1

2

3

Photos:
Photo 1: Photo of tundra degradation and pipeline on the tundra near the core laydown area
Photo 2: Pipeline on pad near the helicopter pad
Photo 3: Tundra degradation and pipeline on the tundra Looking back toward Photo 1

srk consulting	TMAC RESOURCES	2018 Annual Geotechnical Inspection
		Tailings Discharge and Reclaim Pipelines (Near Doris Camp)
Job No: 1CT022.028 Filename: 2018NDGeotechInsp_Rev1_sw.pptx	Doris TIA	Date: January 2019 / Approved: PL / Photolog: **9**

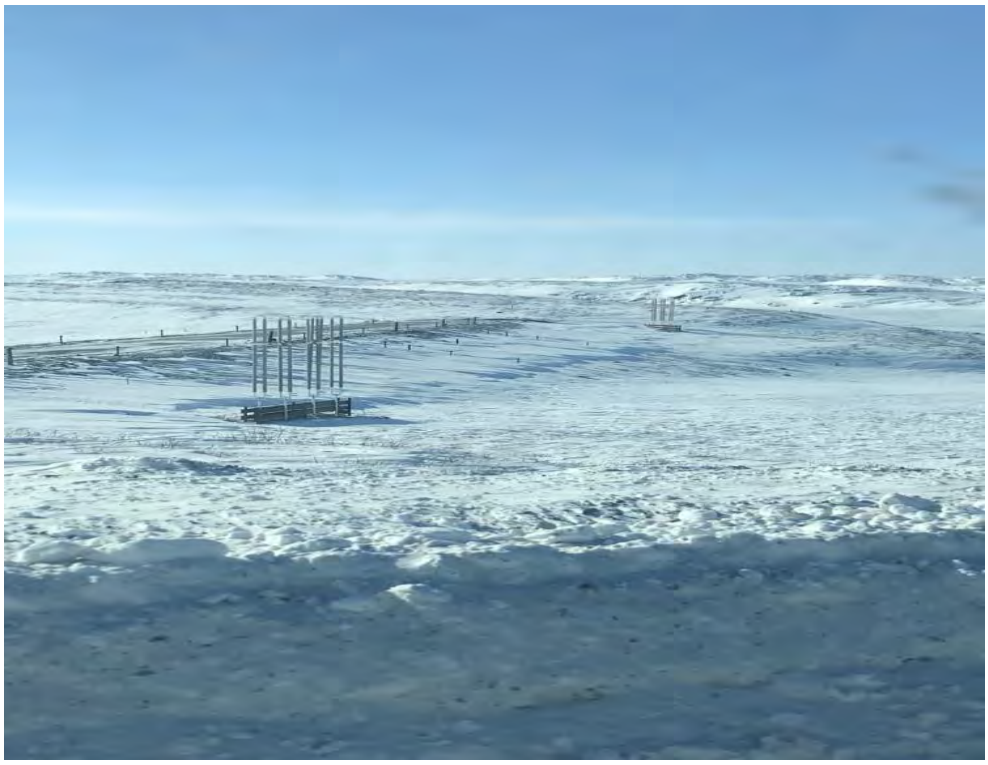
Appendix A – Arctic Foundations of Canada Inspection Report

Arctic Foundations of Canada

Doris North Dam

Inspection of Thermosyphon System

April 10-11, 2018



Background Summary

On April 10-11th AFC Personnel Justin Panagapko and Michael Watt attended the Doris North Dam location at the request of SRK Consulting to inspect the sloped thermosyphon installation within the frozen core dam. During SRK Consulting's ground temperature sensor monitoring, a concern was brought forward that one unit (North 2) showed deviation from the other units and may not be operational.

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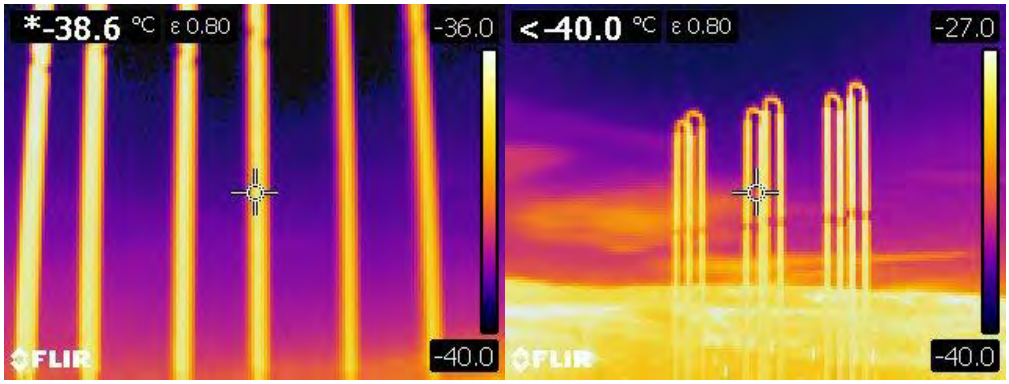
During the inspection, thermal imaging was used as an initial indicator to see if there were obvious signs of a non-functioning unit. Both the north and south banks were inspected and found to show consistent temperature gradients relative to ambient temperature.



North Bank South Bank

Further inspection was conducted by unlocking the valve caps on each of the units and visually checking the fill valves, seats, retaining gasket, and machined cap. All 12 units (north and south banks) were found to be in good condition and in good working order. One indication of a leaking fill valve is the pressurization of the protective cap, this condition was not present in any of the 12 units.

A final check was conducted by attaching a pressure gauge to each unit's fill valve and checking the pressure within each thermosyphon. Once again, it was determined that each unit was functioning as designed with a pressure differential of not more than +/- 10 psi across all 12 units. With the use of a pressure temperature chart, each unit's pressure was also correlated to the most current temperature readings available to AFC and found to be consistent with March/April readings of years prior.

Conclusions

Based on the inspection and various on-site checks conducted by AFC personnel, it was determined that the unit in question (north 2) and all other units were pressurized, in good condition, and functioning as designed.

Recommendations

AFC recommends the following actions to be taken:

- Continued inspection of the thermal data as per the currently implemented monitoring program.
- Continued secondary monitoring of the radiator banks as a means of verifying the thermal data. This can be accomplished by use of a thermal imaging camera or manually with a contact thermometer on the riser piping directly below the radiator fins. The most advantageous time of year to conduct this testing is fall or early winter when the key trench temperature is at its warmest and the air temperature trending colder.
- AFC recommends that any further inspection of the fill valve location be conducted a qualified technician. In the event that there is a valve failure on a unit, the protective cap will contain high pressure refrigerant. This cap functions as a safety to retain pressure in the event of a valve failure and is fitted with a machined surface and retaining gasket. Loosening of the set screws may cause the cap to release with considerable force and could cause injury. AFC utilizes specialized clamping tools to secure the cap upon removal.
- AFC welcomes any questions regarding the operation of our thermosyphon systems.

Appendix B – Ground Temperature Cables