions for non-academic audiences.

I play an active role in an advisory and research capacity for organizations focused on health and environmental health issues. I was the Acting Director for the National Network on Environments and Women's Health in 2012-2013. I have served in an advisory capacity for this national organization, as well as for Breast Cancer Action Quebec. I am an affiliate scientist for the Beatrice Hunter Cancer Research Institute and a researcher on the ENRICH project which focuses on environmental racism in Mi'kmaq and African Nova Scotian communities. I am also a member of the Board of Directors for Prevent Cancer Now and the Scientific Review Panel of Breast Cancer UK, both organizations that focus on preventing cancer by reducing exposure to carcinogens and hazardous chemicals.

I am currently the Director of Strategic Research Initiatives at the Atlantic Partnership for Tomorrow's Health (Atlantic PATH) study. Atlantic PATH is part of the Canadian Partnership for Tomorrow Project, a national multi-cohort prospective research study with more than 300,000 participants. The data collected includes questionnaire data, physical measures and biological samples (blood, urine, saliva, toenails). My research at Atlantic PATH and active participation in our multi-disciplinary research team has resulted in seven published articles to date, with one currently accepted, two under review and one pending submission. In my role as the Director of Strategic Research Initiatives at Atlantic PATH, I am also responsible for overseeing the data access process which involves working directly with researchers and the research platform that holds data and biological samples for more than 35,000 participants.

Human health evaluation

As my expertise lies in health research, I focused on the related material in Northern Pulp's environmental assessment. Overall, I find the material provided in *Section 9.0: Human*

Health Evaluation to be lacking, and that additional content is required in order to provide a fully informed assessment. The information provided falls short and does not include an exposure assessment, toxicity assessment or thoughtful risk characterization. The scoping or screening level approach to the human health evaluation is superficial. The content is missing supporting evidence for the claims that are made, its reference materials are dated and rely heavily on the Toxikos (2006) report, and there is misinterpretation of key concepts throughout.

Vague language is used throughout the discussion (e.g., “the marine study boundary is considered to be a radius of *a couple to a few hundred metres...*” (p. 494, emphasis added) which does not aid in the evaluation of the environmental assessment. There are also problematic language choices such as “implausible” which negates any level of risk, rather than framing something as unlikely to occur.

Unfortunately, it is not possible to fully assess the potential health impacts of the proposed effluent as Northern Pulp states that “various project details [are] under development and/or in the process of being refined” and specific effluent chemistry characteristics “will not be known with certainty until the project is operational” (p. 489, 491). This lack of detailed information about the proposed effluent is problematic, it provides an inaccurate and ultimately incomplete environmental assessment and makes it difficult to truly assess its content and to comment on risks and potential hazards without additional information.

While Northern Pulp does acknowledge that there are other pulp and paper mill projects that may share similarities to the proposed project in Pictou County, the language is both vague and at times contradictory. For example, it is stated that key aspects of these studies, such as exposure pathways and receptors “cannot be assumed to be directly applicable to the current project,” but that they “may facilitate to some degree the identification of key exposure pathways [and] receptors...and may also inform on certain assessment approaches” (p. 492). There is no supporting evidence offered related to these projects.

There is only a single study identified as having a similar method/approach to the Northern Pulp project, a proposed elemental chlorine free kraft pulp mill in Bell Bay, Tasmania.¹ The human health evaluation is largely dependent upon the Toxikos (2006) report, *Marine Impact Assessment – Bell Bay Pulp Mill Effluent* from Bell Bay, Tasmania. Northern Pulp appears to rely heavily on this report, while also critiquing its findings. It is framed as a “highly conservative assessment that substantially overestimated exposure and risk to potential human consumers of fish and shellfish that may be influenced by the effluent diffuser discharge in Bell Bay” (p. 491) without providing any substantive context or evidence for this claim.

Perhaps most concerning about the reliance on the Tasmania project is that it is not explicitly clear that this data comes from a proposal rather than an operational pulp mill. From the media coverage available, it becomes apparent that the Gunns Ltd. timber

¹ It should be noted that the Tasmanian mill process would focus on hardwood eucalyptus, as opposed to softwood coniferous wood species in Nova Scotia.

company collapsed and that the permits for the mill have lapsed. It is not reassuring that Northern Pulp has relied so heavily on a singular proposed pulp mill and cannot point to another example of the proposed work that would provide evidence of successes and/or failures, as well as lessons learned.

It is well established that Atlantic Canada has among the highest rates of cancer and other chronic disease in Canada (Marrett et al., 2008; Canadian Cancer Society's Steering Committee on Cancer Statistics, 2012; Xie et al., 2015; Sweeney et al., 2017a). There are numerous factors that must be considered regarding cancer outcomes, including lifestyle and behavioural factors, genetics, and environmental exposures. As demonstrated in the research report published on Pictou Landing (which is not referenced in the environmental assessment), there is significant concern about the impact that the mill has had in the past and will have in the future on the health of local residents and the broader environment (Pictou Landing Native Women's Group et al., 2016). Northern Pulp states that the proposed project is "expected to have no negative effects on human health" (p. 117). It also references a recent report from the Nova Scotia Health Authority (NSHA) in response to concerns that there is a high incidence of cancer [and other chronic health issues] experienced by Pictou Landing First Nation and surrounding communities. To support this claim, Northern Pulp refers to the NSHA report by stating that the incident rate of all cancers for men in Pictou County is below the provincial average. However, this interpretation could be skewed by the low rates of prostate cancer in Pictou County, as well as by considering the county as a whole rather than at the community-level (Saint-Jacques et al., 2018). It should also be noted that Statistics Canada data indicates that the cancer incidence among men, women and the total cancer cases in Pictou County-Guysborough Antigonish Strait are above the Canadian average (Statistics Canada, 2013).

Northern Pulp suggests that there are limited data on traditional marine food item harvesting and consumption patterns within the Pictou Landing First Nation, as well as the broader experiences of this community. The amount of space dedicated to this topic seems wholly inadequate (p. 485). It is very concerning that the environmental assessment did not include existing reference material available on Pictou Landing (e.g., Pictou Landing Native Women's Group et al., 2016; Castleden et al., 2016), and that the process did not include a formal consultation with Pictou Landing First Nation, as well as with those who could speak to the other community marine recreational patterns. It is stated that a Pictou Landing First Nation dietary survey would be preferable but may not be feasible (p. 499), however, this should be a requirement. A fulsome consultation process with Pictou Landing First Nation should be undertaken, as well as with key experts, such as Dr. Diana (Dee) Lewis who spent seven years researching the impacts of the pulp and paper mill on the health of Pictou Landing First Nation.

