PHASE 2 INITIAL BOREHOLE DRILLING AND TESTING – SOUTH BRUCE

WP02: Data Report for Borehole Drilling and Coring at SB_BH02

APM-REP-01332-0329 **February 2023**

Geofirma Engineering

nwmo
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Phase 2 Initial Borehole Drilling and Testing, South Bruce

WP02: Data Report for Borehole Drilling and Coring at SB_BH02

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1 INTRODUCTION

Geofirma Engineering Ltd. (Geofirma) completed the drilling and coring program at SB_BH02 drill site at 1257 Concession Road 8, northwest of Teeswater, Ontario. This report provides a detailed summary on one component of the Geofirma Engineering Ltd. geoscientific investigations as part of the NWMO Phase 2 Initial Borehole Drilling and Testing Program within the South Bruce area, near Teeswater, Ontario (Figure 1). Specifically, this report describes the activities associated with Geofirma's WP02-Test Plan (Geofirma Engineering Ltd., 2021a), to complete drilling, coring, and casing for borehole SB_BH02.

1.1 Background

Geofirma was retained by the Nuclear Waste Management Organization (NWMO) to complete a drilling and testing program for two deep bedrock boreholes (SB_BH01 & SB_BH02) as part of the NWMO's Phase 2 Geoscientific Preliminary Field Investigations. The full scope of this deep drilling and testing program is described by in the Initial Borehole Characterization Plan (Geofirma Engineering Ltd., 2020a).

Since 2010, the NWMO has been engaged in a multi-year, community-driven, site selection process to identify a site where Canada's used nuclear fuel can be safely contained and isolated in a deep geological repository. This study will assist NWMO in assessing the suitability of the South Bruce area to host a deep geologic repository (DGR) for the long-term storage of high-level radioactive waste. NWMO is currently studying multiple areas in Ontario and ultimately intend to decide on a single community with which to ratify a formal hosting agreement for the used nuclear fuel repository between an informed, willing community and the NWMO. NWMO's process is called the Adaptive Phased Management (APM) plan and comprises multiple phases.

Phase 1 of NWMO's APM plan included preliminary desktop studies using available geoscientific information and a set of key geoscientific characteristics and factors that can be realistically assessed at the desktop phase of the Preliminary Assessment. The Phase 1 Preliminary Assessment of the South Bruce area identified the Cobourg Formation as the preferred host formation for a deep geological repository for used nuclear fuel. The Initial Borehole Drilling and Testing study is a key component of the Phase 2 Geoscientific Preliminary Field Investigations of the NWMO's APM plan.

Boreholes SB_BH01 and SB_BH02 are located approximately 4 km northwest of the community of Teeswater, Ontario. SB_BH02 was drilled through the entire sedimentary bedrock sequence to approximately 14 m into the Precambrian basement, to a total depth of 900.57 mBGS. The borehole was drilled using PQ3 wireline coring equipment that produces a 123 mm nominal diameter borehole and 83 mm nominal diameter core.

The drilling program described in this report was completed to obtain high-quality data representing subsurface conditions at the SB_BH02 drill site. Supplemental reports have been prepared by Geofirma illustrating other aspects of the geoscientific investigations.



LEGEND

- SB_BH01 Drill Site
- SB_BH02 Drill Site
- Municipality of South Bruce
- Municipality of Brockton
- Township of Huron-Kinloss
- Provincially Significant Wetland
- Wetland
- Waterbody
- Watercourse
- Major Road
- Local / Street
- OGSRL Well Locations

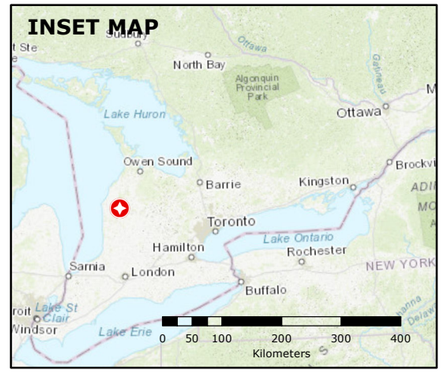


Figure 1
Location of SB_BH02 Drill Site

Scale 1:60,000

0 500 1,000 2,000 3,000 4,000
Meters

N

Projection: NAD 1983 UTM Zone 17N

Source: NWMO, Ontario GeoBase

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster

PROJECT No. 20-211-1

NWMO South Bruce
Drilling and Testing

DESIGN: ADG
CAD/GIS: ADG
CHECK: SNS
REV: 1

DATE: 2023-02-02

GEOFIRMA ENGINEERING

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1.2 Geological Setting

The sequence of rocks encountered in the SB_BH02 borehole consist of Paleozoic-aged strata that were deposited within the Michigan Basin northwest of the Algonquin Arch in Southwestern Ontario. The Michigan Basin is a circular-shaped cratonic basin that is composed primarily of shallow marine carbonates, evaporites, and shales that were deposited while eastern North America was in tropical latitudes during the Paleozoic Era (Armstrong and Carter 2006). West of the Algonquin Arch, strata from the Michigan Basin tend to gradually dip westward into the Michigan Basin. Borehole SB_BH02 was drilled through the entire Paleozoic sequence to approximately 14 m into the Precambrian basement, which is composed of high-grade metamorphic rocks of the Grenville Province.

1.3 Technical Objectives

The primary objective of the drilling and coring program was to obtain high-quality data that is representative of the conditions during the drilling and coring of the SB_BH02 borehole.

The technical objectives of the borehole drilling for SB_BH02, drilling, coring and casing installation activities were:

- The collection of high quality bedrock core, which will allow geological and geotechnical core logging and the collection of core samples (WP03). Core samples will be used for laboratory testing programs to characterize the bedrock environment.
- To provide opportunity to complete supplementary studies such as borehole geophysical logging (WP05), hydraulic testing (WP06) and opportunistic groundwater sampling (WP07) while drilling.
- To provide stable borehole walls to allow for future testing the installation of a Westbay multilevel monitoring system for long term pressure and chemistry monitoring (WP09).
- To ensure the subsurface groundwater is not contaminated and water table environments are isolated through the use of casing and potentially borehole grouting following testing.

In addition, the objectives related to the drilling fluid management and tracer usage included:

- Optimize core recovery and borehole stability through the use of drilling fluids;
- Flush drill cuttings from the borehole;
- Maintain pressure control of the borehole to prevent potential blowouts in accordance with the requirements of the MNRF's Oil, Gas and Salt Resources Act (OGSRA);
- Trace drilling fluids using a combination of stable water isotopes, tritium, sodium fluorescein and measured field parameters; and
- Monitor the flow in/out of the borehole to identify opportunities to collect opportunistic groundwater samples (WP07).

2 DESCRIPTION OF ACTIVITIES

Geofirma was the Lead Contractor for all borehole drilling and coring activities associated with SB_BH02 WP02. Geofirma subcontracted Vital Drilling, based in Haileybury, Ontario to complete this work and Vital subcontracted with TW Marsh Drilling, based in Bothwell, Ontario to complete the drilling and casing installation associated with the upper approximate 50 mBGS due to the larger borehole and casing size requirements. SB_BH02 was completed with an open bedrock interval from 204.95 mBGS (~10 metres below the top of the Salina Formation F-Unit shale) to 900.57 mBGS (~14 metres into the Precambrian basement).

During normal drilling operations, drilling operations were conducted 24 hours per day, 7 days per week. Drill site staffing was organized into two 12-hour shifts, with day shift running from 7am to 7pm and night shift running from 7pm to 7am. A total of 6-10 staff were typically on site throughout the drilling; including Geofirma staff and the drilling contractor crew, with a larger crew present during the day shift. A typical dayshift crew included the following staff:

- 1 x Geofirma Site Supervisor (WP01)
- 1 x Geofirma Drilling Monitor (WP02)
- 1 x Geofirma Core Logger (WP03)
- 1 x Geofirma Field Technician (WP03)
- 1 x Vital Drilling Foreman
- 1 x Vital Driller
- 2 x Vital Drilling Helpers

The Geofirma Drilling Monitor was the primary communication link to the drilling contractor's on-site crew. The Geofirma Drilling Monitor also had the responsibility to verify that all drilling activities were being completed in accordance with the approved Geofirma WP02 Test Plan (Geofirma Engineering Ltd., 2021a) and to document all pertinent information associated with WP02, including but not limited to:

- drilling rig setup and operations;
- establishing depth reference measurement benchmarks for WP02 activities;
- management of drill cuttings and drilling fluid collection and disposal;
- tracking borehole depth and orientation and ensuring borehole deviation measurements were collected as required;
- documenting observations during drilling and recording of drilling parameters;
- ensuring casing programs were followed and documenting the installation and cementing of casing strings;
- testing all fresh water source used during the project;
- measuring drilling fluid parameters during drilling;
- monitoring drilling fluid volume changes during drilling
- collecting drilling fluid samples every 50m during coring operations;

- ensuring borehole flushing of fluids was completed before borehole geophysics and as required after drilling completed; and,
- recording air and noise monitoring results daily.

2.1 Provincial Drilling Regulations and Permits

2.1.1 Drilling License / Permit

The drilling and testing of SB_BH02 was not considered to be under the jurisdiction of the Ontario Ministry of Northern Development, Mines, Natural Resources, and Forestry (MNDMNRF) and on their direction to NWMO was not required to obtain a drilling license as per the Ontario Oil, Gas and Salt Resources Act (OGSRA).

While not under MNDMNRF license, but as best practice, all work associated with the drilling program was completed conforming to the guidance of the MNDMNRF Oil, Gas and Salt Resources of Ontario, Provincial Operating Standards, Version, 2.0 (MNR Standards dated 2002) which covers Well Drilling and Works regulated by the OGSRA. As such, blow-out prevention (BOP) equipment was utilized for all drilling activities below top of the Salina Formation F-Unit shale to address the possibility of potential gas-pressurization issues; however, no significant oil or gas was encountered while drilling SB_BH02.

Geofirma completed all of the following deliverables typically associated with an MNDMNRF licensed well and provided to NWMO to keep on record:

- MNDMNRF Form 1 – Application for a Well License
- MNDMNRF Class 1 Examiner Report – Well Drilling & Plugging, Casing and Cementing (to be submitted within 10 days after inspection date – inspections required for each cementing operation in accordance with API specifications and associated with BOP equipment)
- MNDMNRF Form 7 – Drilling and Completion Report (to be submitted within 60 days after well completion including borehole geophysics and hydraulic testing)

Copies of these documents are included in the data delivery associated with this report.

All deliverables prepared in accordance with MNDMNRF requirements (i.e. the forms listed above) are required to express depths in units of metres below the drilling rig Kelly Bushing (BKB). As the drilling rigs used on this project did not include a Kelly Bushing, the drilling rig foot clamp was used in place and the conventional nomenclature of mBKB was followed. For reporting purposes, the ground surface reference datum was measured to be approximately 2.67 mBKB of the drilling rig at SB_BH02.

MECP - As an administrative, safety and transparency measure, Geofirma will tag the deep boreholes and submit a well record to the Ontario Ministry of Environment, Conservation and Parks (MECP).

2.1.2 MECP PTTW Regulations

The Ontario Water Resources Act (OWRA) and the Water Taking Regulation (O. Reg. 387/04), a regulation under the OWRA, require anyone taking more than a total of 50,000 litres of water in a day to obtain a Permit to Take Water (PTTW) from the Ontario Ministry of Environment, Conservation and Parks (MECP).

During borehole drilling, specifically while enlarging the borehole using air hammering techniques, this requirement became a consideration due to the large volumes of water produces as drilling returns. Due to the nature of this project and to minimize any delays associated with obtaining a PTTW, Geofirma stopped drilling for the remainder of the day or alternatively cemented the permeable sections of the borehole to effectively seal off the bedrock to allow air hammering drilling to continue without exceeding 50,000 L per day.

2.2 Health, Safety, And Environment

All field activities were completed in accordance with the requirements outlined in the project-specific Health, Safety and Environment Plan (HSEP) prepared by Geofirma and approved by NWMO (Geofirma Engineering Ltd., 2020b).

Pre-job briefings were conducted at the beginning of every shift (day and night) by the Geofirma Site Supervisor and/or Geofirma Drilling Monitor with mandatory attendance of all personnel onsite to discuss the daily work plan, health and safety concerns, and any relevant changes to procedures. If any staff or contractors arrived at site during the shift, the Geofirma Site Supervisor completed a separate pre-job briefing at that time. All staff signed a pre-job briefing form to acknowledge the planned scope of work and associated risks.

Geofirma and Vital completed comprehensive “pre-drilling” rig inspections of the TW Marsh cable tool rig and the Vital rotary coring rig prior to drilling at SB_BH02. Vital completed daily rig inspections to ensure equipment was functioning properly and that safety around the drilling operations were maintained throughout the drilling program.

2.2.1 Air Monitoring

Air monitoring was completed throughout the drilling and coring program. These air monitors were typically located on the drilling rig floor and the maximum values were recorded during each shift. When replacing an air monitor with low batteries, the replacement air monitor would either complete a bump test or calibration test before being placed on the drilling rig floor. The values recorded throughout the program were recorded in the Data Quality Confirmation (DQC) Form and can be seen in Appendix F.

No major adverse air quality event occurred during the field activities associated with SB_BH02

2.2.2 Noise Monitoring

Noise monitoring was completed for the first 24 hours of the drilling and coring process. Monitoring was completed at various major points around site, including outside the core logging trailer, directly beside the drilling rig, just north of the drilling rig area, at the south and east fence line, and at the Vital drilling shack. Along with these values a survey was completed to determine a boundary required for hearing protection, this was completed by assessing all areas around the drilling rig as it was drilling and recording where the values exceeded the maximum allowable decibels. A baseline survey was completed prior to the commencement of drilling to assess the changes associated with the drilling rig. A variety of measurements were then taken at varying times throughout the first section of drilling and coring, these values are included within Appendix F.

2.3 Data Quality Assurance and Quality Control

Several data quality assurance and quality control (QA/QC) measures were implemented by Geofirma staff during the program and subsequent analysis and reporting. Verification of results was completed following acceptance criteria and verification procedures outlined in Section 6 of the Drilling and Coring Test Plan (Geofirma Engineering Ltd., 2021a) and the Geofirma Project Quality Plan (Geofirma Engineering Ltd., 2020c). All data acquisition and analysis were reviewed, verified, dated, and signed by a second Geofirma technical staff member who was not directly involved in the work being reviewed.

During shift changes (ie. 7am and 7pm) and during crew switch-out periods (i.e. approximately every 2 weeks), Geofirma and Vital staff held meetings to report and discuss information about the previous shift activities. These meetings varied in length and were typically 10-15 minutes, but durations were longer as required based on the amount and complexity of the information needing to be shared.

All equipment was calibrated prior to use and daily calibration checks were completed to ensure accuracy of data.

Laboratories completing analysis of fluid samples complete their own independent and rigorous internal laboratory QA/QC programs in accordance with best industry practices and certified procedures.

3 SUMMARY OF DRILLING, CORING, AND CASING INSTALLATION

Drilling of SB_BH02 started on August 19, 2021 and was completed on March 22, 2022. While the overall duration is longer than normally required to simply drill a borehole to the target depth, the schedule is influenced by many factors unique to this project, including but not limited to:

- Mobilization of a second drilling rig (cable tool rig) to complete the drilling of larger diameter boreholes and installation of surface casing into competent bedrock.
- Progress slowed (~2 weeks) during cable tool drilling due to encountering large boulder(s).
- Loss of drilling fluid circulation which impacted coring progress and increase in sediment within drilling fluid due to circulation.
- Stopping drilling to collect 4 opportunistic groundwater (OGW) samples, each taking 2-4 days duration.
- Drilling stoppage for approximately 47 days due to drilling rods becoming stuck in borehole and subsequent remedial activities to clear obstruction(s) and resume coring.
- Maintenance, repairs, and troubleshooting activities.
- Managing the entire planning and drilling program during a global pandemic (COVID19) which is an unprecedented undertaking.

TW Marsh started mobilization and setup of their cable tool rig and equipment on August 16, 2021. TW Marsh completed drilling from ground surface to 49.88 mBGS along with the installation of conductor casing and surface casing strings over a period of approximately 51 days between August 19 and October 6, 2021. Demobilization of the TW Marsh cable tool rig and setup of the Vital coring rig occurred over approximately 18 days between October 7 and October 24, 2021. Vital completed drilling the remainder of the borehole (along with intermediate and production casing installation and various testing programs) over a period of approximately 5 months between October 24, 2021 and March 22, 2022.

A summary of the SB_BH02 drilling related activities are presented in Figure 2. The final drilled depth of the borehole was 900.57 m below ground surface (BGS) based on the count of drill rods and the final stickup.

Drilling SB_BH02 finished on March 22, 2022. This was followed by an opportunistic groundwater sampling event (WP07), the final borehole gyro survey, then borehole geophysics (WP05) and hydraulic testing (WP06).

