Test Cell Dike

1. Surficial sloughing and cracking along the edge of the crest of the dike is occurring on the both the internal and the external faces of the dike. The cracks have no significance to overall dike stability. Considering the reclamation plan for the Test Cell area includes levelling the top bench of the dike and re-sloping of the outside face of the dike, no additional maintenance is currently recommended.

West Twin Lake Polishing Pond

1. Some additional silty clay material was placed at the north abutment to repair some of the erosion that had been observed in 2003. Despite this repair work, some erosional scar remain at this location. This erosion has likely occurred in response to surface runoff during the spring melt or summer precipitation events. The abutments are composed of a fine grained marine silt and clay, which is susceptible to erosion. If allowed to continue over time, the erosion could progress to a level where some water may be released from the polishing pond around the abutments. The problem could be mitigated by placing rip rap or coarse gravel and cobbles over the silt and clay. At this time, the minor erosion does not currently pose a concern for the stability of the structure. Since the reclamation plan for the outlet structure includes the removal of the structure and replacement with an engineered channel design, no remedial action is recommended at this time.

East Twin Diversion Dike and Channel

1. The same observations of channel erosion observed in 2003 were also observed in 2004. The reclamation plan for the dike and diversion channel includes re-sloping the inside face of the dike and lining the critical portions of the channel with an appropriately sized rip rap. As such, no remediation beyond the eventual completion of the reclamation plan for this are is currently recommended.

Upper Dump Pond Berm

1. The liner is exposed over most of the dump pond. Considering the reclamation plan for the dump pond is to excavate the tailings and remove the liner it is not recommended that the liner be covered.
2. No significant cracking or sloughing was observed during the inspection. As such, no maintenance is required at the current time.

Mill (Lower) Dump Pond Berm

1. Some erosion was observed along the face of the berm proximal to Twin Lakes Creek in 2003. In 2004, additional coarse gravel and cobbles were placed within the main erosion feature identified during the 2003 site inspection.
2. Other minor erosion of the face of the berm along the creek identified in 2003 does not appeared to have worsened in 2004. The erosion does not appear to cause any concern in regards to the immediate stability of the berm and additional maintenance is not currently required.

Main Tank Farm Berm

1. The liner is exposed in a few locations and should be covered to prevent further damage from occurring (ensure any cuts in the liner are repaired before backfilling).
2. Minor sloughing and cracking was observed along the outside face of the dike. These features do not appear to cause any concern with regards to stability of the berm.

Day Tank Farm Berm

1. The liner is exposed in several locations and should be covered to prevent further damage from occurring (ensure any cuts in the liner are repaired before backfilling).

East Adit Catchment Pond Dike

1. The dike was graded and re-surfaced with shale this spring in response to minor erosional features observed during the 2003 inspection.
2. During the 2004 inspection only minor surficial sloughing was observed on the upstream face of the dike.
3. No significant cracking was observed on the crest of the dike in 2004.
4. Minor seepage was observed downstream of the dike approximately 20 m from the toe of the dike.
5. No remedial work is recommended for this site at this time.

East Adit Retention Pond Dike

1. The crest of the dike was graded and re-surfaced during the spring of 2004. This was completed in response to observations of surficial sloughing and cracking observed during the 2003 site inspection.
2. In 2004, no significant cracking or sloughing was observed on the crest or either face of the dike.
3. A small depression was observed on the crest of the dike. This is likely related to the settlement of some loosely placed fill during the grading and resurfacing of the crest.
4. A wet area at the downstream toe of the dike was observed possibly indicating that it is an area where seepage occasionally occurs. No seepage water was observed at this location during the time of the inspection.
5. In general, the dike is in good shape. No remedial work is recommended for this site at this time.

Any recommended work should be undertaken before constant freezing temperatures resume at site.

Please contact the undersigned should you have any comments or questions.

Respectfully submitted,
BGC ENGINEERING INC.

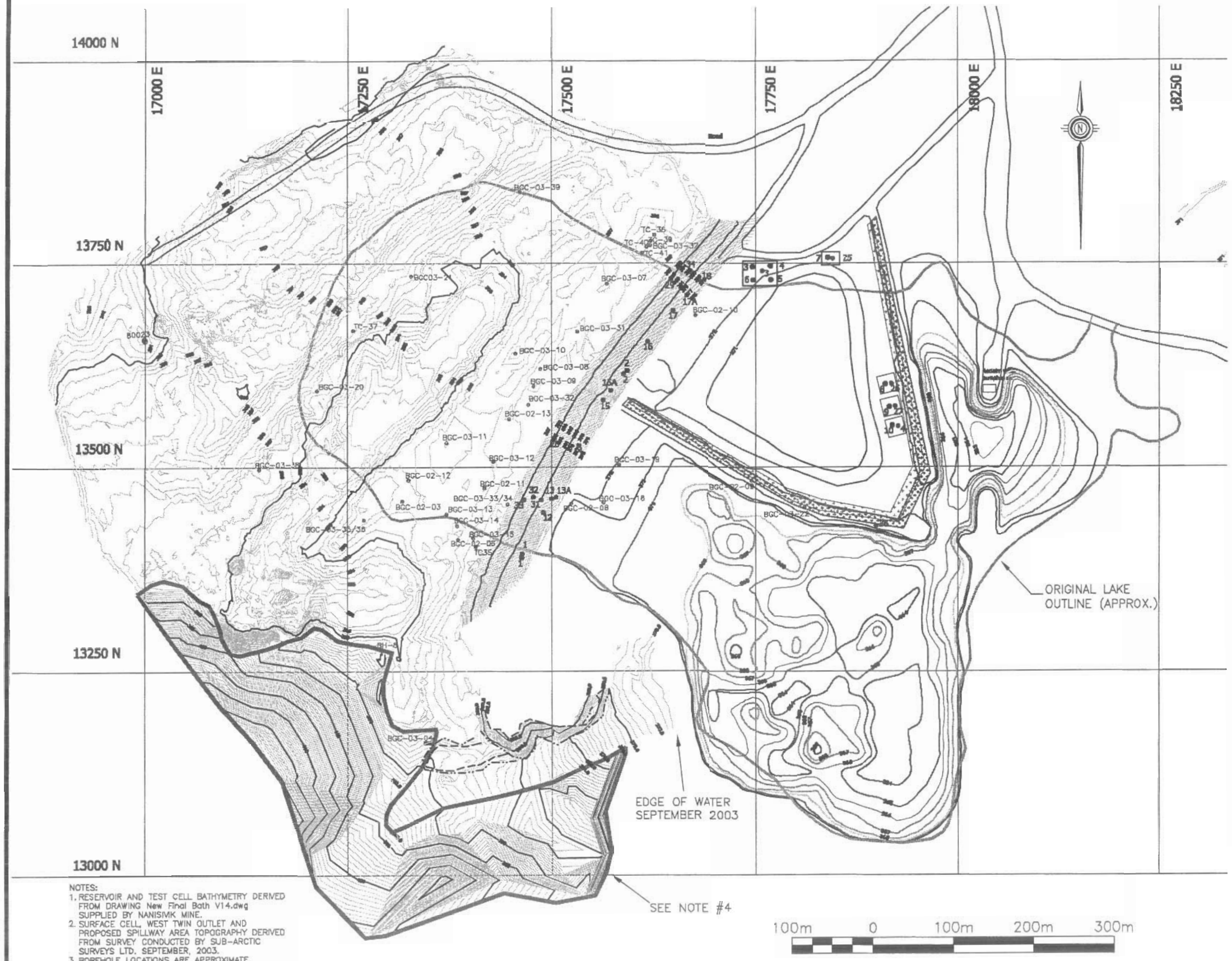
Geoff Claypool, B.Sc., P.Eng.
Geological Engineer

APPENDIX 2 - SUMMARY OF WEST TWIN DIKE AND TEST CELL DIKES MONITORING DATA

Table A2-1: Summary of Instrument Readings in Surface Cell and West Twin and Test Cell Dikes

