REPORT

Interim Waste Rock Management Plan March 2019

Mary River Project

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1.0 INTRODUCTION

Baffinland Iron Mines Corporation's (Baffinland) Mary River Project is an operational iron mine on Baffin Island in Nunavut, Canada. An estimated 640 Mt of waste rock and 32 Mt of overburden will require management from mining Deposit No. 1 (Baffinland, 2014). Baffinland has retained Golder Associates Ltd. (Golder) to assist with developing an updated waste rock management plan (WRMP) for deposition of potential acid generating (PAG) and non-PAG waste rock at their Waste Rock Facility (WRF). An updated WRMP is required to accommodate current operational constraints, address the occurrence of acid rock drainage (ARD) from the WRF, and improve the chemical stability of future PAG waste rock deposition.

An interim WRMP was submitted in December 2018 (Golder, 2018a) that provided an update on the WRF geochemistry, water management, and waste rock deposition (through to May 2019). This current interim WRMP provides an update on the results of the geochemistry sampling and instrumentation program carried out in December 2018 and February 2019, as well as updated waste rock deposition strategies for the period of February 2019 through December 2019.

2.0 GEOCHEMICAL SAMPLING AND INSTRUMENTATION PROGRAM

In response to the observed metal leaching and ARD from the WRF, a field program was undertaken from December 2018 to February 2019 to characterize the WRF and assess its thermal performance. The field program included the installation of thermistors and oxygen sensors to monitor the WRF thermal condition and for presence of oxygen consuming reactions (i.e. oxidation of PAG waste rock). Samples of waste rock were also collected from the thermistor installation boreholes for geochemical analysis.

2.1 Instrumentation

Instrumentation was installed in December 2018 and February 2019. Thermistors were installed at 5 vertical boreholes and 3 horizontal trenches. Oxygen sensors were also installed at 2 boreholes (BH1 and BH2). A plan view of the instrument locations is shown in Figure 1 below.

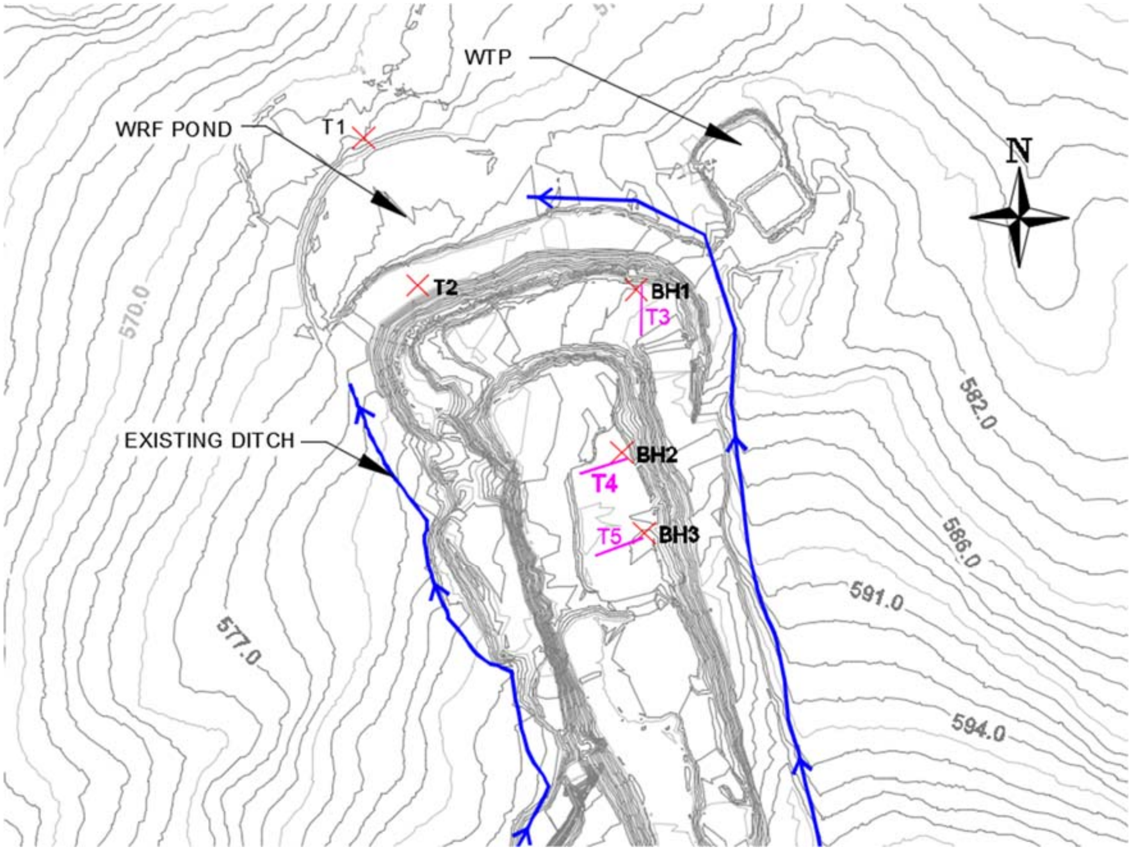


Figure 1: As-Built Instrumentation Plan

Thermistor T1 monitors the subsurface thermal conditions below the future WRF Pond berm expansion. Thermistor T2 monitors the thermal conditions of the WRF toe berm near the future location of the WRF Pond liner anchor trench. Thermistors at BH2 and BH3 monitor the thermal condition of the WRF at locations of primarily PAG deposition, and BH1 at a location of recent non-PAG deposition. The waste rock at BH1, BH2, and BH3 is being characterized as part of the geochemical program discussed under Section 2.2. The horizontal thermistor strings (T3, T4, and T5) will provide information related to lateral heat flow within the stockpile. Typical thermistor sensor spacing varies from 0.5 – 3.0 m, with the 0.5 m spacing used near ground surface and the expected contact with original ground to monitor the permafrost active zone as well as the waste rock/overburden contact. Thermistor strings extended approximately 6 m into native ground.

Oxygen sensors were installed at BH1 and BH2 to monitor the variation in oxygen content within the WRF at locations of primary non-PAG and PAG waste rock placement, respectively. Oxygen sensor spacing varied from 1.0 to 5.0 m, with the tighter spacing near ground surface. Oxygen sensors were installed up to 16.5 m below the stockpile crest.

A vibrating wire piezometer (VWP) was installed at each of BH1 and BH2 at the approximate waste rock/overburden contact. The VWP will monitor for liquid water within the WRF.

Table 1 below provides a summary of the number of sensors installed at each location.

Table 1: Summary of Instrumentation

Instrument	Number of Thermistor Sensors	Number of Oxygen Sensors	Number of VWP	Instrument Length (m)
T1 (vertical)	6	-	-	5
T2 (vertical)	6	-	-	4.9
T3 (horizontal)	20	-	-	40
T4 (horizontal)	20	-	-	40
T5 (horizontal)	20	-	-	40
BH1 (vertical)	23	4	1	20
BH2 (vertical)	26	5	1	26
BH3 (vertical)	23	-	-	23

All instruments are connected to data loggers recording measurements on 8 – hour intervals.

Initial results from the instruments are provided as Appendix A. The thermistor data available to date indicates that, at the locations of the thermistors, the WRF is frozen from the top of the WRF into native ground. The oxygen sensors show a relatively constant oxygen content throughout the stockpile and do not identify the presence of oxygen consuming reactions. A preliminary review of the data indicates that the waste rock development strategies implemented to date are appropriate and that permafrost aggradation within the WRF is being achieved.

The VWP are reading in suction and currently do not indicate the presence of mounded liquid water within the stockpile at the instrumented locations.

Data from the instruments will be downloaded and reviewed periodically throughout 2019.

2.2 Geochemical Sampling

A field program was undertaken in December 2018 to further characterize the waste rock deposited at the WRF. The program included drilling of three boreholes (BH1, BH2, and BH3) within the WRF and collection of waste rock material from each borehole. Boreholes were advanced by Baffinland using an open pit production drill. The drill cuttings were logged and sampled by Baffinland's geologist following drilling of the borehole to final depth (BH1) or at 5 metre intervals (BH2 and BH3). A total of 18 samples were collected from the boreholes and submitted for geochemical analysis which included; acid base accounting (modified Sobek), whole rock analysis, bulk metals analysis, short-term leach testing and X-ray Powder Diffraction (XRD). Sample locations and lithology are summarized in Table 2. Sample depths are approximate.

Table 2: Geochemistry Sample Locations and Lithology

Borehole	Depth (m)	Lithology Description	ABA Classification
BH1 Top 1	NDR[1]	Overburden & Silicified Granite	Non-PAG
BH1 Top 2		Overburden & Minor Iron content	Non-PAG
BH1 MID 1		Silicified Granite & Chlorite Schist	Non-PAG
BH1 MID 2		Silicified Granite & Chlorite Schist & Minor Iron content	Non-PAG
BH1 Bottom 1		Iron > Silicified Granite	Non-PAG
BH1 Bottom 2		Silicified Granite & Chlorite Schist	Non-PAG
BH2	0 – 5	Silicified Granite & Chlorite Schist & Minor Iron content	Non-PAG
BH2	5 – 10	Chlorite Schist & Minor Iron content	PAG
BH2	10 – 15	Silicified Granite & Chlorite Schist & Minor Iron content	PAG
BH2	15 – 20	Silicified Granite & Minor Iron content	PAG
BH2	20 – 25	Silicified Granite	PAG
BH2	25 – 30	Chlorite Schist	Non-PAG
BH3	0 – 5	Silicified Granite & Chlorite Schist	PAG
BH3	5 – 10	Low Grade Iron	PAG
BH3	10 – 15	Chlorite Schist & Minor Iron content	PAG
BH3	15 – 20	Overburden	Non-PAG
BH3	20 – 25	Overburden	Non-PAG
BH3	25 – 31	Chlorite Schist	Non-PAG

[1] NDR = No Depth Recorded, BH1 was logged and sampled after completion of drilling and therefore depth of samples within the WRF cannot be verified.

2.2.1 Preliminary Geochemical Results

Geochemical tests for which preliminary results are available include; acid base accounting (ABA), bulk metals, whole rock analysis and Shake Flask Extraction (SFE). Total sulphur content of the borehole samples ranged from

0.02 to 0.53 wt. % as S. Sulphide-sulphur content ranged from <0.02 to 0.25 wt. % as S while sulphate-sulphur ranged from <0.02 to 0.28 wt. % as S. Elevated sulphate-sulphur content is correlated with total sulphur content. Based on the Neutralization Potential Ratio (expressed as neutralization potential divided by acid potential) and total sulphur cut-off of 0.20 wt.% as S, seven samples were classified as PAG or uncertain (NPR < 2 and/or >0.20 wt.% as S) and the remaining 11 samples were classified as non-PAG (NPR > 2 or <0.20 wt.% as S). Three samples would be considered non-PAG, based on NPR values, however they had total sulphur content greater than 0.20 wt.% as S. All samples from BH1 were classified as non-PAG consistent with the location of the borehole near the toe of the WRF within the non-PAG base layer. All samples classified as PAG were from BH2 (5 to 25 m depth) and BH3 (0 to 15 m depth) and are within the current PAG classified material of the WRF.

Soluble sulphate minerals release stored acidity upon dissolution, unlike sulphide minerals which release acidity based on their rate of oxidation. Soluble sulphate minerals provide an immediate source of acidity but typically over a shorter time frame when compared to the acid generation from sulphide oxidation. SFE testing was completed to assess the presence of soluble sulphates in the WRF. The results show that three of the samples released stored acidity from soluble sulphate minerals as indicated by acidic pH values (<5.5) in the SFE results. All three samples were classified as PAG (based on ABA) and had total sulphur content greater than 0.20 wt.% as S, and sulphate-sulphur content greater than 0.12 wt.% as S. In addition, these samples released trace metals including; copper, iron, nickel and zinc which is consistent with the seepage water quality observed from the WRF.

The preliminary geochemical results appear to support that dissolution of soluble sulphate minerals may be a key source of the acidic drainage currently observed from the WRF. The presence of soluble sulphate minerals, particularly in the PAG waste rock material, will need to be considered as part of the ongoing and future deposition plan for the WRF. Prolonged exposure of unfrozen PAG material during wet periods of the year can result in increased dissolution of sulphate minerals and generation of acidic seepage. Sequencing of PAG deposition and capping with non-PAG material will be optimized to limit exposure and infiltration. The preliminary geochemical results from the borehole investigation appear to support the current PAG classification using a total sulphur cut-off value of 0.20 wt.% as S. Additional investigation into the presence of soluble sulphate minerals, with an emphasis on non-PAG waste rock, is part of the planned 2019 geochemical program to further assess presence and potential implications of soluble sulphate minerals within the WRF. The results of the 2019 geochemical program will be used to evaluate and potentially revise the current geochemical analysis and PAG classification process and the sequencing schedule.