Task Name	Duration	Start	Finish
Cable Tool Rig Mobilization	3	16-Aug-21	18-Aug-21
Cable Tool Drilling	29	19-Aug-21	06-Oct-21
Cable Tool Rig Demobilization	1	07-Oct-21	07-Oct-21
Coring Rig Mobilization	14	08-Oct-21	24-Oct-21
Coring	53	24-Oct-21	22-Mar-22
Casing and Cementing	59	23-Aug-21	24-Feb-22
OGW	13	13-Nov-21	25-Nov-21
Geophysical Logging	4	26-Nov-21	27-Feb-22

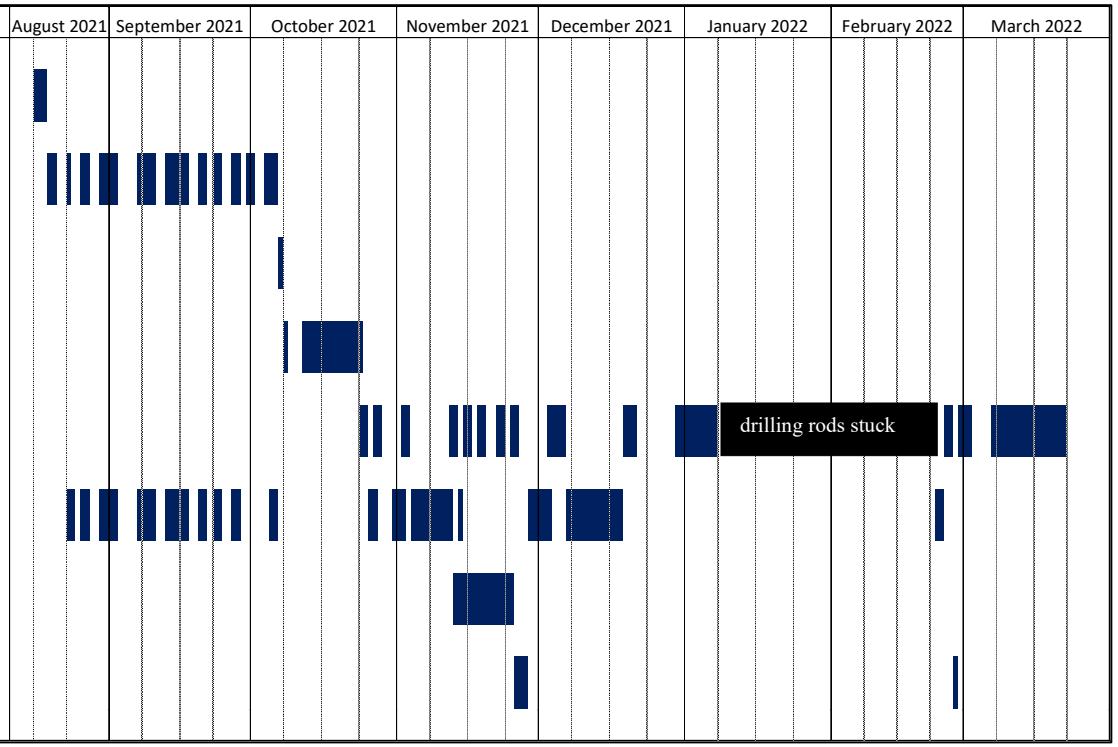


Figure 2: Summary of Drilling, Coring, Casing, and Sampling Activities for SB_BH02

3.1 Drilling Equipment and Setup

As previously discussed, SB_BH02 was drilled using two different drilling rigs. The overburden and upper 15.3 m of bedrock (total depth of 49.88 mBGS) was drilled by TW Marsh using a cable tool drilling rig to install the conductor and the surface casings as the required hole was larger than what the Vital coring rig could achieve. Following the cable tool drilling, Vital completed the drilling program using a conventional mineral exploration coring rig outfitted to accommodate the MNDMNRF requirements for drilling, continuous coring, and casing activities from 49.88 mBGS to 900.57 mBGS.

Prior to drilling operations, a cellar (pit) was constructed at the location of the borehole. The purpose of the cellar was to provide adequate depth below ground surface to install blowout preventer equipment for drilling activities. A pit was excavated, and a 1.8 m diameter corrugated steel culvert was installed to approximately 2 m below ground surface to form the cellar.

3.1.1 Cable Tool Rig and Associated Equipment

A truck mounted Bucyrus-Erie cable tool drilling rig, operated by TW Marsh Drilling, was used to install the conductor casing and surface casing and complete the drilling program from ground surface to a depth of 49.88 mBGS. The cable tool drilling rig was positioned at ground level over the borehole and rigged in place. Figure 3 shows a picture of the cable tool rig setup at SB_BH02.

3.1.2 Coring Rig and Associated Equipment

A truck mounted Atlas Copco Christensen CS4002 series all-hydraulic diamond core drill, operated by Vital Drilling, was used to complete the drilling program from 49.88 mBGS to the total depth of the borehole. This drilling rig was equipped with a hollow spindle with chuck rotation unit capable of delivering a maximum torque of 6291 Nm (4640 ft-lb) and a rotation speed up to 1300 rpm.

The drilling rig was installed on top of a steel substructure frame used to elevate the rig above ground level by approximately 2m which provided sufficient space (along with the 2m deep cellar) to accommodate the blow out prevention (BOP) equipment stack. A set of secondary containment berms were installed as containment to minimize drill fluid entering the environment. Two half round tanks, with a full capacity of 25 m^3 each, were used as a drill fluid source for the drilling program and placed within the vicinity of the drilling rig. Figure 4 shows the layout of drilling equipment at the SB_BH02 site.

Vital used conventional mineral exploration drilling and wireline coring equipment to complete the rock coring program. Triple-tube P-size wireline coring equipment (PQ3) manufactured by Boart Longyear was used with a diamond impregnated reaming shell that an 83 mm (3 ¼-inch) diameter high quality core in 3.00 m lengths. Coring equipment used at SB_BH02 produced a 122.6 mm (4 7/8-inch) diameter borehole from 48.53 mBGS to the total depth of the borehole. When possible, core runs were retrieved in 3.00 m lengths and further processed by Geofirma staff. In-field core length drilled for each core run has been recorded within the DQC, located in Appendix B.

Various coring bits were used to complete the continuous coring of SB_BH02 including diamond impregnated, surface set diamond, and polycrystalline diamond (PCD). Throughout the drilling program bits were typically operated with a bit rotation speed of approximately 600 to 800 revolutions per minute

(RPM) with a torque pressure of approximately 2,500 to 3,400 pounds per square inch (17,237 to 23,442 kPa).

Occasionally the drillers would halt drilling and collect a partially drilled core run due to a drilling blockage, typically caused by certain formation types and drilling fluid properties. When this occurred the driller would record the length drilled which, if possible, was confirmed with the retrieved core length. Core runs were still labeled in three meters segments, when possible, and the partially cored sections were labeled as ‘CR##A’, ‘CR##B’, etc. within the DQC until a full three-meter length was achieved.

The Geofirma drilling monitor communicated the core depth to the Geofirma core logger to ensure an accurate final depth and total core recovery. Analysis of the core was completed in association with WP03, therefore is not included within this WP02 report.

Once coring was completed to a desired casing set depth the boreholes were enlarged using a down-hole air hammer and associated equipment to provide sufficient annular space between the outside diameter of the steel casing and the borehole wall during cementing operations.



Figure 3: Setup of Cable Tool Drilling Rig and Equipment SB_BH02

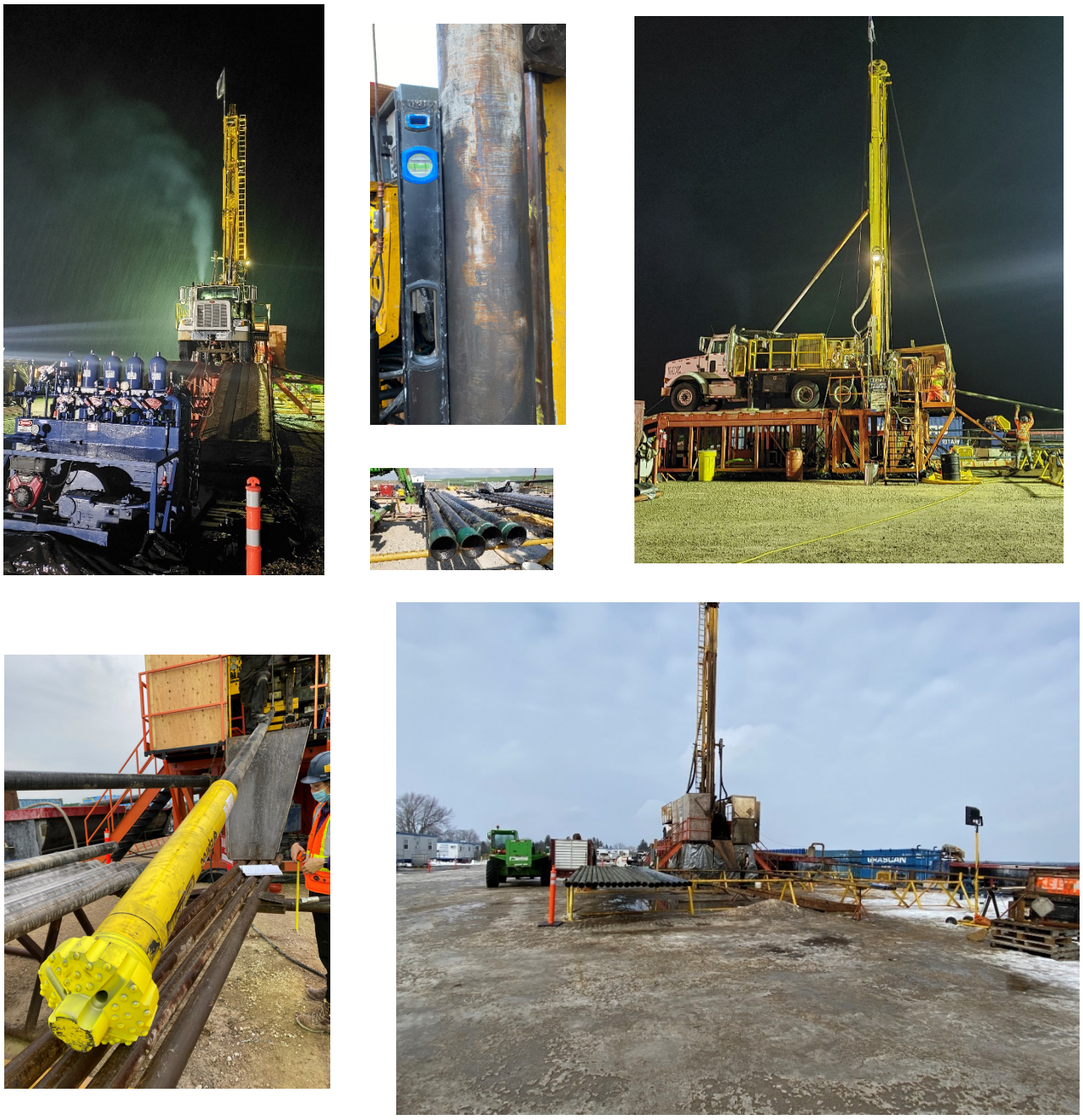


Figure 4: Setup of Coring Drilling Rig and Equipment SB_BH02.

Top Left and Bottom Right: **Coring drilling rig setup;**
Top Middle: **Vertical check during casing installation;**
Top Right: **Coring drilling rig on substructure;**
Bottom Left: **Air hammer equipment**

3.1.3 Blowout Prevention (BOP) Equipment

The potential to encounter highly pressurized zones while drilling required the use of Blowout Prevention (BOP) Equipment. BOP equipment was installed and used in accordance with MNDMNRF guidelines during rotary drilling (coring) operations after the surface casing string was installed. No BOP equipment was used during drilling above this depth while using the cable tool rig. After installation, the BOP equipment was pressure tested in accordance with the specifications outlined in drilling license application.

Drilling between 49.88 mBGS to 78.82 mBGS (after surface casing installment and before intermediate casing installment) used Class A (rotary) well control equipment (Figure 6a), including:

- 11” annular BOP - 3000 psi with flow nipple diverter.

Drilling below 78.82 mBGS to 900.57 mBGS (after intermediate Casing (main BOP string) installment until the end of the borehole 900.57 mBGS) used full stack Class B (rotary) well control equipment (shown in Figure 5 and Figure 6b), including:

- 9” flow nipple on top.
- 9” annular BOP – 3000 psi.
- 9” blind and pipe rams – 3000 psi with pipe ram inserts.
- 9” drilling spool with check value and manual value on one side and hydraulic control remote (HCR) and manual valve on opposite side.
- Accumulator system, flare stack and flare tank.

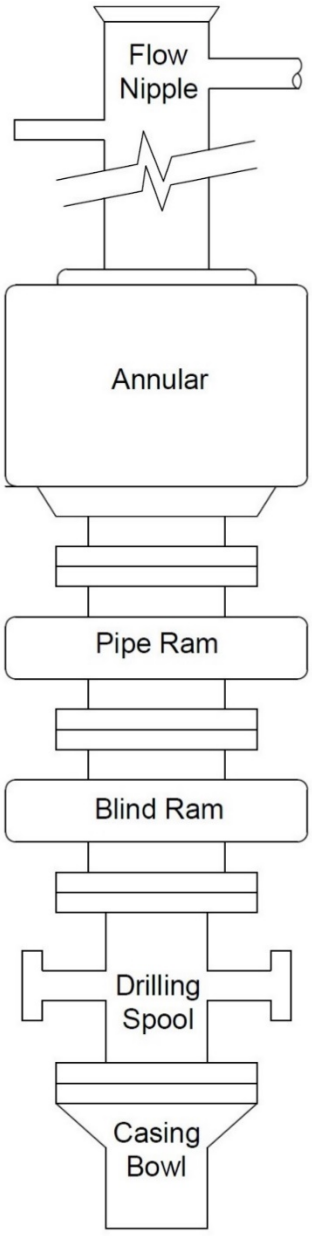


Figure 5: Example BOP Equipment



Figure 6: BOP Setups During Bedrock Drilling

Left: *Class A (rotary) annular BOP with flow diverter used while drilling bedrock from 49.88 mBGS to 78.82 mBGS*

Right*: Class B (rotary) full stack BOP setup while drilling bedrock from 78.82 mBGS to 900.57 mBGS*

3.1.4 Drilling Fluid Cleaning System

The drilling fluid return from the borehole, containing cuttings, was cleaned prior to being recycled and re-used for drilling operations by being pumped back downhole. The drilling fluid cleaning equipment system (Portable Paramount Centrifuge System manufactured by Multi-Power Products) was a closed loop system and comprised a diesel-powered hydraulic motor-driven centrifuge assembly, two fluid pumps and a 1,135 L (300 USGal) holding tank. This equipment was used in series with two ½ round mud tanks with interior baffles and a full capacity of 25 m^3 each that allowed the heavier cuttings to settle. All tanks and drilling equipment was equipped with drive on portable berm systems to contain any spills or leaks that may occur. The settlement tanks were emptied using a vacuum truck as required and the contents trucked offsite for disposal. Figure 7 shows the drilling fluid cleaning system equipment at SB_BH02. Due to the large amount of cuttings and sediment within the drilling fluid, flocculant was added to the main half round tank to facilitate settling.



BH01



BH02

Figure 7: Drilling Fluid Cleaning System During Coring Operations at SB_BH01

3.2 Drilling and Casing Sequencing and Progress

3.2.1 Drilling and Casing Sequencing

In order to meet the casing requirements of the MNDMNRF Operating Standards, multiple telescoped-casing installations were necessary to provide a permanent seal between various aquifers within the Devonian and Silurian formations and to provide suitable blow-out prevention in the event of drilling through a gas-pressurized zone. To accommodate this, SB_BH02 was drilled in the following five distinct stages as summarized in Table 1 and shown in Figure 8:

Stage 1: Conductor Borehole and Casing Installation (0 to 34.60 mBGS)

Drill through overburden material using cable tool rig while advancing conductor casing (406.4 mm OD) to produce ~406 mm diameter borehole from ground surface to top of bedrock.

Stage 2: Surface Borehole and Casing Installation (34.60 to 49.88 mBGS)

Continue drilling through shallow weathered bedrock using cable tool rig to produce a borehole with a minimum diameter of 375 mm (14 ¾”). Install 298 mm ± (11 3/4”) OD diameter Surface Casing to seal off overburden sediment from the bedrock groundwater environment.

Stage 3: Intermediate Borehole and Intermediate Casing Installation (49.88 to 78.82 mBGS)

Continuously core using Class A (rotary) annular BOP with freshwater drilling fluid and PQ3 wireline equipment from bottom of cement to 78.82 mBGS. Enlarge borehole to 273 mm +/- (10 3/4”) and install 219 mm +/- (8 5/8”) OD Intermediate Casing to seal off any potential salty water below this depth from cross connecting with any shallow fresh water aquifer(s) used by nearby residences as a potable water supply source.

Stage 4: Intermediate Borehole to Salina Fm F-Unit shale and Production Casing (main BOP string) (78.82 to 204.95 mBGS)

Continuously core using Class B (rotary) full stack BOP with freshwater drilling fluid and PQ3 wireline equipment from bottom of cement to approximately 5 m into the Salina F Unit shale.

Complete borehole geophysical logging of the upper bedrock interval (bottom of Intermediate Casing to top of Salina Formation F Unit shale). Enlarge borehole to 196 mm +/- (7 3/4”) and install 139.7 mm +/- (5 ½”) OD Production Casing (main BOP string) to allow P-size coring (123 mm) below Salina F Unit shale and seal off any shallow freshwater aquifer(s) for drilling with brine.

Stage 5: Main Borehole to Precambrian Basement (204.95 to 900.57 mBGS)

Continuously core using Class B (rotary) full stack BOP with brine drilling fluid and PQ3 wireline equipment to produce a 123 mm +/- (4 7/8”) open borehole from the Salina F Unit shale to total depth approximately 14 m into Precambrian basement.