Gaps in understanding of environmental exposures and potential health outcomes

I have numerous concerns about the information presented in section 9.2.2: *Identification of Potential Human Receptors and Their Characterization*. This section starts by describing a human receptor as a hypothetical person who may experience exposure and encompasses infants, toddlers, children, adolescents, and adults (p. 496). This definition, as well as the

proposed human receptor age classes (p. 497) exclude fetal exposure which is an important component of exposure to carcinogenic and endocrine disrupting chemicals and intergenerational outcomes. Biomonitoring research demonstrates that virtually all pregnant women in the United States experience body burdens with reproductive and developmental toxic substances such as lead, mercury, toluene, perchlorate, phthalates, bisphenol A (BPA), pesticides, polychlorinated biphenyls (PCBs), perfluorochemicals (PFCs), and polybrominated diphenyl ethers (PBDEs) (Sutton et al., 2010, 2012; Woodruff et al., 2011; Parry et al., 2018). Similar findings have emerged from biomonitoring studies in other western countries, including Canada (Environmental Defence, 2006, 2013; Basu et al., 2013; Sweeney, 2014, 2017; Health Canada, 2018). The body burden associated with exposure to toxic substances that is revealed through biomonitoring processes can be viewed as representing the personalization of pollution -- pollution is no longer something external that occurs in isolation outside of the body (Altman et al., 2008; Sweeney, 2017). These toxic substances can cross the placental barrier which results in infants who are born “pre-polluted” and can result in intergenerational health outcomes (Leffall and Kripke, 2010: 98; Mallozzi et al., 2016; Eisen et al., 2018; Lee and Mykitiuk, 2018).

Northern Pulp also suggests that females may be more sensitive than males as a “function of differences in physiological, endocrine and biochemical parameters” without providing any evidence of this statement (p. 498). In fact, carcinogenic and endocrine disrupting chemicals have been detected in human seminal fluid (Chapin et al., 2004; Marques-Pinto and Carvalho, 2013; UNEP and WHO, 2013; Jeng, 2014; Sweeney, 2017; Rehman et al., 2018; Adoamneia et al., 2018; Smarr et al., 2018). The impairment of testicular development and reproductive function in males have also been associated with fetal exposure to toxic substances (Royal College of Obstetricians and Gynaecologists, 2013; Sweeney, 2017).

It is noted that those with the greatest potential for exposure to toxic substances and/or those who have the greatest sensitivity or potential to develop adverse effects should be considered in a formal human health risk assessment. However, without conducting a human health risk assessment, the next sentence seems to predict that there will be no potential health risks found among these populations and thus, there would be no risk (p. 497). Furthermore, it is suggested that infants and children may be more sensitive to exposure to some toxic substances than adults. This does not allow for fully understanding vulnerable or susceptible populations, including women who may be more susceptible to exposures to toxic substances and subsequent health outcomes based on the timing of exposure and windows of susceptibility. These windows of susceptibility involve periods of development or hormonal activity in which women’s bodies may be more susceptible. They occur throughout the lifecourse and include the prenatal period, childhood, puberty, menstruation, pregnancy, and menopause (Birnbaum, 2009; Diamanti-Kandarakis et al., 2009; Schwarzman and Janssen, 2010; Schug et al., 2011; Brophy et al., 2012; Mallozzi et al., 2016; Gray et al., 2017; Herceg et al., 2018; Cohn et al., 2019).

There is also a great need for a sex- and gender-based analysis to be applied to any evaluation of health, risk and exposure to toxic substances. The analysis of sex and gender in health research has emerged as an increasingly important methodology which

necessitates the consideration of impacts on both men and women, as well as identifying the shortcomings which emerge as a result. The foundation of sex- and gender-based analysis is the understanding that both biology and social experiences, and thus sex and gender, impact the health status of Canadian citizens (Sweeney, 2014; Canadian Institutes of Health Research – Institute of Gender and Health, 2019). In this instance, Northern Pulp is conflating the two concepts when they speak about gender (p. 498).

In brief, sex refers to biological and genetic characteristics which are manifested in one's anatomy, physiology and hormones. Sex includes the "specific capacities of our bodies, and affects the propensity and trajectory of diseases and health conditions" (Greaves, 2009: 3). Gender should not be confused or conflated with sex as it is a social construct that "extends beyond the boundaries of biologically defined categories of sex" (Benoit and Shumka, 2009: 7). Gender includes the social, cultural and economic factors that influence the socially constructed roles and relationships, personality traits, attitudes, behaviours, values, and influence that a particular society assigns to women, men and other gender groups (Clow et al., 2009; Greaves, 2009; Sweeney, 2014). The consideration of gender in health research is especially critical as it can "determine different exposures to certain risks, different treatment-seeking patterns, or differential impacts of social and economic determinants of health" (Hankivsky, 2007: 155).

The discussion related to sex, stated incorrectly in the environmental assessment as gender, does not provide evidence to support the statements about exposure and risk among male and female receptors. There also seems to be some misunderstanding about "body weight" which is stated as both having little difference between men and women, and as a relevant factor potentially affecting female receptors due to a "slightly higher intake rate to body weight ratios" (p. 498). However, there is a difference between body weight and body fat distribution. For instance, women may be at higher risk for health outcomes related to exposure to toxic substances which tend to concentrate in body fat and are often related to estrogen receptors, and women tend to have a higher ratio of body fat and estrogen levels than men (Nickerson, 2006; Assembly of First Nations Environmental Stewardship Unit, 2009; Clow et al., 2009; Sweeney, 2014). It is important to ask questions about levels of susceptibility and sex-linked differences when considering environmental exposures which raises additional issues related to sex-specific variations in disease, health and illness (Sweeney, 2014).

The discussion of "receptors" in this section is lacking. In this case, a "human receptor" is described as someone who lives, visits or works an area where exposure may occur, and the "receptor type," influenced by physical and behavioural characteristics, is used to determine the amount of chemical exposure received by the human receptor (p. 496). The discussion would benefit from evidence to support the claims, likewise the definitions would benefit from being fleshed out. For instance, the use of the term "Indigenous receptors" is unclear. Is this describing "human receptors" with First Nations ancestry and is thus focused on relevant social determinants of health which are not adequately explored, or are there specific biological receptors relevant to members of the Pictou Landing First Nation? Perhaps the discussion of receptors would also benefit from

consideration of biological receptors, such as estrogen receptors which are impacted by endocrine disrupting chemicals (Shanle and Xu, 2011; Li et al., 2013; Barrett, 2014).

Key concepts in assessing exposure to toxic substances

Should a risk assessment process be required moving forward, there are also gaps in this process that should be highlighted. Throughout the human health evaluation, there is a reliance on the concept of risk posed to human health *if there is significant exposure* to toxic substances. This approach is grounded in the risk assessment process that determines toxicological effects employing the traditional dose-response relationship whereby “the dose makes the poison” and utilizing threshold values. The use of threshold values in the risk assessment process suggests that threshold effects occur only at a specific level of exposure (Sweeney, 2014). Health Canada contends that a toxicological threshold exists below which adverse effects do not occur.