2.3 2019 Thermal and Geochemistry Program

A thermal model of the WRF will be completed once sufficient site data has been collected from the thermistors for model calibration. The thermal model will consider the waste rock deposition plan, atmospheric conditions, and stockpile chemistry. Thermal conductivity and heat capacity laboratory testing are also planned to be carried out in 2019 on both PAG and non-PAG waste rock samples to further characterize the waste rock thermal properties. The thermal model is expected to provide an estimate of the freeze-back time for the WRF and ability to maintain the WRF in a frozen state. The results of the available thermal modelling will be included in the December 2019 WRMP. Preliminary thermal modelling was provided in the December 2018 WRMP (Golder, 2018a).

The 2019 geochemical program includes collection of waste rock samples from the WRF in areas where acidic seepage has been observed. In addition, samples of blasthole material from the open pit will be collected, specifically from material classified as non-PAG under the current segregation classification scheme. The requirement for further geochemical sampling is currently being considered as part of the PAG classification review (see Section 3.0).

An updated water quality model will be prepared following collection and analysis of the instrumentation data (thermistor, oxygen sensor, and geochemical samples) and 2019 geochemical sampling and analysis. A mass-balance based model approach will be used to develop water quality predictions that take into consideration the waste rock deposition plan, water balance and geochemical data. Infiltration and runoff flow estimates will be assigned water quality source terms to predict seepage and runoff water quality corresponding to the December 2019 WRMP. Existing data and new results from laboratory-scale geochemical tests will be used to develop mass loading source terms for each of the main material types present in the WRF. The results of laboratory scale tests will be used to develop specific scenarios in terms of particle size distribution, water-to-rock ratios, temperature, and availability of atmospheric gases that could influence material reaction rates (e.g., oxygen and carbon dioxide).

The results of the water quality modelling will be included in the December 2019 WRMP.

3.0 PAG WASTE ROCK CLASSIFICATION

Laboratory determination of PAG waste materials will be completed using total sulphur analysis by Leco sulphur analyser and guidance provided in the report on ML/ARD characterization for the five year pit (AMEC, 2014). Materials identified with total sulphur content greater than 0.20% will be considered PAG rock. The on-site processing of blast hole samples in the on-site laboratory will allow timely development of the mine scheduling plan.

The blast hole results are used to divide the blast pattern into minable units. A minable unit is considered to be anything greater than 125 m^2. If a continuous area of material can be isolated within a blast with a surface area that is 125 m^2 or greater, with a total sulfur content >0.2% and NPR <2, it is identified as PAG and this material is staked out in the field after the blast and then hauled to a specific PAG designated location at the WRF.

As discussed under Section 2.2.1, preliminary results of the December 2018 waste rock geochemical analysis show that the current PAG classification is adequate for segregation of waste rock. However, since the presence of soluble sulphates has been identified within PAG waste rock, further investigation is required to confirm if soluble sulphates within waste rock that has total sulphur content less than 0.20% could release acidic seepage. Additional sampling of waste rock and laboratory analysis will be completed, as outlined in Section 2.3, as due diligence to ensure proper classification and management of waste rock. While Baffinland is actively progressing with confirmatory review of the PAG waste rock classification system, the existing protocols as described above will continue to be followed.

4.0 WRF WATER MANAGEMENT

Current water management practices at the WRF remains similar to that presented in the December 2018 WRMP (Golder, 2018a). The following sections describe updates to the WRF water management system planned for completion in 2019.

4.1 WRF Pond Repair and Capacity

As discussed under the December 2018 WRMP (Golder, 2018a), seepage from the WRF Pond has been observed. The seepage is collected in a ditch system downstream of the WRF Pond and is pumped back into the WRF Pond.

Golder carried out an inspection of the WRF Pond liner over August 17 – 19, 2018. The water elevation at the time of the inspection was approximately 574.07 m. Golder observed that the liner subgrade had underlying voids and channels. While Golder did not identify any visible damage to the liner, the apparent deteriorating condition of the liner subgrade has the potential to negatively impact the liner performance.

Golder has since recommended to Baffinland that the existing liner be removed, the subgrade repaired, and a new liner be installed. Baffinland is currently developing a work plan and intends to complete the repair work by end of August 2019.

Once repaired the WRF Pond capacity will have a storage capacity of 9,000 m^3 (Hatch, 2017). A factory of safety of 1.2 has been applied to the WRF Pond capacity to set the operating capacity (that portion of the WRF pond that will be relied upon for storage) at 7,500 m^3

A review of the WRF Pond capacity was undertaken as part of assessing the potential for increasing the WRF footprint. Consistent with the design for the WRF Pond expansion (Golder, 2018c), the capacity review considers the 1:10 year return event. The estimated runoff values are summarized in Table 3 below (Golder, 2018b).

Table 3: 1:10 Year Return Runoff (in mm)

Return Period (Years)	Flood Event Duration (Days)																	
	1	2	3	4	5	6	7	8	9	10	15	20	30	45	60	75	90	105
10	32	57	74	96	114	131	146	161	175	188	258	298	358	398	430	463	476	478

Figure 2 provides the net WRF Pond capacity requirement (inflow less treatment), considering the runoff values from Table 3 applied to a catchment area of 358,000 m^2. The capacity requirement considers a water treatment rate of 280 m^3/h. A pond capacity of 0 m^3 corresponds to the treatment rate exceeding the rate of runoff inflow.

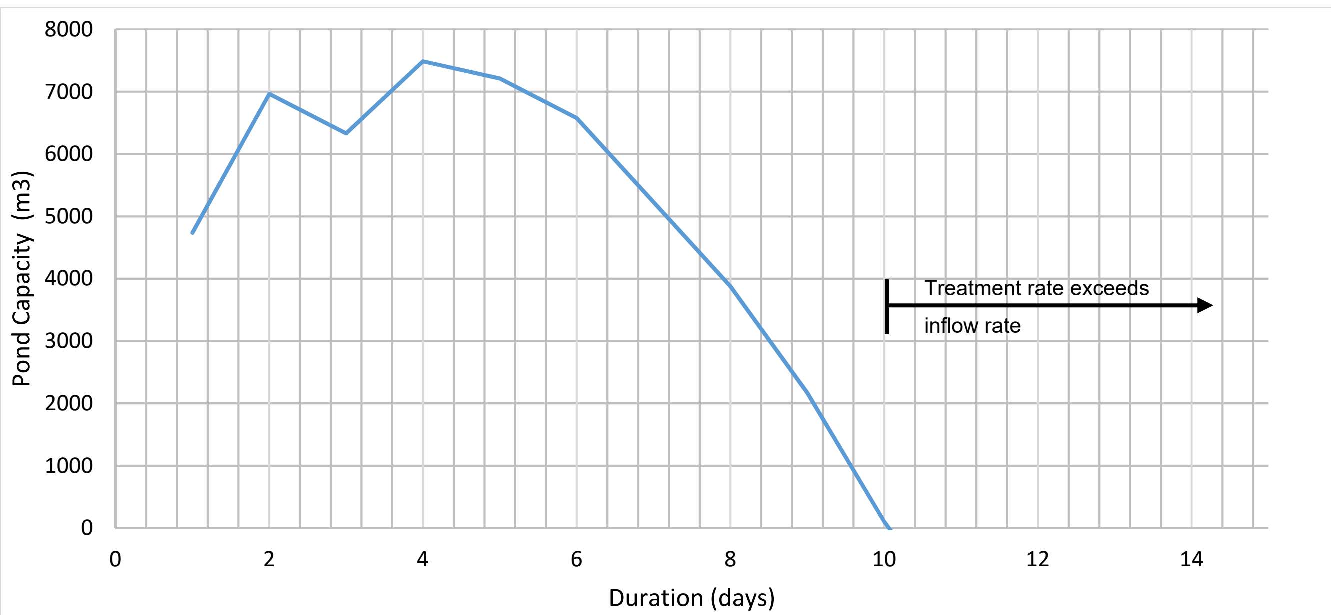
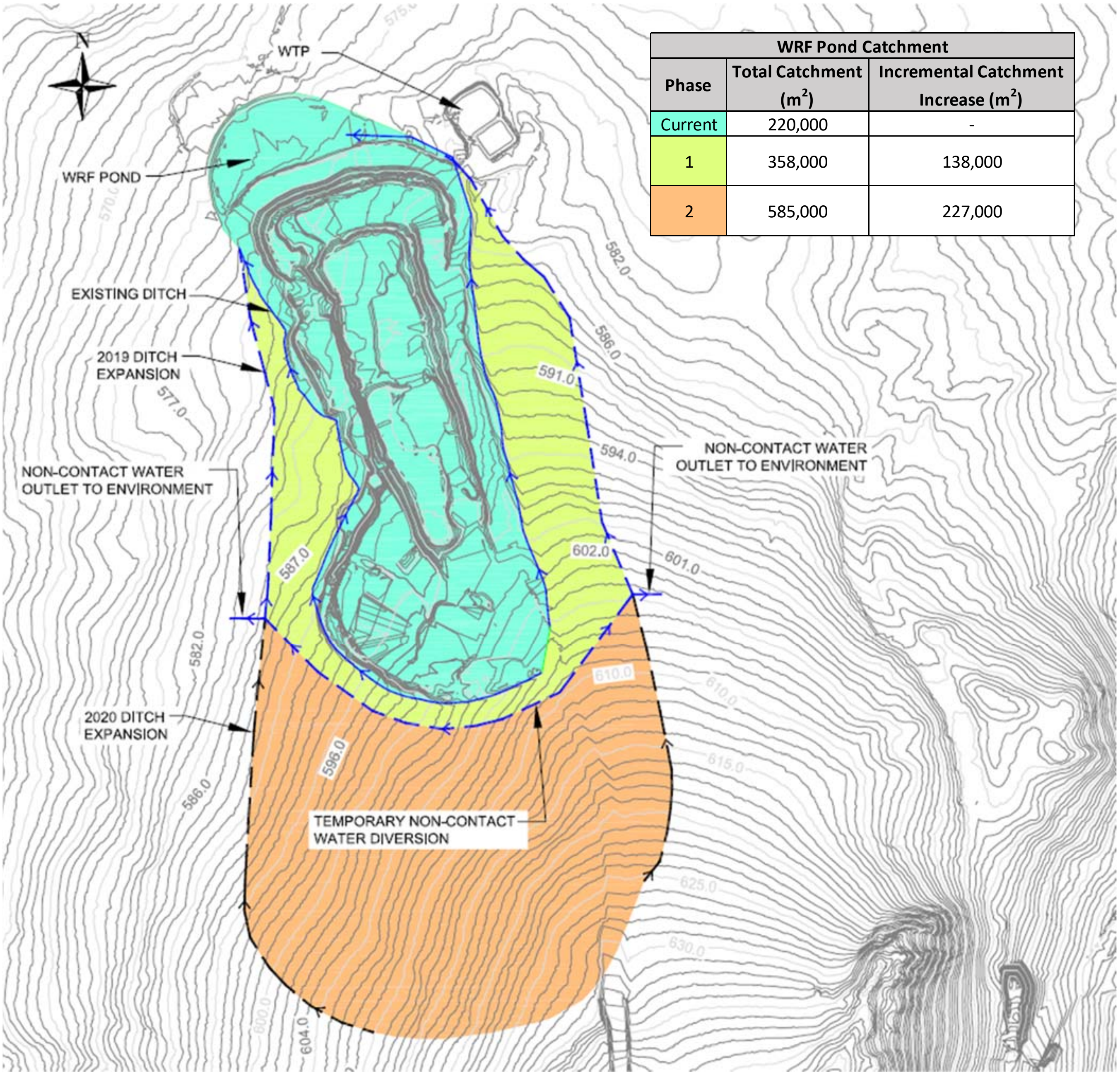


Figure 2: WRF Pond Capacity Requirement

Considering the 1:10 year return event and a pond capacity of 7,500 m^3, the corresponding maximum catchment area is 358,000 m^2. Baffinland intends to expand the WRF footprint and WRF Pond catchment to the 358,000 m^2 footprint in 2019 following repair of the existing WRF Pond liner.

4.2 WRF Ditch Expansion

The WRF is surrounded by a ditch system to direct contact runoff from the WRF to the WRF Pond. In order to follow the WRF development criteria discussed under Section 6.0, expansion of the WRF footprint, and by associated re-alignment of the contact water collection ditches, is required. The phasing of the contact water collection ditch re-alignment and corresponding change to the WRF Pond catchment is shown in Figure 3 below.



WRF Pond Catchment		
Phase	Total Catchment (m^2)	Incremental Catchment Increase (m^2)
Current	220,000	-
1	358,000	138,000
2	585,000	227,000

Figure 3: WRF Pond Catchment Area

Design for the contact water collection ditch system was provided under Golder 2018c. Baffinland proposes to commence construction of these contact water collection ditches in summer 2019 corresponding to the 358,000 m^2

WRF footprint. The revised ditches will not be permitted to discharge into the WRF Pond, and the WRF footprint not expanded, until the WRF Pond liner repair is complete (see Section 4.1).

