ARKTIS SOLUTIONS INCORPORATED

:: 117 Loutitt Street :: Yellowknife, NT:: X1A 3M2 ::

:: Phone: 867.446.4129 :: Fax 866.475.1147 ::

MEMORANDUM

File:	**GN-CGS Project #10-2005 – Improvement of Water Supply System for the Municipality of Igloolik, Baffin Region, Nunavut**
To:	**Government of Nunavut – Department of Community and Government Services**
Attention:	**Mr. Matthew Hamp, Project Officer**
Subject:	***Bathymetric Survey of South Lake and Existing Water Reservoir***
Author:	**Alexandre Knop, Ph.D., P.Eng.**
Page Total:	**10**
Date:	**August 24, 2011**

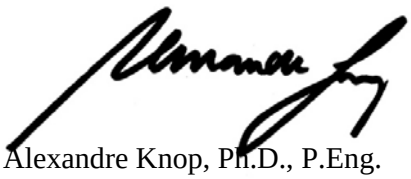
Mr. Matthew Hamp,

ARKTIS is pleased to provide GN-CGS with the results of the bathymetric survey completed by ARKTIS in South Lake and in the existing water reservoir located in Igloolik, Nunavut, as requested by GN-CGS during the project start-up call held on July 12th, 2011.

We trust that the information presented in this report satisfies the requirements of the project. Please do not hesitate to contact the undersigned if there are any questions or comments regarding this report.

Sincerely,

ARKTIS SOLUTIONS INC.



Alexandre Knop, Ph.D., P.Eng.
Geotechnical Engineer, ARKTIS Solutions Inc.

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APPENDICES

Appendix A – General Terms and Conditions

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1. Introduction

ARKTIS Solutions Inc. (ARKTIS) was retained by GN-CGS to complete activities related to the improvement of the water supply system for the Municipality of Igloolik, located in the Baffin Region in Nunavut.

The start-up call between ARKTIS and GN-CGS was held on July 12th, 2011. ARKTIS was requested to complete a bathymetric survey at the existing water reservoir and at South Lake, located approximately 2 km southwest of the reservoir, as illustrated in **Figure 1**.

The objective of this memorandum is to report: the methodology used for the bathymetric survey; the results obtained from the survey; and, the calculation of water volume currently stored at the existing water reservoir and at South Lake (at the time of our review).

To address the objectives of the project, this memorandum is organized into the following sections:

- **Section 1:** Introduction, objectives, memorandum organization.
- **Section 2:** Methodology used for completion of the bathymetric survey at South Lake and existing water reservoir.
- **Section 3:** Results of the bathymetric survey including calculation of current volume of water at South Lake and Storage capacity of the water reservoir at current conditions.
- **Section 4:** ARKTIS disclaimer.
- **Section 5:** Closure

2. Methodology

The method adopted for the completion of the bathymetric survey at South Lake and at the existing potable water reservoir in Igloolik was the use of a survey cable with scale directly launched from a boat. One of the extremities of the cable was fitted with a metal device to allow the cable to sink to the bottom of the lake/reservoir, allowing the assessment of current water depths at the time of review.

3. Results

On July 27th and 28th ARKTIS completed a bathymetric survey (per the above noted methodology) of South Lake and the existing reservoir located in Igloolik, Nunavut. The following results were obtained:

3.1 South Lake

- Water depth was assessed at 18 locations at the South Lake, as shown in **Figure 2**.

- The current lake elevation was surveyed to be 17.75 m above sea level (precision of ± 0.10 m due to waves in the lake during survey).
- The overall water depth of South Lake ranged from 0.80 to 2.80 m.
- The deepest section of South Lake was encountered towards the south center of the lake, between survey points BS-6, BS-7, BS-10 and BS-9, with water depth ranging from 2.45 to 2.90 m.
- The southeast section of South Lake was encountered to have water depth ranging from 0.80 to 1.65 m based on the surveyed points.
- The northwest section of South Lake was encountered to have similar water depth to the southeast section of the lake, with water depths ranging from 0.90 to 1.85 m.
- The footprint of South Lake was surveyed to have an approximate area of 263,287 m^2 at the current lake elevation at the time of our review.
- The current volume of South Lake was estimated to be of 491,956 m^3.