Instrument Label	Instrument Type	Location	Station	Surface Elevation (m)	Interval of thawed ground (>1°C) bleow active layer	Additional Comments	Recommended 2004/ 2005 Monitoring Frequency
TC1	T/C	Dike Face	00+75	376	N/A	Two functioning nodes in foundation indicate frozen conditions throughout year.	Stop Monitoring
TC2	T/C	Dike Face	3+25	376	N/A	Entire profile frozen throughout year.	Monthly
TC12	T/C	Dike Face	1+30	376	N/A	Entire profile frozen throughout year. No additional cooling trend observed.	Monthly
TC13A	T/C	Dike Face	1+15	376	N/A	Entire profile frozen throughout year. No additional cooling trend observed.	Monthly
TC14	T/C	Dike Face	2+25	376	N/A	Entire profile frozen throughout year. No additional cooling trend observed.	Monthly
TC15	T/C	Dike Face	2+88	376	N/A	Entire profile frozen throughout year. No additional cooling trend observed.	Monthly
TC15A	T/C	Dike Face	3+00	377	N/A	Entire profile frozen throughout year. No additional cooling trend observed.	Monthly
TC16	T/C	Dike Face	3+75	376	9 to 11 m	Warm zone between 9 and 11 m remains.	Monthly
TC17	T/C	Dike Face	4+25	376	N/A	Entire profile frozen throughout year. No additional cooling trend observed.	Monthly
TC17A	T/C	Dike Face	4+50	376	N/A	Entire profile frozen throughout year. No additional cooling trend observed.	Monthly
TC18	T/C	Dike Face	4+75	376	N/A	Entire profile frozen throughout year. No additional cooling trend observed.	Monthly
TC28	T/C	Dike Face	2+25	384	N/A	Entire profile frozen throughout year. No additional cooling trend observed.	Monthly
TC29	T/C	Dike Face	4+50	385	N/A	Entire profile frozen throughout year. No additional cooling trend observed.	Stop Monitoring
TC31	T/C	Dike Face	1+50	378	N/A	Entire profile frozen throughout year. No additional cooling trend observed.	Monthly
TC32	T/C	Dike Face	1+50	382	N/A	Entire profile frozen throughout year. No additional cooling trend observed.	Monthly
TC33	T/C	Dike Face	1+50	386	13 to 16 m	No cooling trend observed.	Monthly
TC34	T/C	Dike Face	4+75	385	N/A	Profile below 2 m remained frozen throughout year.	Stop Monitoring
TC35	T/C	Dike Crest	00+75	387.5	10 to 16 m	Erratic data. Tailings below 14 m depth likely remain thawed.	Stop Monitoring
BGC02-03	TM	SC		387	5 - 12 m	Exhibiting cooling of ground temperatures at depth.	Monthly
BGC02-08	T/C	Dike Toe		373	N/A	Instrument broken beyond repair in 2003.	Monthly
BGC02-10	T/C	Dike Toe		373	N/A	No warming or cooling trends noted in data. Data quality erratic during periods of cold climatic conditions.	Monthly
BGC02-11	T/C	SC		387	10 to 25 m	No warming or cooling trends noted in data. Data quality erratic during periods of cold climatic conditions.	Stop Monitoring
BGC02-12	T/C	SC		387	5 - 20 m	No warming or cooling trends noted in data. Data quality erratic during periods of cold climatic conditions.	Stop Monitoring
BGC02-13	T/C	SC		387	10 to 30 m	No warming or cooling trends noted in data. Data quality erratic during periods of cold climatic conditions.	Stop Monitoring
BGC03-03	T/C	SC		387	N/A	Frozen ground conditions below 4 m throughout entire year.	Stop Monitoring
BGC03-07	TM	SC		387	18 to 25 m	Cooling of ground temperatures observed where thawed tailings were previously encountered (18-25 m).	Monthly
BGC03-09	TM	SC		387	13 to 25 m	Cooling of ground temperatures observed where thawed tailings were previously encountered (10-15 m).	Monthly
BGC03-10	TM	SC		387	7 to 27 m	Cooling of ground temperatures observed at top of thwed zone (7 m depth).	Monthly
BGC03-11	TM	SC		387	7 to 25 m	Minimal cooling of ground temperatures observed.	Monthly
BGC03-12	VW	SC		387		Increase in pore pressures observed during winter months.	Monthly
BGC03-13	TM	SC		387	13 to 16 m	Cooling of ground temperatures between 10 and 12 m observed.	Monthly
BGC03-14	VW	SC		387		Increase in pore pressures observed during winter months.	Monthly
BGC03-15	TM	SC		387	N/A	Cooling of ground temperatures throughout entire profile observed.	Monthly
BGC03-18	T/C	Dike Toe		374	N/A	Frozen ground conditions below 3 m throughout entire year.	Monthly
BGC03-19	TM	Dike Toe		374	N/A	Cooling trend observed in ground temperatures at depth.	Monthly
BGC03-20	TM	SC		387	15 to 18 m	No cooling trend observed within thawed zone between 15 and 18 m.	Monthly
BGC03-21	TM	SC		387	N/A	Cooling observed at depth (16 m).	Monthly
BGC03-31	VW	SC		387		Minimal fluctuation in pore pressures observed throughout year.	Monthly
BGC03-32	VW	SC		387		Minimal fluctuation in pore pressures observed throughout year.	Monthly
BGC03-33	TM	Dike Crest		388	18 to 23 m	Minimal cooling observed within thawed tailings between 18 and 23 m.	Monthly
BGC03-34	TM	Dike Crest		388	N/A	Dike remains frozen between 3 and 12 m throughout entire year.	Monthly
BGC03-35	VW	SC				Minimal fluctuation in pore pressures observed throughout year.	Monthly
BGC03-36	T/C	SC		388	5 to 15 m	Minimal cooling of ground temperatures observed.	Monthly
BGC03-37	TM	SC		387	N/A	Penetration of thaw front was not observed to proceed beyond 1 m depth.	Monthly
BGC03-38	T/C	SC		387	N/A	Minimal cooling of ground temperatures observed.	Stop Monitoring
BGC03-39	T/C	SC		387	N/A	Minimal cooling of ground temperatures observed.	Stop Monitoring
TC36	T/C	Test Cell Dike		373.5	5 to 10 m	Minimal cooling of ground temperatures observed.	Stop Monitoring
BGC02-09	TM	Test Cell Dike		375	17 to 22 m	Cooling of ground temperatures observed at 15 m depth.	Monthly
BGC03-22	TM	Test Cell Dike		375	13 to 27 m	No cooling observed within thawed zone between 18 and 28 m.	Monthly

SC - Surface Cell
T/C - Thermocouple
TM - Thermistor
VW - Vibrating Wire



NOTES:
1. RESERVOIR AND TEST CELL BATHYMETRY DERIVED FROM DRAWING New Final Bath V14.dwg SUPPLIED BY NANISIVIK MINE.
2. SURFACE CELL, WEST TWIN OUTLET AND PROPOSED SPILLWAY AREA TOPOGRAPHY DERIVED FROM SURVEY CONDUCTED BY SUB-ARCTIC SURVEYS LTD. SEPTEMBER, 2003.
3. BOREHOLE LOCATIONS ARE APPROXIMATE.
4. TOPOGRAPHY OF THIS AREA WAS DERIVED BY BGC USING ADDITIONAL DATA SUPPLIED BY NANISIVIK MINE.

CLIENT: NANISIVIK MINE
A DIVISION OF CANZINCO LTD.

LEGEND

- 2002/2003 GEOTECHNICAL INSTRUMENTATION
- ORIGINAL LAKE OUTLINE (APPROXIMATE)
- SYMBOL DENOTES THERMOCOUPLE LOCATION
- SYMBOL DENOTES FROST GAUGE LOCATION