Below a certain minimum dose,...compensatory mechanisms can mitigate the adverse effects of a substance, even on a continuing basis. At higher dose levels, however, the ability of the organisms to compensate or adapt becomes overwhelmed, leading to an impairment in organ function or development of disease state (Health Canada, 2007: 6; Sweeney, 2014).

Endocrinologists, environmental health researchers and advocates are raising competing paradigms to contest the reliance on toxicology and the dose-response relationship in risk assessment processes (Pesch et al., 2004; Vandenberg et al., 2009, 2012; Ritter, 2011; Grossman, 2012, 2013; Darbre and Fernandez, 2013; Sweeney, 2014; Zoeller and Vandenberg, 2015; Mallozzi et al., 2016). The traditional dose-response relationship posits that toxicological effects increase with increased exposure and dose of a toxic substance (Health Canada, 2007). The high dose animal testing and linear extrapolation utilized in toxicology does not allow for the potential of health effects occurring below the “safe” levels utilized in evaluating threshold values (Birnbaum, 2012; Brophy et al., 2013). Vandenberg et al. (2012) analyzed hundreds of epidemiological studies in order to demonstrate the impact of low-dose effects of endocrine disrupting chemicals on human health in comparing the role of non-monotonic responses and the traditional dose-response relationship.

Whether low doses of EDCs influence certain human disorders is no longer conjecture, because epidemiological studies show that environmental exposures to EDCs are associated with human diseases and disabilities....[W]hen nonmonotonic dose response curves occur, the effects of low doses cannot be predicted by the effects at high doses. Thus, fundamental changes in chemical testing and safety determination are needed to protect human health (Vandenberg et al., 2012).

Thus, the argument that the amount of exposure, whether it is considered “significant,” does not allow for the acknowledgement of low-dose cumulative exposures. Exposure data and threshold effects, the premise of risk assessment, do not adequately account for the possibility of substances such as endocrine disrupting chemicals that have low dose,

cumulative and synergistic effects as a result of exposure to complex mixtures of toxic substances (Rochon Ford and Sweeney, 2015). While mixtures of chemicals are briefly mentioned in the environmental assessment (p. 512), there is no discussion of synergistic effects and related health outcomes.

Another gap in human health risk assessments conducted in Canada is that they focus on both risk and exposure, but not *hazard*. Health Canada does not recommend the use of hazard assessment over risk assessment because the potential for harmful effects is “wholly dependent upon the extent of exposure,” and that the level of risk increases with an increase in exposure (Health Canada, 1995). As noted above, this does not account for low-dose cumulative exposures and the potential health outcomes. Conversely, environmental health experts recommend the use and implementation of a *hazard assessment*, which does not contain an exposure requirement but rather includes an assessment of the intrinsic hazard or intrinsic toxicity of the substance and its potential to cause harm (Sweeney, 2014; Kienzler et al., 2016; Syberg and Hansen, 2016; Solecki et al., 2017). “The issue of how much of the substance enters the environment is not taken into account. The possibility that an inherently toxic substance *might* enter the environment is accepted as reason enough to trigger the regulatory process” (House of Commons Standing Committee on Environment and Sustainable Development, 1995: 60).²

Potential examples of exposure to toxic substances

Northern Pulp references toluene as having a measurable exposure above recommended detection limits in recent chemical analyses of current treated mill effluent (p. 516). Toluene is an example of a toxic substance that possesses inherently toxic properties but was found to be not toxic under the *Canadian Environmental Protection Act* because of the exposure requirement and thus is not subject to federal risk management provisions. This substance is linked to numerous health concerns including developmental and reproductive toxicity, neurotoxicity, and organ system toxicity (Sweeney, 2014). In California, toluene falls under the risk management provisions of the *Safe Drinking Water and Toxic Enforcement Act*, also known as Proposition 65. Proposition 65 requires the state to publish a list of toxic substances that are known to cause cancer, birth defects or other reproductive harm and which must be updated at least once a year. Industry and businesses must notify citizens about “significant amounts of chemicals in the products they purchase, in their homes or workplaces, or that are released into the environment” (Office of Environmental Health Hazard Assessment, 2013). To some extent, the onus of responsibility is placed on the individual to use the information provided through Proposition 65 to reduce exposures that may not be adequately controlled under other state or federal regulation. However, this law has also created incentives for manufacturers to remove toxic substances that are listed as part of this initiative. For example, following their inclusion on the list, toluene was removed from many nail care products (Office of Environmental Health Hazard Assessment, 2013; Sweeney, 2014). The European Union placed restrictions on toluene in 2004 so that the substance “shall not be placed on the

² For a more detailed discussion of risk vs. hazard assessment and threshold vs. non-threshold values, please refer to Sweeney, 2014.

market, or used, as a substance or in mixtures in a concentration equal or greater than 0.1% by weight where the substance or mixture is used in adhesives or spray paints intended for supply to the general public” (Armstrong and Dupont, 2012: 52).

Northern Pulp also reports a significant list of metals tested in 2002 that were above recommended detection limits, including lead and arsenic. Exposure to lead through drinking water is an issue of increasing concern, particularly with recent high-profile cases of lead-contaminated water (Bellinger, 2016; Hanna-Attisha et al., 2016). Low-level effects of lead are associated with neurodevelopmental, neurodegenerative, cardiovascular, renal, reproductive, and developmental impacts (Sweeney et al., 2017b). The maximum acceptable concentration level for drinking water in Canada is 10 µg/L, whereas the current blood intervention level is 10 µg/dL. The health effects related to lead exposure are well established and there is evidence that blood lead levels as low as 5 µg/dL are associated with adverse health effects in both children and adults. Water and toenail samples from Nova Scotia residents have been analyzed for lead concentrations. Approximately 46% of Nova Scotia residents use well water as their primary source of drinking water. Water from dug wells had higher lead concentrations compared to drilled wells, and the lowest lead levels were found in water from municipal supplies. Although the majority of the lead levels in the drinking water provided by individuals in Nova Scotia were below the Canadian maximum acceptable concentration level, there were outliers, particularly among unregulated private well water sources. Given the health effects that are linked to low-level exposures, any exposure to lead in water sources remains a concern (Sweeney et al., 2017b).

Long-term exposure to environmental arsenic has been associated with many chronic diseases, including cancer and diabetes (Hughes et al., 2011). There are a number of local ongoing projects exploring arsenic and arsenic speciation exposure and associated health conditions, including cancer and diabetes. An article currently under review found that the percentage of monomethylarsonic acid (%MMA) was found to be significantly higher in the toenails of individuals in Atlantic Canada with arsenic-related cancers, compared to healthy individuals with similar total arsenic exposure (Smith et al., Under Review). Other toxic substances highlighted in Northern Pulp’s discussion of substances above recommended detection limits in 2018 include hydrocarbons, cyanide, mercury, other metals and metalloids, and trace polyaromatic hydrocarbons (PAHs); there are also various health concerns with these substances.