3.2 Potable Water Reservoir

- Water depth was assessed at 9 locations at the existing potable water reservoir, as shown in **Figure 3**.
- The current reservoir elevation was surveyed to be at 48.75 m above sea level (precision of ± 0.05 m).
- The water depth in the water reservoir was measured to be approximately 1.9 to 2.0 m (BS-1 and BS-2) along the western section of the reservoir, with water depth increasing towards the eastern section of the reservoir, where water depth was measured to be between 7.8 and 8.2 m (BS-4, BS-5 and BS-6) at current elevations.
- The center of the water body was measured to have a depth of approximately 6.5 to 7.5 m (BS-3, BS-7 and BS-9).
- The footprint of water in the potable water reservoir surveyed to have an approximate area of 10,680 m^2 at current water elevation.
- The current volume of water in the reservoir was estimated to be of 45,080 m^3.

4. Disclaimer

ARKTIS Solutions Inc. assumes no responsibility for inappropriate use of the contents of this report, and disclaims all liability arising from negligence or otherwise in respect of such information and recommendations presented in this memorandum. General terms and conditions are available in **Appendix A**.

5. Closure

ARKTIS would like to thank the GN-CGS for retaining our services. Should you have any questions whatsoever about the content in this Memorandum, please do not hesitate to contact the undersigned.

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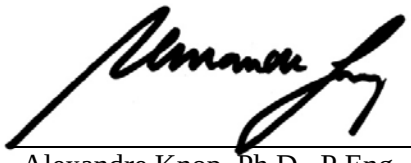

Alexandre Knop, Ph.D., P.Eng.
Geotechnical Engineer

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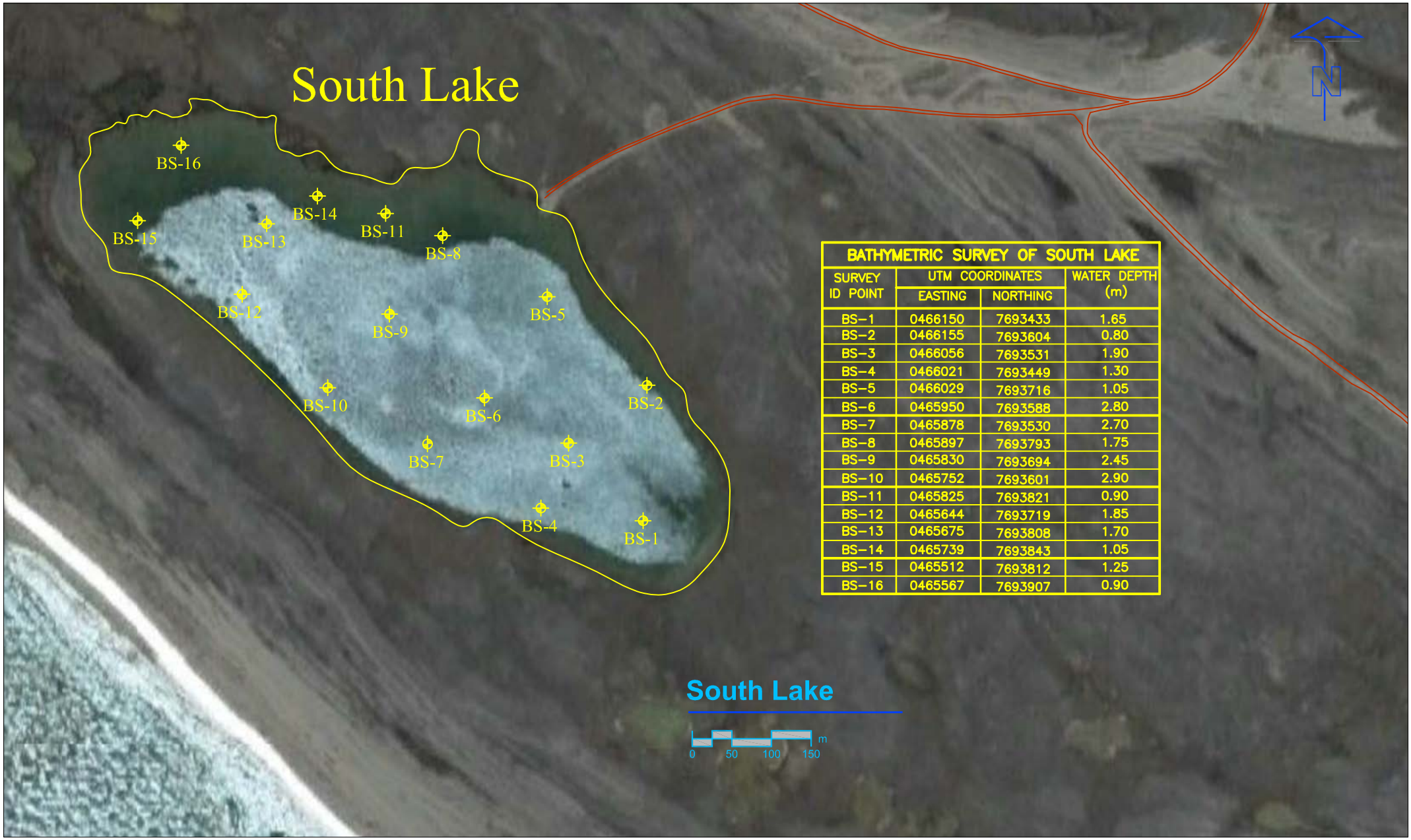
Figure 1. Location of South Lake and Existing Water Reservoir, Igloolik, Nunavut