Following repair of the WRF Pond liner, the revised ditches will be connected to the WRF Pond and the WRF footprint expanded to 358,000 m^2.). Temporary outlets, as shown in Figure 3, will be provided to discharge natural run-off flowing towards the WRF from the south to the environment. Phase 1 of the ditch construction will allow Baffinland to accelerate expansion of the WRF footprint, which better facilitates management of the waste rock. Expansion of the WRF footprint is required to facilitate thin lift deposition of waste rock.

Construction of the Phase 2 ditches, corresponding to a WRF footprint of 585,000 m^2, will commence in 2020. The Phase 2 ditches will not be permitted to discharge into the WRF Pond until the WRF Pond raise to the 65,000 m^3 capacity is complete (see Section 4.3).

4.3 WRF Pond Expansion

A design for expansion of the WRF Pond capacity from 9,000 m^3 to 65,000 m^3 (Golder, 2018c) has been prepared by Golder and submitted by Baffinland to the applicable Regulatory agencies for approval. Baffinland intends to commence construction of the expanded WRF Pond Berm following repair of the existing liner. The WRF Pond raise is expected to be completed before the end of 2019. The expanded WRF Pond can accommodate a total catchment area of 585,000 m^2 (Golder, 2018c).

4.4 Water Treatment

Baffinland continues to maintain and operate a water treatment plant (WTP) to treat surface runoff collected at the WRF Pond. There has been no change to the WTP process since the December 2018 WRMP (Golder, 2018a).

5.0 CONSTRUCTION QUALITY CONTROL (CQC)

Baffinland's waste rock management plan focuses on reducing the potential for development and environmental release of ARD from the WRF through defined waste rock placement methods, collection of the WRF contact water, and treatment of collected flows to comply with MDMER and the Type A Water Licence effluent discharge requirements.

Baffinland is currently developing a construction quality control (CQC) plan to assist with implementing the WRMP. The CQC plan specifies the operational and documentation requirements that are to be followed in order to implement and verify that the waste rock deposition strategy has been followed. Accurate documentation of the WRF construction will assist with further understanding and managing ARD. Baffinland expects to complete the CQC plan by end of May 2019.

6.0 WRF DEVELOPMENT STRATEGY

The primary objectives for the WRF development are safety of personnel/environment and long-term physical and chemical stability. Thin lift deposition of waste rock is expected to create a more homogenous stockpile and reduce segregation that may create preferential air and water flow paths throughout the stockpile (i.e. reduce flow channelization and potential for oxygen supply to PAG materials). Waste rock placement locations and lift thickness also focus on the continuous development and raising of permafrost within the WRF. It is expected that permafrost aggradation will provide an effective barrier to acid-forming reactions as absence of oxygen and water supply limits potential for sulphide oxidation and ARD transport.

The following WRF development strategies were presented in the December 2018 WRMP (Golder, 2018a) and remain applicable:

- **Footprint expansion:** The first lift of the WRF on native ground shall be non-PAG waste rock. Waste rock placement over native ground shall be carried out in the winter to the extent practicable. As a minimum, the lift should be allowed to freeze prior to layering activities. Maintaining a frozen base and perimeter is expected to reduce potential for seepage.
- **Stockpile expansion construction**: Waste rock placed over an area of new WRF expansion shall be carried out in a manner conducive to aggrading permafrost, to limit potential for further development of ARD.
- **Material separation:** PAG waste rock shall be separated from non-PAG waste rock placement (i.e. non-PAG and PAG waste rock shall have defined placement locations). Deposition locations of the PAG waste rock shall be documented by survey.
- **Stockpile exterior face**: PAG waste rock shall be placed 4 m (minimum) interior from the ultimate stockpile face, and 2.5 m interior (minimum) from an interior or temporary face. The final or temporary outer face of the stockpile shall be non-PAG waste rock. This criterion has been established to maintain the PAG materials interior from the permafrost active zone which is estimated at 2.5 m thickness. A larger 4 m buffer has been established for ultimate stockpile faces until the permafrost active zone has been better defined through thermal modelling and site measurements.
- **Lift thickness:** Waste rock placement to target ~3 m lift thickness. This lift thickness has been established to reduce potential for waste rock segregation during placement while remaining operationally feasible with the available equipment. Reducing segregation of deposited waste rock is expected to reduce the potential for development of preferential air flow paths that can delivery oxygen to PAG waste rock.
- **Successive lift placement:** Placement of successive waste rock lifts shall give consideration to the waste rock and environmental conditions as described below. These placement strategies may be revised as the thermal performance of the WRF becomes better understood.
  - When the waste rock temperature at the time of placement is <0^{o}C successive lifts may be continuously placed over a given footprint.
  - When the waste rock temperature is above 0^{o}C and the air temperature below 0^{O}C, the surface of the waste rock shall be kept clear of snow for the length of required to promote permafrost aggradation prior to placement of the subsequent lift.
  - When the waste rock temperature is greater than 0^{o}C only a single ~3 m thick lift is to be placed at a given location, to the extent practical.
- **Capping winter PAG placement before summer:** To the extent practicable, PAG waste rock placed during winter shall be covered with a 2.5 m thick (minimum) layer of non-PAG waste rock prior to summer. The intention of this criteria is to maintain the permafrost active zone within the non-PAG waste rock during the summer months (i.e. maintain the PAG waste rock in a frozen state).

6.1 WRF Design Criteria

The following design criteria have been developed giving consideration the criteria established under the LOM WRMP (Baffinland, 2014):

- The WRF footprint will not be expanded until the WRF Pond has been repaired.
- Runoff and seepage from the WRF will be collected at the WRF Pond. Collected flows will be treated to comply with requirements of the Type A Water License 2AM-MRY1325 and MDMER;

- The WRF will be developed in a manner conducive to permafrost aggradation
- The following conditions define the WRF geometry (Baffinland, 2014):
  - Overall external side slopes of 2H:1V. Exterior slopes will be benched with inter bench slopes of 1.5H:1V;
  - Minimum crest width of 25 m; and,
  - The perimeter of the WRF will be a minimum of 31 m from any water body.

6.2 Waste Rock Volume

An updated waste rock deposition plan has been developed for the interim period ending December 2019 that considers the latest mining plan. The projected quantities of waste rock to be stored at the WRF provided estimated by Baffinland are summarized in Table 4.

Table 4: Estimated Waste Rock Volumes by Month

Year	Time Period	Non-PAG Volume (m^3)	PAG Volume (m^3)	Total Waste Rock (m^3)
2019	February	16,668	3,278	19,946
	March	81,494	18,920	100,414
	April	35,017	21,957	56,974
	May	51,933	9,650	61,583
	June	44,654	25,907	70,561
	July	37,235	10,415	47,650
	August	61,931	16,715	78,646
	September	71,969	26,478	98,447
	October	137,746	35,159	172,905
	November	99,313	14,138	113,451
	December	94,943	24,851	119,794
	Total	**732,903**	**207,467**	**940,371**

6.3 Waste Rock Deposition Plan

The WRF development considers winter (November through May) and summer (June through October) deposition. These climatic periods have been assessed based on climatic records at the Mary River meteorological station (Golder, 2018a). The estimated waste rock volumes for each deposition season are summarized below in Table 5.

Table 5: Estimated Waste Rock Volumes by Deposition Sequence

Period	Non-PAG (m^3)	PAG (m^3)	Total Waste Rock (m^3)
February 2019 to May 2019	185,113	53,805	238,917
June 2019 to October 2019	353,535	114,674	468,208
November 2019 to December 2019	194,256	38,988	233,245
Total	**732,903**	**207,467**	**940,371**

The following sections provide discussion on the planned locations for waste rock placement for February 2019 through to December 2019. As-built survey dated February 20, 2019 was used as the base surface to model the WRF development discussed below. The waste rock deposition strategies and volumetric modelling were carried out by Baffinland (Baffinland, 2019). The deposition strategies have been reviewed by Golder.

6.4 Waste Rock Placement – February 2019 through May 2019

The waste rock deposition locations for the period of February 2019 through May 2019 are provided in Figure 4 below:

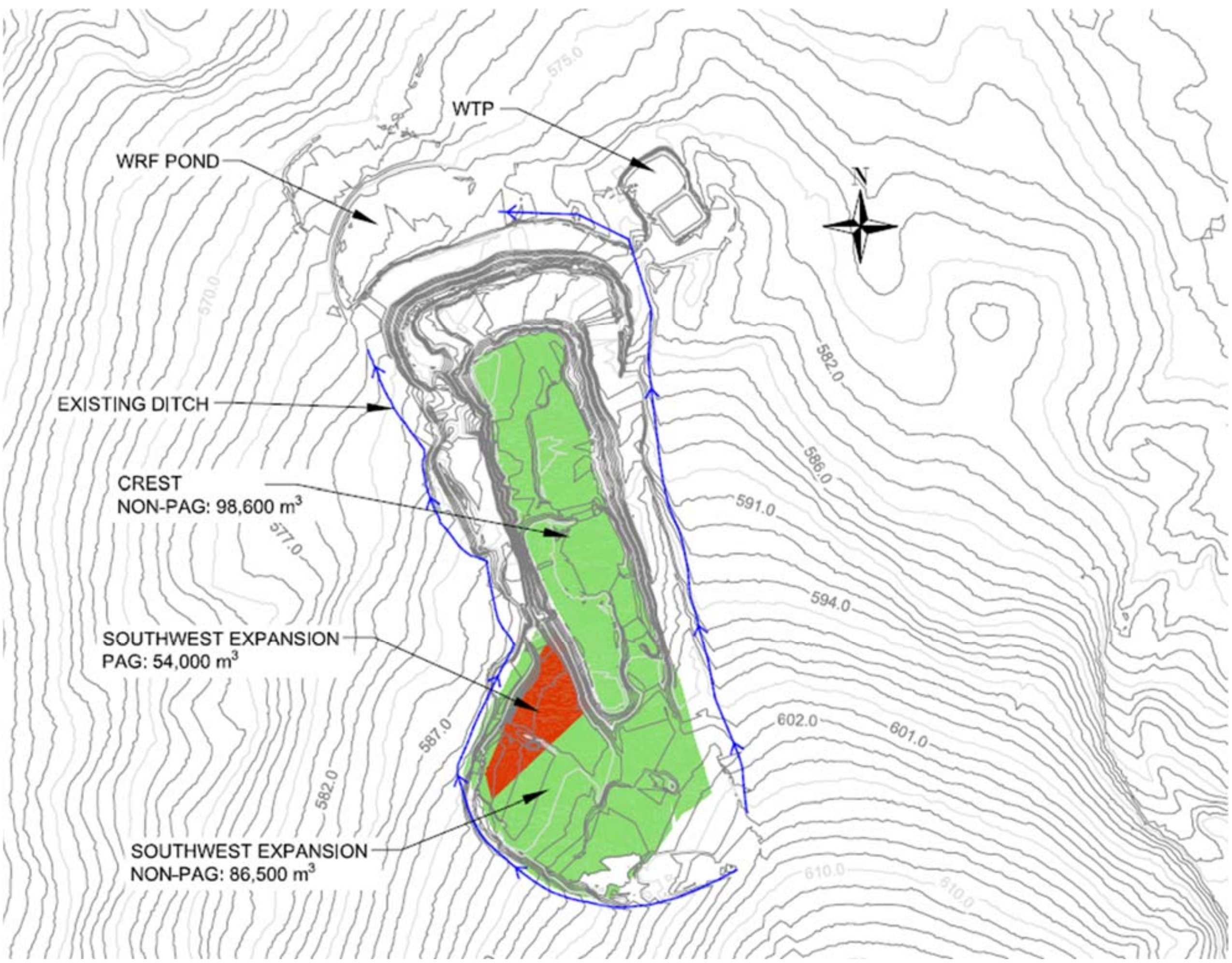


Figure 4: Waste Rock Deposition - February 2019 through May 2019

From February 2019 through May 2019 PAG (54,000 m^3) and non-PAG (86,500 m^3) will be placed at the southwest expansion area that was constructed in 2018. Waste rock will be raised in successive ~3 m thick lifts to level off the area and raise to a uniform crest elevation of approximately 604 m. Lifts will be left exposed as recommended under Golder 2018a, based on the atmospheric temperature at the time of placement, prior to covering over with the subsequent lift. Where waste rock placed is frozen a successive lift may be placed immediately. A minimum 2.5 m wide berm of non-PAG will be placed at the exterior of the lift to protect the PAG waste rock from thaw during the summer.

The remainder of the non-PAG waste rock (98,600 m^3) will be placed over the stockpile crest to raise the stockpile to a uniform crest elevation of approximately 610 m. Levelling of the stockpile crest is desirable to better facilitate stockpile management and uniform raising. As described above, waste rock will be spread in ~ 3 m thick lifts and allowing for freezing of the waste rock prior to placement of the subsequent lift.

If operations allow the PAG waste rock placed at the southwest expansion area will be covered over in a 2.5 m thick layer of non-PAG waste rock prior to summer.