It is particularly concerning that the risks associated with a potential accident where the pipeline travels across land and through watersheds in Pictou County are not considered in the human health evaluation. It is suggested that exposure pathways (e.g., air, ground water) “do not merit consideration in relation to the project” (p. 496), but exposures to toxic substances via air pollution or in drinking water do have potential for detrimental health outcomes and should be fully considered (e.g., Hoffman et al., 2017).

Finally, it is concerning that Northern Pulp uses non-committal language in discussing environmental monitoring in the marine area where treated effluent will be discharged. For example, stating that there “will likely be environmental monitoring” (p. 519), rather

than committing to monitoring practices as part of comprehensive risk management practices.

Conclusion

In sum, I do not believe that the information provided in Northern Pulp's environmental assessment is sufficient in addressing the potential health risks associated with the proposed work. Ultimately, by not providing information on the treated effluent itself, the environmental assessment is incomplete which makes it difficult to truly assess its content and to comment on risks and potential hazards without additional information. The information provided in the human health evaluation does not provide sufficient evidence to support its claims. This project would benefit from a complete risk assessment process, including complete information and evidence about the treated effluent, and a consultation with Pictou Landing First Nations and other community members. The assessment should apply sex- and gender-based analysis and incorporate an in-depth understanding about the limitations of threshold values in accounting for low dose cumulative exposures, as well as a hazard assessment which accounts for the intrinsic hazard or intrinsic toxicity of the substance(s) and the potential to cause harm.

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APPENDIX G-2

Ellen Sweeney, PhD
c/o Atlantic PATH, Dalhousie University

EDUCATION

PhD, Faculty of Environmental Studies, York University, 2013

Specialization: Environmental Health

Dissertation: *Preventing Breast Cancer: An Analysis of Canada's Regulatory Regime for Chemicals*

Canadian Institutes of Health Research Institute of Gender and Health Summer Institute

Intensive training on gender, sex and health research under the guidance of expert mentors

July 5-9, 2010

Vancouver, British Columbia

Master of Arts, Social Anthropology, Dalhousie University, 2006

Specialization: Health and Illness (Environmental Health)

Thesis: *Biographical Disruption and the Environmental Health Controversy at the New Waterford Consolidated Hospital*

Bachelor of Arts, Honours, Social Anthropology, Dalhousie University, 2003

Dean's List (2002-2003)

RESEARCH CONTRIBUTIONS

Refereed Publications:

Sweeney, E., Yu, Z.M., Dummer, T.J.B., Cui, Y., DeClercq, V., Forbes, C., Grandy, S.A., Keats, M., Parker, L., Adishes, A. (Submission Pending). "The Effect of Shift Work on Cardiometabolic Health and Depression: Findings from the Atlantic PATH Study." *International Archives of Occupational and Environmental Health*.

Cui, Y., **Sweeney, E.**, Forbes, C., DeClercq, V., Grandy, S., Keats, M., Parker, L., Yu, Z.M., Dummer, T.J.B. (Under Review). The Association between Physical Activity and Self-Rated Health in Atlantic Canadians. *Journal of Women & Aging*.

Smith, N.K., **Sweeney, E.**, Weerasinghe, S., MacPherson, K., Kim, J.S. (Under Review). "Investigating the Association between Arsenic Exposure and Chronic Disease Using Toenail Speciation Biomarkers: Feasibility and Preliminary Health Outcomes." *Scientific Reports*.

Forbes, C., Yu, Z.M., Cui, Y., DeClercq, V., Dummer, T.J.B., Grandy, S., Keats, M., Parker, L., **Sweeney, E.**, Keats, M. (Accepted, 2019). "Rural-Urban Disparities in Body Composition and Contributing Health Behaviors: An Atlantic PATH Study." *Journal of Rural Health*.

- Delisle, L. and **Sweeney, E.** (2018). "Community Mobilization to Address Environmental Racism: The South End Environmental Injustice Society." *Kalfou: A Journal of Comparative and Relational Ethnic Studies*.
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- DeClercq, V., Cui, Y., Forbes, C., Grandy, S., Keats, M., Parker, L., **Sweeney, E.**, Yu, Z.M., Dummer T.J.B. (2017). "Adiposity measures and plasma adipokines in females with rheumatoid and osteoarthritis." *Mediators of Inflammation*.
- DeClercq, V., Cui, Y., Forbes, C., Grandy, S., Keats, M., Parker, L., **Sweeney, E.**, Yu, Z.M., Dummer, T.J.B. (2017). "Association Between Dietary Patterns and Adiposity in Atlantic Canada." *Nutrients*, 9(10).
- Keats, M., Cui, Y., DeClercq, V., Forbes, C., Grandy, S., Parker, L., **Sweeney, E.**, Yu, Z.M., Dummer, T.J.B. (2017). "Multimorbidity in Atlantic Canada and association with low levels of physical activity." *Preventive Medicine*, 105.
- Sweeney, E.**, Cui, Y., DeClercq, V., Devichand, P., Forbes, C., Grandy, S., Hicks, J., Keats, M., Parker, L., Thompson, D., Volodarsky, M., Yu, Z.M., Dummer, T.J.B. (2017). Cohort Profile: The Atlantic Partnership for Tomorrow's Health (Atlantic PATH) Study. *International Journal of Epidemiology*, 46(6).
- Sweeney, E.**, Yu, Z.M., Dummer, T., Parker, L. (2017). "Lead in Drinking Water: A Response from the Atlantic PATH Study." *Environmental Health Review*, 60(1).
- Sweeney, E.** (2017). "The Role of Healthcare Professionals in Environmental Health and Fertility Decision-Making." *New Solutions: A Journal of Environmental and Occupational Health Policy*, 27(1).
- Sweeney, E.** (2016). "Precautionary Consumption: Interview with Norah MacKendrick." *Women & Environments International Magazine*.
- Sweeney, E.** (2016). "Pink Ribbons: Interview with Samantha King." *Women & Environments International Magazine*.
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Rochon Ford, A. and **Sweeney, E.** (2015). "Missing in Actions: The Critical Role of Environmental and Occupational Exposures in the Development of Breast Cancer in Women." *Women's Health: Intersections of Policy, Research and Practice, 2nd Edition*. Eds. Pat Armstrong and Ann Pederson. Canadian Scholars Press.

Sweeney, E. (2015). Book Review: *Ecosystems, Society, and Health: Pathways through Diversity, Convergence, and Integration*. Edited by L. Hallström, N. Guehlstorf and M. Parkes. *Health Tomorrow: Interdisciplinarity and Internationality*.

Sweeney, E. (2014). "The Individualization of Risk and Responsibility in Breast Cancer Prevention Education Campaigns." *Policy Futures in Education*, 12(7).