BATHYMETRIC SURVEY OF SOUTH LAKE			
SURVEY ID POINT	UTM COORDINATES		WATER DEPTH (m)
	EASTING	NORTHING	
BS-1	0466150	7693433	1.65
BS-2	0466155	7693604	0.80
BS-3	0466056	7693531	1.90
BS-4	0466021	7693449	1.30
BS-5	0466029	7693716	1.05
BS-6	0465950	7693588	2.80
BS-7	0465878	7693530	2.70
BS-8	0465897	7693793	1.75
BS-9	0465830	7693694	2.45
BS-10	0465752	7693601	2.90
BS-11	0465825	7693821	0.90
BS-12	0465644	7693719	1.85
BS-13	0465675	7693808	1.70
BS-14	0465739	7693843	1.05
BS-15	0465512	7693812	1.25
BS-16	0465567	7693907	0.90

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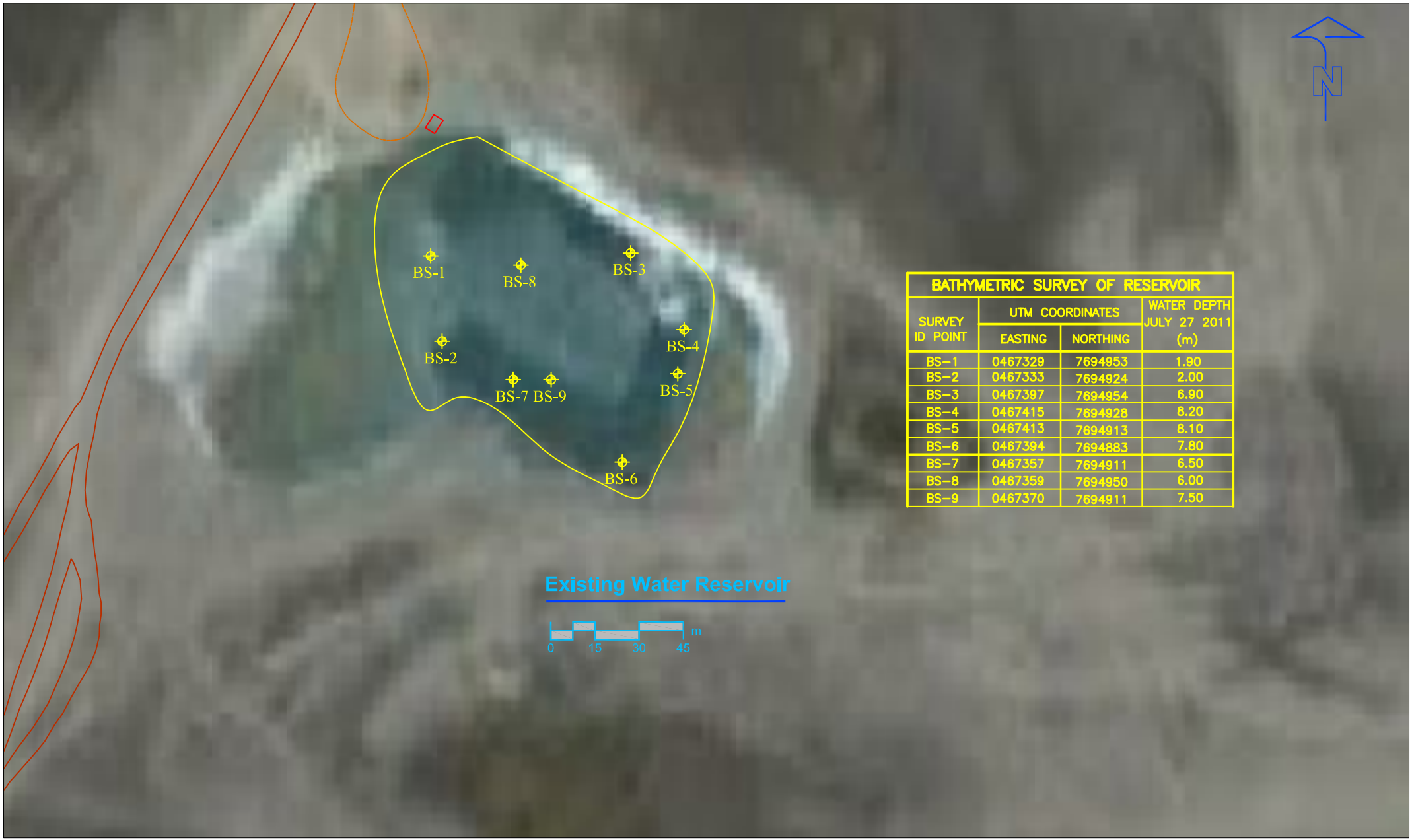
Figure 2. Bathymetric Survey - South Lake, Igloolik, Nunavut