Table 1: Summary of Borehole and Casing Sizes for SB_BH02

Drilling Sequencing Stage	*Casing String/Borehole*	*Casing Grade*	*Casing Weight (kg/m)*	*Bottom Depth (mBGS)*	*Borehole Diameter*		*Casing Size (OD)*		*Casing Size (ID)*	
					(inch)	*(mm)*	*(inch)*	*(mm)*	*(inch)*	*(mm)*
Stage 1	Overburden (Conductor)	LS	n/a	34.60	16	406	16	406	15.3	388
Stage 2	Surface	J-55	42	49.88	14 ½	370	11 ¾	298.5	11 1/16	281.5
Stage 3	Intermediate	K-55	254	78.82	10 ⅜	265	8 5/8	219	8 1/8	206
Stage 4	Production (BOP)	K-55	14	204.95	7 ⅝	193	5 ½	139	5	127
Stage 5	Main Borehole	n/a	n/a	900.57	4 ⅞	123	open hole		open hole	

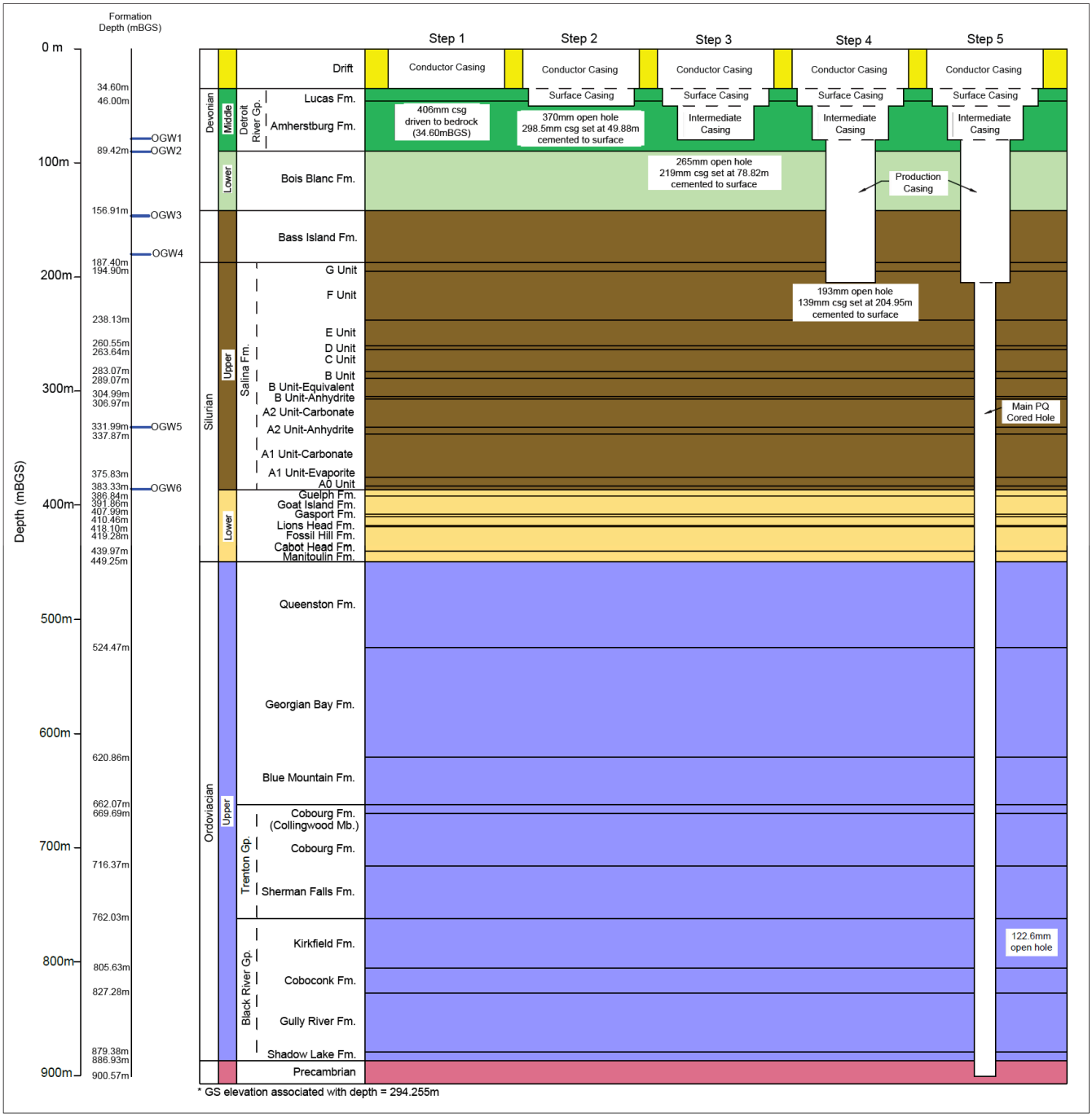


Figure 8: Bedrock Drilling and Casing Installation Sequence – Borehole SB_BH02

3.2.2 Coring Rates and Drilling Progress

The coring times for a 3.00 m length of core typically ranged from 15-25 minutes for softer shale or argillaceous-rich formations such as the Salina G-Unit, Cabot Head, Queenston and Blue Mountain Formations, as well as for the dolostone Lions Head Formation. Core times were typically longer, ranging between 45 to 100 minutes, for harder dolostone and limestone formations such as the Lucas, Amherstburg, Bass Islands, Fossil Hill, Cobourg, Kirkfield, and Gull River. The average coring time was around 40 minutes.

Drilling progress by date is presented in Figure 9 and Figure 10. The daily drilling progress varied based bit changes, equipment maintenance, drilling fluid preparation, time sensitive core sampling (WP03), and opportunistic groundwater sampling (WP07). The average progress over a 24-hour period for days with productive drilling was 20m with a maximum daily drilled depth of 45 m achieved on January 2 and January 5, 2021.

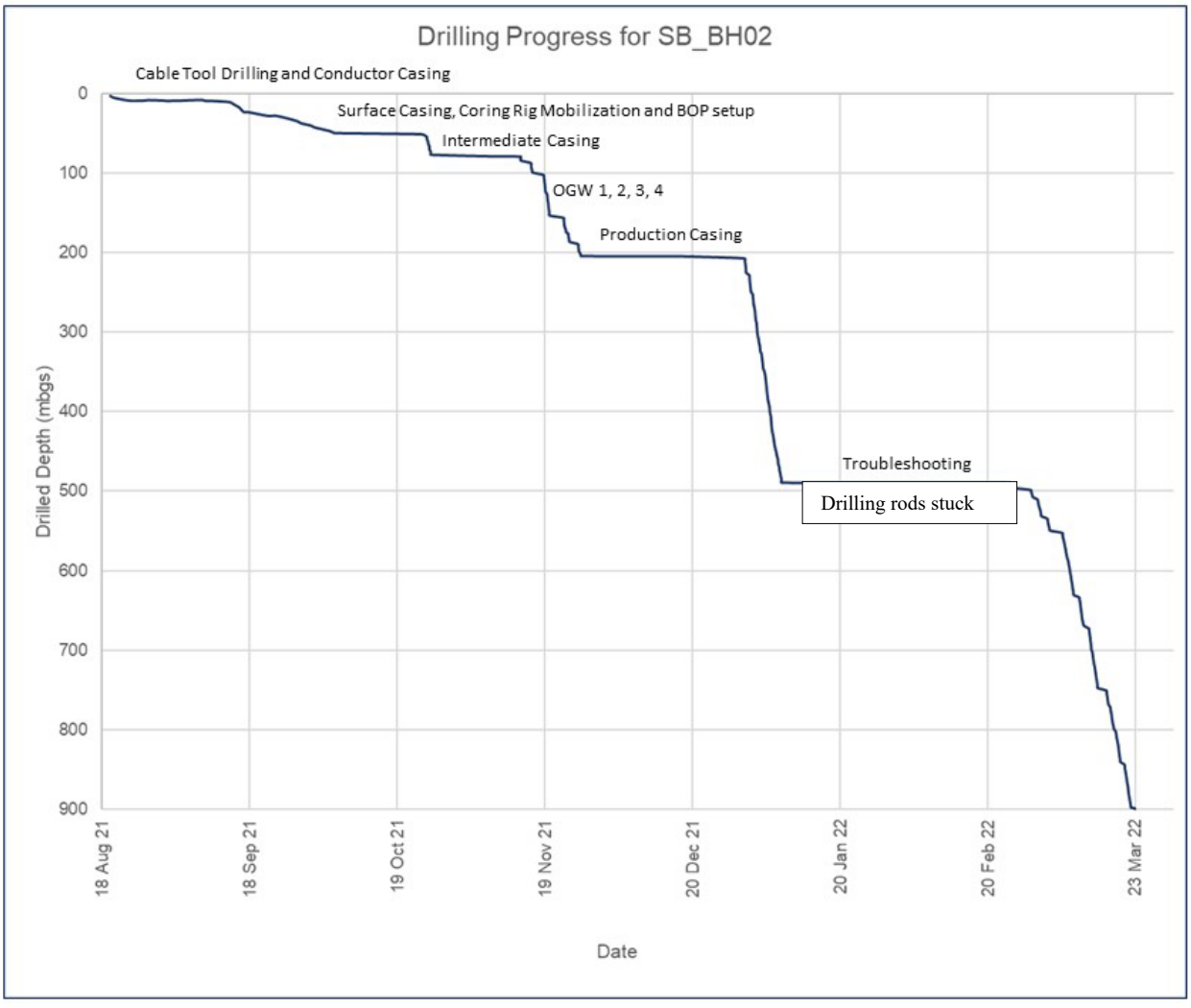


Figure 9: SB_BH02 Drilling Progress

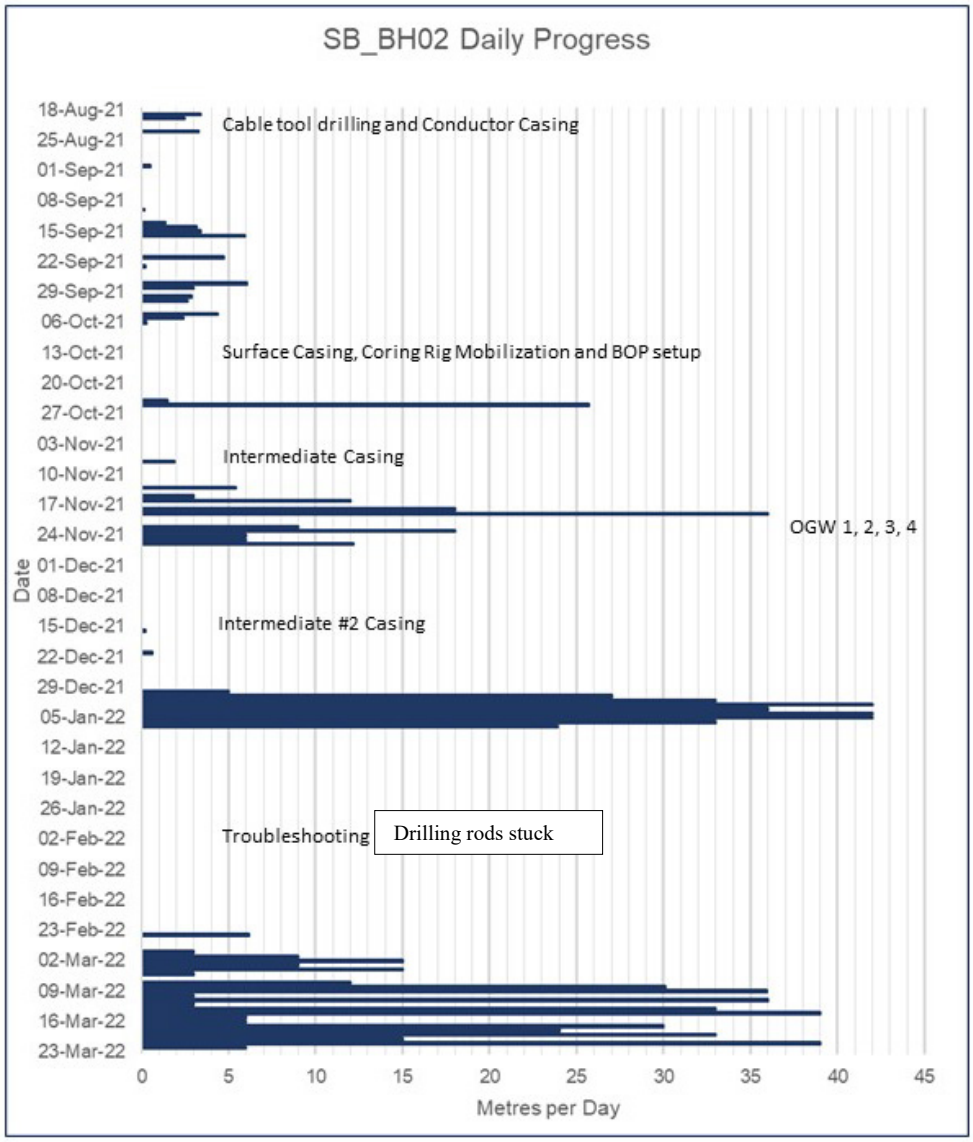


Figure 10: SB_BH02 Daily Progress

3.3 Casing Installation and Cementing Details

As discussed in Section 3.2, four different diameter casings were installed at BH02 at varying depths: the conductor casing, surface casing, intermediate casing, and production casing. Table 1 summarizes the casing details for each section of borehole. The conductor casing was driven and installed during the cable tool drilling process and therefore did not include any cementing. The surface casing was also installed during the cable tool drilling process and was cemented in place. The intermediate and production casings were installed during the rotary drilling / coring process and cemented in place.

All casings were completed in accordance with the requirements set out in the Geofirma Test Plan (Geofirma Engineering Ltd., 2021a) including requirements for QA checks and documentation, borehole

flushing, installation of centralizers, and cementing procedures. The annulus space between the outside of the steel casing and the borehole wall (or between any two casing strings) was fully cemented (except for the conductor casing) to surface following procedures in accordance with MNRF Provincial Operating Standards (POS). All cementing operations were completed by Integral Pumping Services (IPS), based in Merlin, Ontario. The casing installation checklist was completed on the day of installation for each casing installation and a sample checklist can be viewed in Appendix A. The cement level in the annulus after curing for each casing installation was measured to determine if remedial cementing operations were required. Vital Drilling topped up all annular spaces to surface.

The cable tool drilling process did not require a need to enlarge the borehole size prior to installation of surface casing. Throughout the cable drilling process, soil cuttings were collected for 3.0m intervals, when available. These samples were put through a sieve, cleaned, logged, and saved in a Ziploc bag.

During coring operations, the borehole required enlargement following coring of a target interval prior to casing installation which was accomplished by Vital Drilling using air hammer drilling techniques to create an adequately sized hole to meet MNDMNRF POS requirements. During the air hammering process, a large industrial compressor was used to inject highly pressurized air for cooling the drill bit and flushing cuttings out of the borehole. This process produced a large amount of water due to the significant permeability in the section of rock being drilled which would require a permit (PTTW) from the MECP as the volume produced was greater than 50,000 L/day. Through discussions with NWMO it was decided to continue the drilling operations without exceeding the 50,000 L/day extraction limit and therefore not require a PTTW. Geofirma evaluated alternate drilling techniques but due to difficulties obtaining equipment during the COVID19 global pandemic this was not possible in the required timeframe. Ultimately, to minimize the volume of water produced during drilling, and to specifically remain below the threshold requiring a PTTW, Geofirma and NWMO decided to pump cement into the borehole following coring and prior to borehole enlargement to effectively seal off the highly permeable zones. These remedial cementing events (termed cement plugs or squeezes) were completed a total of five times during the drilling of the upper borehole as part of casing installation operations.

Table 2 summarizes the details including depths and dates for each casing installation and cement plug event. Figure 11 shows some pictures of the casing installation and cementing operations. Each casing installation and cementing event is discussed in further detail below.

Table 2: Casing and Cementing Summary for SB_BH02

Borehole Section	Cement Event ID	Date	Cement Interval (mBGS)	Rational
Overbuden / Conductor Casing	n/a	27-Sep-21	n/a	driven into bedrock – no cementing
Surface Casing	Surface Casing	6-Oct-21	0 to 49.88	Casing install - cement to surface

Borehole Section	Cement Event ID	Date	Cement Interval (mBGS)	Rational
Intermediate Casing	Plug #1	26-Oct-21	49.88 to 77.23	Excessive permeability would exceed PTTW - cement plug to seal prior to air hammering and Intermediate Casing (BOP) install
Intermediate Casing	Plug #2	1-Nov-21	49.88 to 72.53	Previous cement plug did not work, repeat
Intermediate Casing	Intermediate Casing	10-Nov-21	0 to 78.82	Casing install - cement to surface
Production Casing	Plug #3	2-Dec-21	78.82 to 204.69	Excessive permeability would exceed PTTW - cement plug to seal prior to air hammering and Production Casing (BOP) install
Production Casing	Plug#4	7-Dec-21	105.54 to 204.54	Previous cement plug did not work, repeat
Production Casing	Plug#5	14-Dec-21	78.82 to 204.54	Previous cement plug did not work, repeat
Production Casing	Production Casing (BOP)	17-Dec-21	0 to 204.95	Casing install - cement to surface

3.3.1 Conductor Casing (0 to 34.6 mBGS)

A steel conductor casing with a nominal outside diameter (OD) of 406.4 mm was installed by TW Marsh through the overburden material and driven using a cable tool rig into competent bedrock at a depth of approximately 34.6 mBGS. Driving the conductor casing while cable tool drilling resulted in a borehole diameter equal to the OD of the steel casing. The purpose of the conductor casing was to seal off the overburden sediment from the bedrock groundwater environment.

3.3.2 Surface Casing (0 to 49.88 mBGS)

Prior to hanging the surface casing, the borehole was drilled with a diameter of 370 mm into competent bedrock to a depth of 50.04 mBGS by TW Marsh using the cable tool rig. The purpose of the surface casing was to seal off the shallow permeable bedrock and any connection to the overburden – bedrock contact aquifer with the underlying competent bedrock aquifer(s). The final casing depth was selected by Geofirma based on drilling properties and soil cuttings. Following drilling of the surface borehole, a steel surface casing with a nominal OD of 298 mm was installed by TW Marsh and Vital and was cemented into the rock.



Figure 11: Casing Installation Operations.

Top Left: **Casing lengths ready for installation.**
Top Middle and Bottom Left: **Cementing contractor equipment (tanks and pump truck).**
Top Right: **Cement head on casing.**
Bottom: **Casing length being installed.**

Cementing was completed by IPS on October 6, 2021 and an MRNF Class 1 Examiner was present to ensure the casing was cemented properly. IPS recorded volumes, pressures, and final cement composition associated with the cementing job. Three cement samples were taken at varying times during the cement job, at the beginning, middle, and end, to ensure the cement hardens adequately before drilling proceeds.

