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Nova Scotia Expert Panel on Hydraulic Fracturing  
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**Submission to the Nova Scotia Expert Panel on Hydraulic Fracturing**

Dear Dr. Wheeler and Panel Members,

I am writing you as an interested citizen. I come to the complex question of hydraulic fracturing in N.S. through professional and private interests in population and public health. I am scientific director of a national, federally funded centre that translates knowledge to help the public health sector become more effective about the complex social and economic factors that influence community and personal health.<sup>i</sup> Prior to relocating to N.S., I was the Executive Director of Canada's longest standing health promotion organization, and served as the policy director for Toronto Public Health, a position that included oversight of a highly specialized Environmental Protection Office that analyzed the intersection of environmental issues and community health. Thank you for the opportunity to submit my concerns and requests to the Expert Panel.

First and foremost, I encourage the Panel to urge – with your most persuasive voices – the N.S. Government to apply the precautionary principle to decisions about hydraulic fracturing. Applying precaution is an essential approach when harm can potentially result from Government or other policy, especially when evidence is uncertain or incomplete. I commend the Government for initiating application of the precautionary principle by establishing the Expert Panel as part of a deliberative process with opportunities for input by varied communities and stakeholders. And, for showing unusual foresight in appointing a public health specialist, Dr. Frank Atherton, to the Panel. I suggest that hydraulic fracturing is a near perfect case example of the types of issues in the face of which precaution is crucial. To assist you, I bring to your attention the *Guide to Applying Precaution in Local Public Health Settings* developed by esteemed former staff and academic colleagues.<sup>ii</sup>

My preliminary review (far from complete) of the factors that should influence N.S.'s decision making suggests uncertainty in terms of causal relationships between the hydraulic fracturing processes and potential environmental, social and health harms and the potential avoidance of harms should fracturing proceed. In light of this, I urge that the Panel recommend that hydraulic fracturing *not* be approved in N.S. until further evidence exists and is analyzed provincially (including significant case study of other jurisdictions).

Most of my further comments will focus on social health and wellbeing issues. I choose to focus my comments here both because of my professional expertise and because I anticipate numerous submissions by others, many of whom will be more qualified than I, regarding potential economic benefits and risks and assessment of potential (and probable) risks to the physical environment and to human health from direct environmental exposures.

The Chief Medical Officer of New Brunswick has translated a superb review of research into a very readable report<sup>iii</sup> that I urge all Panel members to read. Having read that report and gone back to some of its source research, I will draw your attention to its key points here.

Of great concern to me are the under recognized negative effects of resource boom economies on communities. Research has identified increased crime, drug and alcohol abuse, sexually-transmitted infections, and domestic violence; inadequate infrastructure (e.g. road ways, community centres); stretched-thin public services (e.g. social services, health care, policing); and shortages of housing in the wake of boom economies. When the Conference Board of Canada initiated a Roundtable on Socio-Economic Determinants of Health,<sup>iv</sup> an early action was to invite members to visit Fort McMurray to meet with local leaders and see the hidden underside of that boom firsthand. Sadly, I'm not aware of resource extraction experiences where adequate early planning and infrastructure investments avoided negative social impacts. Because the N.B. public health report suggests that the effect of booms "is thought to be more intense for small communities with a traditional way of life," I urge the Expert Panel to put these considerations at the heart of your assessment.

A disconcerting aspect of potential population health impacts of shale gas extraction is the likely inequitable distribution of risk and reward to local residents. Studies already in the Expert Panel's web-based resources identify the likelihood that a significant portion of jobs will go to out-of-area, transient workers with minimal long-term interest in their temporary home. The risk of exacerbating the gap between haves and have-nots is high. Rural Canadians are, on average, already less healthy than urban Canadians and experience suggests that local community members will bear the brunt of the challenges identified in the last paragraph. It's not surprising then that community dissatisfaction increases in boom economies. First Nations community health should warrant special attention on the part of the Expert Panel and N.S. Government because First Nations peoples have long experienced disproportionate health disadvantage. Until a wealthier government than N.S.'s figures out how to avoid these problems, I can't imagine that we'll be able to manage development of hydraulic fracturing such that community wellbeing increases.

I also bring your attention to two health considerations about which there is minimal research: the role of exposure to nature as a contributor to health, and the role of connectedness to place and community as an influence on health. There is a growing body of research<sup>v</sup> that suggests that human health benefits from contact with the natural world. Studies focus are identifying benefits for patients who can see natural landscapes (even through a bedside window) or engage in horticultural therapy; benefits to children's mental and physical health of being in 'green' and natural spaces; and positivity of outdoor exercise (compared to indoor). Other studies identify health improvement or maintenance for people who have opportunities to be in wilderness.<sup>vi</sup> And, a growing movement, based on a research-based hypothesis,<sup>vii</sup> associates children's reduced exposure with nature and increased incidence of behavioural problems.

Personally, I am very 'place-centric,' caring deeply about my immediate community and physical surroundings and delivering that quality of place influences wellness in ways we don't yet fully understand. Although I had been peripherally aware of the proliferation of shale gas extraction in parts of the U.S. it wasn't until I saw images of the density of wellheads in communities in Pennsylvania that I paid attention. I was shocked to see extreme visual and esthetic disruption of the portrayed community landscapes, disruption that likely occurred very rapidly. I have found no research regarding social or wellbeing impacts of wellheads in the heart of communities. Nor do I know if rural Canadians have a different and deeper understanding of and connection to place, although I suspect this is true. I ask that you give consideration to community destabilization that results from rapid change, and also to reduced mental health that might result from diminished natural places adjacent to our homes.