BATHYMETRIC SURVEY OF RESERVOIR			
SURVEY ID POINT	UTM COORDINATES		WATER DEPTH JULY 27 2011 (m)
	EASTING	NORTHING	
BS–1	0467329	7694953	1.90
BS–2	0467333	7694924	2.00
BS–3	0467397	7694954	6.90
BS–4	0467415	7694928	8.20
BS–5	0467413	7694913	8.10
BS–6	0467394	7694883	7.80
BS–7	0467357	7694911	6.50
BS–8	0467359	7694950	6.00
BS–9	0467370	7694911	7.50

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Figure 3. Bathymetric Survey - Existing Water Reservoir, Igloolik, Nunavut

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APPENDIX A

GENERAL TERMS AND CONDITIONS

This report incorporates and is subject to these **"General Conditions"**

USE OF REPORT

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report and the assessments and recommendations contained in it are intended for the sole use of Arktis Solutions Inc.'s (ARKTIS) client. ARKTIS does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than ARKTIS' client unless otherwise authorized in writing by ARKTIS. Any unauthorized use of the report is at the sole risk of the user.

LIMITATIONS OF REPORT

This report is based solely on the conditions which existed on site at the time of ARKTIS' investigation. The client, and any other parties using this report with the express written consent of the clients and ARKTIS, acknowledge that conditions affecting the environmental assessment of the site can vary with time and that the conclusions and recommendations set out in this report are time sensitive.

The client, and any other party using this report with the express written consent of the client and ARKTIS, also acknowledge that the conclusions and recommendations set out in this report are based on limited observations and testing on the subject site and that conditions may vary across the site which, in turn, could affect the conclusions and recommendations made.

The client acknowledges that ARKTIS is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the client.

During the performance of the work and the preparation of this report, ARKTIS may have relied on the information provided by persons other than the client. While ARKTIS endeavors to verify the accuracy of such information when instructed to do so by the client, ARKTIS accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

LIMITATIONS OF LIABILITY

The client recognizes that property containing contaminants and hazardous wastes creates a high risk of claims brought by third parties arising out of the presence of those materials. In consideration of these risks, and in consideration of ARKTIS providing the services requested, the client agrees that ARKTIS' liability to the client, with respect to any issues relating to contaminants or other hazardous wastes located on the subject site shall be limited as follows:

a. With respect to any claims brought against ARKTIS by the client arising out of the provisions or failure to provide services hereunder shall be limited to the amount of fees paid by the client to ARKTIS under this Agreement, whether the action is based on breach of contract or tort;
b. With respect to claims brought by third parties arising out of the presence of contaminants or hazardous wastes on the subject site, the client agrees to indemnify, defend and hold harmless ARKTIS from and against any and all claim or claims, action or actions, demands, damages, penalties, fines, losses, costs and expenses of every nature and kind whatsoever, including solicitor client costs, arising or alleged to arise either in whole or part out of services provided by ARKTIS, whether the claim be brought against ARKTIS for breach of contract or tort.

STANDARD OF CARE

Services performed by ARKTIS for this report have been conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and financial and physical constraints applicable to the services. Engineering judgment has been applied in developing the conclusions and/or recommendations provided in this report. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of this report.

ALTERNATE REPORT FORMAT

Where ARKTIS submits both electronic file and hard copy versions of reports, drawings and other project related documents and deliverables (collectively termed instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by ARKTIS shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by ARKTIS shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of instruments of professional services shall not, under any circumstances, no matter who owns or uses them, be altered by any party except ARKTIS. The Client warrants that instruments of professional services will be used only and exactly as submitted by ARKTIS.