3.3.3 Intermediate Casing – Cement Plug #1 (49.88 to 77.23 mBGS)

Prior to hanging the intermediate casing string, the upper bedrock was continuously cored and the borehole required enlarged to a diameter of 265 mm by Vital Drilling using air hammer drilling equipment and the coring rig. The open borehole interval requiring enlargement extended below the surface casing and to a depth of 78.82 mBGS and was significantly fractured with high permeability which resulted in loss of circulation during coring. As discussed above, Geofirma and NWMO decided to inject a cement plug in the entire open interval to seal off the fractures and hence reduce the permeability further into the bedrock prior to enlarging using air hammer techniques.

Cementing was completed by IPS on October 26, 2021 and an MRNF Class 1 Examiner was present to observe. IPS recorded volumes, pressures, and final cement composition associated with the cementing job. A total of 2.0 m^3 of cement with the addition of loss circulation fibres was injected (including 100% of excess cement volume). Three cement samples were taken at varying times during the cement job, at the beginning, middle, and end, to ensure the cement hardens adequately before drilling proceeds.

The cement plug was allowed to cure for a minimum of 24 hours prior to coring through the cement to create a pilot hole, followed by resuming air hammering drilling to enlarge the borehole.

3.3.4 Intermediate Casing – Cement Plug #2 (49.88 to 72.53 mBGS)

During the drilling of a pilot hole through the original cement job (Cement Plug #1) the drilling rods deviated slightly from the original path and the cemented area became open to the porous formations. Due to this, circulation was again lost. Geofirma and NWMO decided to inject another cement plug into the open interval to seal off the fractures and reduce the permeability prior to enlarging the borehole for casing installation.

Cementing was completed by IPS on November 1, 2021 and an MRNF Class 1 Examiner was present to observe. IPS recorded volumes, pressures, and final cement composition associated with the cementing job. This plug utilized 1.0 m^3 of fresh water, followed by 1.2 m^3 of cement with the addition of loss circulation fibres was injected, then displacement was continues using 0.15 m^3 of fresh water. This resulted in the top of cement measured approximately 25.18m below the drilling rig floor (~22.51 mBGS). No returns to surface were observed during injection, however during displacement with fresh water returns to surface were achieved with the annular BOP bag closed. Cement samples were taken to ensure the cement hardens adequately before drilling proceeds.

The cement plug was allowed to cure for a minimum of 24 hours prior to coring through the cement to create a pilot hole, followed by resuming air hammering drilling to enlarge the borehole. While the cement plug did not completely seal off the borehole, it was effective in reducing the volume of water produced while air hammering to below the 50,000 L/day threshold.

3.3.5 Intermediate Casing Installation (0 to 78.82 mBGS)

Following borehole enlargement, the intermediate casing string, consisting of steel casing with a nominal OD of approximately 219mm was installed at 78.82 mBGS on November 10, 2021.

The purpose of the intermediate casing string was to provide additional protection of the shallow bedrock aquifer(s) from deeper saline water that was reported by local water well contractors as a possibility below approximately 65 mBGS near the study area. The final casing depth was selected by Geofirma to be a minimum of 15 m below the surface casing string and based on drilling properties and rock core analysis to ensure competent bedrock to allow an effective casing seal, resulting in a depth of 78.82 mBGS.

This casing was cemented to surface to ensure an effective seal. Cementing was completed by IPS, and overseen by an MRNF Class 1 Examiner. IPS provided a final report with volumes, pressures, and final cement composition of the cement job. In order to drive cement down into the casing, over 3.0 m^3 of water and 4.6 m^3 of cement was required. Three samples were taken of the cement as the cement job was being completed.

3.3.6 Production Casing– Cement Plug #3 (78.82 to 204.69 mBGS)

Prior to hanging the production casing string, the section of open borehole between the Intermediate Casing (~78.82 mBGS) and the target setting depth (~204.95 mBGS) was continuously cored and the borehole required enlargement to a diameter of 193 mm by Vital Drilling using air hammer drilling equipment and the coring rig. Similar to before, this interval was significantly fractured with high permeability which resulted in loss of circulation during coring which resulted in the decision to inject a cement plug in the entire open interval to seal off the fractures and reduce the permeability prior to using air hammer techniques. Based on drilling observations and core quality, the target interval for cement was between 78.82 to 204.69 mBGS

Cementing was completed by IPS on December 2, 2021 and an MRNF Class 1 Examiner was present to observe. IPS recorded volumes, pressures, and final cement composition associated with the cementing job. The cement design included 3 tonne of Class G cement without the use of loss circulation fibres with the intent of allowing the cement to flow further into the formation. IPS pumped 1.5 m^3 of water with no returns, followed by 4.0 m^3 of cement with no returns, followed by displacing the cement with water until the cement was measured at approximately 70 metres below the rig floor. Displacement was continued with 0.1 m^3 of water and the cement was measured at 69.55m below rig floor.

Following a wait on cement for a minimum of 24 hours, it was apparent the cementing plug was not effective.

3.3.7 Production Casing – Cement Plug #4 (105.54 to 204.54 mBGS)

As the prior cement plug attempt was unsuccessful, IPS returned on December 7, 2021 to complete another attempt. IPS recorded volumes, pressures, and final cement composition associated with the cementing job. The cement design was Class G cement with the use of loss circulation fibres liquid antifoam additives to help the cement cure more quickly. IPS pumped 2.5 m^3 of water at a rate of 700 L/min with no returns, followed by 7.0 m^3 of cement with no returns, followed by displacing the cement with approximately 0.2 m^3 of water.

The cement plug was allowed to cure for a minimum of 24 hours prior to attempting coring through the cement to create a pilot hole, followed by resuming air hammering drilling to enlarge the borehole. After

air hammering it became apparent that the cement plug was not effective enough and therefore another cement plug was planned.

3.3.8 Production Casing – Cement Plug #5 (78.82 to 204.54 mBGS)

As the prior two cement plugs attempt were unsuccessful, IPS returned on December 14, 2021 to complete another attempt and an MRNF Class 1 Examiner was present to observe. IPS recorded volumes, pressures, and final cement composition associated with the cementing job. The cement design included Class G cement with the use of loss circulation fibres (similar to cement plug #3 and plug #4) and liquid antifoam additives to help the cement cure more quickly. IPS pumped 3.0 m^3 of water at a rate of 270 L/min with no returns, followed by 5.0 m^3 of cement with no returns, followed by displacing the cement with approximately 0.15 m^3 of water.

The cement plug was allowed to cure for a minimum of 24 hours prior to attempting coring through the cement to create a pilot hole, followed by resuming air hammering drilling to enlarge the borehole. Although similar observations were noted during the cement plugging process, unlike cement plug #4 and #5, this plug was effective and allowed the air hammering process to enlarge the borehole.

3.3.9 Production Casing Installation (0 to 204.95 mBGS)

Following borehole enlargement, the production casing string, consisting of steel casing with a nominal OD of approximately 139 mm was installed to a depth of 204.95 mBGS, approximately 10 m below the interpreted top of the Salina Formation F-Unit shale. This casing was installed on December 16/17, 2021 and cemented on December 17, 2021.

The purpose of the production casing string was to provide additional protection of the shallow bedrock aquifer(s) from deeper saline water below the Salina Fm and to also provide adequate strength and protection to install BOP equipment for drilling the main section of the borehole. The final casing depth was selected by Geofirma based on drilling properties and rock core analysis to ensure installation in the Salina Fm F-Unit shale.

Cementing was completed by IPS, with Mike Dorland as the MRNF Class 1 Examiner onsite. A final report with volumes, pressures, and final cement composition was provided by IPS. In order to push cement into the casing, 3.0 m^3 of water followed by 6.2 m^3 of cement followed by 0.28 m^3 of water was used. Throughout the cement job three samples were taken, at the beginning, middle and end of the process, to ensure adequate curing. The plug was set to 12 MPA and resulted in a final tagged depth of approximately 8.3 mBGS.

3.4 Details of Drilling Activities

3.4.1 Maintenance

Throughout drilling operations continuous maintenance was conducted on the drilling rig and relevant drilling components. This included, but was not limited to, repairs and replacements on the reaming shell, transmission, oil change, swivel hose, chucks, hoisting cable, and splits. All maintenance was conducted to ensure a safe and productive work site.

Excluding general maintenance, the repair completed most frequently was associated with the wireline cable, occasionally this cable would break or be deemed unsafe or unreliable due to an increase in wear on the line. Other rig maintenance issues that occurred include rig electrical breaker, rig transmission, and chuck not operating properly. Table 3 outlines the maintenance and repairs completed, although this is a thorough list it may not include every repair or minor maintenance work conducted onsite.

Table 3: Maintenance and Repair Summary

Date	Equipment	General Description of Work
26-Oct-21	General	General Maintenance
27-Oct-21	Hoisting Cable	Hoisting Cable
06-Jan-22	General	Replaced air filters, oil in head, jaws, and ring in drill head
11-Jan-22	General	Mechanical work on all machines and equipment
04-Feb-22	General	Replace oil and flush out top drive
16-Feb-22	General	General rig maintenance
16-Feb-22	Cable	Install new wireline
17-Feb-22	General, Chucks	Maintenance on drilling rig, replace tranny, replaced chuck
25-Feb-22	General	Replaced bolt on tower slide and saddle
02-Mar-22	General	Rig service
04-Mar-22	Transmission	Finish work on transmission and general rig service
05-Mar-22	Electrical Issues	Rig electrical and Fuel sensor
06-Mar-22	Fuel Sensor	Maintenance and repairs on rig pump, fuel rail pressure sensor
12-Mar-22	Chucks	Install flange spindle bolts, install new chuck
13-Mar-22	General	Oil change
16-Mar-22	Crown	Replace crown keepers
17-Mar-22	Cable	Repair wireline
18-Mar-22	General	Maintenance on top drive, oil change, and inspect chain
19-Mar-22	General	Drill shut down, check fuses and clean connections

3.4.2 Drill Bit Changes

Due to varying rock properties and the loss of drill fluid returns, excess heat and pressure was applied to the drill bits. This resulted in coring bit replacements at varying stages on the drilling program. Total depths drilled with a single bit ranged from 29 m to 410 m and was heavily influenced by the effectiveness of drilling fluid circulation. In total five (5) different coring bits were used. The main reason that some bits were used for such a short duration is related to the timing of activities; the first bit was replaced following the installation of the intermediate casing and the final bit did not require replacing as drilling was completed. Figure 12 shows a variety of coring bits at various stages of wear during drilling at SB_BH02. Table 4 summarizes the bit replacements completed at SB_BH02, this table only includes those bits used during the coring activities at SB_BH02.



Figure 12: PCD Coring Bits.

Left: **New bit installed on outer core barrel.**
Middle: **Worn bit due to excessive heat.**
Right: **Worn bit from excessive wear and heat, compared to new bit.**

Table 4: Bit Replacement Summary

Date On	Date Off	Manufacturer and Type		DHA#	DHA length (m)	Approximate Depths Drilled (mBGS)		CR completed
24-Oct-21	02-Nov-21	Fordia	HERO7	#02	4.85	48.53	77.23	CR011
02-Nov-21	08-Jan-21	Fordia	HERO7	#03	4.86	77.23	486.54	CR147
21-Feb-22	10-Mar-22	Fordia	4-6	#04	4.85	489.42	630.57	CR195
10-Mar-22	22-Mar-22	Hayden	8	#04	4.85	630.57	898.18	CR285B
22-Mar-22	22-Mar-22	Hayden	9	#05	4.85	898.18	900.57	CR285D

3.4.3 Troubleshooting Stuck Equipment

During coring activities on January 7, 2022, the driller completed CR147 (483.54 to 486.54 mBGS) and had difficulty retrieving the inner core barrel. The drilling crew attempted multiple times to retrieve it but were unsuccessful and began tripping out the drill string to remove the barrel. Unfortunately during this time the drill string got stuck downhole at a depth of approximately 389 mBGS within the bottom of the Guelph Fm. This resulted in unexpected troubleshooting activities that continued from January 8 to February 24, 2022. Many tactics were utilized to remove the drill string and downhole assembly, including circulation of fresh brine, utilizing a pressurized casing jack at surface, using a downhole cutter to cut rods and retrieving sections using various drilling fishing gear (spears, taps, etc), using different sized rods to nest smaller rods within a larger rods that was stuck, drilling through the steel (rods, reaming shells, bits), and cementing the affected section with steel in place to allow milling and drilling through the remnant steel bits.

A summary of the major work completed and changes to work are outlined within Table 5. Following these troubleshooting activities, the core depth was found to be 489.42 mBGS; 2.88m greater than the

expected 486.54 mBGS. Along with pre-existing QA procedures, additional QA checks were completed to ensure this depth was accurate, including multiple rod counts and comparisons completed between geophysical logs and core logs. This loss of core was likely the result of the trouble shooting activities occurring during the previous 47 days, including inadvertently advancing the original coring bit further downhole while attempting to ream/drill through the remnant steel pieces located at the bottom of the borehole section.

Table 5: Troubleshooting Summary

Date	Summary
07-Jan-22	PQ rod string got stuck
09-Jan-22	Create fishing tool with NQ rods, lower tool to ~339m and latch onto stuck tubing. Rods were holding strong and not releasing.
12-Jan-22	Create fishing tool with HQ rods, lowered and pulled out 35m of wireline total.
13-Jan-22	HQ rods lowered to ~169m and used to ream to ~195m.
14-Jan-22	Lower BQ rods and cutter downhole ~291m, complete 3 cuts.
15-Jan-22	Lower NQ wedge to ~169, unsuccessful
16-Jan-22	Hooked onto NQ, all NQ rods removed from downhole
17-Jan-22	All wireline retrieved
18-Jan-22	Lower HQ downhole to ~313m, reamed to ~387m until drilling steel
19-Jan-22	Pulled out HQ, 6ft fisher still downhole, lower hammer with HQ rods. Attempt to hammer, too much resistance
20-Jan-22	Remove HQ rods, setup casing jack to latch onto PQ rods.
21-Jan-22	PQ rods broke at lock and coupling, removed overshot from fisher, latched onto PQ inner tube and retrieved core.
22-Jan-22	Attempt to cut PQ rods.
23-Jan-22	Pull out HQ, trip out PQ, and attempt to use tap, unsuccessful.
24-Jan-22	Use jack on PQ pipe, attempt to work pipe up and down.
25-Jan-22	Use tap, and work pipe.
26-Jan-22	Run in with HQ and drill out tap
27-Jan-22	Circulate heated brine and work rods, attached jack, break down tap, make starter barrel, drill ~0.3m of core barrel
28-Jan-22	Drill; replace bit and reaming shell.
31-Jan-22	Lower cutter on HQ rods, make cut and place tap (First cut retrieved 0.53m; second cut retrieved 0.63m).
02-Feb-22	Trip in HQ rods with bit and reaming shell to polish top; remove rods and lower cutter to cut core barrel.
03-Feb-22	Tap into cut core barrel and cut barrel. (First cut retrieved 1.12m; second cut retrieved 0.46m).
04-Feb-22	Lower milling reaming shell.
05-Feb-22	Lower drill reaming shell, drilled; lowered milling bit, milled.
07-Feb-22	Pull out NQ and HQ rods, make tap and ran to ~456, circulate drill fluid downhole
08-Feb-22	Secure tap and back reamed
10-Feb-22	Lower cutter to ~466m
11-Feb-22	Utilize milling reaming shell, then utilize drilling bit
12-Feb-22	Drill
18-Feb-22	Drill to clear area around 465 to 470m
19-Feb-22	Cement section downhole as remaining bit pieces seem to be rotating with the drilling bit.

20-Feb-22	Wait on cement and drill through plug and steel
21-Feb-22	Drilling, no progress, found cracked rod at 216m, cracked rod led to no circulation at bit, resulting in the bit burning up
22-Feb-22	Drilled to ~489.54m
23-Feb-22	Cement section downhole as remaining bit pieces seem to be rotating with the drilling bit.
24-Feb-22	Wait on cement and drill through plug, cement, and any remaining steel; Start coring.

3.4.4 Depth Control During Drilling Operations

The depth of the borehole was closely monitored by Geofirma throughout the drilling process. All depths of core runs and sub-sample locations were measured from a common elevation reference point which was selected prior to the start of drilling. For SB_BH02, the reference datum was ground surface, which was surveyed relative to a geodetic benchmark. The depth to the bottom of the drill rod was determined by adding up the lengths of all drill rods on the drill string, the down hole assembly (DHA) which comprises the core barrel, drill bit and any subs / stabilizers etc; then subtracting any length of drill rod above a fixed reference datum. The drilling rig foot clamp in its lowest position was used as the fixed reference datum during drilling at SB_BH02 (Figure 13) and was measured to be approximately 2.67 m above ground surface. During trouble shooting activities from January 8 to February 23, 2022, this foot clamp was affected; the reference point was remeasured and found to be 2.63 m above ground surface.