REV.	DATE	REVISION NOTES	DRAWN	CHECKED	APPROVED

SCALE:	AS SHOWN
DATE:	NOV 2004
DRAWN:	CJT
DESIGNED:	GKC
CHECKED:	JWC
APPROVED:	JWC

PROJECT: ANNUAL INSPECTION OF WASTE CONTAINMENT DIKES

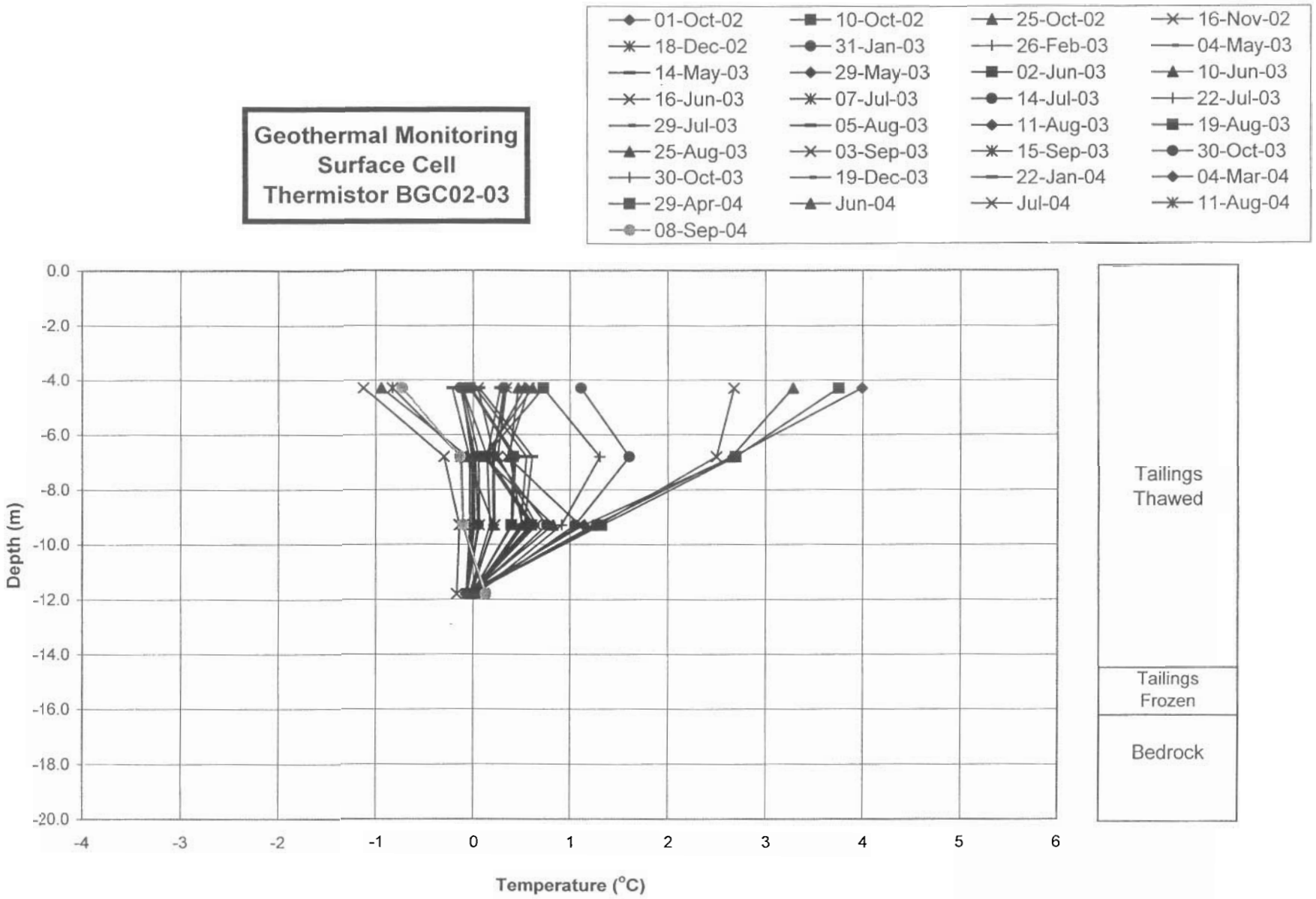
TITLE: WEST TWIN DISPOSAL AREA
GEOTECHNICAL INSTRUMENT LOCATIONS

PROJECT No.	DWG	REV.
0255-009-06	FIGURE A2-1	0

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Calgary, AB Phone: (403) 250 5185

0255-009-06 006 FIGURE_A2_1.dwg

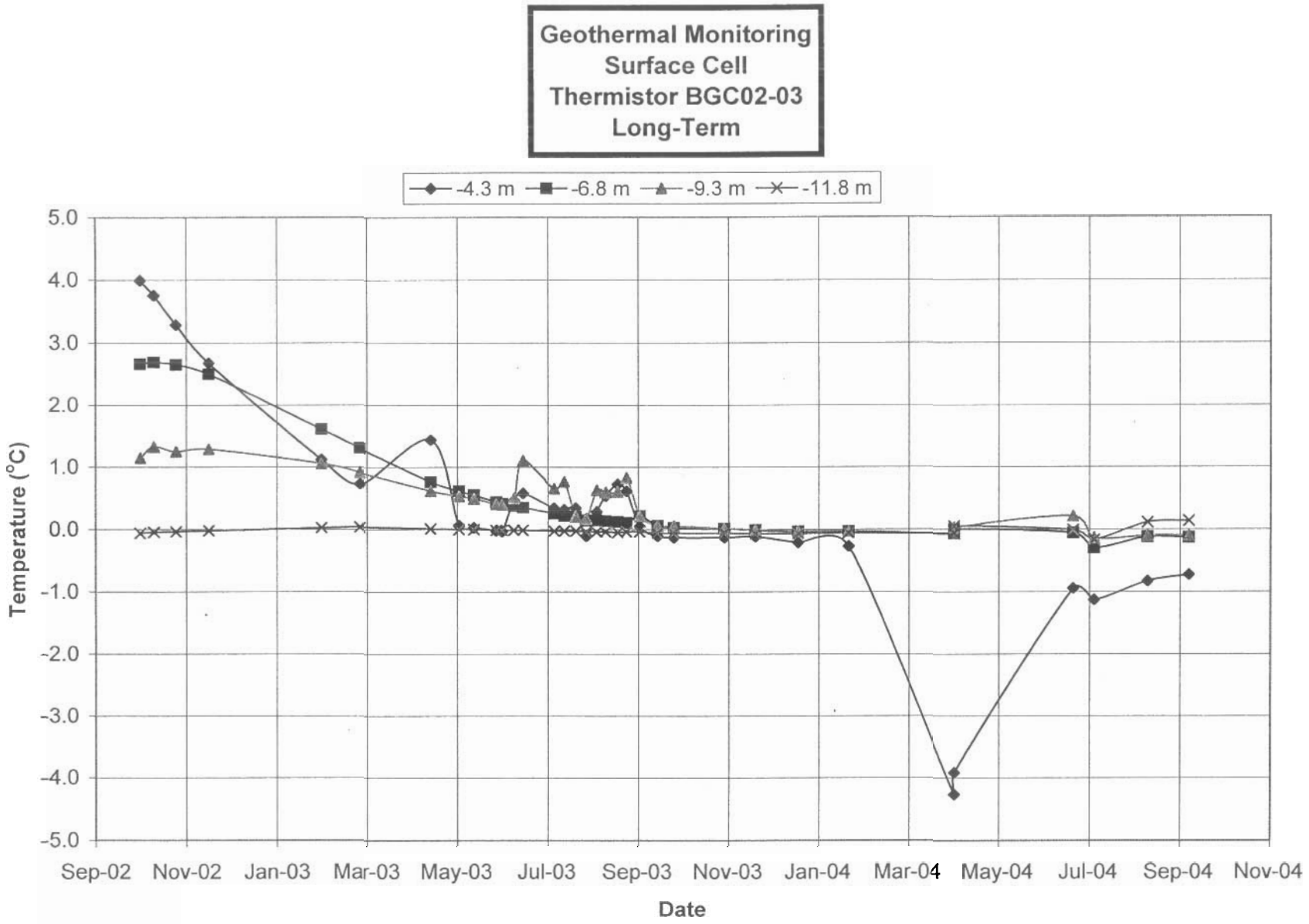
Geothermal Monitoring
Surface Cell
Thermistor BGC02-03



Thermistor Plots 2004
BGC02-03

BGC ENGINEERING INC.

Note: Borehole log based on observations made during drilling in September 2002.


