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March 30, 2019

Subject: Report on activities related to geoscience mapping on Somerset Island and northernmost Boothia Peninsula, under 8WLC-GBS1819 – Approval for the Use of Waters and Deposit of Waste Without a Licence

In compliance with the reporting conditions for K8WLC-GBS1819 – Approval for the Use of Waters and Deposit of Waste Without a Licence herein is a record of water use and waste deposit for the period from July 5 to August 20, 2018.

To update and improve understanding of the bedrock geology of Somerset Island, six weeks of fieldwork took place from July 5 to August 15, 2018. A temporary, low-impact tent camp erected 200 km south of Resolute Bay, NU on Creswell Bay (**Figure 1**) served as the base for this fieldwork. This location was one of the few locations that would accommodate landing of a Twin Otter aircraft on tundra tires proximal to a fresh source of potable water (Union River). We were grateful to have the permission, support and assistance of traditional hunters and homesteaders Martha and Nathaniel Kalluk who were present in the field at the camp for the duration of the project. As typical for this region, weather negatively impacted coverage in 2018, with below-average temperatures, snow and ice fog. Regardless, 990 locations were mapped by foot traverse, and 900 hand-sized samples were collected using pick-hammers.

Campsite Information:

Six weeks of fieldwork took place from July 5 to August 15, 2018, based from a low-impact tent camp constructed 200 km south of Resolute Bay, on Creswell Bay, Somerset Island (**Fig. 1**) at co-ordinates 72° 44.240'N, 94° 19.110'W (**blue star in Fig. 3**). This location was one of the few localities that would accommodate landing of a Twin Otter aircraft on tundra tires (**Fig. 2**) proximal to a fresh source of potable water, the Union River (**Figures 4, 5**).

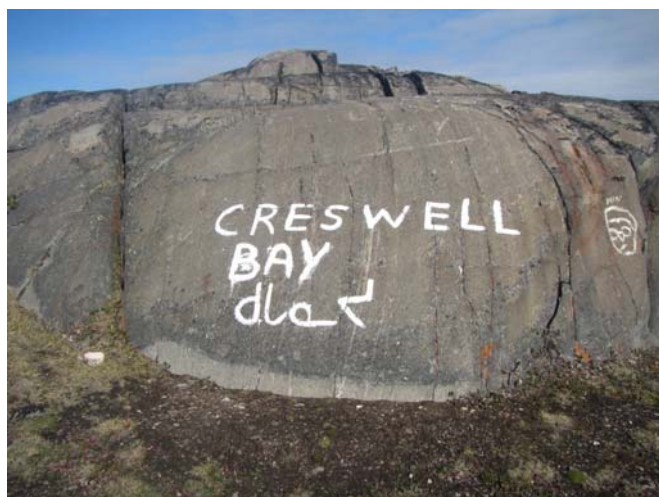


Figure 1: Signpost on runway at Creswell Bay.



Fig. 2: View to northwest of Creswell Bay airstrip & twin otter.