Sweeney, E. (2012). "Tracing the Role of Gender in the History of Breast Cancer Social Movements." *Women's Health and Urban Life*, 11(1). University of Toronto.

Sweeney, E. (2011). Book Review: *Dodging the Toxic Bullet: How to Protect Yourself from Everyday Environmental Hazards* by David Richard Boyd. Green Book Reviews.

Gahagan, J., **Sweeney, E.**, Worthington, C., Perry, D., Satzinger, F., and Rogers, E. (2008). "Research Ethics Issues for Biomedical HIV/AIDS Researchers in International Settings – Perspectives from Canadian Experience." *International Journal of Infectious Diseases*, 12(6).

Sweeney, E. (2006). "Breast Cancer: The Importance of Prevention in Public Education Literature." *Women's Health and Urban Life*, 5(1). University of Toronto.

Media Releases:

"Re-Think Pink During Breast Cancer Awareness Month: A Prevent Cancer Now Challenge to Canadians." Media Release for Prevent Cancer Now. October 14, 2016.

"Chemical exposures contributing to elevated breast cancer risk in some occupations: Research findings." Media Release for the National Network on Environments and Women's Health. Distributed internationally. November 19, 2012.

Select Non-Refereed Publications:

Sweeney, E. (2015). "Gaps in Environmental Regulations: Placing Women's Health at Risk." *BCA-Qc Connected Newsletter*. Breast Cancer Action Quebec.

Sweeney, E. (2012). *Breast cancer risk in relation to occupations with exposure to carcinogens and endocrine disruptors: a Canadian case-control study. Summary of Research Findings*. Canadian Women's Health Network and National Network on Environments and Women's Health.

Sweeney, E. (2011). "Breast Cancer as a Contested Illness." *Proceedings from the 16th Annual Graduate Student Symposium*. York Institute for Health Research (YIHR). York University. Toronto, Ontario.

Sweeney, E., Gahagan, J., and Langille, D. (2007). *Framework for Action: Youth Sexual Health in Nova Scotia Literature Review - "Attitudes Towards Youth Sexual Health*. Nova Scotia Department of Health Promotion and Public Protection.

Sweeney, E. and Gahagan, J. (2007). *Nova Scotia – Sierra Leone Programme (NSSLP) Peer Health Education Programme. Mid-Term Evaluation Report*. Nova Scotia-Gambia Association.

Published Abstracts:

Sweeney, E. (2015). "Contesting Everyday Exposures: Case Studies in Toxic Exposure, Public Health and Canada's Regulatory Regime." *Discard Studies: Studies of Waste, Pollution, and Externalities*. <http://discardstudies.com/>.

Sweeney, E. (2012). "Moving Beyond Breast Cancer Awareness Campaigns." York Institute for Health Research (YIHR) Graduate Student Research Symposium. York University. Toronto, Ontario. <http://www.yorku.ca/yihr/>.

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Gahagan, J., **Sweeney, E.**, Jackson, R., Mill, J., Dykeman, M., Ricci, C., Patrick, C., and Benton, A. (2009). "HIV Risk, Historical Trauma and Systemic Inequities among Aboriginal Women in Canada." *The Canadian Journal of Infectious Diseases & Medical Microbiology, Vol. 19, Supplement B: 104B*.

Gahagan, J., **Sweeney, E.**, Jackson, R., Mill, J., Dykeman, M., Patrick, C., Ricci, C., and Benton, A. (2009). "Challenges and Barriers to Health Care HIV Service Delivery: The Experience of Aboriginal Women in Canada." *The Canadian Journal of Infectious Diseases & Medical Microbiology, Vol. 19, Supplement B: 84B*.

Jackson, R., Gahagan, J., **Sweeney, E.**, Mill, J., Dykeman, M., Benton, A., Patrick, C., and Ricci, C. (2009). "A Review of Methods and Models of Culturally Sensitive HIV Prevention Programs for Canada's Aboriginal Population." *The Canadian Journal of Infectious Diseases & Medical Microbiology, Vol. 19, Supplement B: 85B*.

Gahagan J., **Sweeney, E.**, and Baxter, J. (2007). "Peer Health Education: Lessons Learned from Sierra Leone." *The Canadian Journal of Infectious Diseases and Medical Microbiology, Vol. 18, Supplement B: 90B*.

Presentations as a Guest Speaker:

Invited Speaker. “Environmental Exposures and Breast Cancer: Considerations for Primary Prevention.” Beatrice Hunter Cancer Research Institute Seminar Series. April 6, 2018.

Invited Speaker. “Exclusion, Extraction, and the Politics of Breast Cancer: The US-Middle East Partnership for Breast Cancer Awareness” by Samantha King. Faculty of Environmental Studies, York University. Co-Sponsored by the Canadian Women’s Health Network and the National Network on Environments and Women’s Health. March 20, 2012.

Invited Panel Discussant. Screening of Sandra Steingraber’s story, *Living Downstream*, a film about cancer and the environment by Chanda Chevannes. Presented by the National Network on Environments and Women’s Health. November 10, 2010.

Refereed Conference Presentations:

Sweeney, E., Cui, Y., DeClercq, V., Forbes, C., Grandy, S., Hicks, J., Keats, M., Parker, L., Yu, Z.M., Dummer, T.J.B. (2018). “Atlantic Partnership for Tomorrow’s Health: Opportunities for Collaborative Health Research.” Poster presentation at the Healthy Living, Healthy Life Conference. Halifax, Nova Scotia.

Sweeney, E., Cui, Y., DeClercq. (2018). “A Profile of Breast Cancer in Atlantic Canada: The Atlantic Partnership for Tomorrow’s Health (Atlantic PATH) Study.” Poster Presentation at Improving Breast Cancer Outcomes Through Fundamental Research. Halifax, Nova Scotia.

Sweeney, E. (2018). “Environmental Exposures and Breast Cancer: Considerations for Primary Prevention.” Poster Presentation at Improving Breast Cancer Outcomes Through Fundamental Research. Halifax, Nova Scotia.

Vena, J., Dummer, T.J.B., Le, N., Chu, J., Lai, C., Hicks, J., **Sweeney, E.**, Keats, M., Awadalla, P., McDonald, K., Jacquemont, S., Obadia, A., Noisel, N., Fortier, I., Davison, A., Chappell, H. (2018). “Use of mixed methods for follow-up survey implementation in five large geographically dispersed cohorts in Canada: successes and challenges in the Canadian Partnership for Tomorrow Project.” Oral presentation at the International Conference on the Methodology of Longitudinal Surveys. Essex, England.

Sweeney, E., Cui, Y., DeClercq, V., Forbes, C., Grandy, S., Keats, M., Parker, L., Thompson, D., Yu, Z.M., and Dummer, T. (2018). “Cohort Profile: The Atlantic Partnership for Tomorrow’s Health (Atlantic PATH) Study.” Poster Presentation at the Canadian Nutrition Society Conference. Halifax, Nova Scotia.