Geothermal Monitoring
Surface Cell
Thermistor BGC02-03
Long-Term
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-6.8 m
-9.3 m
-11.8 m
Temperature (°C)
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
Sep-02
Nov-02
Jan-03
Mar-03
May-03
Jul-03
Sep-03
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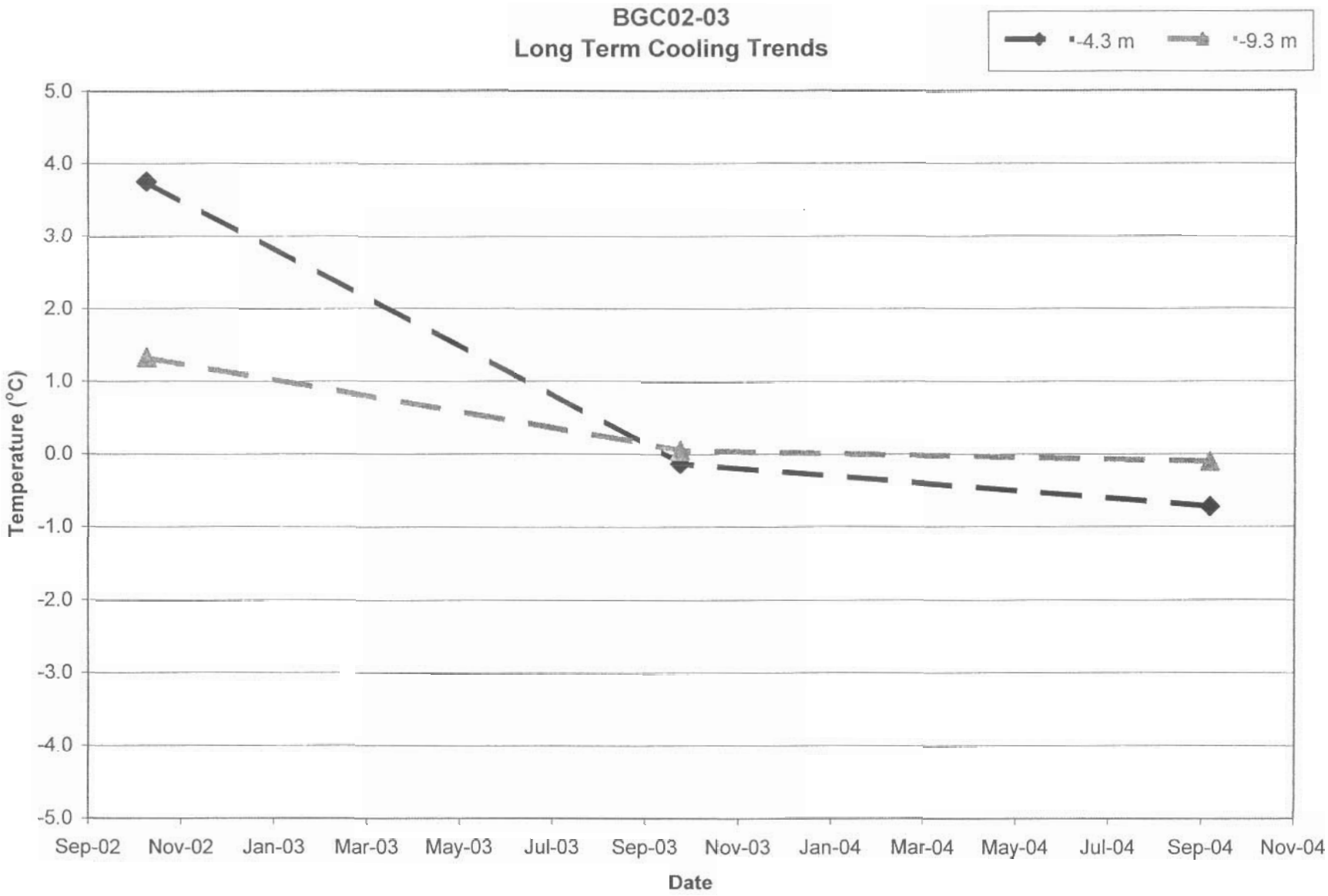
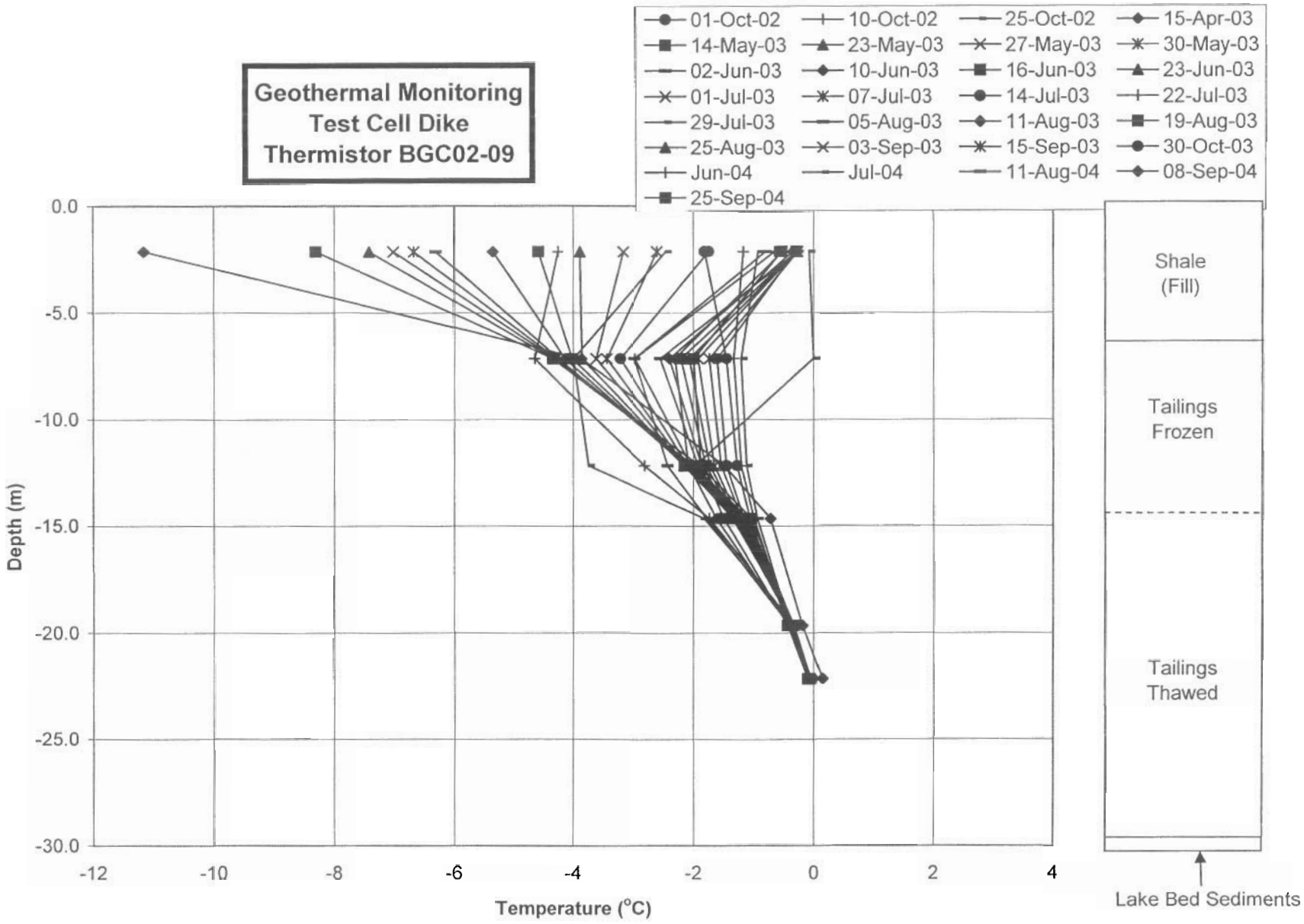
Jul-04
Sep-04
Nov-04
Date


BGC02-03
Long Term Cooling Trends
-4.3 m
-9.3 m
Temperature (°C)
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
Sep-02
Nov-02
Jan-03
Mar-03
May-03
Jul-03
Sep-03
Nov-03
Jan-04
Mar-04
May-04
Jul-04
Sep-04
Nov-04
Date