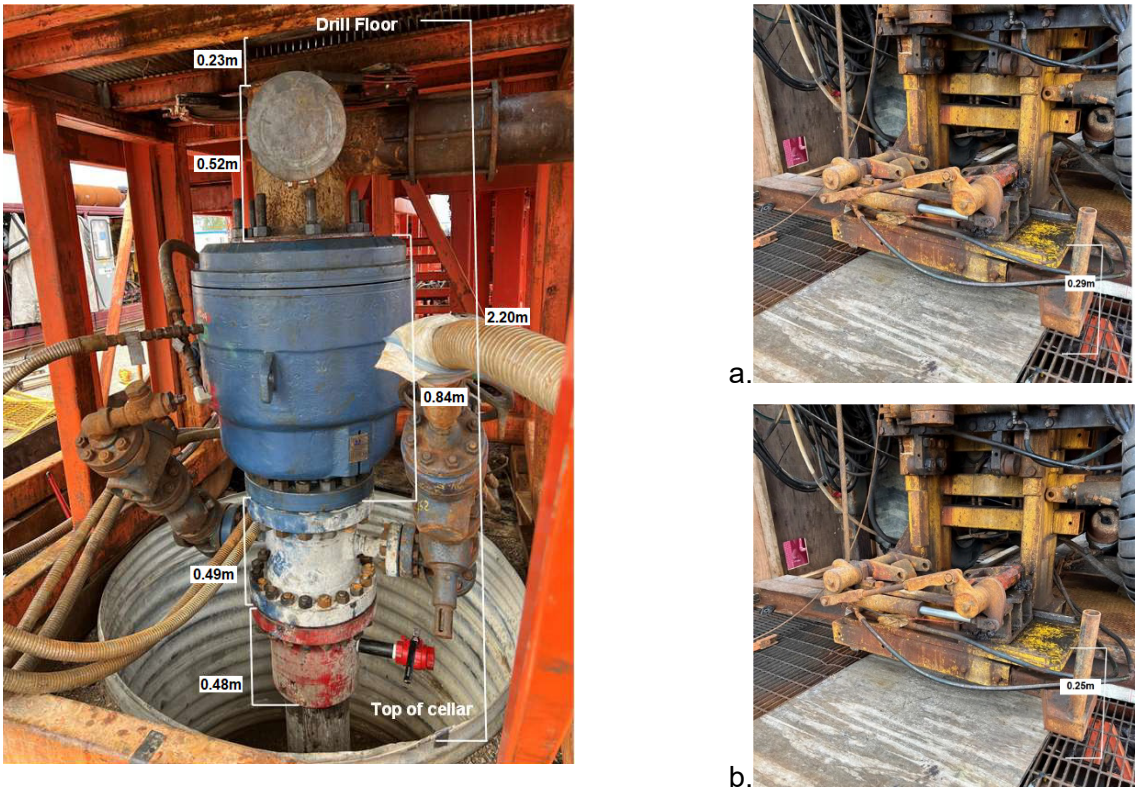


Figure 13: Depth Reference Datum (Foot Clamp) at SB_BH02.

a. Foot clamp position prior to troubleshooting (January 8, 2022)
b. Foot clamp position following troubleshooting activities (February 24, 2022)

Several quality control checks were completed during drilling to ensure depth accuracy, including:

- Re-measuring and recording any changes to the downhole assembly configuration (bits, stabilizers, subs, etc) in the Data Quality Confirmation (DQC) forms;
- Measuring a portion of the drill rods (10%) to ensure a consistent length of 3.00 m. If the drilling rods were tripped out, a count was completed on the rods removed from downhole to reconfirm the depth.

3.4.5 Drill Cuttings and Waste Liquid Management

All freshwater based drilling fluids and cuttings (including freshwater returns during drilling through cement) were removed from site using vacuum trucks and disposed of at Teeswater Concrete in their settling pond.

All brine-based drilling fluids and cuttings (including sulfurous water) were removed from site using Ontario Ministry of Environment, Conservation and Parks (MECP) licensed waste haulers following the Hazardous Waste Identification Network (HWIN) registration process. Geofirma has contracted with Revolution Environmental Solutions LP (Operating as TerraPure Environmental) with MECP Receiver License # A280285. TerraPure use a variety of Carrier/Transporters including Revolution Environmental Solutions LP (i.e. they truck for themselves) under MECP Carrier License # A820156, and has also used a 3rd party carrier (AMICUS – Terra HX Inc with Carrier PIN # 3136-BHMT4C).

Other liquid waste, such as water collected in berms, including rainwater and potential oily water, were disposed of under HWIN manifest similar to the sulphurous water and trucked by TerraPure. When possible, any uncontaminated water (ie rainwater) was filtered properly and released onto the drill pad.

3.4.6 Monitoring Drilling Parameters

The Geofirma Drilling Monitor supervised the drilling operations and recorded a variety of drilling parameters during each core run. The drilling parameters recorded include: the rate of penetration, torque, weight on bit, holdback pressure, fluid injection pressure, and downhole flow rate. These values were recorded in the Data Quality Confirmation (DQC) workbook and are summarized in tabular form in Appendix B and plotted with depth in graphical form in Appendix B.

Drilling parameters were affected by a variety of factors including the formation type, bit condition, drilling fluid condition, and driller preferences. The rate of penetration had three major peaks, one of which was outside the established graphical limits, this value was 256.00 min/m at 898.18 mBGS. This value was excluded from the graph to show the variation throughout the remaining hole. These values were associated with a short core run attempt (<0.30m), therefore the rate of penetration is not representative of the penetration rate of that formation.

3.5 Drilling Conditions

3.5.1 Lost Circulation Zones

As discussed in Section 3, the drilling conditions in SB_BH02 were difficult due to a variety of reasons, including large permeable zones. Permeable zones to approximately 204.95 mBGS resulting in circulation loss during coring operations and the need to seal off the borehole using cement prior to

installation of the intermediate and production casing strings to ensure effective casing installations that provide the proper BOP control for drilling deeper depths.

3.5.2 Evidence of Overpressures or Underpressures During Drilling

No significant overpressures or underpressures were observed during drilling operations.

3.5.3 Oil and Gas Occurrences

No direct evidence of commercial oil occurrence or any gas occurrence was observed during the drilling of SB_BH02. A very minor of oil was observed in the pore space of core collected within the Georgian Bay Fm and within the Coboconk and Gull River Formations. Petroliferous odours were reported for core collected from the Salina Fm A2-Unit carbonate, Salina Fm A1-Unit carbonate, Salina Fm A1-Unit evaporate, Sherman falls, Kirkfield, and Coboconk formations.

3.6 Borehole Location and Orientation

3.6.1 Surveyed Location

Geofirma contracted with GM BluePlan to establish local temporary benchmarks onsite relative to nearby local benchmarks. Two site benchmarks were established using a Trimble R10 GPS unit with a Trimble S3 Total Station and Trimble TSC3 Data Collector on October 16, 2020, including:

- Local Elevation Benchmark #1 as the top rebar, north of BH02.
- Local Elevation Benchmark #2 as the top of nail in fence post along west property line as shown in data delivery.

These benchmarks were established by referencing the following coordinate systems and datums:

- Horizontal (northing and easting): referenced to Universal Transverse Mercator (UTM) North American Datum of 1983 (NAD83) with Canadian Spatial Referencing System (CSRS) version 6 (V6, epoch 2010.0) Zone 17N acquired via CanNet VRS. Horizontal position tied into the Ministry of Transportation of Ontario monument #00820040101.
- Vertical (elevation): referenced to the Canadian Geodetic Vertical Datum of 2013 (CGVD2013) acquired via CanNet VRS and CGG2013e geoid model. Elevations tied into the Ministry of Transportation of Ontario monument #MTO 65-303 and #MTO 65-300.

A survey of the borehole horizontal and vertical position on May 29, 2021 by Geofirma personnel using a Trimble Catalyst survey Unit. This location survey was completed after the cable tool drilling rig was demobilized from the borehole and the coring rig was setup on top of the substructure. Geofirma also completed elevation checks of borehole depth measurement reference points (i.e. the drilling rig foot clamp in lowest position) throughout the drilling and testing program.

Following drilling and testing activities a final survey was conducted on October 12, 2022 by GM BluePlan. The elevation surveys completed represent the borehole condition at the time of the survey. Due to drilling, testing, and mobilization/demobilization activities the ground surface elevation is likely to change, however for the purpose of reporting all reference to depth as metres below ground surface

is relative to the pre-drilling survey elevation measured on May 29, 2021. Table 6 summarizes the location and elevation surveys for SB_BH02.

Table 6: Summary of Survey Elevations at SB_BH02 Location

Parameter	October 16, 2020 (m) Original Survey	May 29, 2021 (m) Pre-Drilling Survey	October 12, 2022 (m) As-Built Survey
Local Benchmark #1	292.545	n/a	n/a
Local Benchmark #2	293.455	n/a	293.445
SB_BH02 Northing	n/a	4872548.566	4872547.661
SB_BH02 Easting	n/a	471318.358	471318.219
GS Elevation at SB_BH02	n/a	294.255	294.144
Coring Rig Foot Clamp (KB) Elevation (2.67mAGS)	n/a	296.925	n/a
Coring Rig Foot Clamp (KB) Elevation (after troubleshooting: 2.63mAGS)	n/a	296.885	n/a
Top of Cap	n/a	n/a	295.744
Top of 6” Stick-up	n/a	n/a	295.553

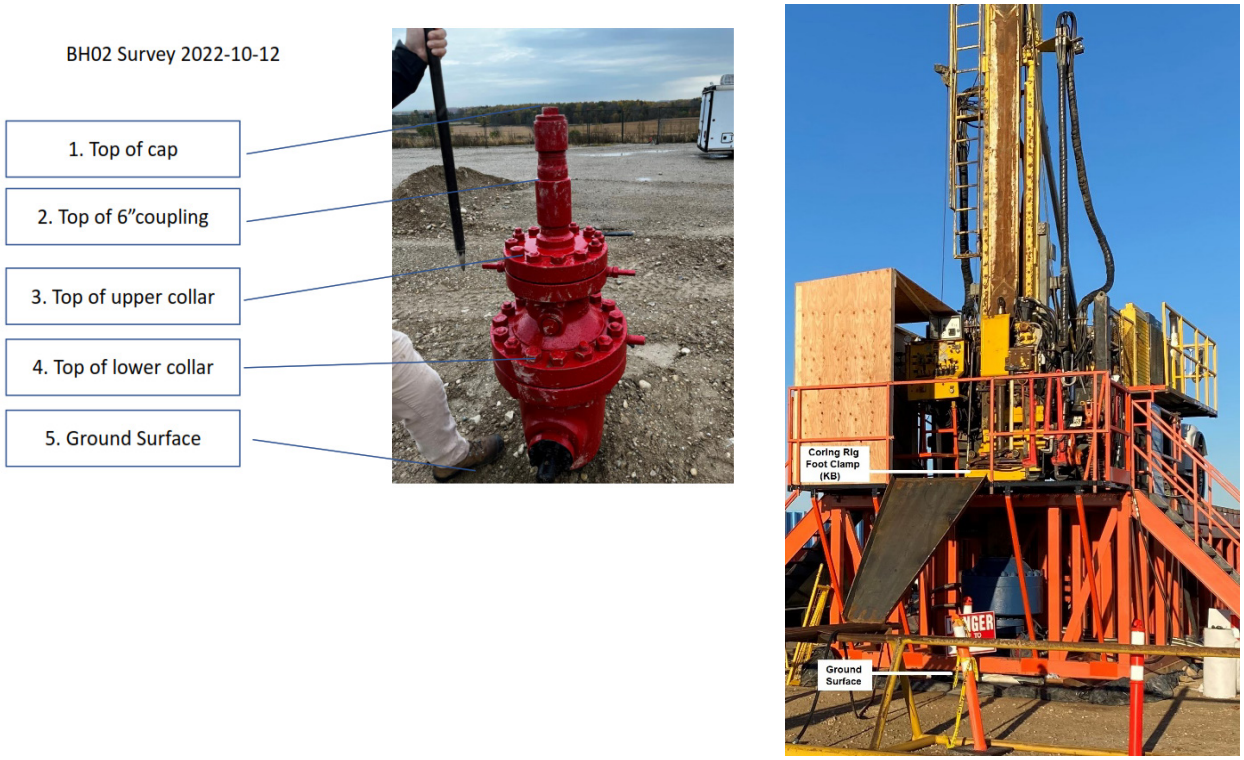


Figure 14: Survey Data Points

3.6.2 Borehole Orientation

The borehole was planned to be drilled vertically at an inclination of -90° without any azimuth. While the target is to keep the borehole as straight and vertical as practical, variations of inclination and azimuth while drilling vertical boreholes is common. No corrections were made for deviation during drilling operations, however reasonable care was taken in selection of drilling rates using weight on bit and selection of downhole stabilizers to keep the inclination close to vertical.

Borehole orientation was measured using a north-seeking gyroscopic tool (Axis Champ Gyro) to measure the azimuth and plunge of the borehole as it advanced. A calibration check was completed at ground surface prior to lowering the tool into the rods on a wireline inside of the drill rods to the targeted depth. The Axis Champ Gyro provides azimuth readings to within +/- 0.75° and dip to within +/- 0.15°.

Single-shot borehole orientation measurements were collected every 50 m as drilling progressed. A final borehole orientation survey was conducted using the same Axis Champ Gyro on March 23, 2022 following the completion of drilling BH02. The final borehole survey was completed taking measurements at every 10 m; and was comparable to the single shot measurements every 50 m. The final borehole orientation survey resulted in an average inclination over the entire borehole length of -87.30° degrees and an average azimuth of 54°. The total deviation from the original collar location was calculated as approximately 42 m at the bottom of the borehole. A copy of the final borehole orientation survey data collected with gyroscopic tool is presented in Appendix C. The maximum reported borehole inclination over the entire borehole during any one measurement was 3.19 degrees at ~177 mBGS and the maximum reported inclination below the deepest casing installation (~205 mBGS) was 3.06 degrees at ~757 mBGS. The inclination near the bottom of the borehole was 2.79 degrees from vertical.

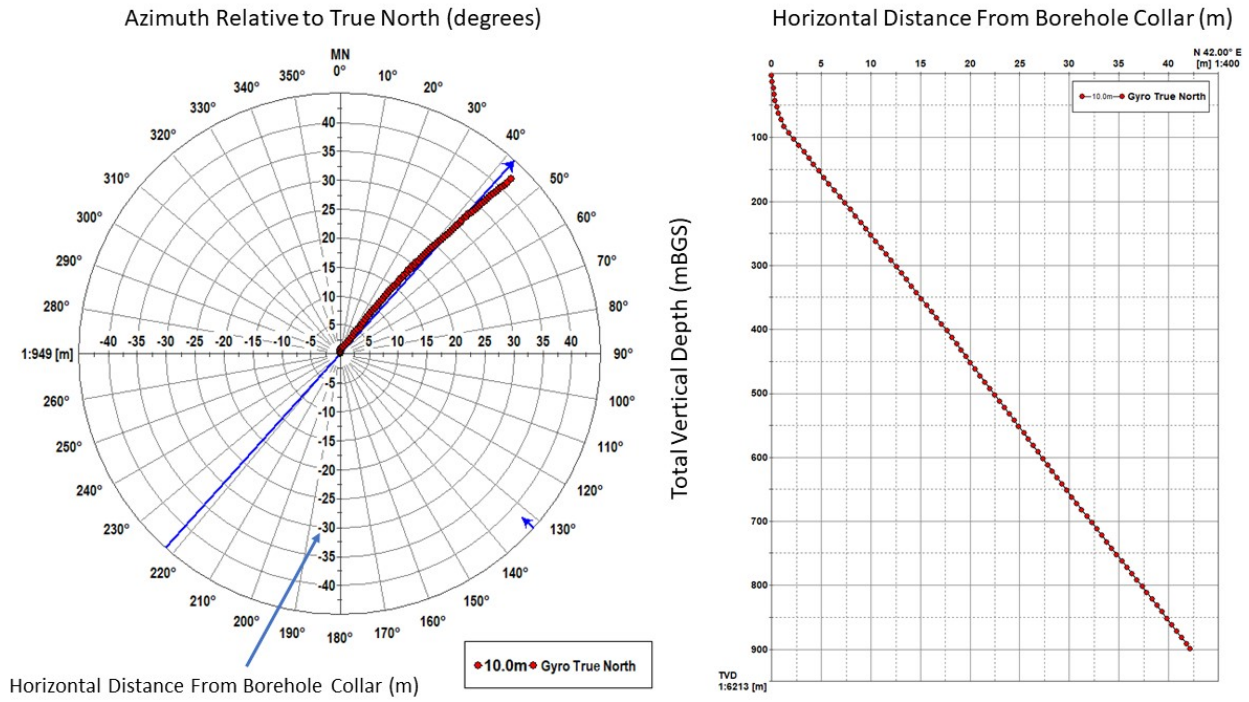


Figure 15: Borehole Deviation

3.7 Borehole Flushing

Geofirma completed borehole flushing in SB_BH02 prior to completing geophysical logging in an effort to clean the borehole fluid and maximize the quality of subsequent geophysical surveys, particularly the televiewers surveys. Borehole flushing in SB_BH02 was completed on two occasions including prior to installation and cementing of the Production Casing (~205 mBGS), and at the completion of drilling.

Prior to Production Casing installation flushing was carried out on November 26, 2021, with the borehole at a depth of 204.69 mBGS with an approximate borehole water column volume of 2,400 L. Approximately 3,800 litres of clean brine-based drilling fluid (~1.6 borehole volumes) was flushed through the borehole.

At the completion of drilling, flushing was completed on March 23, 2022 with the borehole at a depth of 900.57 mBGS and an approximate borehole water column volume of 10,630 L. Approximately 30,000 L of clean brine-based drilling fluid was flushed through the borehole. During this flushing event, field parameters were collected from the drilling fluid returning from downhole.

After flushing during both occasions, the borehole was allowed to settle for a minimum of 12 hours prior to borehole geophysical logging.

4 DRILLING FLUID MANAGEMENT

Drilling fluids played a critical role during the drilling program; providing lubrication for the drilling rods, cooling the drill bit, stabilizing the borehole wall, and removing cuttings from the borehole. Drilling was completed using a combination of fresh water and brine-based drilling fluids, depending on the expected in-situ bedrock formation chemistry, to cool the bit and clean the cuttings from the borehole. Sodium fluorescein (NaFl), a fluorescent green dye, was added to the drilling fluid as a tracer to provide a quick field assessment of the percentage of drilling fluid within a groundwater sample during WP07 OGW sampling.

The Geofirma drilling fluid management program was designed, and adjusted throughout the drilling program, with the following objectives:

- Optimize core recovery and borehole stability through the use of drilling fluids;
- Flush drill cuttings from the borehole;
- Maintain pressure control of the borehole to prevent potential blowouts in accordance with the requirements of the MNRF's Oil, Gas and Salt Resources Act (OGSRA);
- Trace drilling fluids using a combination of stable water isotopes, tritium, sodium fluorescein and measured field parameters; and
- Monitor the flow in/out of the borehole to identify opportunities to collect opportunistic groundwater samples (WP07).