Forbes, C., Yu, Z.M., Cui, Y., DeClercq, V., Grandy, S., Keats, M., Parker, L., **Sweeney, E.**, Dummer, T.J.B. (2018). “Prevalence and comparison of obesity and health behaviours between urban and rural residents: an Atlantic PATH study.” Poster presentation at the Society of Behavioral Medicine Conference. New Orleans, Louisiana.

Sweeney, E., Yu, Z.M., Dummer, T.J.B., Cui, Y., DeClercq, V., Forbes, C., Grandy, S.A., Keats, M., Parker, L., Adishes, A. (2018). “The Effect of Shift Work on Cardiometabolic Health: Findings from the Atlantic PATH Cohort Study.” Oral presentation at the International Congress on Occupational Health. Dublin, Ireland.

Sweeney, E., Yu, Z.M., Dummer, T.J.B., Cui, Y., DeClercq, V., Forbes, C., Grandy, S.A., Keats, M., Parker, L., Adishes, A. (2017). “The Effect of Shift Work on Cardiometabolic Health: Findings from the Atlantic PATH Cohort Study.” Poster presentation at the 9th Annual New Brunswick Health Research Conference. Moncton, New Brunswick.

Atlantic PATH Team. (2017). Pre-Conference Session: An Overview of the Canadian Partnership for Tomorrow Project and the Atlantic Partnership for Tomorrow’s Health.” Canadian Public Health Association Conference. Halifax, Nova Scotia.

Sweeney, E., Cui, Y., DeClercq, V., Forbes, C., Grandy, S., Keats, M., Parker, L., Thompson, D., Yu, Z.M., and Dummer, T. (2017). “Cohort Profile: The Atlantic Partnership for Tomorrow’s Health (Atlantic PATH) Study.” Poster Presentation at the Canadian Public Health Association Conference. Halifax, Nova Scotia.

Yu, Z.M., Cui, Y., DeClercq, V., Forbes, C., Grandy, S., Keats, M., Parker, L., **Sweeney, E.,** and Dummer, T. (2017). “Fruit and Vegetable Intake and Obesity among Populations in Eastern Canada: the Atlantic Partnership for Tomorrow’s Health Study.” Poster Presentation at the Canadian Public Health Association Conference. Halifax, Nova Scotia.

DeClercq, V., Cui, Y., Forbes, C., Grandy, S., Keats, M., Parker, L., **Sweeney, E.,** Yu, Z.M., and Dummer, T. (2017). “Sleep and obesity in the Atlantic PATH cohort.” Poster Presentation at the Canadian Public Health Association Conference. Halifax, Nova Scotia.

Forbes, C., Cui, Y., DeClercq, V., Grandy, S., Keats, M., Parker, L., **Sweeney, E.,** Yu, Z.M., and Dummer, T. (2017). “A comparison of the physical activity and sitting time correlates among Atlantic Canadians.” Poster Presentation at the Canadian Public Health Association Conference. Halifax, Nova Scotia.

Cui, Y., DeClercq, V., Forbes, C., Grandy, S., Keats, M., Parker, L., **Sweeney, E.,** Yu, Z.M., and Dummer, T. (2017). “Association between Physical Activity and Self-Rated Health in Atlantic Canadians.” Poster Presentation at the Canadian Public Health Association Conference. Halifax, Nova Scotia.

Dummer, T.J.B, and Atlantic PATH team. (2017). “Multimorbidity and physical activity in Atlantic Canadians.” Oral presentation at the Society of Behavioral Medicine Conference. San Diego, California.

Traynor, R., Curran, J., Bishop, A., Cassidy, C., Hayden, J., Lawrence, L., McIssac, J., McNeil, K., Snelgrove-Clarke, E., **Sweeney, E.,** and Urquhart, R. (2016). “Designing policy and practice change interventions: Findings from a learning collaborative initiative to build capacity in KT practice.” Poster presentation at KT Canada Annual Scientific Meeting. Toronto, Ontario.

Sweeney, E. (2013). "Canada's Toxic Regulatory Regime: A Discussion of Gender, Risk and Breast Cancer." Oral Presentation at the Environmental Health Conference: Science and Policy to Protect Future Generations. Boston, Massachusetts.

Sweeney, E. (2013). "Canada's Regulatory Regime for Chemicals: Implications for Breast Cancer and Risk." Oral Presentation at the York Institute for Health Research (YIHR) Graduate Student Research Symposium. York University. Toronto, Ontario.

Sweeney, E. (2012). "Women's Environmental Health: The Importance of Primary Prevention in Canadian Health Policy." Oral Presentation at the Canadian Institutes of Health Research (CIHR) Institute of Gender and Health, Advancing Excellence in Gender, Sex and Health Research Conference. Montreal, Quebec.

Sweeney, E. (2012). "Pink Ribbon Fatigue: A Critique of Cause-Related Marketing." Oral Presentation at the Environmental Studies Association of Canada (ESAC) Conference. Waterloo, Ontario.

Sweeney, E. (2012). "Environmental Health: A Call for Primary Prevention in Public Health Policy and Education." Oral Presentation at the Environmental Studies Association of Canada (ESAC) Conference. Waterloo, Ontario.

Sweeney, E. (2012). "Moving Beyond Breast Cancer Awareness Campaigns." Oral Presentation at the York Institute for Health Research (YIHR) Graduate Student Research Symposium. York University. Toronto, Ontario.

Sweeney, E. (2011). "The Gendered Implications of Breast Cancer, Risk and the Environment." Oral Presentation at the Environmental Studies Association of Canada (ESAC) Conference. Fredericton, New Brunswick.

Sweeney, E. (2011). "Breast Cancer as a Contested Illness." Oral Presentation at the York Institute for Health Research (YIHR) Graduate Student Research Symposium. York University. Toronto, Ontario.

Gahagan, J., **Sweeney, E.**, Jackson, R., Mill, J., Dykeman, M., Ricci, C., Patrick, C., and Benton, A. (2009). "HIV Risk, Historical Trauma and Systemic Inequities among Aboriginal Women in Canada." Poster Presentation at the 18th Annual Canadian Conference on HIV/AIDS Research (CAHR). Vancouver, British Columbia.

Gahagan, J., **Sweeney, E.**, Jackson, R., Mill, J., Dykeman, M., Patrick, C., Ricci, C., and Benton, A. (2009). "Challenges and Barriers to Health Care HIV Service Delivery: The Experience of Aboriginal Women in Canada." Poster Presentation at the 18th Annual Canadian Conference on HIV/AIDS Research (CAHR). Vancouver, British Columbia.

Jackson, R., Gahagan, J., **Sweeney, E.**, Mill, J., Dykeman, M., Benton, A., Patrick, C., and Ricci, C. (2009). "A Review of Methods and Models of Culturally Sensitive HIV Prevention Programs

for Canada's Aboriginal Population." Poster Presentation at the 18th Annual Canadian Conference on HIV/AIDS Research (CAHR). Vancouver, British Columbia.

