Iqaluit – Kimmirut Terrestrial Route Development
Description of Fieldwork to be Permitted

DRG has been engaged to prepare the set of technical requirements that will allow the Government of Nunavut (GN) to proceed with a study ("Project") that will result in the documentation necessary to assess the potential viability of a terrestrial fibre optic cable between the communities of Iqaluit and Kimmirut on Baffin Island. This document provides a description of the necessary fieldwork activities to complete the Project assessment.

A. Background

The objective of the Project is to develop a terrestrial fibre optic connectivity solution between Iqaluit and Kimmirut communities in the Canadian territory of Nunavut. In order to develop an understanding of the feasibility of implementing such a solution, information needs to be developed through onsite inspection and visits.

Development of the required information involves the following steps:

1) Review the terrain, verify elevations, validate width of water crossings and other similar non-invasive research to be conducted in the field along a pre-engineered route corridor up to 5km wide. The width of the corridor is required to find a route through the remote and rugged terrain involved where there is currently very limited information available for cable route development. Exhibit A highlights a 5-km wide centerline of this pre-engineered route corridor.
2) Real-time assessments will be involved primarily within the 2-km wide corridor but may require expansion up to 5km in areas where particularly difficult terrain is encountered in the field. The result of this fieldwork will be to establish an updated centerline of a planned cable route within the up to 5km wide corridor. This centerline may be marked with targets to be used as Ground Control Points for subsequent topographical and aerial photography data collection within a 2km wide corridor of this centerline.
3) The information developed from topographical and imagery data collection, as well as environmental and archeological information that will be separately developed by GN, will be used to finalize the best possible fibre optic cable route within the 2km wide corridor.

B. Description of Field Activities to be Permitted within the Route Corridor

There is anticipated to be approximately six (6 $\pm$ 2) research personnel who will conduct a helicopter-based assessment, potentially supported by ground-based assessment. All field assessments will be scheduled in unison and sequenced to take place within a three- to four-week period from late June to late July 2021 (airborne data collection would follow shortly thereafter). Observations, photos and records at sufficient level of detail to document considerations which may have an impact on the design engineering and specification will be made.

- **Terrain verification**: Observe, photograph and record. **No tools or equipment.**
- **Geotechnical**: Observe, photograph and record. No equipment and tools are limited to geological hand hammer, hand shovel and hand auger to assess material properties. A requirement for a minimal amount of digging is anticipated in areas of permafrost/soil conditions to understand depth and composition. Small geological handheld hammer may be used to assess hardness.
- **Hydrological**: Observe, photograph and record. **No tools or equipment.**
- **Placement of Targets for LiDAR Ground Control Points**: LiDAR may be required for all or portions of the route if alternative sources of topographical information and imagery is not available at the level of required detail. In the case LiDAR is required, targets will be survey-grade spray paint (~48" x 48") at approximately 5 km intervals (-3km/+5km) along a linear path within the cable corridor described above. A description of the spray-paint (or

equivalent) to be used is provided in Exhibit B. The painted targets are anticipated to naturally erode within a 4 month to 6-month period, depending on weather conditions

C. Means of Transport in the Field

- Helicopter-based Assessment: Approximately 3 to 5 people flying the route and making approximately 100 touchdowns (1 hr or less) at places of interest. Places of interest could be watercourse crossings, permafrost features, geological landforms, and steeper sections of the route.
- Ground-based Assessment, with helicopter support: Approximately 3 people driving by all-terrain vehicle (ATV) or walking the route making approximately 200 stops at places of interest. Anticipated to require helicopter support, due to rugged terrain and water crossings, to sling ATV's/transport crew between locations.

Helicopter Touchdowns & ATV's:

The large number of touchdowns/stops are anticipated given the relative unknown conditions of this remote area that will have an impact on the ability to install and maintain a robust fibre optic cable solution. It is understood that there is sensitivity to the portions of the route that cross park boundaries. These areas will be addressed by low-fly height reconnaissance without actually touching down, using ATV's or placing any targets for Ground Control Points within park boundaries provided to the engineering consult team. Current best information on park boundaries available for the engineering consult team is shown in Exhibit A.