4.1 Freshwater Management and Characterization

All fresh water used for drilling fluids was obtained from the Kincardine municipal water plant near Lake Huron. Fresh water was transported to site by large volume tanker trucks which pumped into one large water tanks, with a capacity of approximately 80,000 L. The water in the large holding tank remained untraced fresh water so that it can be transferred to smaller tanks for mixing various salt and tracer concentrations.

Freshwater source samples were collected directly from the designated water storage tank using a foot valve and HDPE tubing. A total of 13 fresh water source samples were over the duration of the drilling operations at SB-BH02, labelled SB_BH02_WS001 through SB_BH02_WS013.

All samples were collected in laboratory-supplied bottles, in accordance with laboratory requirements, and stored in fridges. The samples were delivered to laboratories in rigid sided coolers on ice, either by hand or courier, following chain of custody procedures.

4.1.1 Freshwater Source – Field Parameters

For each sample set collected, field parameters (pH, temperature, EC, ORP, turbidity, DO, TDS) were measured using a Horiba U52 multiparameter probe, fluorescein was measured with a Turner Designs AquaFluor Fluorometer, Ferrous Iron and Sulfide were measured using a DR900 colorimeter, and Alkalinity was measured using a digital titrator. Each instrument was calibrated as required; all calibration records were recorded in the DQC workbook.

In-field geochemistry analyses methodologies are described in the WP07 Data Report – Opportunistic Groundwater Sampling for SB_BH02 (Geofirma, 2021b).

4.1.2 Freshwater Source - Laboratory Analysis

Laboratory analysis of the water source samples used for drilling fluid was completed by Bureau Veritas Laboratories and the University of Ottawa. A complete list of analytes analyzed by laboratories for water samples during this program are listed in Table 7 below.

Bureau Veritas (formerly Maxxam Analytics Inc) completed laboratory analyses of the non-isotopic parameters listed, which included listed major elements and metals, trace elements, anions and nutrients. All isotope analyses were completed by the University of Ottawa. Lab reports associated with the freshwater analysis are included in the associated data delivery.

Table 7: Detailed List of Sample Analyses by Lab

Analytes	Volume	Analytical Lab or Storage	Analysis Suite
Major Elements and Metals (Na, K, Ca, Mg, Sr, Li, Si, Al, B)	120 mL	Bureau Veritas Labs	Y
Dissolved Sulphur, Dissolved Iron			Y
Ruthenium (Ru)	120 mL		Y
Reactive Silica (SiO_2)	250 mL		Y
Sulphide (S^{2-})	120 mL		Y
Anions (Br, Cl, SO_4, PO_4, I, NO_2, NO_3)	500 mL		Y
Fluoride (F)			Y
HCO_3			Y
Total Nitrogen	120 mL		Y
Total Phosphorus			Y
Total Organic Carbon (TOC)			Y
Dissolved Organic Carbon (DOC)	120 mL		Y
Total Ammonia (NH_4+NH_3)	40 mL		Y
Gross Alpha and Gross Beta	1000 mL		Y
^{238}U, ^{234}U, ^{235}U	1000 mL		Y
^{222}Rn	250 mL		Y
$\delta^{18}O$, $\delta^{2}H$	100 mL	University of Ottawa	Y
^{3}H	500 mL		Y
$^{87}Sr/^{86}Sr$	500 mL		Y
$\delta^{13}C$-DIC	40 mL x 3		Y
^{14}C-DIC	500 mL		Y
^{129}I, ^{36}Cl	1000 mL		Y
$\delta^{37}Cl$	500 mL		Y

Analytes	Volume	Analytical Lab or Storage	Analysis Suite
Drill Fluid Archive	2 x 500 mL & 1 x 120 mL	NWMO South Bruce Storage Facility	Y

4.1.3 Water Source Quality

Water quality results from the laboratory analysis and field parameter measurements were consistent throughout the drilling program with no unexpected or abnormal results associated with the water source samples. Appendix D includes a summary of these analyses. Full reporting of all freshwater source data (including in-field parameters, in-field analyses and laboratory results) are included in the Opportunistic Groundwater Sampling WP07 report for SB_BH02 (Geofirma, 2021b).

4.2 Preparation of Drilling Fluids and Use of Additives

In general, freshwater drilling fluids were used to drill the bedrock above the Salina Formation F-Unit shale (~200 mBGS) and brine-based drilling fluids were used to drill the bedrock formations below this depth.

4.2.1 Freshwater Based Drilling Fluid (0 to ~200 mBGS)

No drilling fluid additives were used when drilling with fresh water. The freshwater source from the large holding tanks were simply transferred to the half-round drilling fluid circulation and mixing tanks and pumped downhole.

4.2.2 Brine Drilling Fluid

Following the installation of the production casing in the Salina F-Unit Shale, brine-based drilling was used to ensure the drilling had a lower impact on the in-situ groundwater and porewater chemistry. Brine-based drilling fluids were prepared onsite by adding sodium chloride (NaCl) and calcium chloride ($CaCl_2$) salts to fresh water sourced from Lake Huron. The sodium chloride used was SIFTO Industrial Purity Salt and the calcium chloride was DOWFLAKE XTRA. The target density of this brine-based drilling fluid (~1100 kg/m3) will provide protection against possible artesian flows and minor gas flow zones during drilling, although these conditions are not expected.

This deep bedrock drilling fluid was mixed to have a Na:Ca:Cl ratio of target concentrations at about 35:16:84 g/L, respectively, for a total dissolved solids content of about 135 g/L. The target density of this brine-based drilling fluid was 1100 kg/m^3 which provided protection against possible artesian flows and minor gas flow zones during drilling. The density was measured using a pre-calibrated hydrometer and values measured were recorded in the WP02 Data Quality Confirmation Form.

4.2.3 Tracer – Fluorescein

Sodium fluorescein was added to all drilling fluids following the installation of the Intermediate Casing at a depth of 78.82 mBGS. This tracer provides a quick field assessment to determine the percentage of drilling fluid in a water sample. Sodium fluorescein is a fluorescent tracer that was added to the drilling

fluid using pre-mixed high concentration stock solutions. Geofirma prepared sodium fluorescein stock solutions in a controlled environment at three concentrations; 1g/L, 2g/L, and 10g/L. These concentrated stock solutions were refrigerated and out of direct sunlight until mixed into the drilling fluid.

While mixing the fluorescein into the drilling fluid, concentrations were regularly checked by Geofirma personnel using a handheld fluorometer (Turner Designs AquaFluor). A fluorescein concentration of 100 μg/L (100 ppb) ± 10 % was used during coring operations, borehole flushing, and downhole testing.

4.3 Drilling Fluid Returns and Volume Monitoring

During drilling, drilling fluid was pumped downhole to cool the bit and flush drill cuttings from the borehole. Generally during drilling this fluid returns up the borehole to the surface and is recirculated into the drilling fluid half round tank. A sample of these drilling fluid returns was collected at surface prior to discharging into the half round tank to be cleaned and recirculated. This sample was analyzed for a variety of field parameters as described in Section 4.4.

The total volume of drilling fluid in the drilling circulation and mixing tanks was determined at any given time by manually measuring the depth of fluids in each tank using fixed graduated measurement rods. To ensure accurate volume calculations the manual water level readings were completed at consistent points throughout each core run (ie. Initial water levels read at the very beginning of starting a core run). The total system volume was then calculated by adding the tank volume to the water volume within the drill rods. The change in drilling fluid volume during each core run was calculated and expressed as fluid loss or fluid gain. This was the primary method of calculating drilling fluid loss within a core run interval, all volume values are captured in the DQC forms.

Drilling fluid loss into formations while fluid circulation up the borehole was effective (below ~205 mBGS) averaged approximately 90 L per 3 m core run, while average drilling fluid loss for the portion of the borehole without effective fluid circulation averaged to approximately 1 230 L.

Fluid loss was one of the parameters used to identify a zone for opportunistic groundwater sampling (WP07) as discussed in Section 5.

4.4 Monitoring Drilling Fluid Field Parameters

4.4.1 Density

Density measurements were taken from the drilling fluid returns and periodically from the drilling fluid tank. Initial density values were expected, and shown to be, approximately 1.000 g/cc, this is due to the fresh drilling fluid and no formational salt impact. Following the installation of the production casing, at approximately 204.95 mBGS, traced brine water was used as the primary drilling fluid. Therefore, density measurements of the tank were taken more regularly and prior to drilling to ensure a density of approximately 1.100 g/cc.

From the bottom of the production casing (204.95 mBGS) to the bottom of the hole (900.57 mBGS) the density associated with the drilling fluid returns fluctuates between 1.085 and 1.146. This fluctuation and higher values are not unexpected as while drilling, sediment and core dust is flushed out with the drilling fluid returns, therefore altering the density. The minimum, 1.085, was a density associated with a

refreshed half-round tank of drilling fluid, and therefore had yet to mix; the density measurement following this value was 1.090 and continued to increase throughout coring.

A summary of the density values can be seen, along with pH, temperature, dissolved oxygen, turbidity, electrical conductivity, and ORP, in Appendix B.

4.4.2 Fluorescein

Fluorescein values for the half round tank and drilling fluid were measured near or at the end of each core run. Fluorescein fluctuated due to the light and heat sensitivity, fluid returns, sediment effects, and mixing constraints of the tank.

The tank fluorescein had an average concentration of 91.57 ppb and a standard deviation of 11.72 ppb; with a maximum concentration of 139.8 ppb and a minimum concentration of 55.97 ppb. When the concentration in the tank was extraordinarily high more water was added to the half round tank to ensure a fluorescein level between 90 and 110 ppb. If the tank had low concentrations of fluorescein, additional fluorescein tracer would be added and mixed into the half round tank immediately. Generally, when the fluorescein levels were outside the established concentration range the levels measured during the following core run would be within the acceptable range.

The fluorescein associated with the fluid returns averaged around 78.66 ppb with a standard deviation of 17.4 ppb; this included a maximum concentration of 113.8 ppb and a minimum of 28.89 ppb. Larger variation of fluorescein levels was expected from the fluid returns due to impacts from the drilling and formation properties.

The fluctuations associated with the fluorescein concentrations are illustrated in Appendix B.

4.4.3 Turbidity

Turbidity values were measured for the drilling fluid returns near or at the end of each core run. Turbidity fluctuated a lot in association with the sediment returns and frequency of drilling fluid turnover. The turbidity would decrease when the half round tank was refilled with fresh liquids, and as the water was recirculated through the system the turbidity would increase.

The turbidity associated with the fluid returns averaged around 117 740 NTU with a standard deviation of 67 670 NTU; this included a maximum value of 393 200 NTU and a minimum of 317 NTU. The high turbidity levels (>1 000 NTU) required dilution and therefore have a slightly higher margin of error than if no dilution was required.

4.4.4 Electrical Conductivity

Electrical Conductivity (EC) values were measured for the drilling fluid returns near or at the end of each core run. EC fluctuated due to the different formations, sediment returns, circulated drilling fluid parameters, and frequency of drilling fluid turnover. EC increased as the water was recirculated through the system due to the higher sediment, density, and turbidity levels.

Following the installation of the production casing, the fluid return EC averaged around 319 mS/cm with a standard deviation of 190 mS/cm; this included a maximum value of 1 672 mS/cm and a minimum of

90 mS/cm. The high EC levels (>100 mS/cm) required dilution and therefore have a slightly higher margin of error than if no dilution was required.

4.4.5 Dissolved Oxygen

Dissolved Oxygen (DO) values were measured, with EC, temperature, and turbidity, for the drilling fluid returns near or at the end of each core run. The DO in the drilling fluid returns averaged around 2.4 mg/L with a standard deviation of 3.4 mg/L; this included a maximum value of 13.8 mg/L and a minimum of 0.0 mg/L. The DO values of groundwater are typically expected to be 0 mg/L, however as the original drilling fluid has high DO levels and is aerated throughout the drilling and circulation process, it is expected that the DO levels will exceed 0 mg/L.

4.4.6 Temperature

Temperature values were measured along with EC, DO, and turbidity for the drilling fluid returns near or at the end of each core run. Temperatures did not widely vary; this is likely due to the large water volumes used, consistent atmospheric temperature, and low temperature fluctuations associated with formation water. The temperatures averaged around 10.3°C with a standard deviation of 2.6°C; this included a maximum value of 15°C and a minimum of 3.1°C.

4.5 Drilling Fluid Sampling and Field Measurements

4.5.1 Drilling Fluids – Sampling

Archive samples representative of the returned drilling fluid were collected throughout the drilling program. The drilling fluid archive samples were taken every 50 m throughout the borehole. Typically, the archive samples were collected from the drilling fluid circulation return stream, prior to remixing in the surface tanks. When there were no drilling fluid circulation returns, archive samples were collected from the drilling fluid source tank (main half-round tank). In addition, when there were no fluid returns, if possible, the archive sample was taken from the fluid swabbed from the rods while the inner core barrel was tripped out of the borehole.

Table 8 summarizes the drilling fluid archive samples collected from SB_BH02. A total of 19 archive drilling fluid samples directly associated with WP02 were collected during drilling at SB_BH02. The WP02 archive drilling fluid samples summarized in Table 8 are not in direct sequential order as drilling fluid samples were also collected in association with WP03 and WP07. The samples associated with WP03 and WP07 are therefore reported within their respective data deliveries and reports.

Table 8: Drilling Fluid Archive Samples

Sample ID	Approximate Depth Range		Date Sampled	Comments
SB_BH02_DW001	48.53	51.53	25-Oct-21	Sample taken from drilling fluid returns during CR
SB_BH02_DW004	99.54	102.54	18-Nov-21	Sample taken from drilling fluid returns during CR
SB_BH02_DW006	153.54	153.54	20-Nov-21	Sample taken from half round tank
SB_BH02_DW007	165.02	174.54	23-Nov-21	Sample taken from half round tank
SB_BH02_DW009	198.54	198.54	26-Nov-21	Sample taken from half round tank

Sample ID	Approximate Depth Range		Date Sampled	Comments
SB_BH02_DW010	246.54	249.54	01-Jan-22	Sampled water returning during core recovery
SB_BH02_DW011	297.54	300.54	02-Jan-22	Sampled water returning during core recovery
SB_BH02_DW012	345.54	348.54	03-Jan-22	Sampled water returning during core recovery
SB_BH02_DW013	396.54	399.54	05-Jan-22	Sampled water returning during core recovery
SB_BH02_DW014	449.11	450.54	06-Jan-22	Sampled water returning during core recovery
SB_BH02_DW015	498.57	501.57	01-Mar-22	Sampled water returning during core recovery
SB_BH02_DW016	546.57	549.57	05-Mar-22	Sampled water returning during core recovery
SB_BH02_DW019	597.57	600.57	09-Mar-22	Sampled water returning during core recovery
SB_BH02_DW020	648.57	651.57	11-Mar-22	Sampled water returning during core recovery
SB_BH02_DW023	699.57	702.57	13-Mar-22	Sampled water returning during core recovery
SB_BH02_DW024	747.57	750.57	16-Mar-22	Sampled water returning during core recovery
SB_BH02_DW025	798.57	801.57	18-Mar-22	Sampled water returning during core recovery
SB_BH02_DW026	849.57	850.57	20-Mar-22	Sampled water returning during core recovery
SB_BH02_DW029	897.57	898.18	22-Mar-22	Bottom of Borehole

4.5.2 Drilling Fluids – Field Measurements

For each sample collected, field parameters (pH, temperature, EC, ORP, turbidity, DO) were measured using a Horiba U52 multiparameter probe, fluorescein was measured with a Turner Designs AquaFluor Fluorometer, Ferrous Iron and Sulfide were measured using a DR900 colorimeter, and Alkalinity was measured using a digital titrator. The instruments were calibrated as required and all calibration records were recorded in the DQC workbook.

Field parameters and in-field lab values assessed for each of the archive samples were inputted directly into acquire, along with the depth associated with the sample.

Each archived drill water sample was analyzed for a variety of parameters, included temperature, pH, EC, ORP, DO, turbidity, sulfide, ferrous iron, and alkalinity. Appendix E contains graphical plots with vertical profiles of these parameters.

4.5.3 Drilling Fluids - Quality

Most parameters were in the expected range with a few anomalous values. The anomalous values are associated with samples that also demonstrated high turbidity. Any visually abnormal values were noted and reviewed along with any previous records (ie. DQC and notes) to ensure values were accurate to what was measured in the field.

5 OPPORTUNISTIC GROUNDWATER EVENTS

Four groundwater samples were collected during drilling operations at SB_BH02 from permeable zones with sufficient hydraulic conductivity to enable sample collection using a single downhole packer to isolate the target interval. Two additional groundwater samples were collected at SB_BH02 following drilling and testing activities (after WP06 hydraulic testing) using a straddle packer system to revisit zones of interest that were not sampled during drilling operations. These water samples are referred to as opportunistic groundwater samples and are collected to obtain accurate geochemical results from permeable zones. Details of opportunistic groundwater (OGW) sampling and the results of analyses are presented in a separate Data Report associated with WP07 - Opportunistic Groundwater Sampling (Geofirma Engineering, 2021b).

Assessment of WP02 data contributed to the justification for each OGW event, specifically including assessing the changes associated with drilling parameters, drilling fluid properties, and drill fluid volume changes/losses. Table 9 summarizes the six OGW sampling events completed at SB_BH02, including dates completed and justification during drilling associated with the events, as well as the sampling intervals tested following drilling activities. The formation identified in Table 9 refers to the formation picks assessed in WP03.