Sweeney, E. (2008). "Contested Illness and the Environmental Health Controversy at the New Waterford Consolidated Hospital." Oral Presentation at the International EcoHealth Forum. Merida, Mexico.

Gahagan, J., Worthington, C., **Sweeney, E.**, Satzinger, F., and Rogers, E. (2008). "Ethics Issues for Canadian HIV/AIDS Researchers in International Settings." Poster Presentation at the 15th Canadian Conference on International Health. Ottawa, Ontario.

Gahagan, J., **Sweeney, E.**, Worthington, C., Rogers, E., Satzinger, F., and Perry, D. (2008). "Why Research Ethics Matter in International Settings: The Example of HIV/AIDS Research from a Canadian Perspective." Poster Presentation at the XVII International AIDS Conference. Mexico City, Mexico.

Gahagan, J., **Sweeney, E.**, Worthington, C., Rogers, E., Satzinger, F., and Perry, D. (2008). "Why Research Ethics Matter in International Settings: The Example of HIV/AIDS Research from a Canadian Perspective." Oral Presentation at the Canadian Public Health Association Conference (CPHA). Halifax, Nova Scotia.

Gahagan J., **Sweeney, E.** and Baxter, J. (2007). "Peer Health Education: Lessons Learned from Sierra Leone." Poster Presentation at the 16th Annual Canadian Conference on HIV/AIDS Research (CAHR). Toronto, Ontario.

Sweeney, E. (2007). "The Environmental Health Controversy at the New Waterford Consolidated Hospital." Oral Presentation at the International Ecological Integrity and a Sustainable Society Conference. Halifax, Nova Scotia.

Sweeney, E. (2006). "When Environment-Related Illness Strikes the Health Care Profession: An Exploratory Case Study of the New Waterford Consolidated Hospital." Oral Presentation at From the Cradle to the Grave: Future Perspectives on the Social History of Health and Healthcare. Glasgow, Scotland.

PROFESSIONAL EXPERIENCE

Adjunct Professor. Graduate Studies, Dalhousie University. June 2018-Present.

Director, Strategic Research Initiatives. Atlantic Partnership for Tomorrow's Health (Atlantic PATH). (Research investigating the environmental, lifestyle and genetic factors related to the development of cancer in Atlantic Canada). April 2017-Present.

Health Research Scientist. Atlantic Partnership for Tomorrow's Health (Atlantic PATH). Halifax, Nova Scotia. February 2016-Present.

Research Associate. REAL Knowledge Program and REAL Evaluation Services, Nova Scotia Health Research Foundation (NSHRF). Halifax, Nova Scotia. January 2014-February 2016.

Advisor to CIHR Team Grants. “Effects of Brominated Flame Retardants on Reproductive Health: Animal, Human, Ethical, Legal and Social Studies” and “‘Green’ Plasticizers: Impact of Exposure to Phthalates, their metabolites and ‘green’ plasticizers on male reproductive health.” June 2013-2015. University of Western Ontario.

Acting Executive Director. National Network on Environments and Women’s Health (NNEWH). York University. September 2012-July 2013.

Research and Writing Contract. Summary of research findings on a Canadian project related to breast cancer risk and occupational exposure to carcinogens and endocrine disruptors. Canadian Women’s Health Network (CWHN) and National Network on Environments and Women’s Health (NNEWH). August-November 2012.

Project Coordinator. “HIV Prevention in Canada: A Meta-Ethnographic Synthesis of Current Knowledge.” School of Health and Human Performance, Dalhousie University. April 2008-April 2009.

Research Associate. “The Canadian Sexual Health Assessment Model: Establishing Indicators to Evaluate the Sexual Health of Canadians.” School of Health and Human Performance, Dalhousie University (PI: University of Alberta). June 2007-March 2008.

Research Associate. Various Projects. School of Health and Human Performance, Dalhousie University. November 2007-March 2008.

Research Assistant. “The Problematization of OxyContin and the Treatment of Pain.” Department of Sociology and Social Anthropology, Dalhousie University. November 2005-November 2007.

Project Coordinator. “Determinants of Adolescent Pregnancy: Factors Influencing Youth Behaviours in a Rural Nova Scotia Community.” Department of Community Health and Epidemiology, Dalhousie University. November 2006-October 2007.

Research Associate. Various Projects. Atlantic Interdisciplinary Research Network (AIRN) for Social and Behavioural Issues in Hepatitis C and HIV/AIDS. November 2006-June 2007.

Research Associate. Evaluation of “Peer Health Education in Sierra Leone” for the Nova Scotia Gambia Association. School of Health and Human Performance, Dalhousie University. November 2006-April 2007.

Research Associate. “Framework for Action: Youth Sexual Health in Nova Scotia.” Nova Scotia Department of Health Promotion and Public Protection and Dalhousie University. January 2007-March 2007.

Executive Member, Communications Officer. Canadian Union of Public Employees, Local 3912. 2004-2005.

Research Assistant. “Fluoride Mouthrinse Program.” School of Dental Hygiene, Dalhousie University. October 2004-December 2004.

Referrals Clerk (Habitat Referrals Tracking System). Department of Fisheries and Oceans, Habitat Management Division. Dartmouth, Nova Scotia. Term Positions: 2001-2003.

TEACHING EXPERIENCE

Teaching Assistant (Tutorial Leader). “ENVS 1000: Introduction to Environmental Studies: Earth in our Hands.” Faculty of Environmental Studies, York University. 2011-2012.

Teaching Assistant. “ENVS 2150: Environment, Technology and a Sustainable Society.” Faculty of Environmental Studies, York University. 2010.

Teaching Assistant (Tutorial Leader). “ENVS 1000: Introduction to Environmental Studies: Earth in our Hands.” Faculty of Environmental Studies, York University. 2009-2010.

Teaching Assistant. “SOSA 1100: Introduction to Anthropology.” Department of Sociology and Social Anthropology, Dalhousie University. 2005-2006.

Teaching Assistant. “SOSA 2100: Environment and Culture.” Department of Sociology and Social Anthropology, Dalhousie University. 2003-2006.

SELECT FUNDING AND AWARDS

Murphy, R., Dummer, T., Le, N., Vena, J., DeClercq, V., Cui, Y., Keats, M., Grandy, S., Sweeney, E., Awadalla, P., Brenner, D., Chu, Q., and Di Sebastiano, K. (2019). “Beyond Smoking: Investigating Risk Factors for Lung Cancer in the Canadian Partnership for Tomorrow Project.” CIHR Operating Grant: Data Analysis Using Existing Databases and Cohorts. Value: \$100,000.