6.5 Waste Rock Placement – June 2019 through October 2019

The waste rock deposition locations for the period of June 2019 through October 2019 are provided in Figure 5 below:

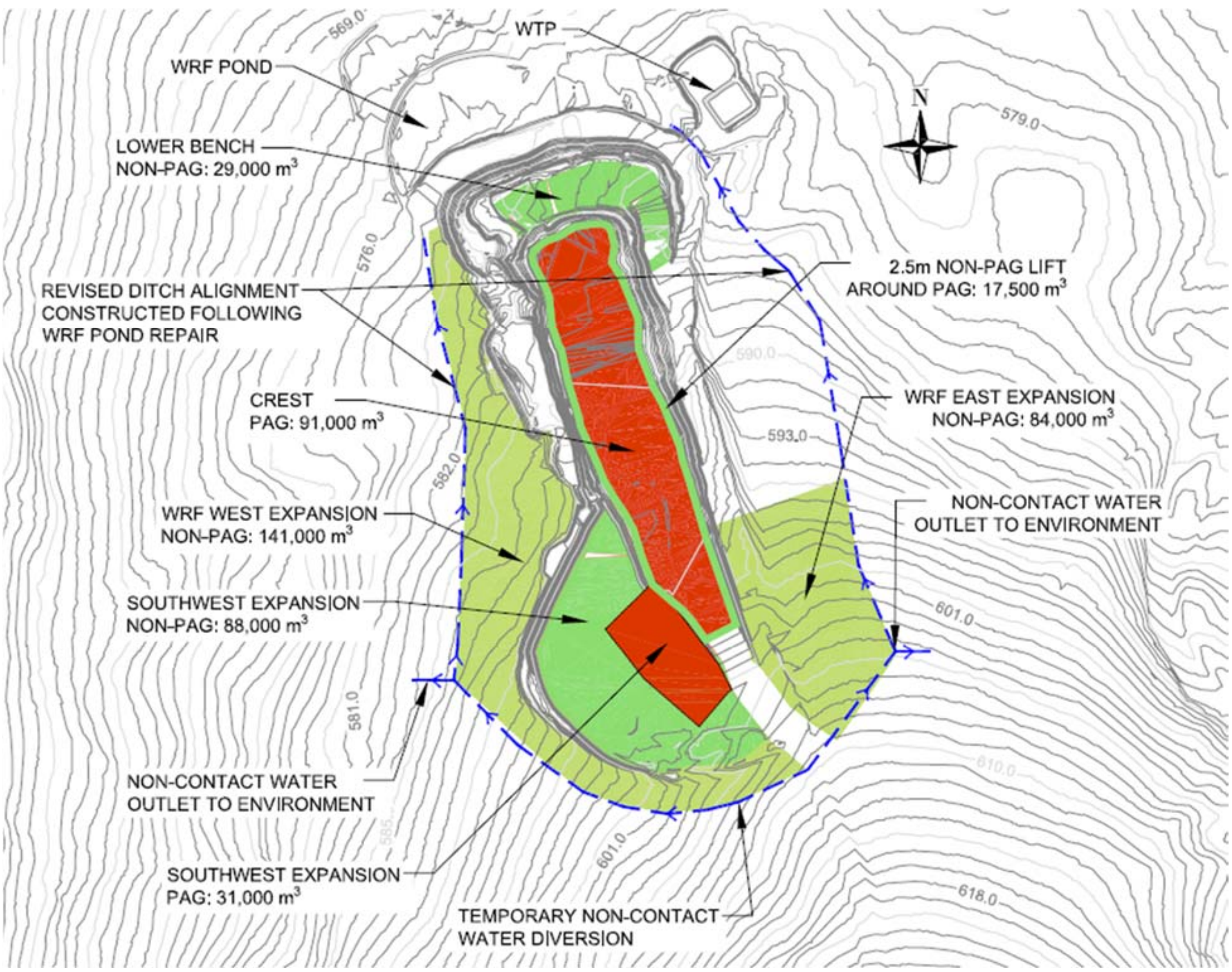


Figure 5: Waste Rock Deposition - June 2019 through October 2019

From June 2019 through October 2019 PAG waste rock (91,000 m^3) will be placed on the stockpile crest in an ~ 3 m thick layer. A minimum 2.5 m wide berm of non-PAG will be placed at the exterior of the PAG waste rock. The remaining volume of PAG (31,000 m^3) will be placed at the southwest expansion area as shown in Figure 5.

Non-PAG waste rock will be initially placed in an ~ 3 m thick lift on the lower bench at the northern extent of the WRF (29,000 m^3) and at the southwest expansion area (88,000 m^3). Following completion of re-aligning the contact water collection ditches around the perimeter of the WRF and repair of the existing WRF Pond liner, the remaining volume of non-PAG waste rock will be placed in an ~ 3 m thick lift to expand the WRF footprint to the west (141,000 m^3) and east (84,000 m^3). Expansion of the WRF footprint is required in order to limit the thickness of material placed on the existing WRF in Summer 2019 to ~3 m. Maintaining an ~3 m thickness of material placed in summer is preferred until thermal modelling of the stockpile has been completed.

6.6 Waste Rock Placement – November 2019 through December 2019

The waste rock deposition locations for the period of November 2019 through December 2019 are provided in Figure 6 below:

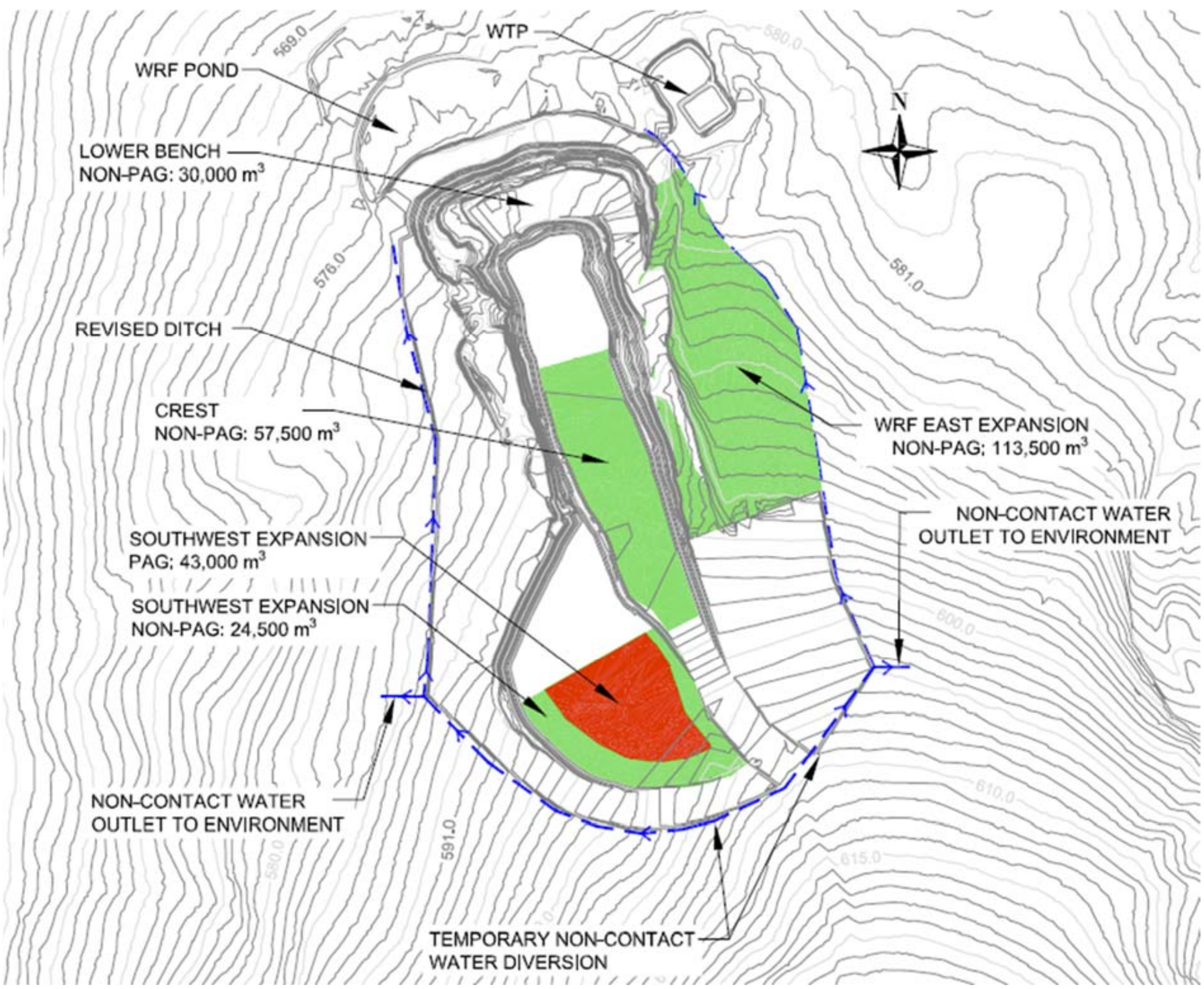


Figure 6: Waste Rock Placement November 2019 through December 2019

From November 2019 through December 2019 PAG (43,000 m^3) will be placed at the southwest expansion area. The PAG waste rock will be surrounded by a minimum 2.5 m wide berm of non-PAG waste rock (24,500 m^3). Non-Pag waste rock (113,500 m^3) will be placed to advance the WRF East expansion to the WRF northern extent. The remaining volume of non-PAG waste rock (57,500 m^3) will be placed on the WRF crest to begin covering over PAG waste rock placed during Summer 2019. Waste rock will be raised in successive ~3 m thick lifts. Lifts will be left exposed as recommended under Golder 2018a, based on the atmospheric temperature at the time of placement, prior to covering over with the subsequent lift. Where waste rock placed is frozen a successive lift may be placed immediately.

7.0 LIMITATIONS

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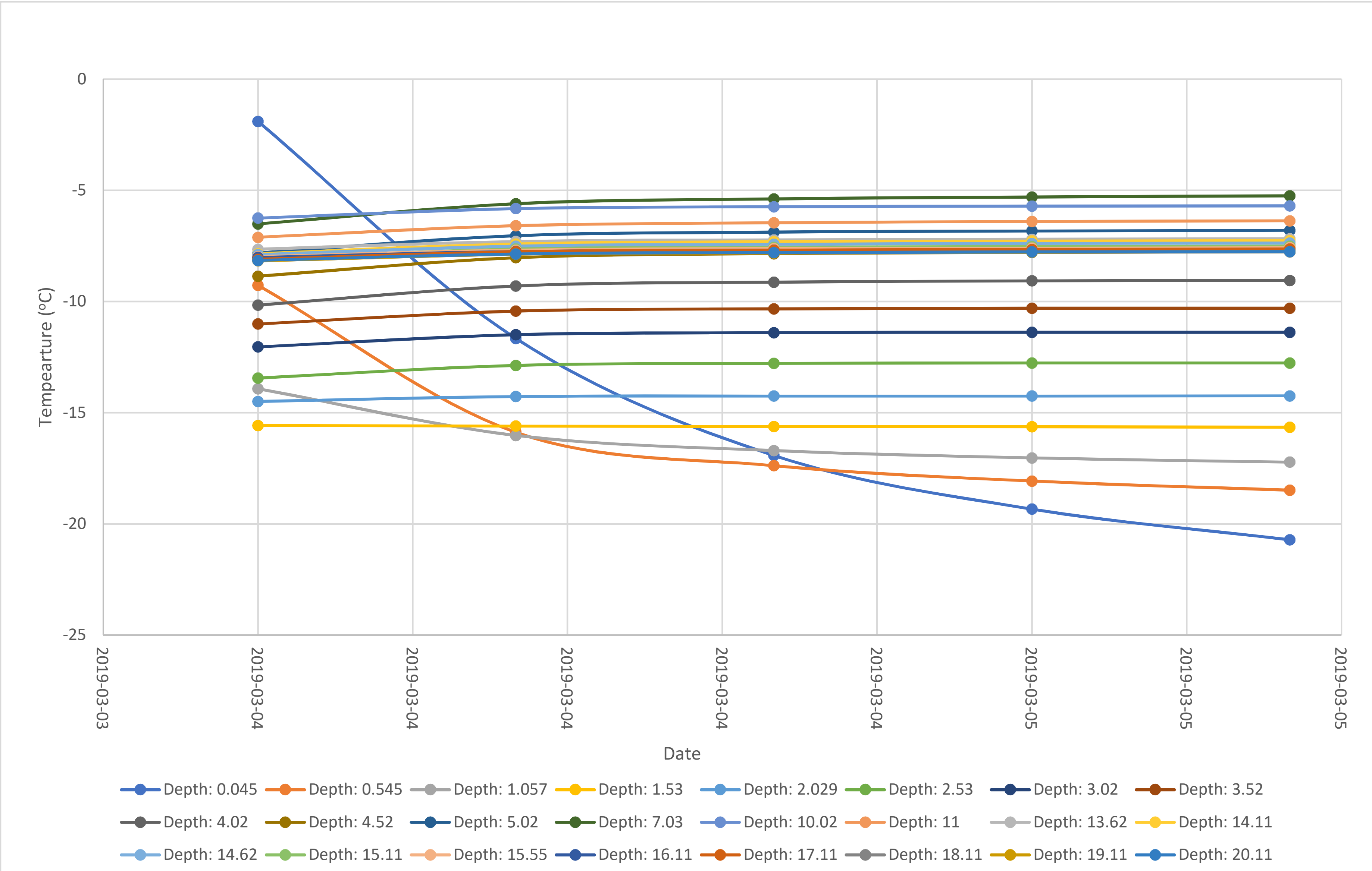
https://golderassociates.sharepoint.com/sites/22103g/technical work/phase 80000 - march 2019 wrmp/1790951_doc034_interim wrmp_mar2019- rev0.docx