Table 9: Summary of OGW Sampling Intervals in SB_BH02

Event	Formation	Depth (mBGS)	Start Date	End Date	Justification associated with WP02
OGW1	Amherstburg Fm	78.82 to 84.54	13-Nov-21	15-Nov-21	*Drilling fluid losses*: ~380 L for CR from 79.54 to 81.54 m ~370 L for CR from 81.54 to 84.54 m
OGW2	Bois Blanc Fm	90.02 to 99.54	16-Nov-21	18-Nov-21	*Drilling fluid losses*: ~510 L for CR from 90.54 to 93.54 m ~1010 L for CR from 93.54 to 96.54 m
OGW3	Bois Blanc Fm	146.50 to 153.54	19-Nov-21	22-Nov-21	• Decrease in pump pressure near end of CR034. *Drilling fluid losses*: ~660 L for CR from 144.54 to 147.54 m ~980 L for CR from 147.54 to 150.54 m ~1 640 L for CR from 150.54 to 153.54 m
OGW4	Bass Island Fm	180.02 to 186.54	24-Nov-21	25-Nov-21	• Driller required higher flow rate during CR047. *Drilling fluid losses*: ~1 730 L for CR from 180.54 to 183.54 m ~3 300 L for CR from 183.54 to 186.54 m
OGW5	Salina Fm A2-Unit anhydrite and Salina Fm A1-Unit carbonate	331.71 to 339.97	11-Sep-22	18-Sep-22	Zone of interest based on previous boreholes. Interval selected in discussion with NWMO
OGW6	Guelph Fm	386.00 to 394.26	03-Sep-22	10-Sep-22	Zone of interest based on previous boreholes. Interval selected in discussion with NWMO

6 REFERENCES

Geofirma Engineering Ltd., 2020a. Initial Borehole Characterization Plan for SB_BH02, Phase 2 Initial Borehole Drilling and Testing, South Bruce Area, Revision 0, in progress.

Geofirma Engineering Ltd., 2020b. Health, Safety and Environment Plan – Phase 2 Initial Borehole Drilling and Testing, South Bruce Area, Revision 0, July 28.

Geofirma Engineering Ltd., 2020c. Project Quality Plan – Phase 2 Initial Borehole Drilling and Testing South Bruce Area, Revision 0, June 25.

Geofirma Engineering Ltd., 2021a. WP02 Test Plan: Borehole Drilling and Coring for SB_BH02, Phase 2 Initial Borehole Drilling and Testing, South Bruce Area, Revision 0, April 14, 2021.

Geofirma Engineering Ltd., 2021b. WP07 Data Report: Opportunistic Groundwater (OGW) Sampling at SB_BH02, Phase 2 Initial Borehole Drilling and Testing, South Bruce Area, Revision 0. September 22, 2021

Appendix A

Data Quality Confirmation Workbook

Sample DQC Forms

DRILLING RECORD FORM

Project Number: 20-211

Core Run Number: CR
Reference Point ID: SB_BH02_
DHA ID: SB_BH02_

	Depth (mBGS)	Date / Time (dd-mmm-yy / hh:mm)
Start		
End		
Run Length	3.00 m	

Drill Run Information

Length of DHA: _____ m

Number of Rods x Length of Rod = Total Length of Drill Rods

_____ x 3 m = _____ m

Driller's stickup of rods above RP = _____ m
Stickup of Reference Point (RP) = _____ m

RP Description: Top of Foot Clamp

RP Stickup + Rod Stickup = Stickup of Drill Rods

_____ + _____ = _____ m

Length DHA + Total Length of Drill Rods - Stickup = **Drilled Depth**

_____ + _____ - _____ = _____ mBGS

Drill Parameters

Record the most representative value of the parameters in Table 1 *during drilling of the core run.*

Table 1: Recorded Drill Parameters

Drill Parameter	Recording	Units	Notes
Rate of Penetration (ROP)		minutes/m	
Torque		PSI	
Weight on Bit		lbs	
Holdback Pressure		PSI	
Fluid Injection Pressure		PSI	
Flow Rate		Liters / minute	

DRILLING RECORD FORM

Project Number: 20-211

Drill Fluid Monitoring

Core Run Number: CR

Record the measured value of every parameter and volume listed in Table 2 *and* Table 3 *after drilling of the core run.*

Table 2: Drill Fluid Monitoring Parameters

Parameter	Instrument	Measurement	Units	Trigger	Notes
Fluorescein Concentration	Aquafluor Fluorometer		ppb	20% change from previous drill fluid source	
Density	Hydrometer		API Gravity	N/A	
Temperature	Horiba U52-2 Multi-parameter Water Quality Meter		˚C	N/A	
pH			-	0.5 change from previous drill fluid source	
Electrical Conductivity			mS/cm	10% change from previous drill fluid source	
ORP			mV	N/A	
Dissolved Oxygen			mg/L	10% change from previous drill fluid source	
Turbidity			NTU	10% change from previous drill fluid source	
TDS			g/L	N/A	

Table 3: Drill Fluid Volume Monitoring

	Half Tank WL (m)	Drill System volume (L)
Start of Run		
End of Run		
Change in Drill Fluid Volume =		

(-)ve change indicates loss of fluid volume to borehole; +ve change indicates gain of fluid volume from borehole unless otherwise specified as adjustments

Adjustments to Drill Fluid

All additions and/or adjustments made to the drill fluid must be documented on this form after the applicable run. Specify changes made: (include type of additive, product name, volume etc.)

Adjustments Made: ☐ Yes ☐ No

If Yes: ☐ Before CR ☐ After CR

Water Dilution: ☐ Yes ☐ No

Tank Fluorescein: _____ ppb

Notes:

Name: _____ Date: _____ Time: _____

Reviewer Sign Off

Reviewed by:

_____ _____

Signature Date

DAILY QUALITY CONFIRMATION (QC) REPORT

Project Number: 20-211

DATE: _____ Day/Night

Daily Quality Checks Completed by (WP02 Drilling Monitors): _____ (initial)

Tracking Drilled Depth:

Quality Acceptability Checks (OK? Y/N)

Depth From	Depth To	Selection of Rods measured and confirmed 3 m length	Number of Rods confirmed by driller and monitor	Comments
mbgs	mbgs			

Drill Parameters:

Quality Acceptability Checks (OK? Y/N)

Core Run #	Most representative values recorded during drilling	Verified by (Initial)	Comments

Drill Fluid Parameters:

Quality Acceptability Checks (OK? Y/N)

Core Run #	Fluorescein within 20% of prev drill fluid source?	EC, DO, Turb within 10% of prev drill fluid source?	pH within 0.5 of prev drill fluid source?	Comments

DAILY QUALITY CONFIRMATION (QC) REPORT

Drill Fluid Volume Monitoring;

Quality Acceptability Checks (OK? Y/N)

Core Run #	Volume Calculations Checked	>100 L Volume Change?	Comments

Borehole Deviation:

Quality Acceptability Checks (OK? Y/N)

Measurement Depth	Calibration Check Completed and Passed	Comments

Fluid Sampling:

Quality Acceptability Checks (OK? Y/N)

Sample Type	# of Samples Collected	Deviation from Sample plan	Sampled according to procedures	Labelled according to procedures	Stored according to procedures	Comments
Drill Water (DW)						
Water Source (WS)						
Ground Water (GW)						
Purge Water (PR)						
Cuttings (TCLP)						

Reviewer Sign Off

Reviewed by:

Signature Date

INSTRUMENT CALIBRATION CHECK FORM

Project Number: 20-211

Borehole	SB_BH02

Completed by: _____ Date and time: _____

Calibration Check Details

Instrument / Serial Number	Parameter	Units	Calibration Standard		Pre-Calibration Value	Type of Calibration	Post-Calibration / Check Value	Further Calibration Required?
			Exp. Date	Target Measurement				
AquaFluor	Fluorescein Concentration	ppb		0		4 Point		No
				10 ± 5%				
				100 ± 5%				
				400 ± 5%				
Horiba U52-2	pH	-		4.0 ± 0.02	--	Auto Calibration		No
	Conductivity	mS/cm		4.49 ± 1%	--			
	Turbidity	NTU		0.00 ± 1%	--			
DR900	Multiparameter Colorimeter	520 nm		Blank: 0.00 Std 1: 0.558 ± 0.05 Std 2: 1.141 ± 0.10 Std 3: 1.741 ± 0.15	--	Calibration Check	Blank: -- Std 1: -- Std 2: -- Std 3: --	No
		610 nm		Blank: 0.00 Std 1: 0.566 ± 0.05 Std 2: 1.133 ± 0.10 Std 3: 1.730 ± 0.15	--		Blank: -- Std 1: -- Std 2: -- Std 3: --	
Analytical Scale	Mass	kg	N/A	1 kg ± 0.1kg	--	Calibration Check	--	No
			N/A	3 kg ± 0.3kg	--			
			N/A	6kg ± 0.6kg	--			

Horiba requires manual calibration (Y/N)? N If yes and not performed under WP07, see WP02 Horiba Calibration Form.

Notes (include any additional instrument calibration checks):

Reviewer Sign Off

Reviewed by:

Signature _____ Date _____

HORIBA CALIBRATION FORM

Project Number: 20-211

Borehole	SB_BH02

Calibration by: _____

Calibration date and time: _____

Temperature Electrode Calibration							
Temp Meter Model	**Horiba U52-2 Water Quality Meter**						
Temp Probe Model							
Solution Type	**Temperature (˚C)**	**Standard Value**	**Measured Value (˚C)**	**Calibration Completed?**	**Post Cal Value (˚C)**	**Initial**	**Time**
DI at room temp	--	--	--	--	--	--	--
pH Electrode Calibration (2-point)							
pH Meter Model	**Horiba U52-2 Water Quality Meter**						
pH Probe Model	**pH sensor model 7112**						
Solution Type	**Temperature (˚C)**	**Standard Value**	**Measured Value**	**Calibration Completed?**	**Post Cal Value**	**Initial**	**Time**
pH 7.00 Buffer	--	--	--	--	--	--	--
pH 4.01 Buffer	--	--	--	--	--	--	--
ORP Electrode Calibration							
Eh Meter Model	**Horiba U52-2 Water Quality Meter**						
Eh Probe Model	**ORP sensor model 7313**						
Solution Type	**Temperature (˚C)**	**Standard Value (mV)**	**Measured Value (mV)**	**Calibration Completed?**	**Post Cal Value (mV)**	**Initial**	**Time**
240 mV Test Solution	--	--	--	--	--	--	--
Conductivity Electrode Calibration							
Cond. Meter Model	**Horiba U52-2 Water Quality Meter**						
Cond. Probe Model	**Four-AC-Electrode**						
Solution Type	**Temperature (˚C)**	**Standard Value (mS/cm)**	**Measured Value (mS/cm)**	**Calibration Completed?**	**Post Cal Value (mS/cm)**	**Initial**	**Time**
AutoCal							
DO Electrode Calibration (2-point)							

HORIBA CALIBRATION FORM

Project Number: 20-211

DO Meter Model	Horiba U52-2 Water Quality Meter						
DO Probe Model							
Solution Type	**Temperature (˚C)**	**Standard Value (mg/L)**	**Measured Value (mg/L)**	**Calibration Completed?**	**Post Cal Value (mg/L)**	**Initial**	**Time**
0.00 mg/L (Zero DO)	--	--	--	--	--	--	--
8.92 mg/L (Auto Cal)	--	--	--	--	--	--	--
Turbidity Electrode Calibration (2-point)							
Turb. Meter Model	**Horiba U52-2 Water Quality Meter**						
Turb. Probe Model							
Solution Type	**Temperature (˚C)**	**Standard Value (NTU)**	**Measured Value (NTU)**	**Calibration Completed?**	**Post Cal Value (NTU)**	**Initial**	**Time**
0 NTU	--	--	--	--	--	--	--
100 NTU	--	--	--	--	--	--	--

Notes:

Notes:

Geofirma DQC Form: WP02 Drilling DEVIATION TOOL CALIBRATION CHECK FORM	Borehole: SB_BH02

Calibration Check by: _____

Calibration date and time: _____

Tool Make: _____

Tool Model: _____

Serial Number: _____

Manufacturer's Calibration Date: _____

Geofirma DQC Form: WP02 Drilling	**Borehole: SB_BH02**

Planned Azimuth
Planned Dip

Criteria Observed	Confirmed by	
	Initial	*Date and time*
Rig mast aligned to planned azimuth using survey station?		
Rig mast aligned to planned dip using level?		
Photographs taken to document process?		

Notes:

Reviewer Sign-off

Reviewed by:

Signature

Date

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling
DRILLING RIG DEPTH REFERENCE MEASUREMENT POINT

Borehole: SB_BH02

Depth Reference ID
Date Measured
Initials

Height above ground surface: m
Description: From GS to top of foot clamp plate

Drilling Rig Depth Reference Measurement Point

Reviewer Sign Off

Reviewed by:

Signature

Date

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling
DOWNHOLE ASSEMBLY (DHA) CONFIGURATION

Borehole: SB_BH02

DHA ID
Date Assembled
Initials

Downhole Assembly Tool Sketch

Component	Total Length (m)	Effective Length (m)	DHA Cumulative Length (m)	Notes / Comments

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling

RATIONALE FOR DETERMINATION TO CEMENT A PERMEABLE ZONE

Borehole: SB_BH02

Permeable Zone Name				
Permeable Zone Depth Range				
Key Criteria to Cement a Permeable Zone		**Depth From (m)**	**Depth To (m)**	**Notes**
Core Logging Observations (fractures, staining, etc.)				
Drilling fluid volume measurements (fluid loss or gain), changes in drilling fluid parameters (pH, electrical conductivity, or tracer concentration)				
Drill pump pressure changes that may indicate loss of circulation or the presence of a water producing feature				
Drilling performance indicators, such as rod drops, changes in advance rates, or changes in drive head torque				
Other (explain)				

Completed By:

Name Date

Reviewer & Approver Sign-off

Reviewed by:

Signature Date

Approved by:

Signature Date

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling

CASING CEMENTING CHECKLIST

Borehole: SB_BH02

Casing Details		Confirmed by	
Casing Size		*Initial*	*Date and time*
Inspected casing ends	*ensure not damaged*		
Planned installation Depth	Based on observed drilling conditions		
Actual installation depth (mbgs)	*Number of casing rods x Length each rod - Stickup above ground surface*		
Cement Grout Details			
Mix Recipe	*(confirm water : cement)*	N/A	
Sample collection	*Minimum three samples from mixing tank (beginning, middle, end)*	N/A	
	Minimum two samples from grout return to surface	N/A	
Grout return to surface	*Confirm good grout return to surface through annulus*	N/A	
MNRF Class 1 Examiner	*confirm MNRF Class 1 Examiner onsite during cementing*	N/A	

Notes:

Reviewer Sign-off

Reviewed by:

Signature Date

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling
BOREHOLE DEVELOPMENT

Borehole: SB_BH02

Borehole:	Total Depth: mBGS	Multiparameter Probe:	Comments
Total Depth:		Fluorometer:	Start Time =
Minimum Required Purge Volume (2 BH volumes) =	L		Displacement Rate =

Notes: = calculated based on input values = requires input by user

17:25

Date	Time	Measured by (Initials)	Elapsed Time Since Start of Development (min)	Volume Removed (L)		Fluid Density (using hydrometer)	Multiparameter Probe							Fluorometer		Comments
				Since Last Measurement	Cumulative		Calibrat	pH	Temp (°C)	EC (mS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Calibrat	Fluorescein (ppb)	

Reviewer Sign Off

Reviewed by:

Signature Date

Appendix B

Drilling Parameters

Table B.1 – Drilling Parameters

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling
Borehole Summary: DRILLING DEPTH AND DRILLING PARAMETERS

