Assessing methane emissions from legacy fossil resource development and methane mitigation potential in Atlantic Canada Nova Scotia (GaSP- Gas Seepage Project)

GRANT WACH[1], DAVID RISK[2], MICHELLE GRAY[3], OWEN SHERWOOD[1], KERRY MACQUARRIE[4], KARL BUTLER [5], AND MAURICE DUSSEAULT[6]

1.Department of Earth Sciences, Faculty of Science, Dalhousie University, 1355 Oxford Street, Life Sciences Centre, Halifax, Nova Scotia B3H 4R2, Canada

2. Department of Earth Sciences, St. Francis Xavier University, Antigonish, Nova Scotia B2G 2W5, Canada

3. Faculty of Forestry and Environmental Management, University of New Brunswick, Fredericton, New Brunswick E3B 5A3, Canada

4. Department of Civil Engineering, University of New Brunswick, Fredericton, New Brunswick E3B 5A3, Canada

5. Department of Earth Science, University of New Brunswick, Fredericton, New Brunswick E3B 5A3, Canada

6. Department of Earth and Environmental Sciences, Centre for Environmental and Information Technology (EIT), Waterloo, Ontario N2L 3G1, Canada

The Atlantic Provinces have been extracting onshore energy resources, such as natural gas, oil and coal, for more than 200 years. Most of these developments are considered legacy (historic) fossil fuel sites that predate modern environmental and structural regulations. A number of these sites have been emitting methane gas continuously since abandonment and may be a significant contributor to greenhouse gas (GHG) emissions. Canada hopes to reduce methane emissions by 40–45% from the oil and gas sector below 2012 levels by 2025. Legacy sites in the Maritimes could be excellent targets for permanent mitigation.

In New Brunswick, 85% of 302 total drilled onshore wells sit in a suspended or abandoned state, and 60% were abandoned over 70 years ago. In both provinces, most wells were decommissioned before proper well abandonment procedures were developed and enforced. Improperly sealed wells can lead to well bore leakage and gas migration, a process which involves the uncontrolled migration of thermogenic gas and oil to the surface and into shallow groundwater, soils, and atmosphere. For coal mining, the Nova Scotia government has documented approximately 7000 historic mine openings, including 1922 pits, shafts, adits, and slopes. Methane liberation declines after mining activity ceases, but abandoned mines can emit methane at a near-steady rate for an extended period although, if flooded, only for a few years.

The Gas Seepage Project (GaSP) is the first of a multiphase methane mitigation initiative to be conducted in Atlantic Canada, with a focus on legacy fossil resource extraction sites. This includes evaluating methane gas release from legacy coal mines in Nova Scotia, and from oil and gas fields in New Brunswick. The results of this collaborative project include an atmospheric methane emission inventory estimate for legacy fossil resource extraction sites in Nova Scotia and New

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Brunswick; a techno-economic assessment of methane mitigation potential; development of new technologies and methodologies from local industry, and provide them with valuable corroborating data to assist in product validation. This project is important for methane management and policy formation in Atlantic Canada, and will provide benefits to Canadians via improvements in methane management technology and methodology, as a new regulatory framework is developed in Canada.

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