APPENDIX A

Instrumentation Results



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Instrument BH1
Temperature Time Series

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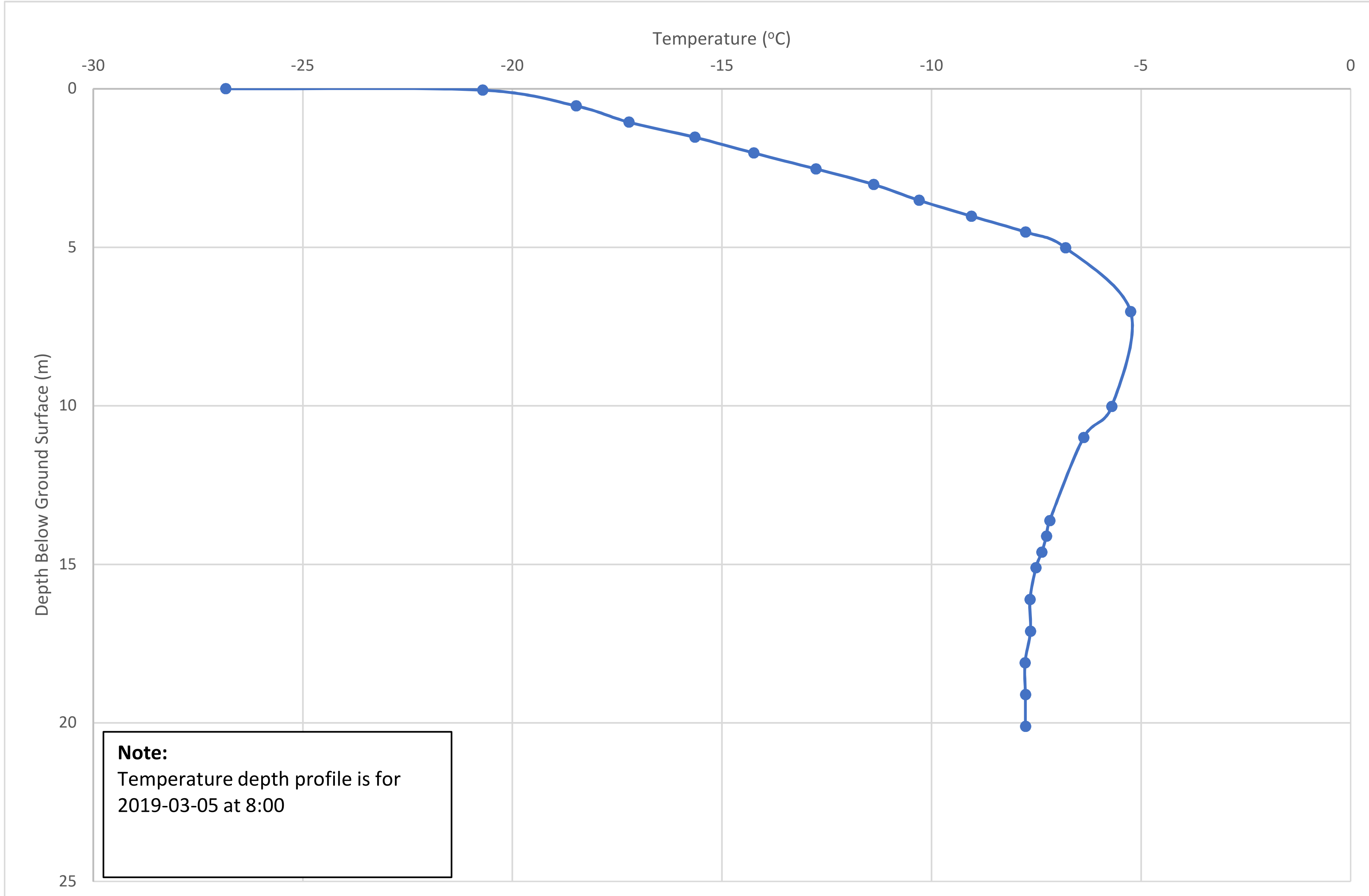
BY:	BA	Review:	KD

Baffinland | **Figure A1**



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Instrument BH1
Temperature Depth Profile

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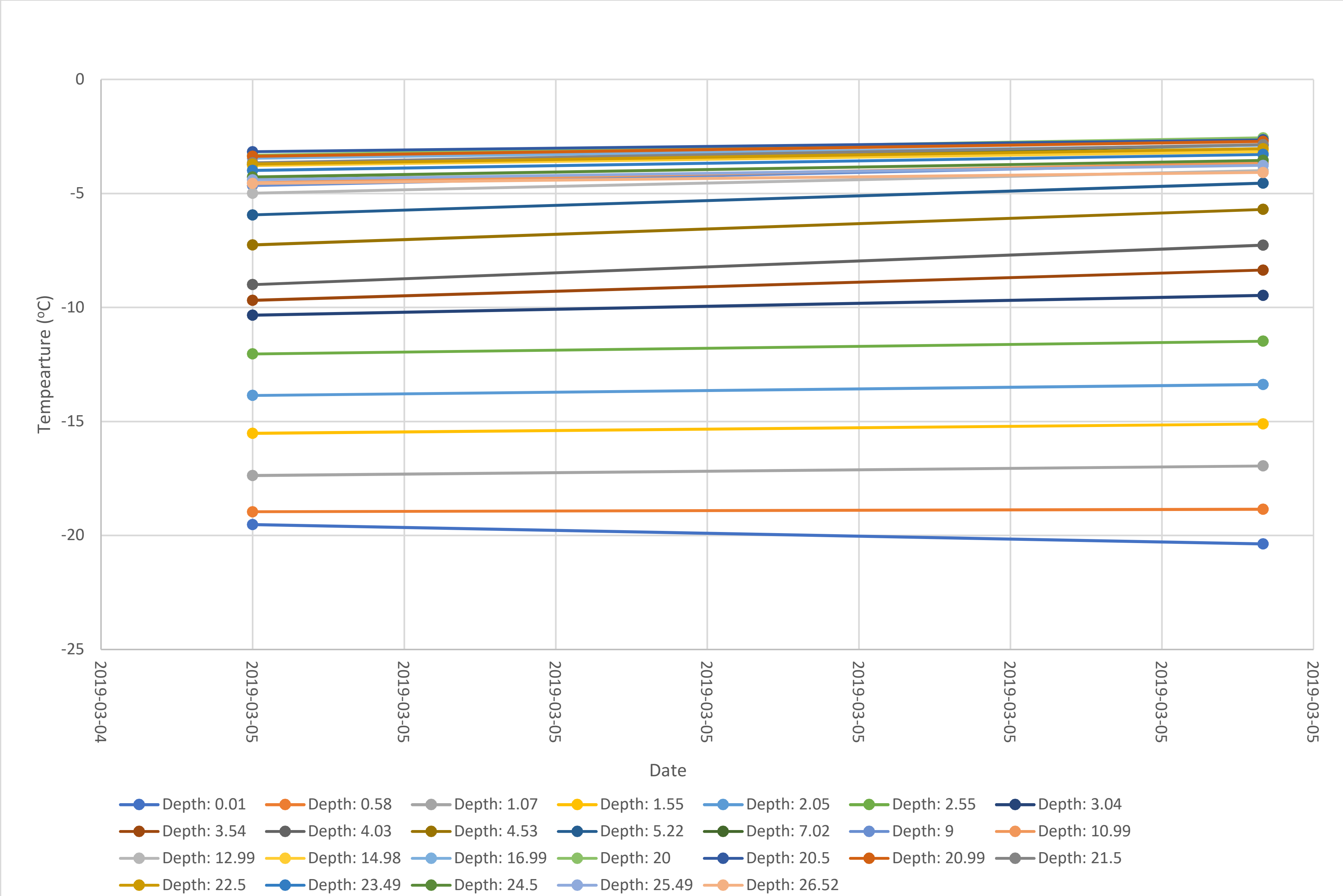
Figure A2



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Instrument BH2
Temperature Time Series

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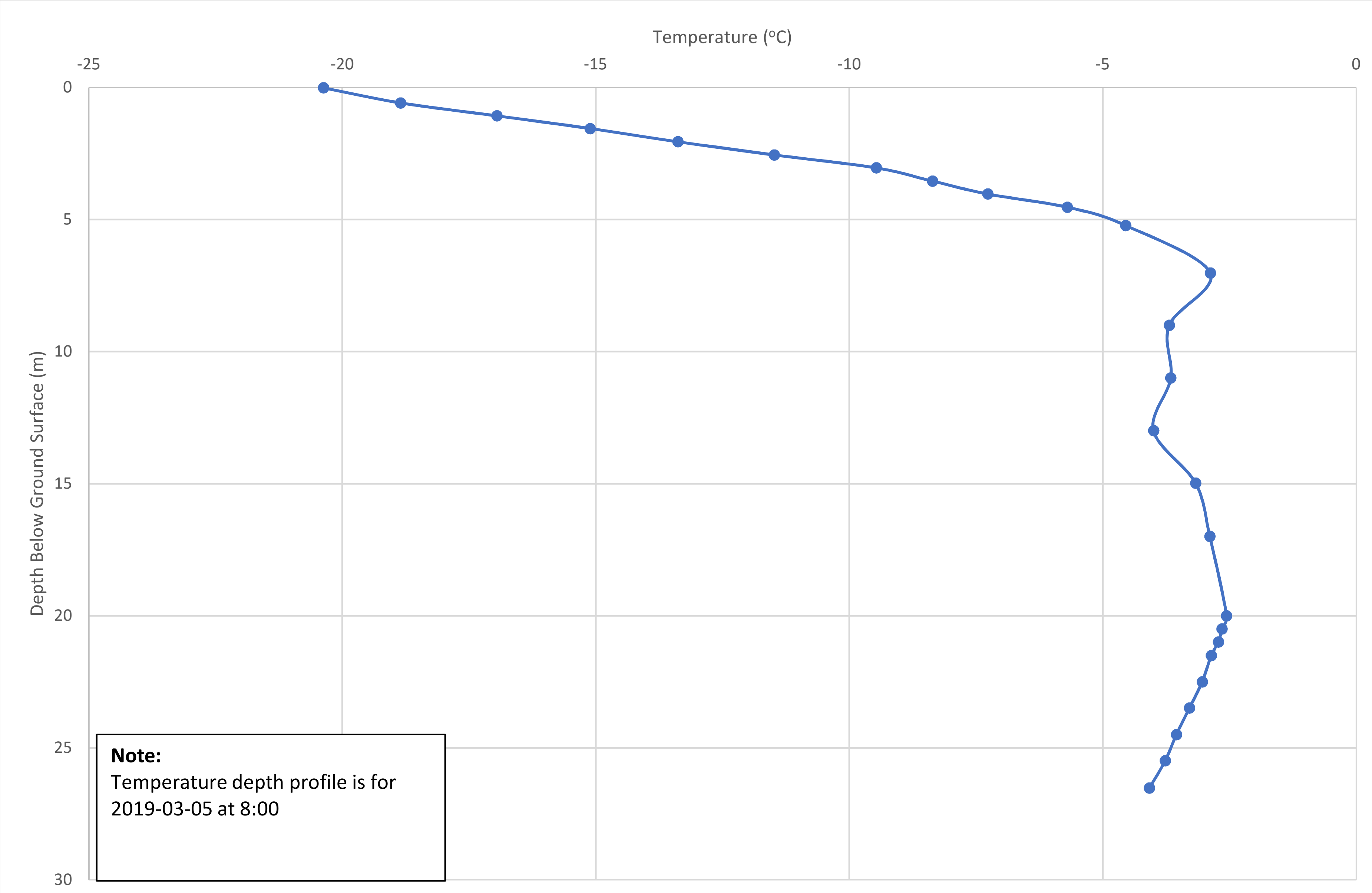

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Instrument BH2
Temperature Depth Profile