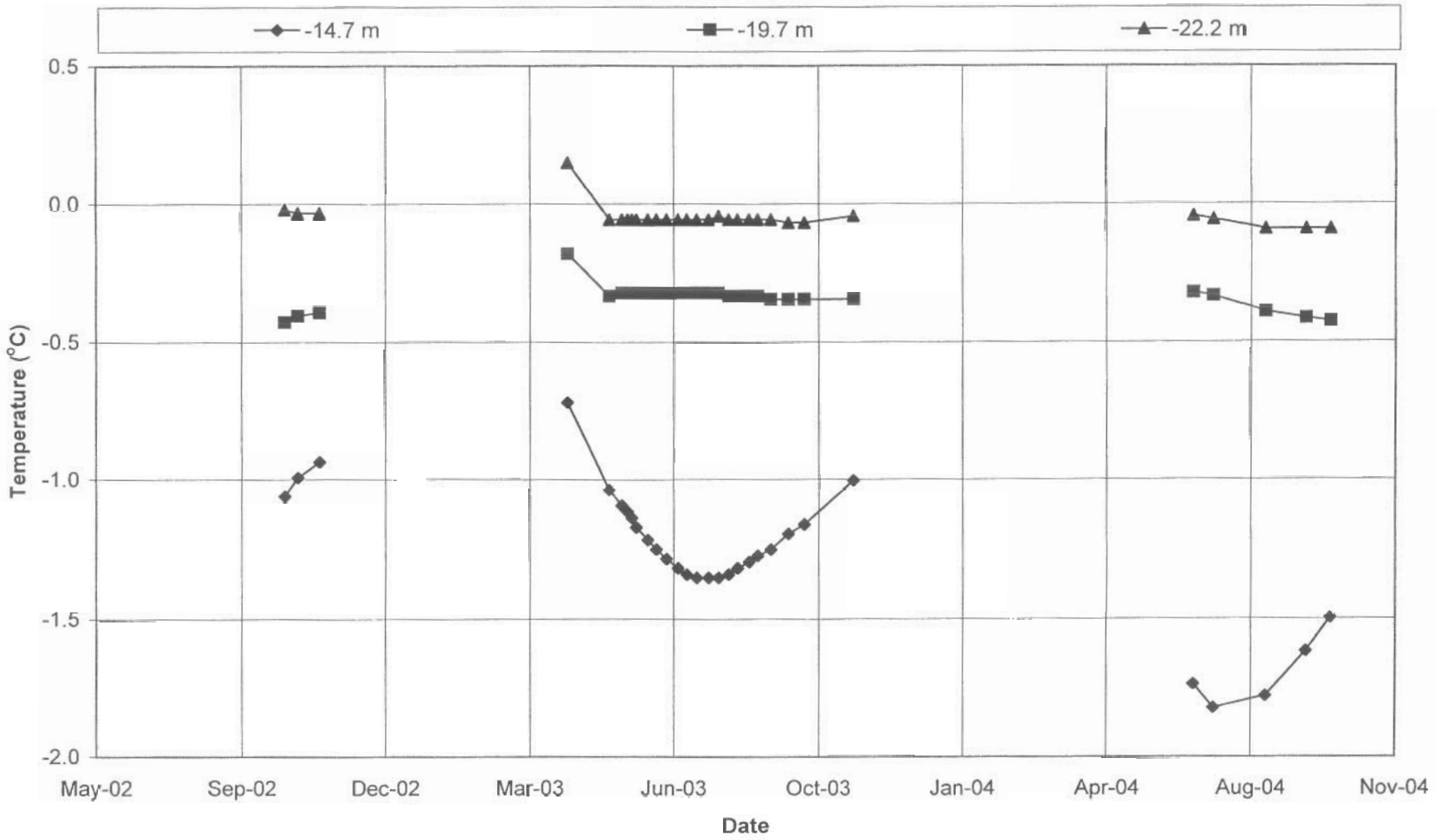


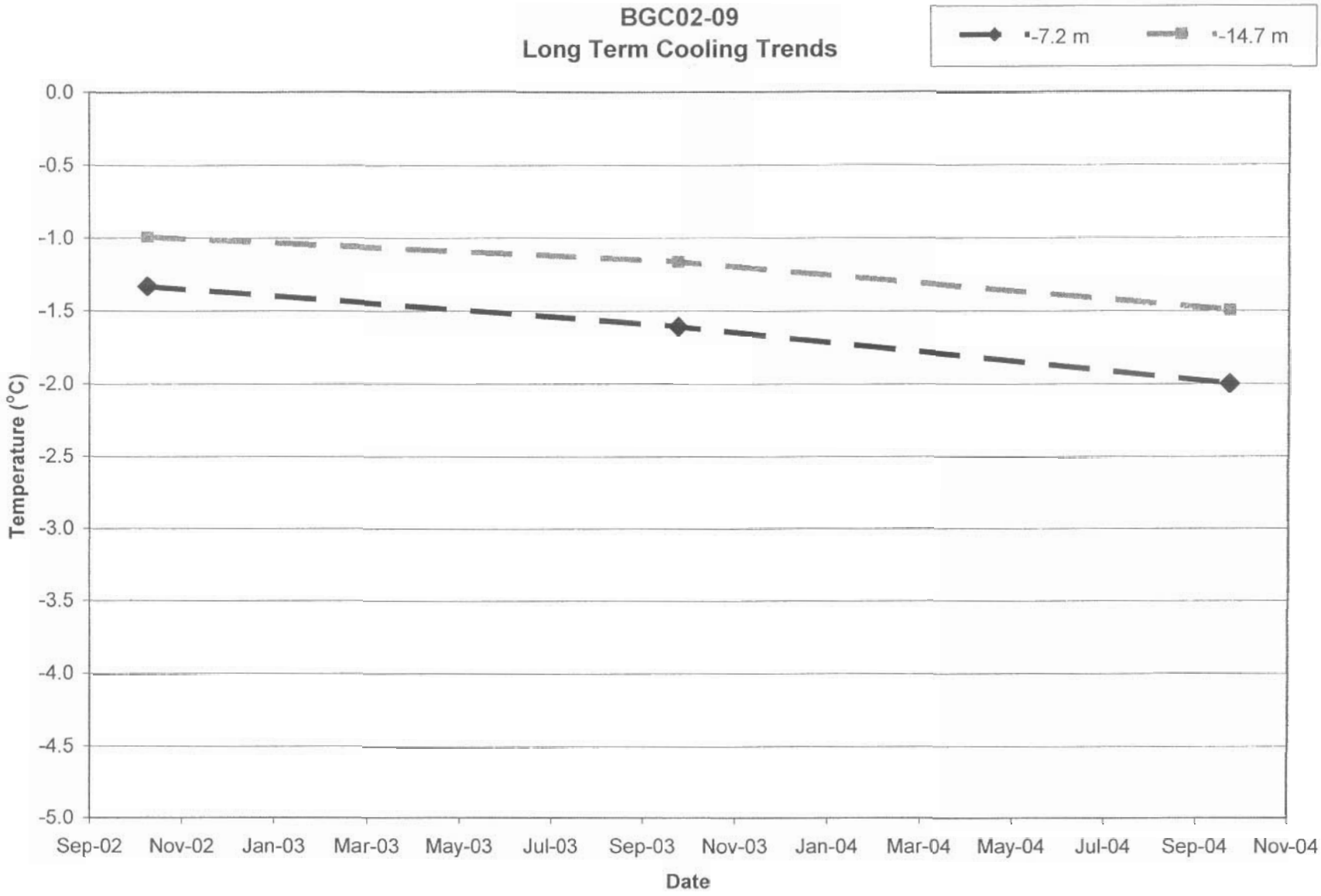
Thermistor Plots 2004
BGC02-09

BGC ENGINEERING INC.

Note: Borehole log based on observations made during drilling in September 2002.

Geothermal Monitoring
Test Cell Dike
Thermistor BGC02-09
Long-Term




BGC02-09
Long Term Cooling Trends
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-14.7 m
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
-3.5
-4.0
-4.5
-5.0
Temperature (°C)
Sep-02
Nov-02
Jan-03
Mar-03
May-03
Jul-03
Sep-03
Nov-03
Jan-04
Mar-04
May-04
Jul-04
Sep-04
Nov-04
Date

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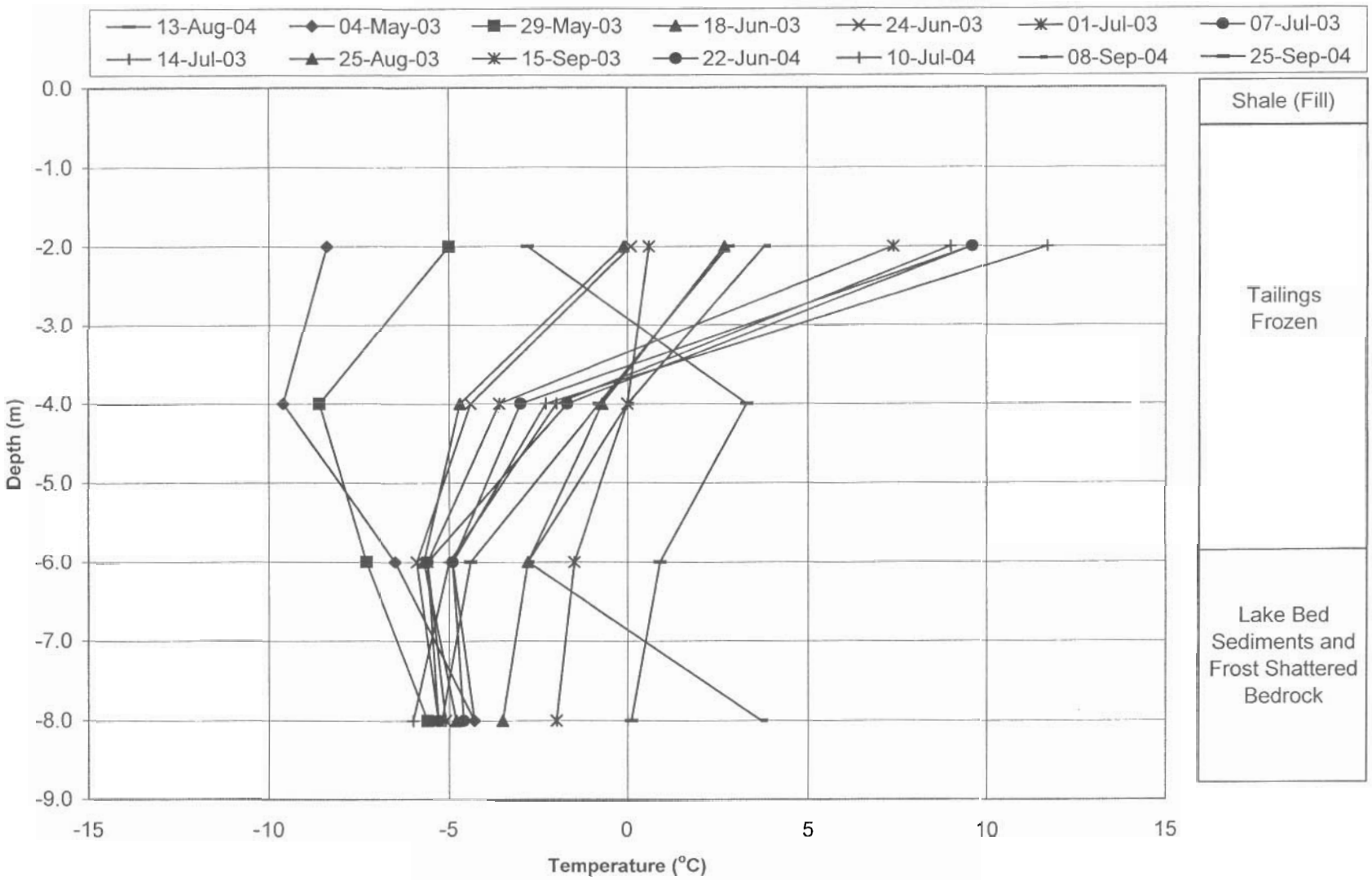
Toe of WTD
Thermocouple BGC02-10

