

## 2020 Nunavut Scientific Research License 02 034 19N-M

### 2020 Annual Report – Transmit Array Antenna Farm

The primary work performed under this License in 2020 was the transportation of the required large items to Eureka. These items arrived at Eureka by sealift in September 2020 and comprise a large electrical generator, 5 electronics shelters, numerous equipment crates, and a shelter sled. The generator will provide electrical power to the project radio electronics, which will be brought in by airlift at a later time. The electronics shelters will house the radio electronics and provide a climate-controlled environment to ensure reliable operation. The equipment crates contain essential accessories for the shelters such as blower fans and weather hoods. The shelter sled is intended to be used with a tracked vehicle to move shelters from the sea lift drop-off point to the location of the antenna farm. Currently the generator, shelters, crates, and sled are stored near the Eureka Weather Station.

A significant amount of work scheduled for 2020 had to be deferred due to the closure of the Eureka Weather Station to visitors during 2020 in response to the COVID-19 pandemic. Only essential workers are permitted and all non-essential research project work is on hold at this time. The deferred work under this License includes the completion of the cabling of the antenna farm, the move of the generator, shelters, and crates to the antenna farm site, and the electrical connection of the electronics shelters to the power generator. These deferred tasks are discussed in more detail below.

The antenna cabling task involves connecting the remaining 192 of 256 antennas in the antenna farm to coaxial cables and running these cables from the antenna farm to patch panels at the location of the shelters. This work could not be completed in 2019 due to weather-related delays in getting the work crew to the site in September 2019, and could not be completed in 2020 because the work crew could not get to the site at all due to the pandemic-related closure of the Eureka Weather Station to visitors.

The item-moving task requires preparation of the shelter cribs and foamed polystyrene ground insulation to provide a location to place the items. The cribs and ground insulation were prepared in 2019 but it was later discovered that the prepared location was too close to the airstrip to meet Transport Canada aeronautical obstruction rules. The current prepared location is 16 meters away from the airstrip and needs to be repositioned at a location 28 meters away from the airstrip to clear a 1:7 inclined-plane obstruction-control surface. Once the prepared location is repositioned, the items can be moved to the site.

The electrical connection task involves feeding the generator output into three step-down transformers, each of which feeds one of three shelters that contain high-power electronics. The two remaining shelters contain low-power equipment which will be fed from energized electrical panels at the site. All power feeds will use armoured weatherproof electrical cable that is suitable for running across the exposed ground surface. This weatherproof electrical cable for the electrical connections will be brought in by airlift at the beginning of the work season.