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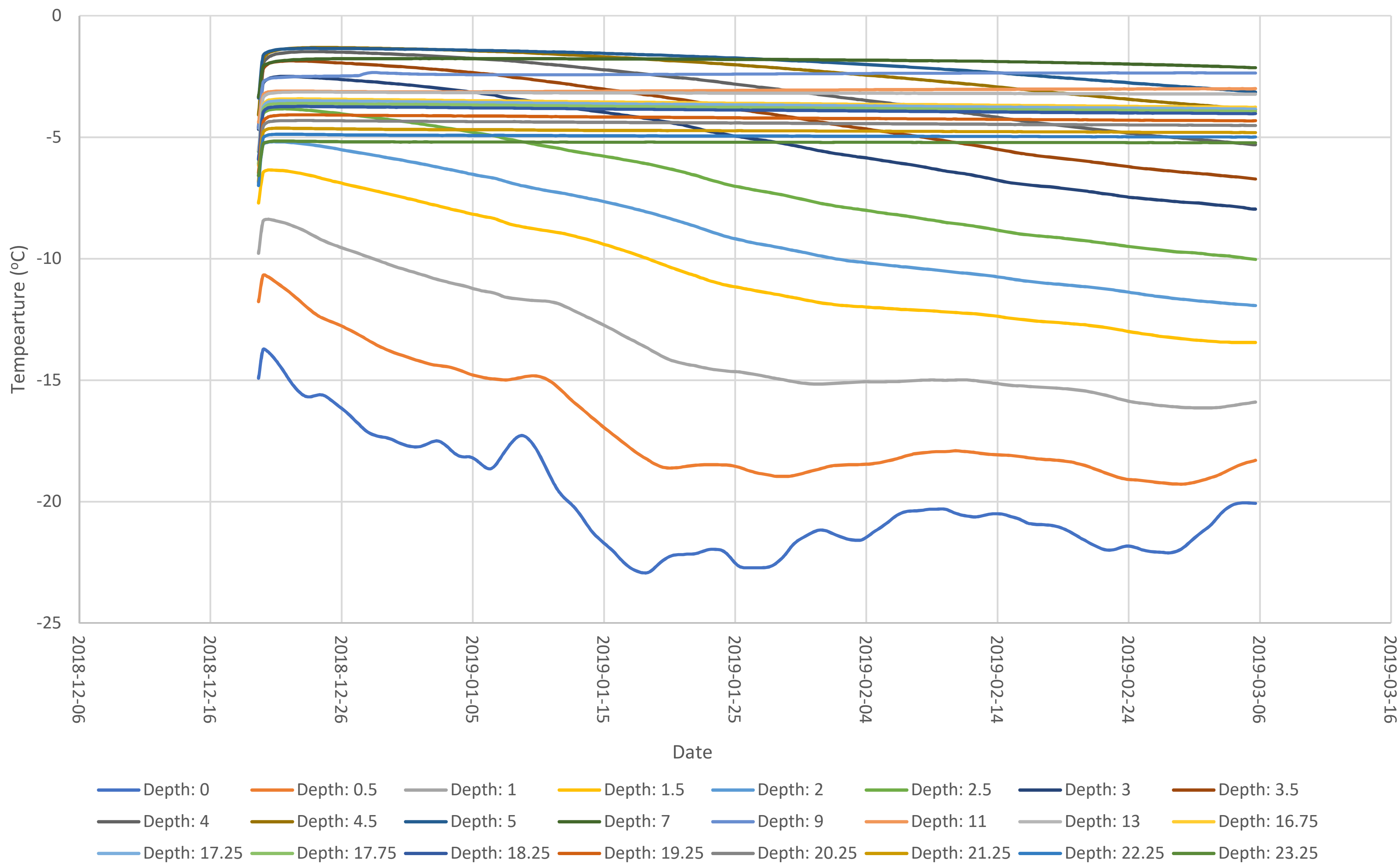
Figure A4



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Instrument BH3
Temperature Time Series

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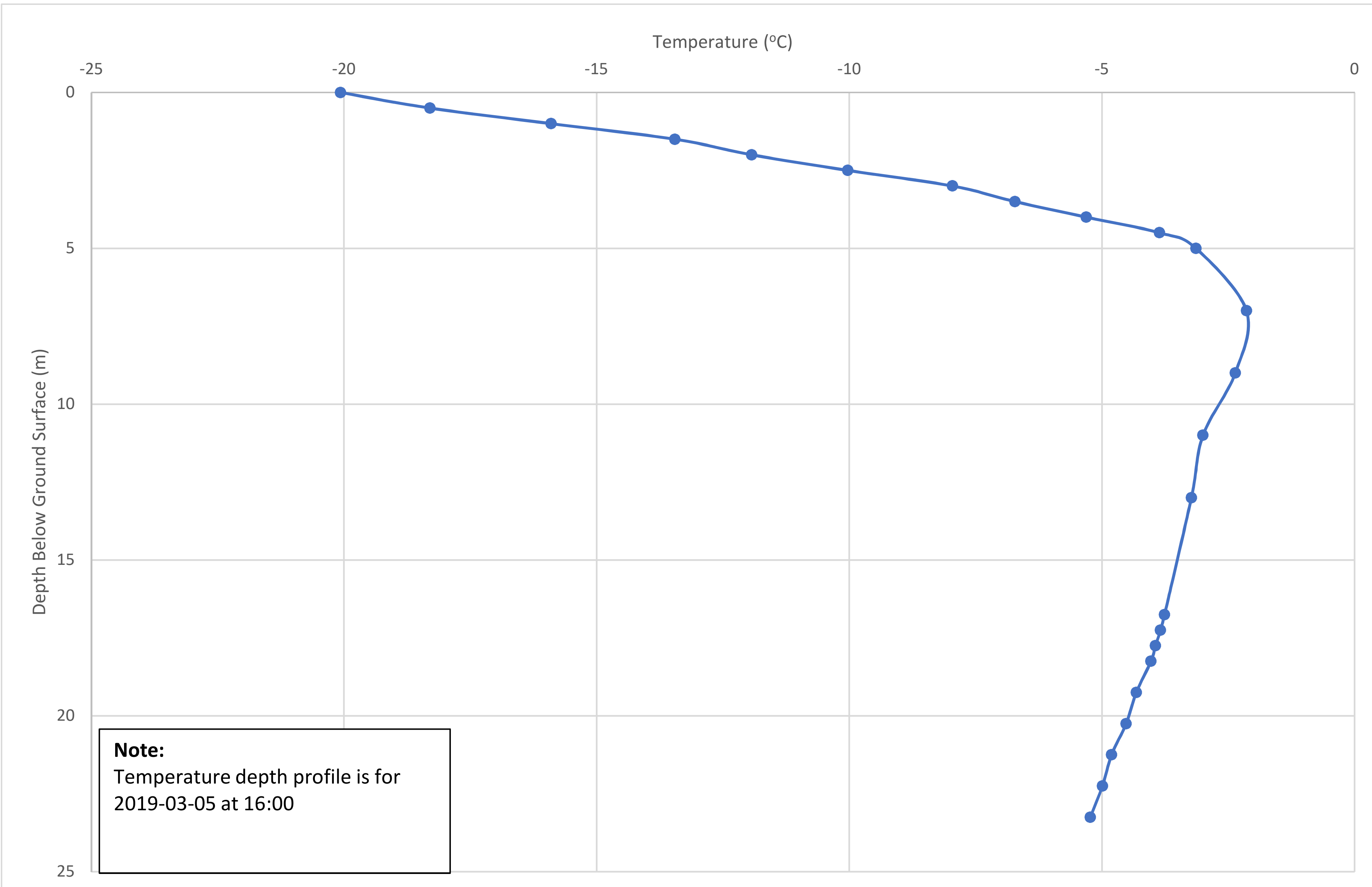
Figure A5



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Instrument BH3
Temperature Depth Profile

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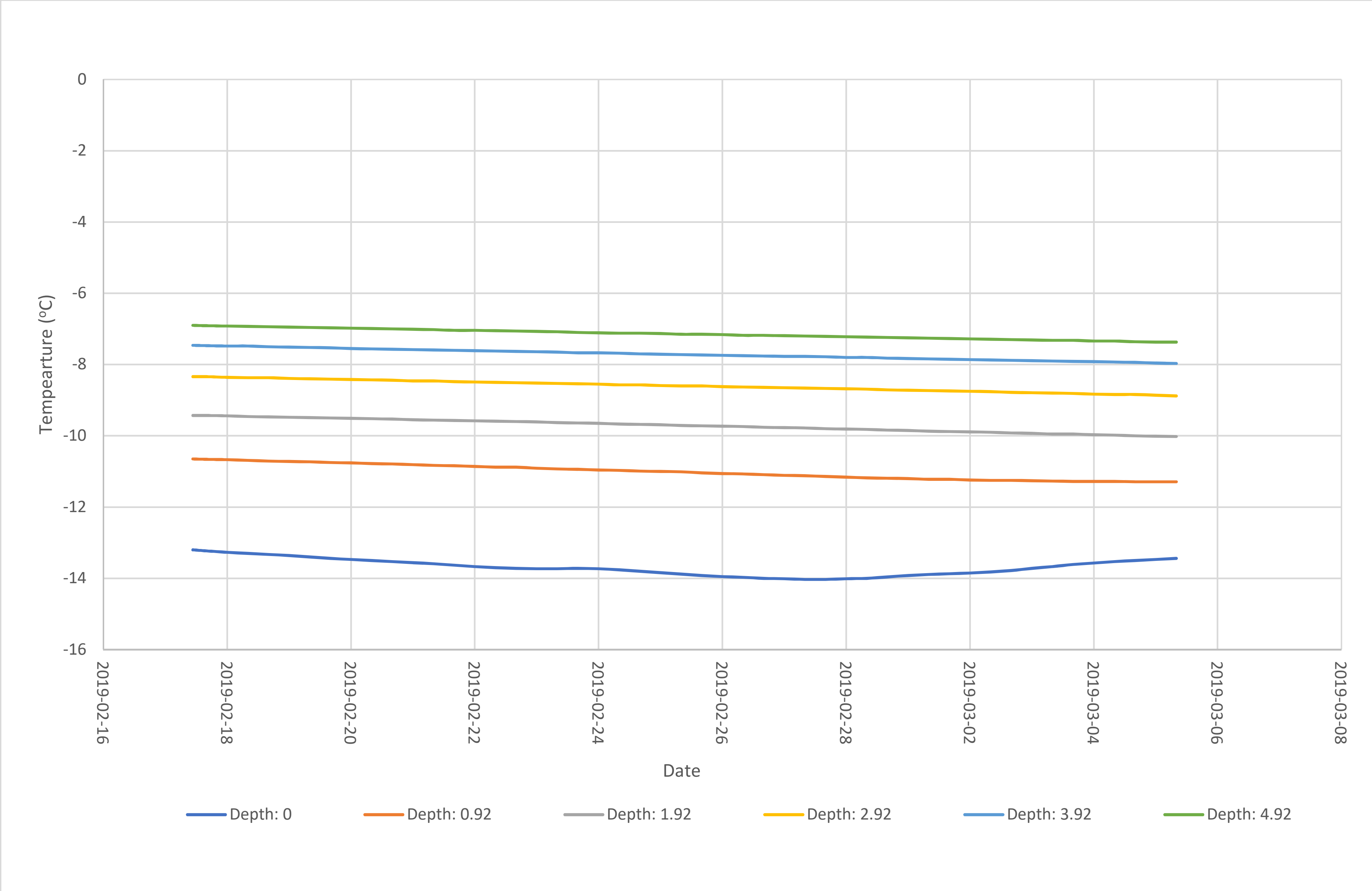
Figure A6



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Instrument T1
Temperature Time Series