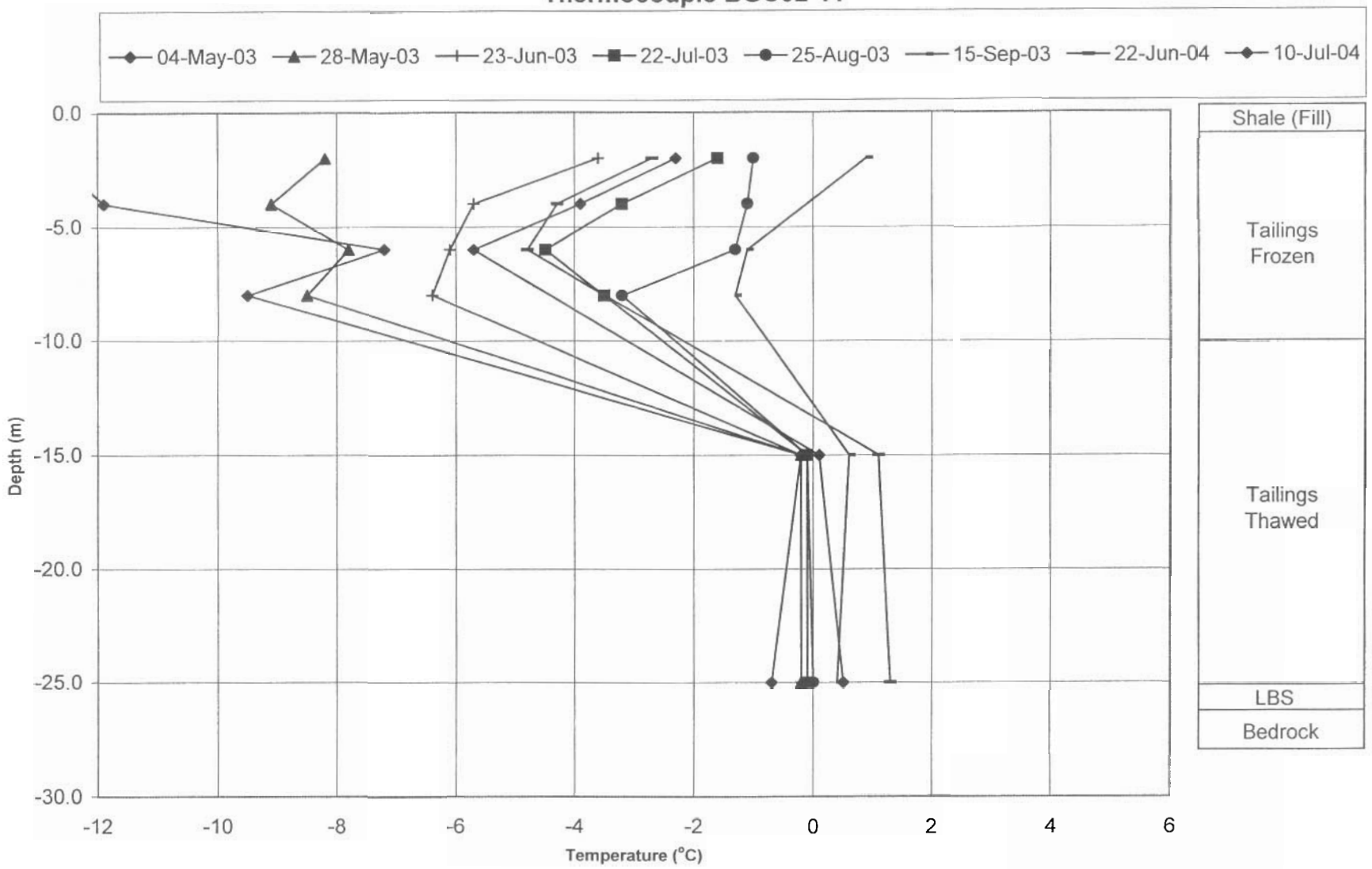


Nanisivik Thermocouples data and trmps (version 1)
BGC02-10 trmp

BGC ENGINEERING INC.

Note: Borehole log based on information collected when borehole was drilled.

Geothermal Monitoring
Surface Cell
Thermocouple BGC02-11



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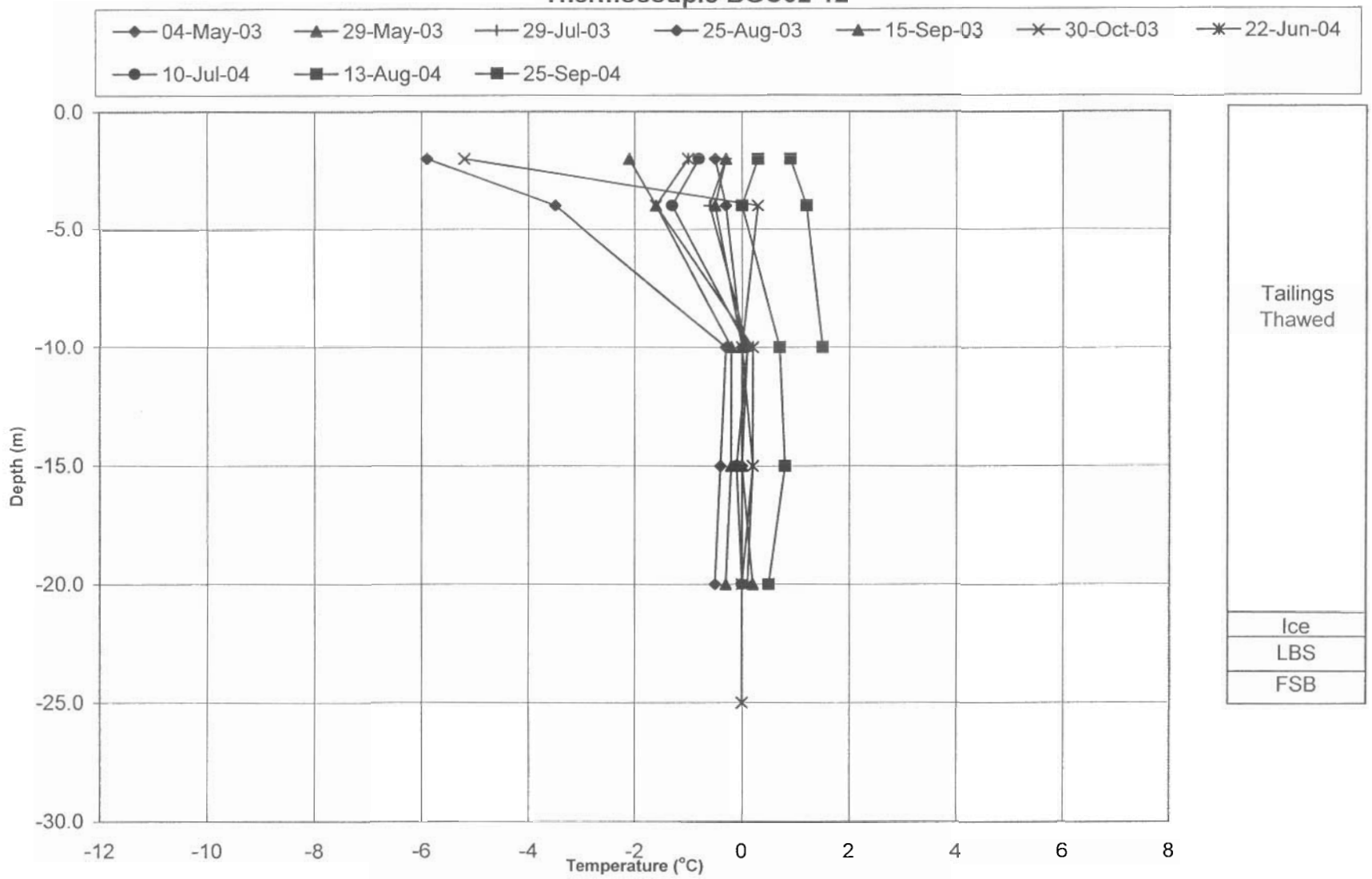
BGC ENGINEERING INC.

Note: Borehole log based on information collected when borehole was drilled.

