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**GEOLOGICAL SURVEY OF CANADA  
OPEN FILE 8720**

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Woodburn Lake group, Nunavut**

**V.M. McNicoll**

**2020**

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# U-Pb detrital-zircon geochronology of the Woodburn Lake group, Nunavut

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## Introduction

This multi-component Open File report releases SHRIMP U-Pb zircon data from 6 sedimentary and epiclastic rock samples from the Woodburn Lake group (Table 1). These analyses are contributions toward the GEM 1 Uranium Project (2008-2013), in helping to elucidate basement rocks that in places host unconformity associated uranium deposits. The Woodburn Lake group contains multiple volcanic and sedimentary assemblages (Pehrsson et al. 2013), and some of these assemblages were suspected to be distributed over disparate locations. The detrital zircon suites are of great help in testing correlations of these assemblages from place to place, as well as in refining their relative ages.

This release contains one Excel spreadsheet containing the U-Pb data for each of the six samples and an accompanying Adobe pdf file containing images of the zircon grains. The zircon images have been annotated with numbers that correspond to the analysis name and the location of SHRIMP analytical pits have been recorded. The purpose of this report is to make the U/Pb detrital zircon geochronology dataset publically available for evaluation and interpretation, not to provide such interpretation herein.

Expanded information on the geological setting of these samples and representations of their detrital provenance profiles in the form of probability density plots are provided in a forthcoming publication by Jefferson et al. (in prep.).

**Table 1. Sample Summary**

Lab Number	Sample Number	Lithological Description	Latitude (NAD27)	Longitude (NAD27)
10810	12JP040	Sedimentary, epiclastic: well lithified thinly laminated and graded beds of siliceous siltstone interlayered with volcanic-greywacke sandstone to mudstone (now phyllite) with locally abundant phenocrysts of quartz and feldspar. Sample from AREVA drill core GG21.	64.43194	-97.75467
10807	11JP009	Metasedimentary: amphibolite grade paragneiss with relict graded bedding, interpreted as metagreywacke; beds 10s to >100 cm thick. Extensive outcrop along southwest shoreline of elongate lake ~20 km south of Marjorie Hills.	64.21557	-98.84211
10574	PQB-MDB-2011-06	Sedimentary: feldspathic lithic wacke with some pebble-sized fragments. Outcrop near the northeast corner of Third Portage Lake.	65.00381	-96.10564
10809	11PHA041	Sedimentary: schistose feldspathic metagreywacke with transposed, thinly graded beds, hosts the auriferous Jim Zone iron-formation. Broad lichen-covered outcrop.	65.2083	-96.05364
10808	11JP398A01	Sedimentary: schistose feldspathic metagreywacke, large block with graded bedding, represents one host of the Kiggavik uranium deposit. Outcrop in gully west side of Lone Gull exploration camp.	64.44028	-97.66217

10971	10JPM078A	Sedimentary: schistose feldspathic metagreywacke, type locality of the Pipedream assemblage of the Woodburn Lake group, hosts non-mineralized iron formation. From outcrop 7 km northeast of the Meadowbank gold mine.	65.066	-95.93151
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## Analytical Methods

All samples were disaggregated using standard crushing/pulverizing techniques followed by density separation using the Wilfley table and heavy liquids.

SHRIMP analytical procedures followed those described by Stern (1997), with standards and U-Pb calibration methods following Stern and Amelin (2003). Briefly, zircons were cast in 2.5 cm diameter epoxy mounts along with fragments of the GSC laboratory reference zircon (z6266, with  $^{206}\text{Pb}/^{238}\text{U}$  age = 559 Ma). The mid-sections of the zircons were exposed using 9, 6, and 1  $\mu\text{m}$  diamond compound, and the internal features of the zircons (such as zoning, structures, alteration, etc.) were characterized in back-scattered electron mode (BSE) utilizing a Zeiss Evo 50 scanning electron microscope. On the mass spectrometer, eleven masses including background were sequentially measured with a single electron multiplier. Off-line data processing was accomplished using SQUID2 (version 2.50.11.10.15, rev. 15 Oct 2011). The  $1\sigma$  external errors of  $^{206}\text{Pb}/^{238}\text{U}$  ratios reported in the data table incorporate the error in calibrating the reference material. Common Pb correction utilized the Pb composition of the surface blank (Stern, 1997). Analyses of a secondary zircon reference material z1242 were interspersed between the sample analyses to assess the requirement of an isotopic mass fractionation correction for the  $^{207}\text{Pb}/^{206}\text{Pb}$  age. The accepted  $^{207}\text{Pb}/^{206}\text{Pb}$  age of z1242 is  $2679.7 \pm 0.2$  Ma, based on 59 isotope dilution fractions (Davis, 2019). Details of the analytical session, including spot size, calibration error and the any application of the isotopic mass fractionation correction are given in the footnotes of the table.

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