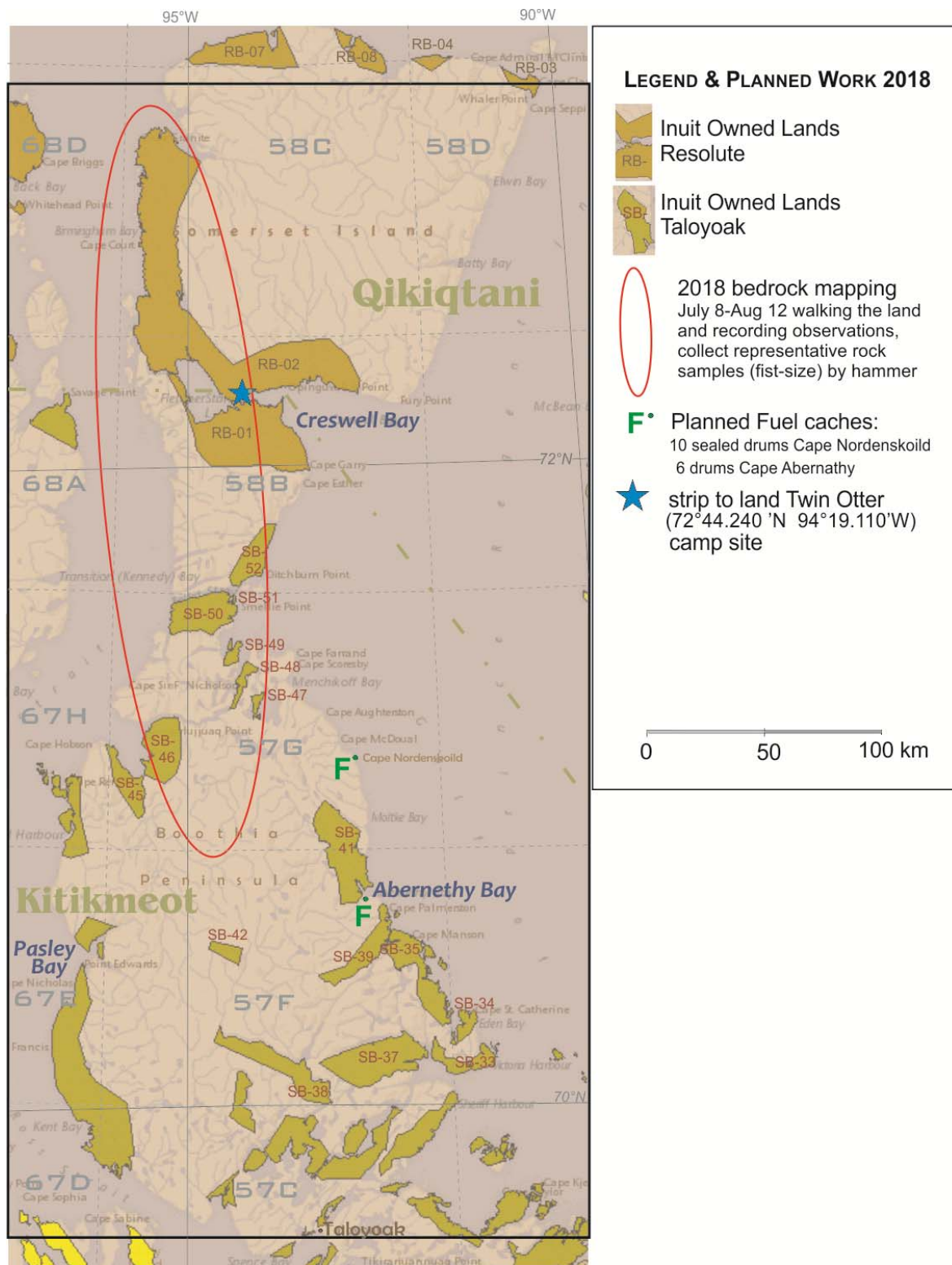


Figure 3: Region of focus for geoscience fieldwork in 2018 and logistics map on Somerset Island & northernmost Boothia Peninsula under Nunavut Research Institute Licence 04 013 18R-M and Land Use Permits #N2017J0009, QIA QX-1803, KIA KTX117X006 & 8WLC-GBS1819. Currently, no fuel and no empty fuel drums remain at the 2018 camp sites, or at the fuel cache sites.



Fig. 4: Satellite image of Creswell Bay site showing location where tents were erected from July 5-Aug. 15, 2018 (dashed yellow circle)



Figure 5: Aerial view of temporary tent camp on July 30, 2018.



Figure 6: Individual single-pole 8' by 8' sleeping tents for minimal impact.

All operations were carried out in a manner to minimize surface disturbances (**Figure 6,7**). The project footprint was kept as small as possible, and any disturbed area was restored. This included raking foot-trampled areas and repositioning reserved tundra sod. Other than aircraft, no heavy equipment was on site. No drilling or other industrial-type work was undertaken and no roads, or tracks, were constructed.



Figure 7: Draining system for greywater with grease trap (grey box) that collected all grease and debris prior to filtration through soil at location >35 m from high tide. Tundra sod (right photo) was carefully excavated, reserved, and repositioned during camp take-down in order to re-establish natural conditions at the site.