Adishes, A., Dummer, T., Kim, J.S., Keats, M., Sweeney, E. (2018). “Cadmium, Arsenic and other metal exposures as determinants of prostate cancer in the Canadian Atlantic provinces.” Prostate Cancer Canada and New Brunswick Health Research Foundation. Value: \$180,000.

Kim, J.S., Sweeney, E., Adishes, A. (2018). “Arsenic speciation profiling for evaluating the association between cancer and arsenic exposure using toenail biomarkers in the Atlantic PATH Cohort Study: Feasibility and preliminary health outcomes.” Nova Scotia Health Authority Research Fund Application. Value: \$25,000.

Adishes, A., Fleming, D., Kim, J.S., Sweeney, E., Dummer, E. (2018). Measurement methods for Lead in toenails: towards a novel biomonitoring of occupational exposure. WorkSafeNB Chief Medical Officer Occupational Medicine Research Fund. Value: \$14,900.

Kim, J.S., Sweeney, E., and Sweeney, C. (2018). Metabolic Profiling of Human Biospecimens for Identification of Novel Biomarkers Associated with Pesticide Exposure Using a Non-Targeted Approach. Seed Funding. Beatrice Hunter Cancer Research Institute. Value: \$10,000.

Waldron, I., Beaton, S., Haluza-Day, R., Mitchell, L., Teelucksingh, C., Thomas, R., Rutland, T., Sweeney, E. (Awarded). "Over the Line: A Bilateral Conversation on Race, Place, and the Environment." Connection Grant. Social Sciences and Humanities Research Council of Canada (SSHRC). 2017-2018. Value: \$50,000.

Waldron, I. and Sweeney, E. (2016). "Over the Line: A bilateral conversation about the health effects of race, place and the environment." Nova Scotia Health Research Foundation Knowledge Sharing Support Award. Value: \$10,000.

Kim, J.S., Sweeney, E., and Smith, N. (2016). "Toenail Biomarkers of Environmental Arsenic Exposure and Metabolism, and their Relation to Skin cancer, Lung cancer, and Diabetes Mellitus." Seed Funding. Beatrice Hunter Cancer Research Institute. Value: \$10,000.

PSY-CA Consortium (Netherlands). (Awarded). "Psychosocial factors and cancer incidence: a pre-planned meta-analysis of the PSYchosocial." Dutch Cancer Society. 2017-2022. Value: 1,327,072 Euros (\$1,967,211 CAD).

Provost Dissertation Scholarship (Awarded to ten graduate students at York University). Faculty of Graduate Studies, York University. 2012-2013. Value: \$22,000.

National Network on Environments and Women's Health (NNEWH) Conference Costs. Environmental Health Conference: Science and Policy to Protect Future Generations. Boston, Massachusetts. March 2013. Value: \$1500.

Canadian Institutes of Health Research (CIHR) Institute of Gender and Health Conference Scholarship. "Advancing Excellence in Gender, Sex and Health Research." Montreal, Quebec. October 2012. Value: \$750

Ontario Graduate Scholarship (*Declined*). 2012-2013. Value: \$15,000

Ontario Graduate Scholarship. 2011-2012. Value: \$15,000

Ontario Graduate Scholarship. 2010-2011. Value: \$15,000

National Network on Environments and Women's Health (NNEWH) Registration Costs. Canadian Institutes for Health Research, Institute of Gender and Health Conference - "Innovations in Gender, Sex and Health Research." Toronto, Ontario. November 2010. Value: \$200

Canadian Institutes of Health Research, Institute of Gender and Health Summer Institute. July 5-9, 2010. Vancouver, British Columbia. Costs of travel, accommodations and meals.

PhD Funding. Faculty of Environmental Studies, York University. 2009-2010. Value: \$22,400.

EcoHealth Forum and International Development Research Centre (IDRC) Travel Award.
International EcoHealth Forum. Merida, Mexico. December 2008. Value: \$1500

Nova Scotia Health Research Foundation Travel Award. From the Cradle to the Grave: Future Perspectives on the Social History of Health and Healthcare Conference. Glasgow, Scotland. January 2006. Value: \$2500

PROFESSIONAL SERVICE

2017-Present	Scientific Review Panel Member, Breast Cancer UK
2017-Present	Affiliate Member, Beatrice Hunter Cancer Research Institute
2016-Present	Board of Directors, Prevent Cancer Now
2016-Present	Editorial Board Member, <i>Palgrave Communications</i>
2016-Present	Senior Editorial Board, <i>Journal for Undergraduate Ethnography</i>
2016-Present	Working Group Member, Nova Scotia Environmental Rights Working Group
2015-Present	Working Group Member, Environmental Noxiousness, Racial Inequities and Community Health Project (ENRICH)
2015-Present	Advisory Board Member, <i>Health Tomorrow: Interdisciplinarity and Internationality</i>
2015-Present	Reviewer, <i>Health Tomorrow: Interdisciplinarity and Internationality</i>
2015-2016	Knowledge Translation Mentor, REAL Change Intervention Workshop Curriculum
2015-2016	Guest Editor, <i>Women & Environments International Magazine</i> Sustainable Consumption Issue
2013-Present	Scientific Advisory Board Member, Breast Cancer Action Quebec (formerly Breast Cancer Action Montreal)
2013-Present	Advisor, National Network on Environments and Women's Health
2013	National Organizing Committee Member, "Preventing Environmental and Occupational Endocrine Disrupting Chemical Exposures" and Public

- Event: “Hormone Disrupters Unmasked: How Chemical Exposures are Harming Human Health.” Workshop. Toronto, Ontario.
- 2012-2015 Editor, *Health Tomorrow: Interdisciplinarity and Internationality*
- 2012 Reviewer, Canadian Institutes of Health Research (CIHR) Institute of Gender and Health, Advancing Excellence in Gender, Sex and Health Research Conference
- 2011 Guest Editor, *Women & Environments International Magazine* Women, Gender and Labour Issue (February-August 2011)
- 2010-Present Copy Editor, *Anthropology Matters Journal*, United Kingdom.
- 2009-2013 Volunteer, Women’s Healthy Environments Network (WHEN). Toronto, Ontario.
- 2008-2009 Advisory Board Member, National Network on Environments and Women’s Health (NNEWH).
- 2008-2009 Steering Committee Member, “The Gendered Effects of Chronic Low Dose Exposures to Chemicals in Canadian Drinking Water.” National Network on Environments and Women’s Health (NNEWH).
- 2008-2009 Project Lead and National Organizing Committee Member, “Women and HIV in Canada: The Past, the Present, and the Future – Implications for Research, Policy and Practice.” Satellite Session at the 18th Annual Canadian Conference on HIV/AIDS Research (CAHR). Vancouver, British Columbia.
- 2007 Volunteer, 16th Annual Canadian Conference on HIV/AIDS Research (CAHR). Toronto, Ontario.
- 2003 Volunteer, Canadian Anthropology Society (CASCA) Conference. Halifax, Nova Scotia.

APPENDIX G-3