Geothermal Monitoring
Surface Cell
Thermocouple BGC02-12

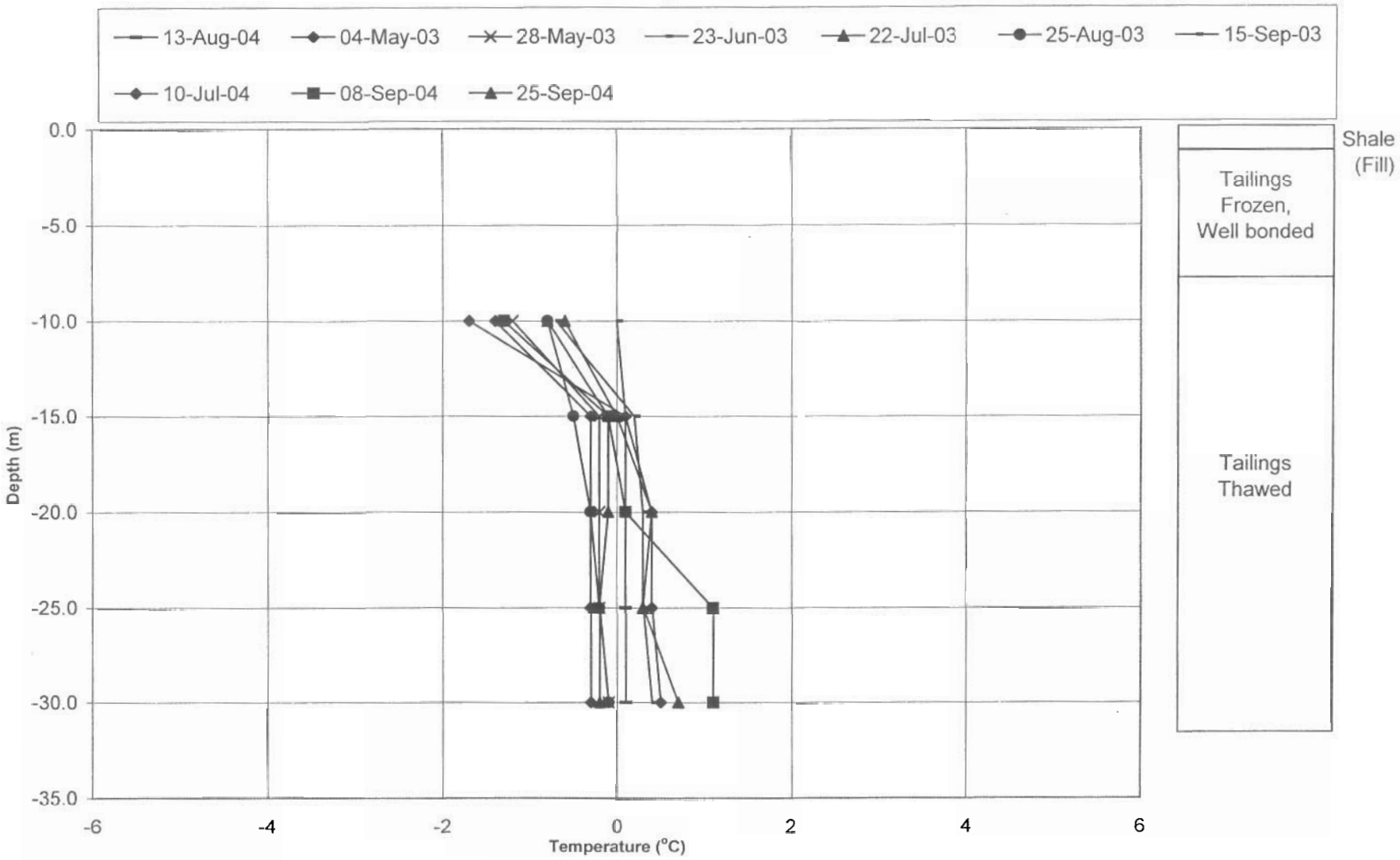


Nanisivik Thermocouples data and trmps (version 1)
BGC02-12 trmp

BGC ENGINEERING INC.

Note: Borehole log based on information collected when borehole was drilled.

Geothermal Monitoring
Surface Cell
Thermocouple BGC02-13



Nanisivik Thermocouples data and trmps (version 1)
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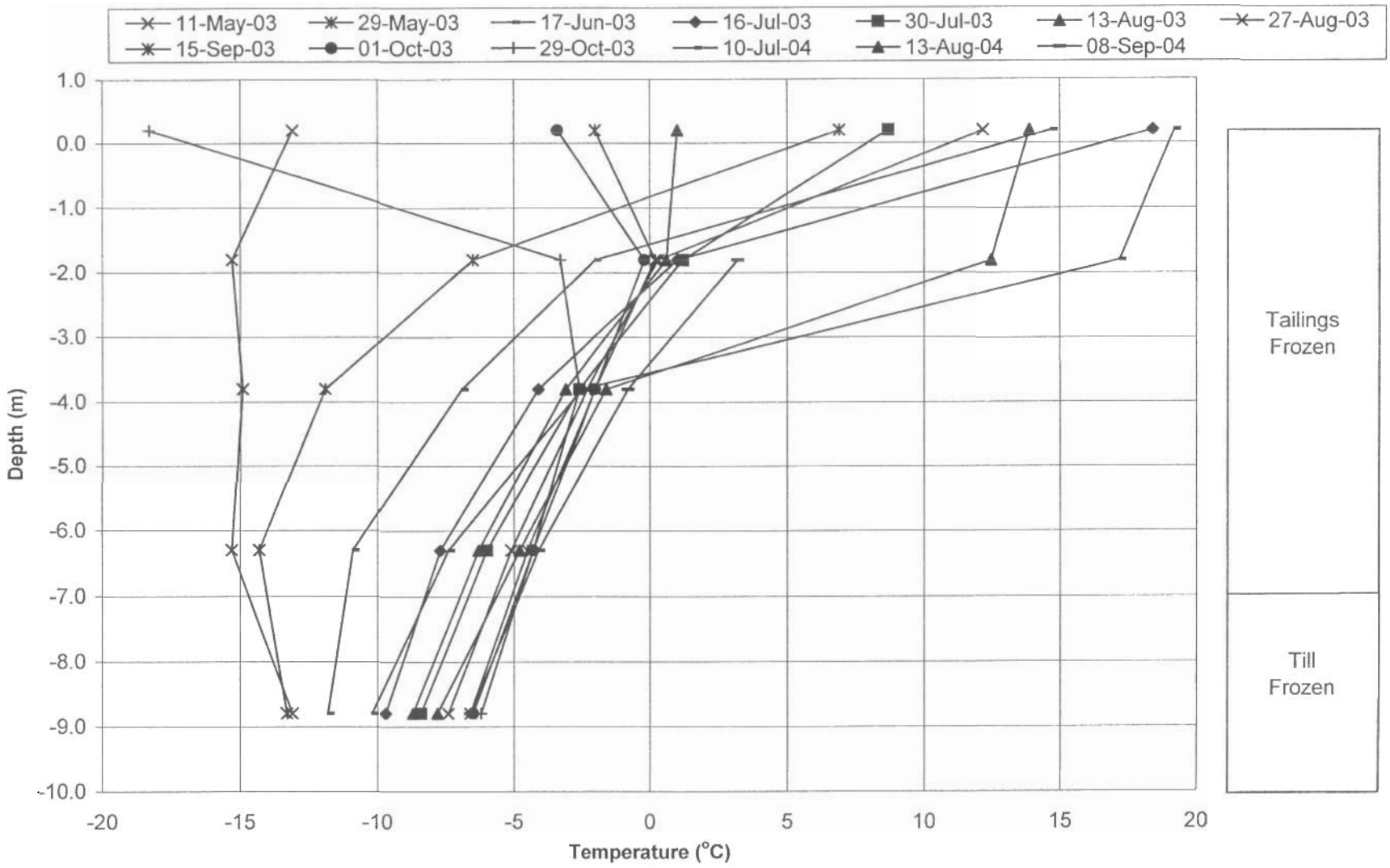
BGC ENGINEERING INC.

Note: Borehole log based on information collected when borehole was drilled.