Record Keeping:

- i. **quantity of water used each day:** 1 cubic metre (1000 litres)
- ii. **quantity of waste, in cubic meters, deposited each day:** 0.28 cubic metres of human feces; 0.96 cubic metres of greywater
- iii. **type of waste deposited:** human feces; grey water from shower; grey water from kitchen sink;
- iv. **where the waste is deposited:** greywater was filtered for food debris and grease and then naturally filtered through soil at latitude 72° 43' 46.45"N, longitude 94° 19' 12.23"W;
Temporary toilet pits were located at 72° 43' 45.49"N, 94° 19' 14.43"W and 72° 43' 45.58"N, 94° 19' 16.56"W and were filled in with reserved soil after use.
- v. **concentration of the substance, or substances, in the deposited solid or liquid that has the effect of making the deposit waste:** greywater may have 10 parts per million food and grease; average human feces has 25% biodegradable solids (75% water content)
- vi. **methodology of calculation:** bladder held 2000 litres of water and to retain pressure, was filled once a day once it got to halfway mark; 14 people at the site averaged 1 feces event per day (daily 7 litres) times 41 days = 287 litres (0.28 cubic metres) human feces
- vii. **measures taken to avoid or mitigate any adverse impacts of waste:** >35 m from high water, a shallow pit was dug which allowed greywater to be slowly filtered through the soil horizon only once bulk of food debris and grease was collected in a grease trap (see Figure); soil and lichen horizon was retained and replaced before leaving in order to attempt to restore ground cover; small toilet pits were dug >35 m from high water to accumulate human feces and once covered allow it to decay naturally over time.

No human-bear interactions occurred over the course of the fieldwork. On the other hand, the close proximity of waterfowl (**Fig. 8**) and musk ox (**Fig. 9**) throughout the 2018 operations at the camp site indicated that wildlife was not disturbed by our temporary presence. All ancestral markers near the camp were left undisturbed.



Figure 8: Two pairs of red-throated loons remained undisturbed in ponds at the camp site throughout our operations. Their eggs, shown here on July 25, 2018 hatched on Aug. 1 and both pairs had two healthy chicks.



Figure 9: Muskox within sight of the camp was a common observance.

The camp was taken down August 13-14th, 2018. All camp gear, garbage, fuel and empty fuel drums were removed from the site on August 15-20 2018. Unopened dry and canned goods were donated to the Resolute Bay community food bank, and to the school lunch program.





Figure 10: Camp take down on August 13-14, 2018. Nathaniel Kalluk and David Idlout assisted with transportation of gear to the airstrip for removal back to Resolute Bay via twin otter.

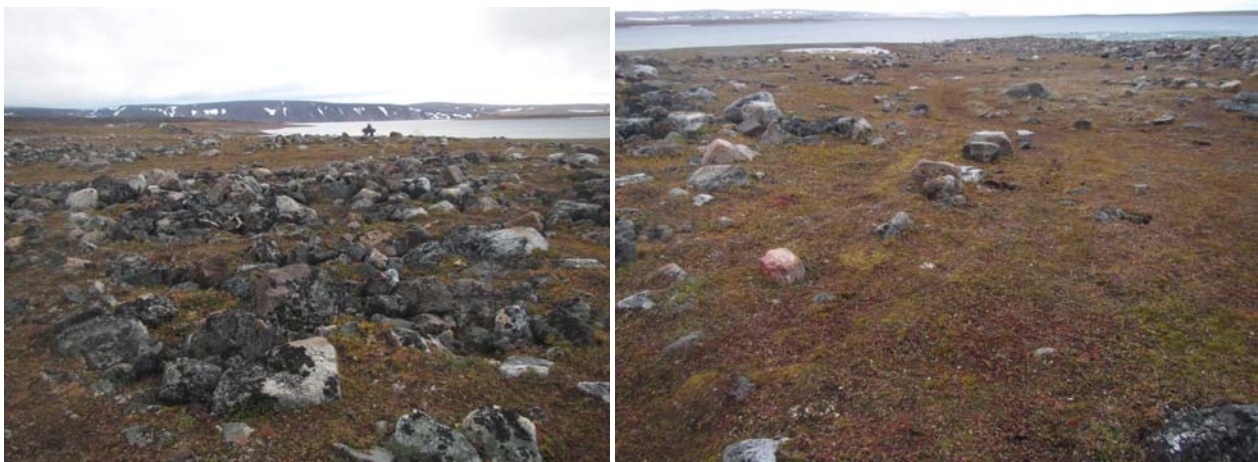


Figure 11: View to northeast (left photo) and east (right photo) of the site on August 15, 2018 following camp take down showing complete removal of all gear, fuel drums, and garbage from the 2018 site. All that remained at the site was an inukshuk built by local resident Nathan Kalluk on Nunavut Day July 9 2018.

Please do not hesitate to contact me if you would like any further information.

Thank you very much,

Sincerely,

Mary Sanborn-Barrie
Research Scientists, Geological Survey of Canada
Natural Resources Canada.