We do know that healthy communities contribute greatly to population health. I encourage the panel to learn about and encourage investment in a healthy communities approach. The healthy communities movement has its origins in Canada during the 1980s, was picked up worldwide by the World Health Organization, and today is used in communities of all sizes throughout the world. The fundamental core value of a healthy community approach is capacity building and empowerment of individuals, organizations and communities, utilizing five core strategies: community/citizen engagement; multi-sectoral collaboration; political commitment; healthy public policy; and asset-based community development. Today's Canadian Healthy Communities Network is comprised of strong initiatives in BC, ON, QC and NB. It behoves N.S. to strengthen policies, practices and investments that enhance community health.

I encourage the Expert Panel to strongly recommend – in the event that N.S. allows hydraulic fracturing in principle -- comprehensive health impact assessment, using methods that integrate a health equity analysis, for each proposed development. Health impact assessments judge the potential effects on the health of a population, and the distribution of those effects within the population, of interventions and policies. Numerous methods have been design and tested, including mechanisms that assess how actions are likely to diminish or exacerbate health disparities among sub-groups of affected populations.

Although my submission has focused on health and wellbeing concerns, I'd like to close by stating that my reading of government and academic reports leaves me with deep concern regarding environmental and health risks that are likely to result from hydraulic fracturing at all stages (exploration; development; fracturing; gas capture; storage, treatment and disposal; and decommissioning of fracturing sites) in terms of toxicity (risks to water and air quality), noise and future access to water supplies. I reiterate my hope that the Expert Panel recommends – and that the N.S. Government takes a position – that hydraulic fracturing *not* proceed at this time. We simply don't yet know enough to assess risk, even *if* as a society we can answer the question of how much risk N.S. will accept in return for perceived economic gains.

My public health policy experience has, sadly, convinced me that industry has ably and repeatedly demonstrated that it does not put environmental, social and human interests foremost and, thus, should never be permitted to self-regulate. A review by Public Health England<sup>viii</sup> identifies the importance of baseline and continuing environmental monitoring; high standards of disclosure (e.g. which chemicals and how additives are used at all stages of fracturing); and that each site be assessed on a case by case basis. Therefore, should the N.S. Government proceed precipitously to approve hydraulic fracturing before we fully understand the likely impacts

of such development (or, approve fracturing at a later date, based on further assessment of more complete scientific and a reasonable accumulation of experiential evidence), I urge that the most robust, thorough and stringent regulations be imposed *before* Government approves hydraulic fracturing. And, that establish – in advance – mechanisms such that the financial cost of risk management, monitoring and remediation of harm is borne by industry and managed by Government on behalf of all Nova Scotians.

I wish you all the best in your deliberations. Nova Scotians are relying on your balanced and thoughtful weighing of the complex issues you've been assigned.

Sincerely,

Connie Clement

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<sup>i</sup> These complex social and economic factors are termed the 'social determinants of health.' The Senate Sub-Committee on Population Health, recently supported by the Canadian Medical Association, estimate that 75% of factors that influence health are not related to the health care system. Social determinants of health are well defined in Part one of the *Chief Medical Officer of Health's Recommendations Concerning Shale Gas Development in New Brunswick* (see endnote iii). A Canadian analysis of key determinants of health can be found in *Social Determinants of Health: The Canadian Facts* ([www.thecanadianfacts.org/The\\_Canadian\\_Facts.pdf](http://www.thecanadianfacts.org/The_Canadian_Facts.pdf)).

<sup>ii</sup> Toronto Public Health. 2011. *Guide to Applying Precaution in Local Public Health Settings*. Internal Document. Last updated September 22, 2011. [http://www.toronto.ca/health/hphe/pdf/applying\\_precaution\\_sep2011.pdf](http://www.toronto.ca/health/hphe/pdf/applying_precaution_sep2011.pdf) (downloaded 22 March 2014).

<sup>iii</sup> Office of the Chief Medical Officer of Health, New Brunswick Department of Health, *Chief Medical Officer of Health's Recommendations Concerning Shale Gas Development in New Brunswick*. 2012.

<sup>iv</sup> The Roundtable, of which I was a member for two years, aimed to stimulate effective strategies and collaborative approaches between business and government to achieve better health outcomes for Canadians, based on evidence that improved health can lead to improved productivity and economic growth.

<sup>v</sup> As examples, see: Frumkin, Howard, *Beyond Toxicity: Human Health and the Natural Environment*, American Journal of Preventive Medicine. 2001. 20(3): 234–24). Also, Wolf, K.L. and K. Flora. 2010. *Mental Health and Function - A Literature Review*. In: *Green Cities: Good Health*. University of Washington. 2010. ([www.greenhealth.washington.edu](http://www.greenhealth.washington.edu)).

<sup>vi</sup> Louv, Richard, *Last Child in the Woods: Saving our Children from Nature Deficit Disorder*, Algonquin Books. 2005.

<sup>viii</sup> Kibble, A et al, *Review of the Potential Public Health Impacts of Exposures to Chemical and Radioactive Pollutants as a Result of Shale Gas Extraction: Draft for Comment*. Public Health England. 2013. [http://www.hpa.org.uk/webc/HPAwebFile/HPAweb\\_C/1317140158707](http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317140158707) (downloaded 22 March 2014).