A Natural Seepage of Biogenic Natural Gas In the Intermontane Belt (Bowser Basin) of the Canadian Cordillera

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ABSTRACT

The identification, characterization, and exploitation of natural petroleum seepages and stained outcrops has provided an important method for finding rank wildcat discoveries in Canadian petroleum provinces. In the summer of 2002 the owners of Tatogga Lake Resort, Bunty and Hal Althaus, described evidence suggesting a natural gas seepage at Tatogga Lake British Columbia, to K. Osadetz and F. Ferri. The Mr. And Mrs. Althaus described persistently anomalous freezing and melting in the same area of the lake, and on at least one occasion, the seep was flammable. On November 17, 2003 Tatogga Lake was visited by C. Evenchick to observe the reported gas seepage in more favorable conditions and to recover gas for analysis. Observations and sampling were performed November 17 when the air temperature was about 0^{o}C. The lake is about 0.7 - 1.5 m deep in the region of interest. On that date most of Tatogga Lake was frozen, with 2 cm of fresh snow. Several circular or oval openings in the ice were present from the dock area (UTM zone 9, 440378/6396983, NAD27) to at least 100 m northeast of the dock, along a northeast trending belt roughly 20 to 40m from the eastern shore. The openings ranged from individual holes about 15 to 30 cm diameter, to coalesced holes a couple of metres long. The ice at the dock was 15 to 20 cm thick. A hole about 2 m off the dock was 15 cm in diameter. It had no surface activity when we arrived, but after about 15 minutes bubbles rose in one spot for at least a minute. Other holes far from the dock and the shore appeared to have surface activity and these were sampled using a flat-bottom aluminum boat as a sampling platform. One open patch with surface activity was about 1 x 2 m in size, and 30 m northeast of the dock. Closer inspection revealed that it was actually three coalesced openings resulting from bubbles rising from 3 places. The bubbles were about 3 - 8 mm diameter. When a sample was collected from this seep it took about 3 or 4 periods of streams of

bubbles to fill about 1/3 of the 125 ml bottle, over a total of about 3 or 4 minutes. A sample of head space gas was recovered from 1 of 2 isolated holes nearby where bubbles were about 5 -10 mm in diameter. A third sample was recovered from the northeastern-most stream of bubbles in the large hole. The gas is composed essentially of methane and carbon dioxide. The carbon isotopic composition of the gases indicate that they are produced by biogenic processes.