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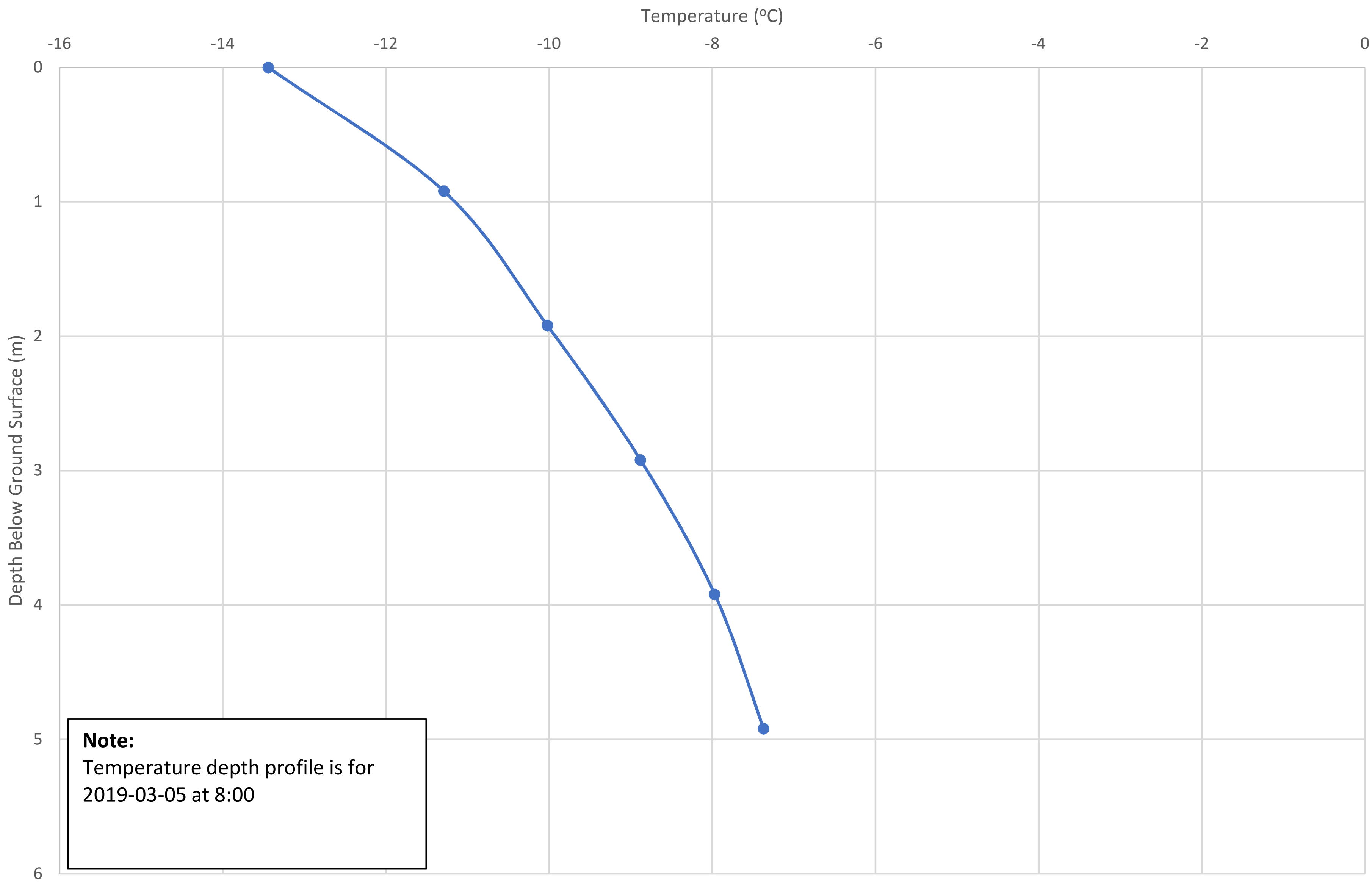
Figure A7



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Instrument T1
Temperature Depth Profile

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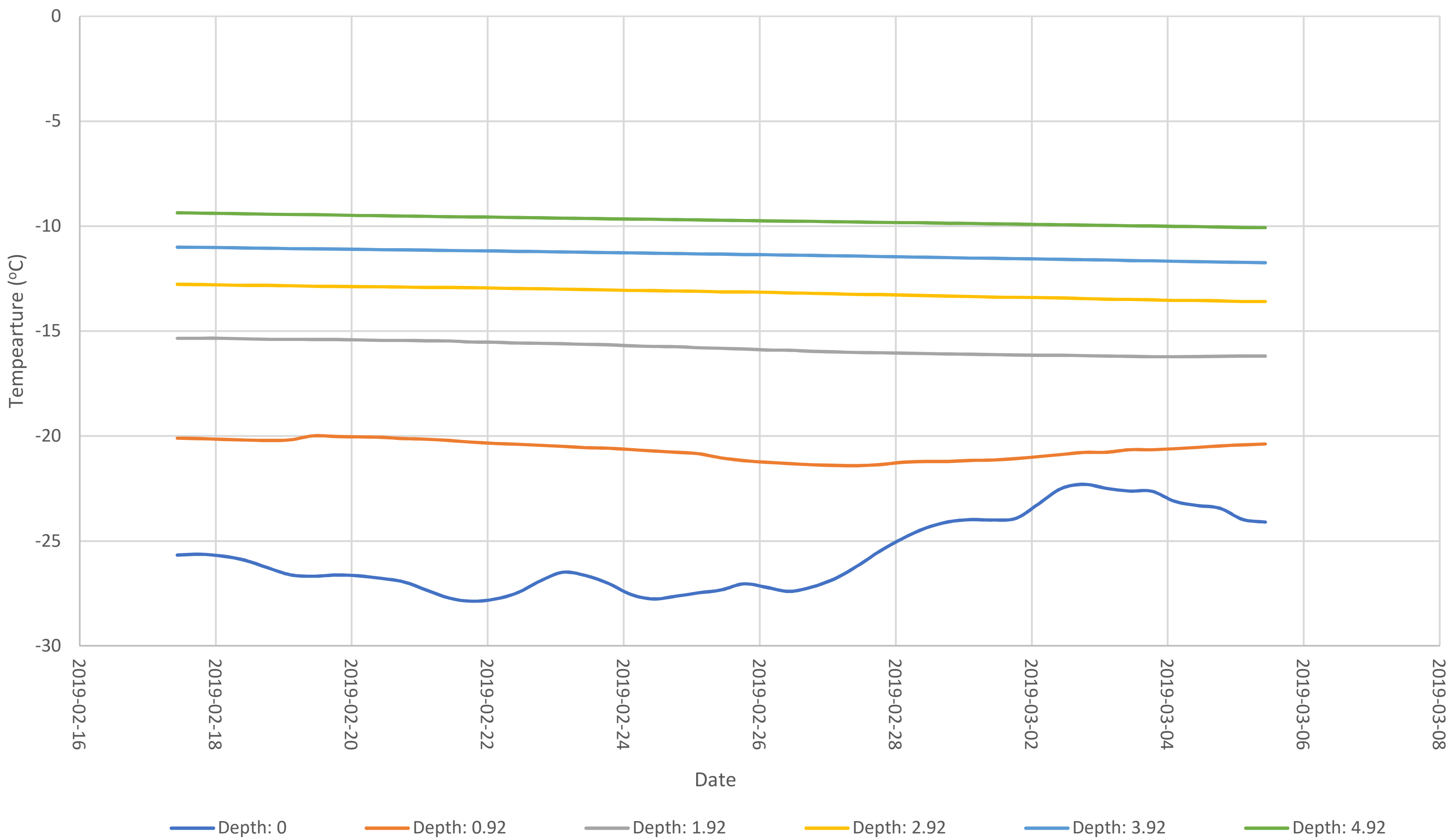
Figure A8



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Instrument T2
Temperature Time Series

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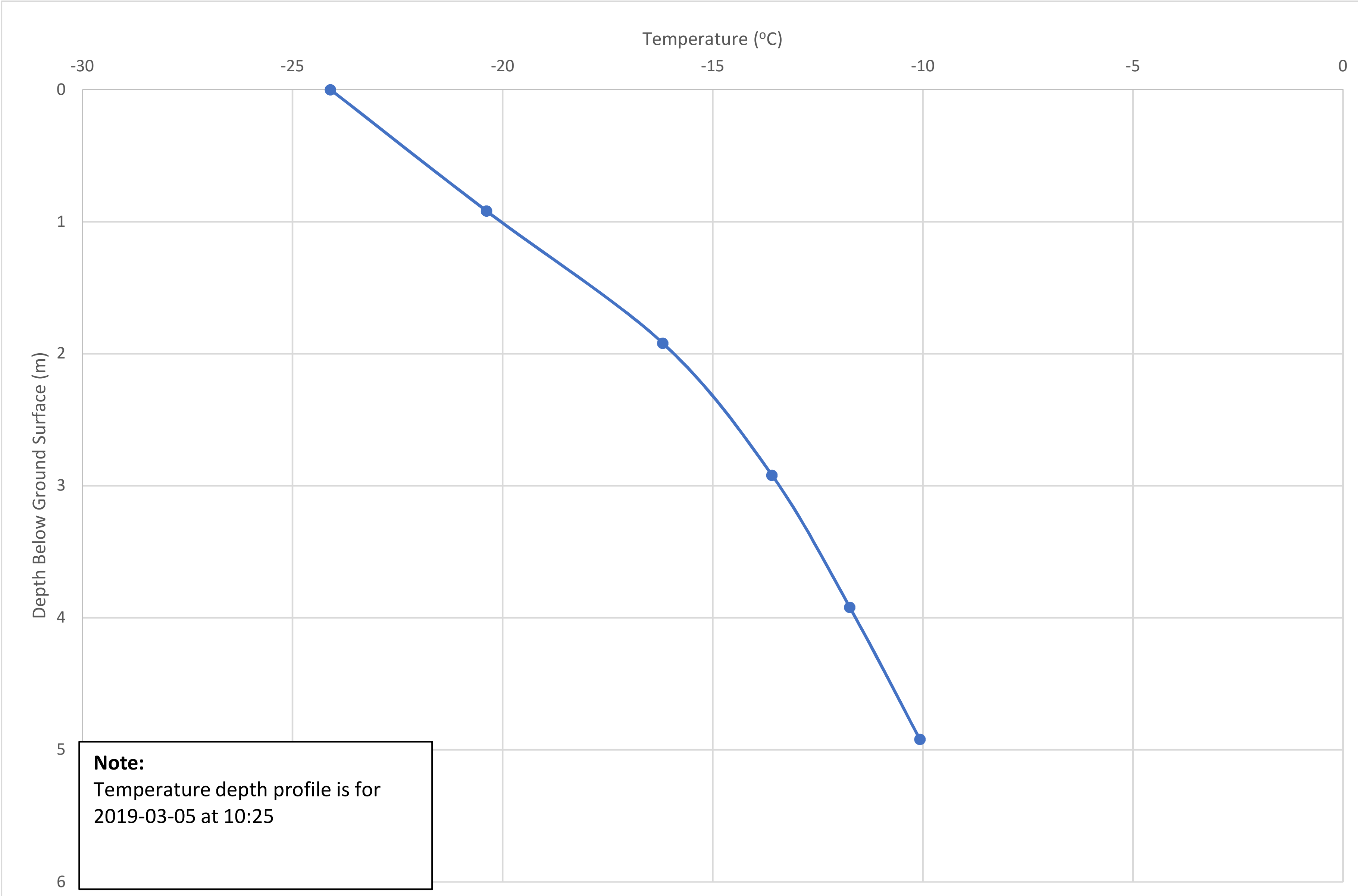

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Instrument T2
Temperature Depth Profile

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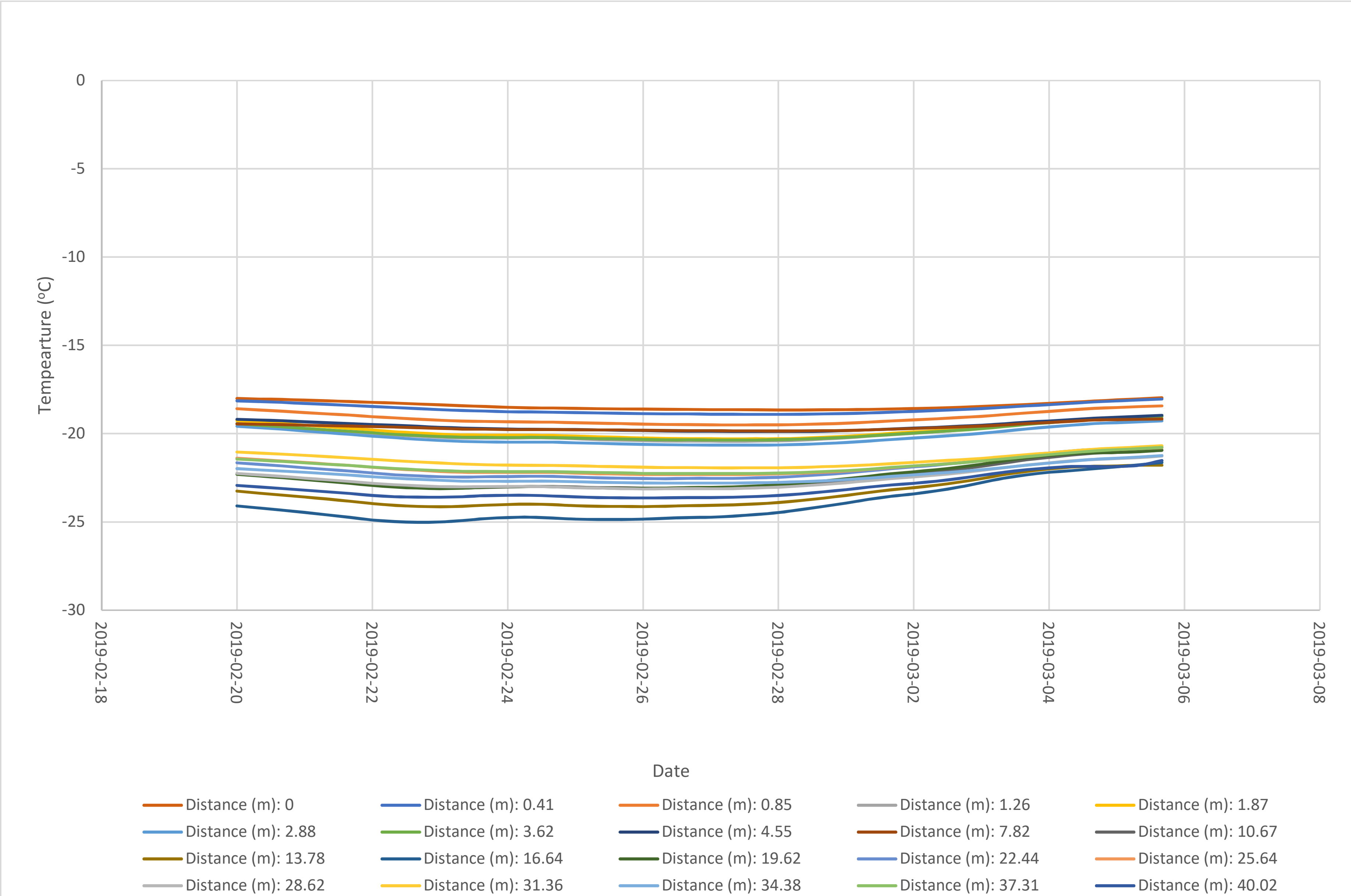
Figure A10