Geothermal Monitoring
Surface Cell
Thermocouple BGC03-03



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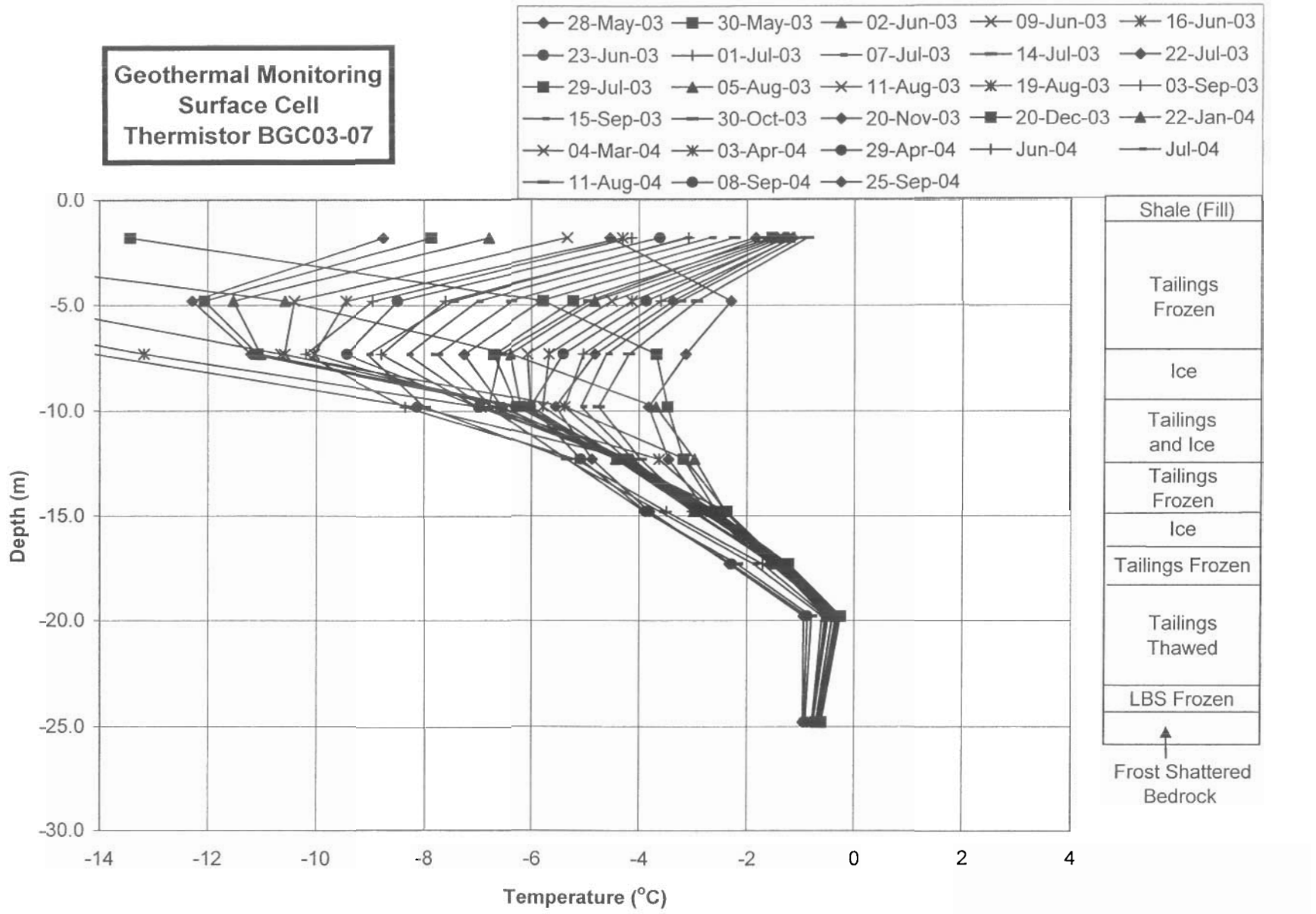
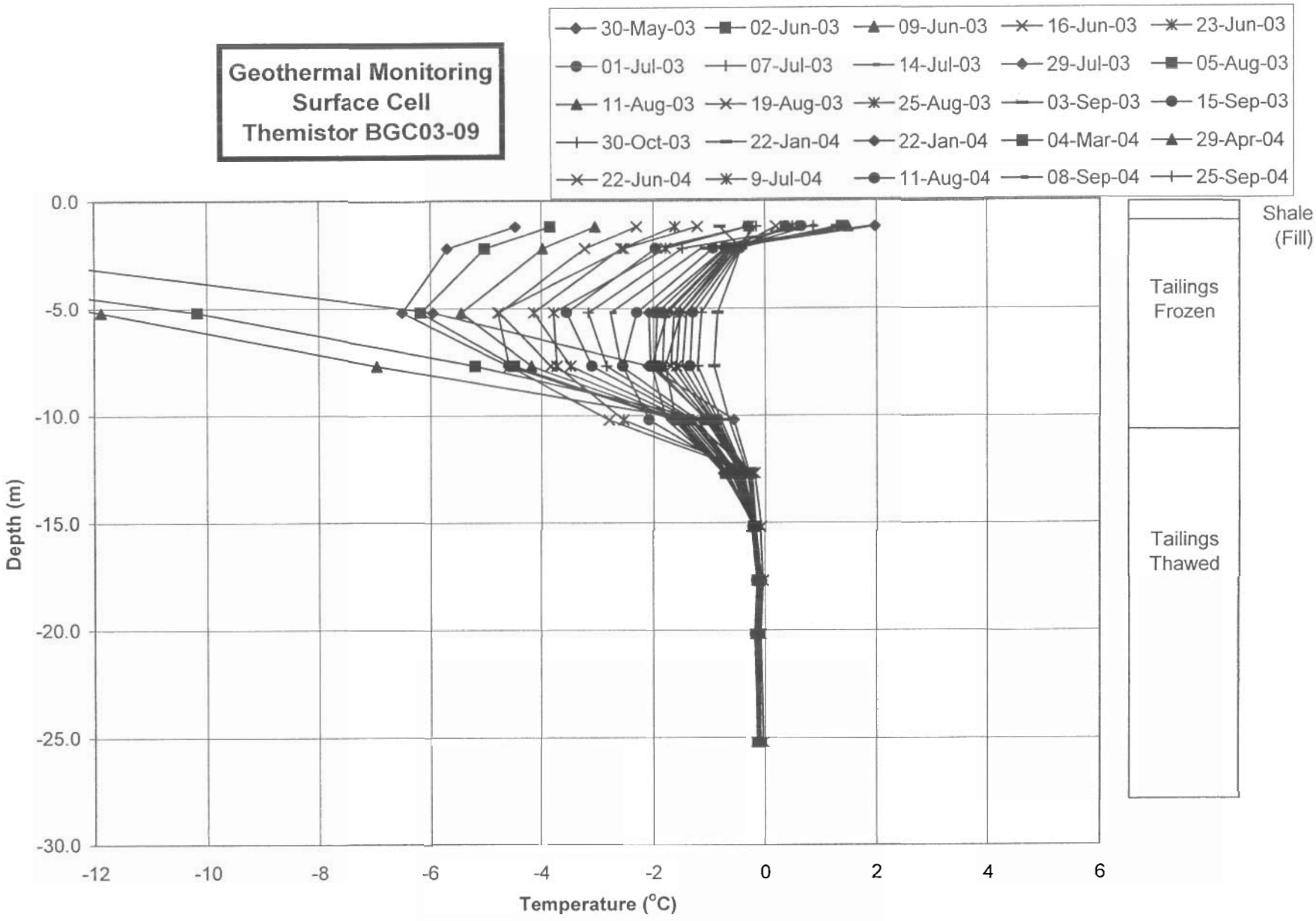
BGC03-03 trmp

BGC ENGINEERING INC.

Note: Borehole log based on information collected when borehole was drilled.



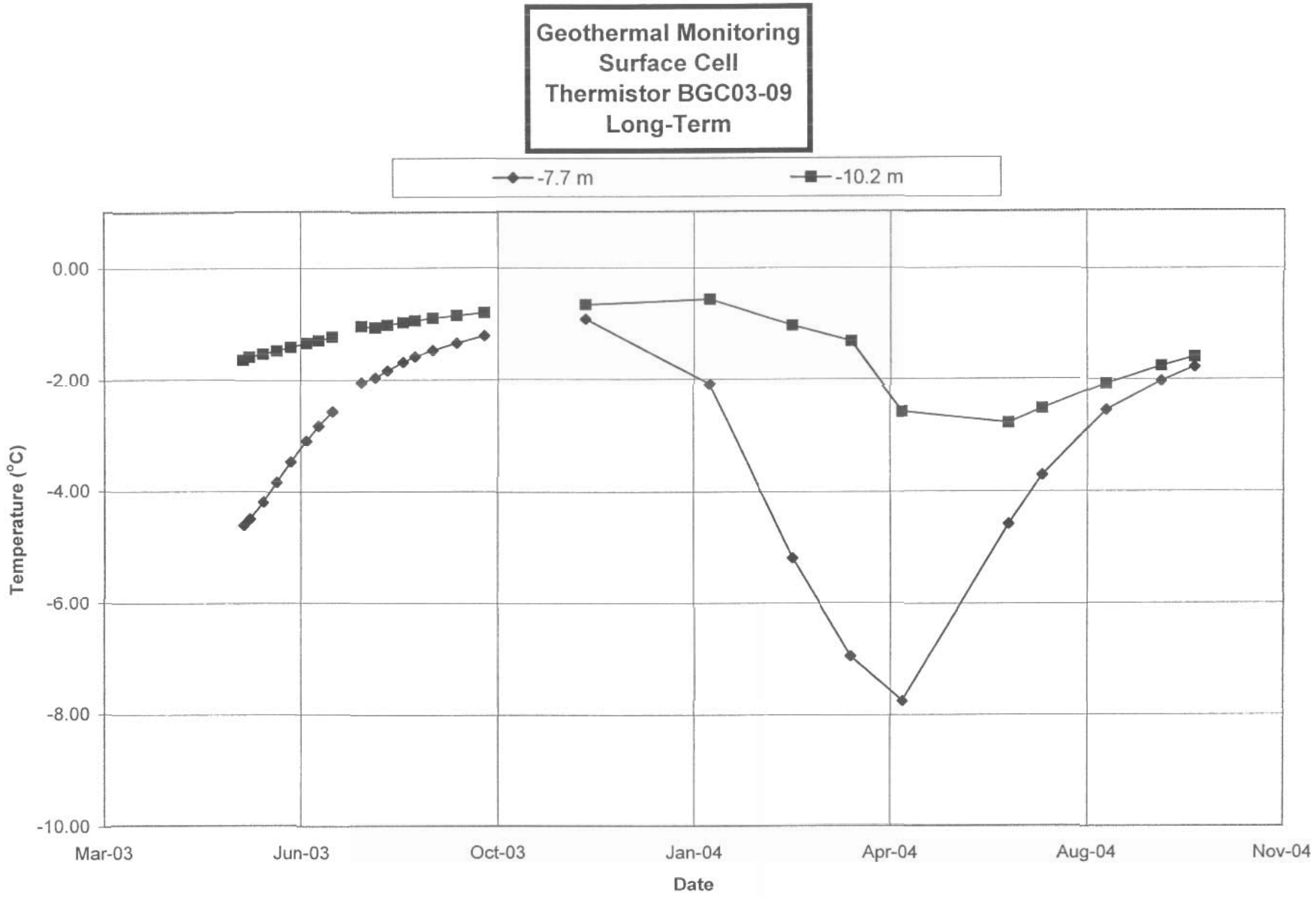
Note: Borehole log based on observations made during drilling in May 2003.



Thermistor Plots 2004
BGC03-09

BGC ENGINEERING INC.

Note: Borehole log based on observations made during drilling in May 2003.


Geothermal Monitoring
Surface Cell
Thermistor BGC03-09
Long-Term
-7.7 m
-10.2 m
0.00
-2.00
-4.00
-6.00
-8.00
-10.00
Temperature (°C)
Mar-03
Jun-03
Oct-03
Jan-04
Apr-04
Aug-04
Nov-04
Date