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Instrument T5
Temperature Time Series

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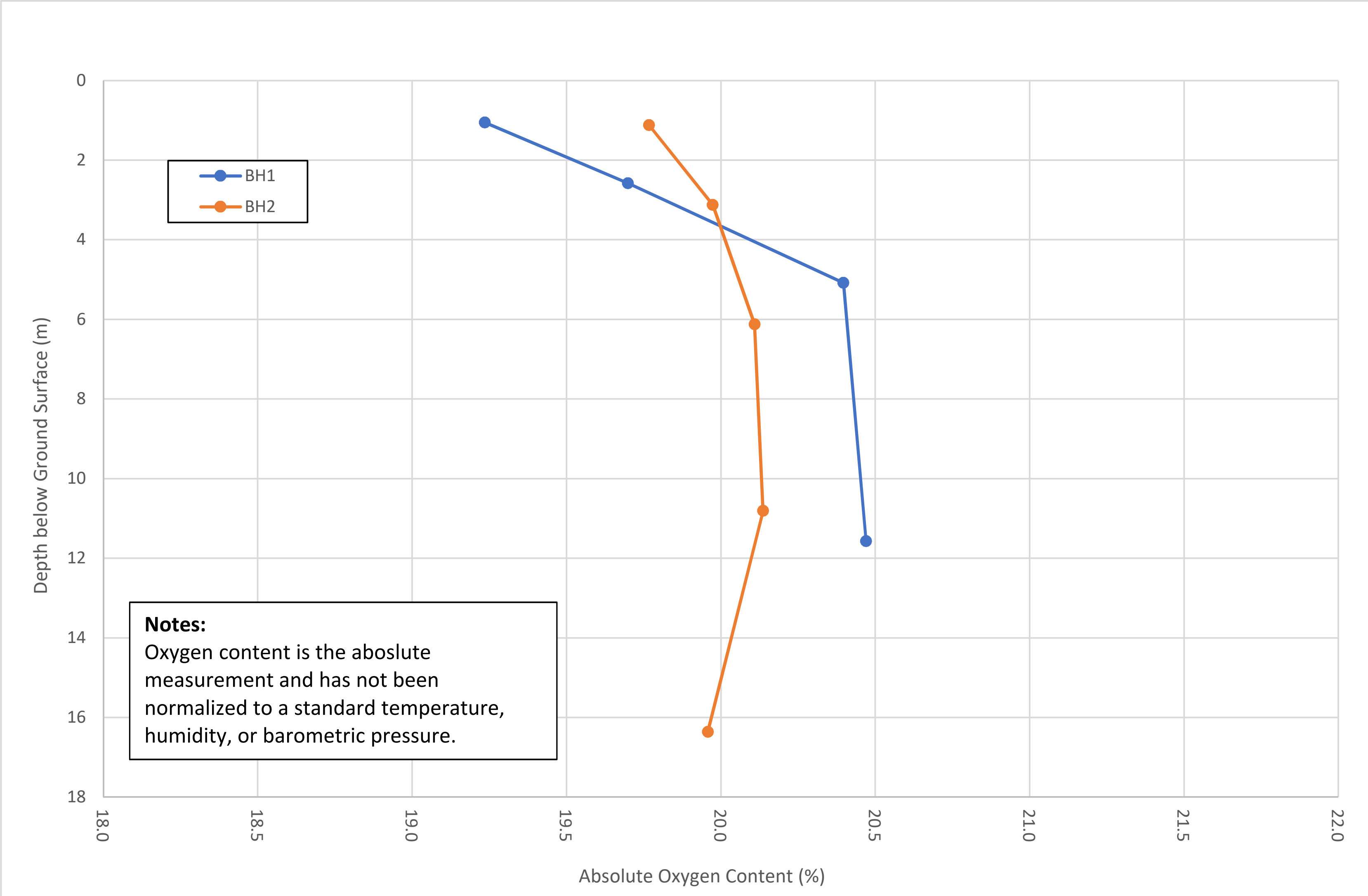
Figure A11



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Instruments BH1 and BH2
Oxygen Depth Profile

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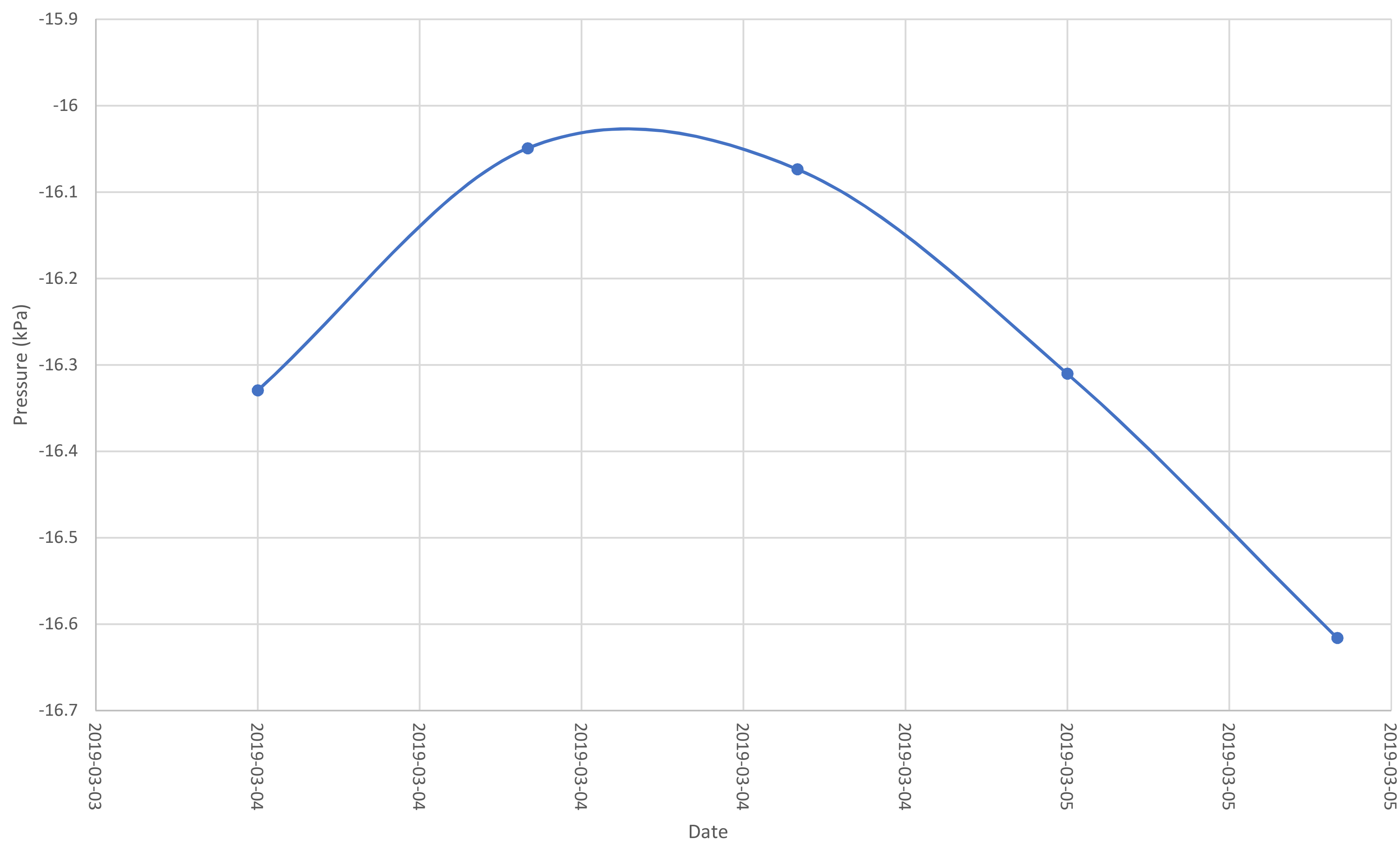
Figure A12



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Instrument BH1
Pressure Time Series

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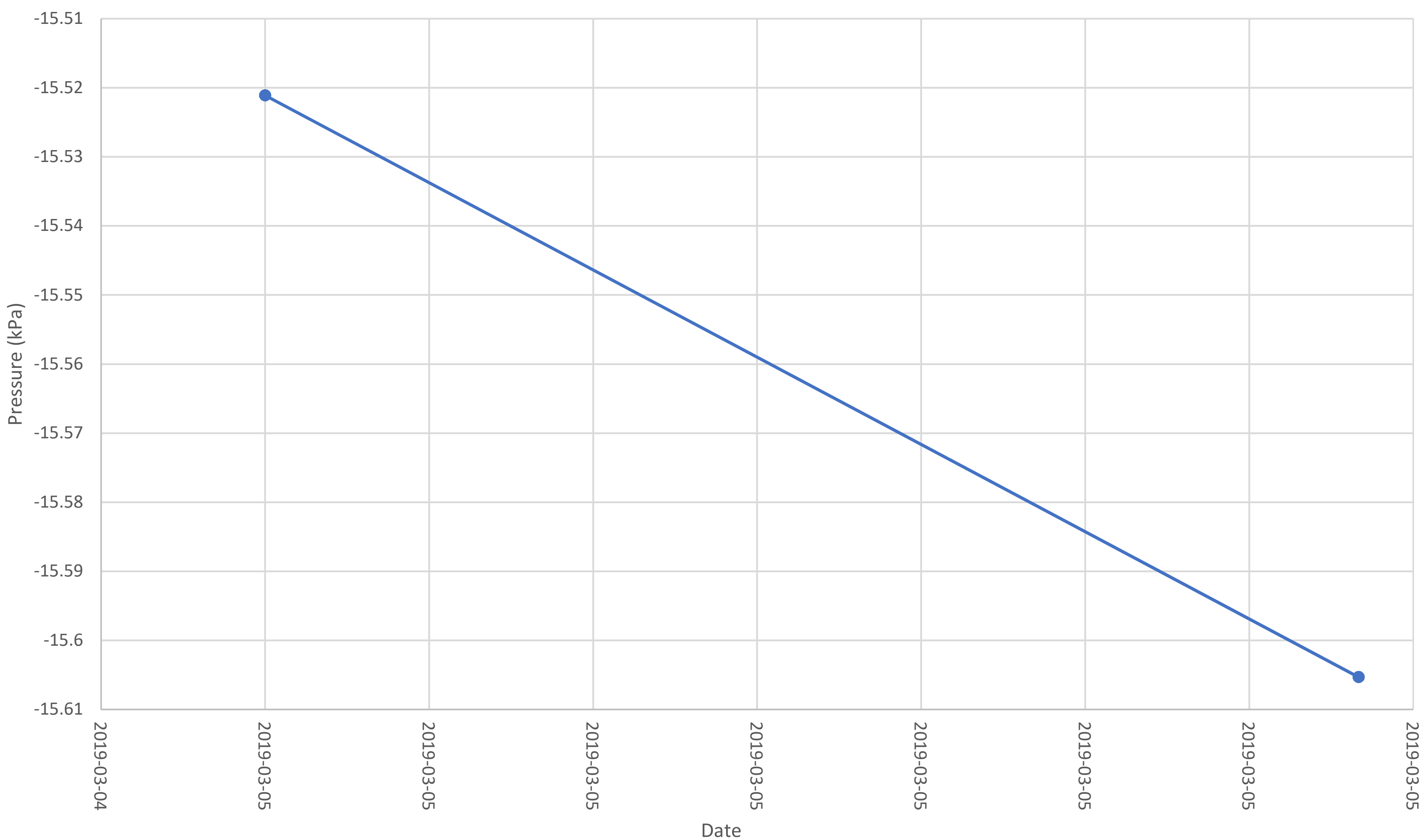
Figure A13



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Instrument BH2
Pressure Time Series

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