Borehole: SB_BH02

Core Run Information									Drilling Rig Parameters								Drilling Fluid Volume Changes					Drilling Fluid Parameters													Additives			Tank		Comments
Date	Approx Start Time	Approx End Time	Approx Duration	Initials	Core Run #	Top Depth of Run	Bottom Depth of Run	Length of Core Run	Actual Duration of Core Run	Rate of Penetration (ROP)		Bit Rotation Speed (Head RPM)	Torque (Torque Pressure)	Injection Fluid Pressure (H2O Pressure In)	Down hole Fluid Flow Rate (H2O Flow in)	Weight On Bit	Holdback Pressure (Feed Pressure)	Tank #1 - Start of run (Volume)	Tank #1 - End of Run (Volume)	System - Start of run (Volume)	System - End of Run (Volume)	Total Volume Change During Run	Sample ID	Date	Time	Initials	Fluorescein Concentration	Density	Temperature	EC	pH	DO	ORP	Turbidity	Salt	Fluorescein	Freshwater	Fluorescein	Density	
-	-	-	min		-	mBGS	mBGS	m	min	min/m	m/hr	RPM	psi	psi	L/min	lbs	psi	L	L	L	L	L		dd-mmm-yy	hh:mm		ppb	g/cc	°C	mS/cm	-	mg/L	mV	NTU	Bags: Salt/Ca	L of Soln	m3	ppb	g/cc	
24-Oct-21	23:35	1:15	100	MEOR	CR001	48.53	51.53	3.00	37	12.33	4.86	--	1500	50	45.40	350	1350	22453	21674	23089	22310	-779	SB_BH02_DW001	25/Oct/21	0.04861	MEOR	0.075	1.006	10.44	7.69	12.90	9.39	31	30800	--	--	--	0.071	--	DW Archive sample collected. Lost return fluid at the end of the CR
25-Oct-21	1:59	2:30	31	MEOR	CR002	51.53	54.53	3.00	30	10	6.00	--	1500	50	75.71	350	1350	20498	19022	21170	19693	-1477	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.051	--	No return fluid
25-Oct-21	3:50	4:19	29	MEOR	CR003	54.53	57.53	3.00	29	9.67	6.21	--	1500	25	75.71	350	2050	18693	16198	19400	16905	-2495	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.090	--	No return fluid
25-Oct-21	8:15	9:20	65	MdK	CR004	57.53	60.53	3.00	30	10.00	6.00	--	1500	100	75.71	200	2000	13764	10320	14507	11099	-3408	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No return fluid, CR completed in two segments
25-Oct-21	10:03	10:40	37	MdK	CR005	60.53	63.53	3.00	35	11.67	5.14	--	1500	150	75.71	150	2000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.077	--	No return fluid
25-Oct-21	14:07	14:28	21	MdK	CR006	63.53	65.53	2.00	20	10.00	6.00	--	1500	150	75.71	200	2000	15621	14561	16435	15410	-1025	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No return fluid
25-Oct-21	16:05	16:18	13	MdK	CR007	65.53	66.53	1.00	10	10.00	6.00	--	1500	150	75.71	200	2000	13183	11471	14033	12321	-1712	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No return fluid
25-Oct-21	16:26	16:58	32	MdK	CR008	66.53	69.53	3.00	35	11.67	5.14	--	1500	150	75.71	200	2000	11131	9351	11981	10237	-1744	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No return fluid
25-Oct-21	17:26	17:52	26	MdK	CR009A	69.53	71.53	2.00	25	12.5	4.80	--	1500	150	75.71	150	2000	9351	7269	10237	8190	-2047	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No return fluid
25-Oct-21	22:29	22:42	13	MEOR	CR009B	71.53	72.53	1.00	15	15	4.00	--	1200	50	75.71	200	2100	21340	19814	22262	20735	-1527	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14.5	--	--	No return fluid. Refilled tank before CR.
25-Oct-21	22:58	23:25	27	MEOR	CR010	72.53	75.53	3.00	27	9	6.67	--	1200	50	75.71	200	2100	19814	17190	20735	18111	-2624	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No return fluid
25-Oct-21	23:40	23:56	16	MEOR	CR011	75.53	77.23	1.70	16	9.41	6.38	--	1200	50	75.71	200	2100	18149	17190	18147	16428	-1719	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No return fluid
7-Nov-21	12:45	13:35	50	AMSC	--	77.23	79.14	1.91	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Interval not cored. Air hammer final depth was 79.14 Mbgs
13-Nov-21	20:43	21:01	--	MEOR	CR012A	79.14	79.54	0.40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No parameters recorded. End of coring through the cement. 0.40m of rock for FIT and the end of the Run.
13-Nov-21	20:43	21:01	18	AMSC	CR012B	79.54	81.54	2.00	18	9	6.67	--	2300	--	45.42	1200	0	24573	24193	25601	25221	-380	--	13-Nov-21	21:00	AMSC	94.21	1.000	11.71	5.16	12.69	9.97	73	819	--	--	--	102.4	--	New batch of fresh water in half round. DO and Turb of drill fluid were descending
13-Nov-21	22:03	22:25	22	AMSC	CR013	81.54	84.54	3.00	22	7.33	8.18	--	2300	--	45.42	1700	0	24193	23791	25221	24855	-366	--	13-Nov-21	22:35	AMSC	97.55	1.000	13.74	4.72	12.56	6.68	-46	850	--	--	--	89.02	--	DO and Turb of drill luid descending,
15-Nov-21	23:25	23:45	20	AMSC	CR014	84.54	87.54	3.00	29	9.67	6.21	--	2600	--	45.42	1300	0	21785	21008	22849	22071	-778	--	15-Nov-21	23:45	AMSC	60.16	0.998	10.66	1.27	12.05	12.24	92	>1000	--	--	--	73.62	--	New batch of fresh water in half round. DO of drill fluid was decreasing when parameters were recorded. Turb >1000 with 20x dilution. **Note: Fluid loss not representative as some fluid was used for flushing of hole prior to coring.**
16-Nov-21	0:15	0:50	35	AMSC	CR015	87.54	90.54	3.00	34	11.33	5.29	--	2700	--	45.42	1200	0	21008	20720	22071	21855	-216	--	16-Nov-21	0:55	AMSC	57.61	1.005	12.65	1.88	12.02	7.77	48	>1000	--	--	--	74.25	--	Turb >1000 with 50x dilution. DO still decreasing when parameters recorded.
16-Nov-21	2:01	2:28	27	AMSC	CR016	90.54	93.54	3.00	25	8.33	7.20	--	2700	0	45.42	1100	0	20720	20211	21855	21346	-509	--	16-Nov-21	2:25	AMSC	68.62	1.003	12.97	1.98	12.19	10.51	45	28900	--	0.5	--	87.81	--	Topped up fluorescein before run. DO still decreasing when parameters recorded.
16-Nov-21	5:10	5:35	25	AMSC	CR017	93.54	96.54	3.00	22	7.33	8.18	--	2700	0	45.42	1100	0	20211	19131	21345	20338	-1007	--	16-Nov-21	5:36	AMSC	67.52	1.010	11.64	2.2	12.27	9.51	30	96600	--	--	--	--	--	DO still decreasing when parameters recorded.
16-Nov-21	9:44	10:09	25	MEOR	CR018	96.54	99.54	3.00	32	10.67	5.63	--	2000	175	75.71	300	2000	18693	18037	19899	19243	-656	--	16-Nov-21	10:21	MEOR	81.42	0.998	12.44	2.09	11.71	9.73	114	317	--	0.15	--	89.89	--	DO still decreasing when parameters recorded. DW pre purge sample collected
18-Nov-21	15:04	15:31	27	MEOR	CR019	99.54	102.54	3.00	28	9.33	6.43	--	2000	200	75.71	300	1500	23233	22363	24439	23570	-869	SB_BH02_DW004	18-Nov-21	15:55	MEOR	76.99	1.004	9.49	2.19	12.49	12.63	39	82700	--	0.3	--	90.01	--	DW Archive sample collected. Turbidity 100x dilution
18-Nov-21	16:30	17:12	42	MEOR	CR020	102.54	105.72	3.18	35	11.01	5.45	--	2000	175	75.71	400	2000	21785	21785	23285	23062	-223	--	18-Nov-21	17:05	MEOR	78.04	1.004	10.94	2.26	12.58	13.64	67	47700	--	--	--	89.98	--	Issues retrieving core to surface. The driller had to drill extra 0.18m to recover the core. CR021 2.82m. Turbidity 100x dilution
18-Nov-21	19:30	19:58	28	MdK	CR021	105.72	108.54	2.82	23	8.16	7.36	--	2700	--	45.42	1100	0	21785	21163	23098	22512	-586	--	18-Nov-21	19:58	MdK	79.07	1.006	11.53	2.8	12.57	9.64	51	50500	--	0.2	--	87.39	--	
18-Nov-21	20:12	20:34	22	MdK	CR022	108.54	111.54	3.00	21	7.00	8.57	--	2800	--	45.42	1100	0	20697	20542	22046	21927	-119	--	18-Nov-21	20:31	MdK	78.78	1.002	9.61	2.96	12.47	11.81	8	89000	--	--	--	94.99	--	
18-Nov-21	22:11	22:35	24	MdK	CR023	111.54	114.54	3.00	24	8.00	7.50	--	2700	--	45.42	1050	0	20034	19924	21419	21344	-75	--	18-Nov-21	22:28	MdK	84.47	1.002	10.29	3.17	12.66	11.01	14	63900	--	--	--	95.70	--	
19-Nov-21	2:50	3:13	23	MdK	CR024	114.54	117.54	3.00	23	7.67	7.83	--	2750	--	45.42	1050	0	19615	19505	21035	20961	-74	--	18-Nov-21	23:10	MdK	85.37	1.012	10.80	2.85	12.45	11.19	10	>100 000	--	--	--	93.75	--	
19-Nov-21	0:30	0:59	29	MdK	CR025	117.54	120.54	3.00	22	7.33	8.18	--	2700	--	45.42	1050	0	19197	19109	20653	20601	-52	--	19-Nov-21	12:56	MdK	87.25	1.011	10.21	3.04	12.59	11.08	45	78500	--	0.2	--	89.34	--	
19-Nov-21	1:17	1:37	20	MdK	CR026	120.54	123.54	3.00	21	7.00	8.57	--	2600	--	45.42	1100	0	18627	18518	20119	20045	-74	--	19-Nov-21	1:37	MdK	98.78	1.010	9.28	3.26	12.62	11.54	-30	86800	--	--	--	96.20	--	
19-Nov-21	8:40	9:16	36	MEOR	CR027	123.54	126.54	3.00	32	10.67	5.63	--	1700	200	75.71	400	2000	16305	15770	17833	17297	-536	--	19-Nov-21	9:15	MEOR	81.27	0.998	10.57	3.07	12.38	9.48	122	72600	--	--	--	92.56	--	Turbidity 100x dilution
19-Nov-21	10:48	11:19	31	MEOR	CR028	126.54	129.54	3.00	30	10.00	6.00	--	2000	300	75.71	400	1750	15770	14962	17333	16525	-808	--	19-Nov-21	11:17	MEOR	81.62	0.998	8.95	3.36	12.60	11.02	71	35100	--	--	--	92.56	--	Turbidity 100x dilution
19-Nov-21	11:37	12:07	30	MEOR	CR029	129.54	132.54	3.00	30	10.00	6.00	--	1700	150	75.71	350	2000	14078	13452	15676	15051	-625	--	19-Nov-21	12:18	MEOR	70.83	1.001	9.26	3.43	12.60	9.2	61	94700	--	--	--	89.63	--	Turbidity 100x dilution
19-Nov-21	13:04	13:35	31	MEOR	CR030	132.54	135.54	3.00	30	10.00	6.00	--	1750	150	75.71	350	2000	11411	10418	13045	12052	-993	--	19-Nov-21	13:35	MEOR	79.14	1.001	9.10	3.94	12.65	8.04	19	43400	--	--	--	82.19	--	Turbidity 100x dilution
19-Nov-21	15:22	15:48	26	MEOR	CR031	135.54	138.54	3.00	26	8.67	6.92	--	1700	150	75.71	400	2000	23590	22475	25260	24145	-1115	--	19-Nov-21	15:48	MEOR	80.28	0.997	11.56	3.11	12.55	10.01	64	46400	--	0.35	13.7	93.44	--	Refilled tank before CR. . Turbidity 100x dilution
19-Nov-21	16:12	16:40	28	MEOR	CR032	138.54	141.54	3.00	25	8.33	7.20	--	1700	200	75.71	400	2000	21540	20476	23246	22182	-1064	--	19-Nov-21	16:42	MEOR	80.75	0.999	7.20	3.51	12.48	13.83	41	84300	--	--	--	92.21	--	
19-Nov-21	17:07	17:31	24	MEOR	CR033	141.54	144.54	3.00	25	8.33	7.20	--	1700	250	75.71	400	2000	19880	19241	21621	20982	-639	--	19-Nov-21	17:40	MEOR	87.95	1.000	7.93	3.57	12.66	11.81	13	40500	--	--	--	93.48	--	
19-Nov-21	19:30	19:52	22	MdK	CR034	144.54	147.54	3.00	22	7.33	8.18	--	2500	--	45.42	1200	0	14540	13848	16316	15660	-656	--	19-Nov-21	19:51	MdK	87.72	1.002	7.74	3.94	12.66	11.43	-3	49500	--	--	--	92.39	--	
19-Nov-21	20:10	20:27	17	MdK	CR035	147.54	150.54	3.00	17	5.67	10.59	--	2500	--	51.1	1300	0	12874	11854	14686	13702	-984	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No Return
19-Nov-21	22:24	22:44	20	MdK	CR036	150.54	153.54	3.00	18	6.00	10.00	--	2500	--	45.42	1300	0	10813	9141	12661	11025	-1636	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No Return
22-Nov-21	20:38	21:03	25	MdK	CR037	153.54	156.54	3.00	22	7.33	8.18	--	2500	--	45.42	1300	0	22074	20321	23958	22241	-1717	SB_BH02_DW005	20-Nov-21	3:40	MdK	96.55	0.999	5.43	2.99	12.52	10.04	12	704	--	0.4	--	82.89	--	No Return. Drill Water Archive sample taken from half round tank.
21-Dec-21	21:24	21:46	22	MdK	CR038	156.54	159.54	3.00	22	7.33	8.18	--	2400	--	45.42	1350	0	20233	18474	22152	20429	-1723	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	105.9	1.000	No Return
22-Nov-21	23:13	23:36	23	MdK	CR039	159.54	162.54	3.00	23	7.67	7.83	--	2200	--	45.42	1400	0	21740	20034	23695	22025	-1670	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.1	1.5	93.00	--	No Return
23-Nov-21	0:00	0:18	18	MdK	CR040	162.54	165.54	3.00	18	6.00	10.00	--	2300	--	45.42	1400	0	19527	17928	21518	19954	-1564	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.3	--	73.89	--	No Return
23-Nov-21	3:03	3:30	27	MdK	CR041	165.54	168.54	3.00	27	9.00	6.67	--	2200	--	45.42	1400	0	10655	9046	12681	11108	-1573	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	96.32	1.001	Refilled tank after CR
23-Nov-21	8:02	8:30	28	MEOR	CR042	168.54	171.54	3.00	25	8.33	7.20	--	1750	175	75.71	300	1950	23054	21030	25116	23092	-2024	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	98.84	1.000	No return fluid
23-Nov-21	9:11	9:36	25	MEOR	CR043	171.54	174.54	3.00	25	8.33	7.20	--	1750	175	75.71	300	1950	19329	17341	21427	19439	-1988	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	93.41	0.999	No Fluid Returns
23-Nov-21	19:42	20:16	34	MdK	CR044a	174.54	176.16	1.62	33.5	20.68	2.90	--	2400	--	45.42	1200	0	20985	18868	23119	21037	-2082	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	106.6	1.000	No Fluid Returns
23-Nov-21	20:35	21:06	31	MdK	CR044b	176.16	177.54	1.38	19	13.77	4.36	--	1500	--	45.42	1400	0	18146	16822	20297	18991	-1306	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	105.8	1.000	No Fluid Returns
23-Nov-21	21:29	21:53	24	MdK	CR045	177.54	180.54	3.00	25	8.33	7.20	--	2600	--	45.42	1400	0	16027	14413	18195	16618	-1577	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	106.3	1.000	No Fluid Returns
24-Nov-21	0:46	1:11	25	MdK	CR046	180.54	183.54	3.00	25	8.33	7.20	--	2600	--	45.42	1400	0	13702	11935	15906	14175	-1731	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	108.9	1.000	No Fluid Returns
24-Nov-21	2:40	3:04	24	MdK	CR047	183.54	186.54	3.00	25	8.33	7.20	--	2800	--	53	1400	0	10635	7305	12875	9581	-3294	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	106.6	1.000	No Fluid Returns
24-Nov-21	3:04	3:24	20	MdK	CR047	183.54	186.54	3.00	25	8.33	7.20	--	2800	--	53	1400	0	10635	7305	12875	9581	-3294	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	106.6	1.000	No Fluid Returns
25-Nov-21	21:27	21:49	22	MdK	CR048	186.54	189.54	3.00	25	8.33	7.20	--	1800	--	47.32	1400	0	19307	17602	21583	19913	-1670	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.1	--	87.95	1.000	No Fluid Returns
25-Nov-21	22:18	22:40	22	MdK	CR049	189.54	192.54	3.00	23	7.67	7.83	--	1800	--	45.42	1400	0	16520	15471	18832	17818	-1014	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	103.6	1.000	No Fluid Returns
26-Nov-21	0:26	0:59	33	MdK	CR050	192.54	195.54	3.00	34	11.33	5.29	--	2000	--	37.85	1100	0	14308	12874	16655	15256	-1399	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.2	--	96.50	1.001	No Fluid Returns
26-Nov-21	1:34	2:04	30	MdK	CR051	195.54	198.54	3.00	29.5	9.83	6.10	--	2200	--	41.64	1300	0	12056	10833	14439	13251	-1188	SB_BH02_DW009	26-Nov-21	3:00	MdK	115.8	1.001	5.15	0.457	9.15	13.15	124	405	--	--	--	103.6	1.001	No Fluid Returns. Drilling archive sample taken from half round tank. The fluorescein of the sample was slightly high, however the average value in the tank was 109.7 ppb.
26-Nov-21	8:45	9:14	29	KBT	CR052	198.54	201.54	3.00	25	8.33	7.20	--	2000	100	75.7	300	1950	22854	19769	25272	22223	-3049	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.15	--	98.71	1.001	No Fluid Returns
26-Nov-21	11:10	11:44	34	KBT	CR053	201.54	204.54	3.00	30	10.00	6.00	--	2000	100	75.7	300	1950	18146	15493	20600	17982	-2618	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.1	--	103.1	1.002	No Fluid Returns
26-Nov-21	12:35	12:42	7	KBT	CR054a	204.54	204.69	0.15	8	53.33	1.13	--	2000	100	75.7	300	1950	14224	14099	16714	16624	-90	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.1	--	93.75	1.002	No Fluid Returns, blocked at 0.15m into run. Stopped drilling to start washing for geophysics prep and casing installation.
16-Dec-21	8:58	9:57	59	AMSC	--	204.69	204.92	0.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Interval not cored. Air hammer final depth was 204.92 Mbgs
21-Dec-21	22:08	22:27	19	MEOR	CR054b	204.92	205.54	0.62	--	--	--	--	--	--	--	--	--	23233	23121	25723	25611	-112	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No parameters recorded. End of coring through the cement. 0.62m of rock for FIT and the end of the Run.
30-Dec-21	21:04	21:30	26	KBT	CR054c	205.54	207.54	2.00	19	9.50	6.32	--	2000	200	--	300	2500	21496	20476	24053	23033	-1020	--	30-Dec-21	21:21	KBT	78.71	1.105	7.76	--	11.23	7.45	206	45100	--	0.01	--	95.51	1.097	100X dilution for EC and Turbidity. Drill rig flow rate meter is not working, driller provided estimate only
30-Dec-21	22:02	22:34	32	KBT	CR055	207.54	210.54	3.00	25	8.33	7.20	--	2000	200	--	400	2200	20476	20189	23033	22781	-252	--	30-Dec-21	22:19	KBT	68.06	1.105	6.18	723	12.10	10.52	150	95600	--	--	--	101.3	1.095	100X dilution for EC and Turbidity. Drill rig flow rate meter is not working, driller provided estimate only
30-Dec-21	23:59	0:27	28	KBT	CR056	210.54	213.54	3.00	25	8.33	7.20	--	2000	200	--	500	2200	20189	19990	22781	22618	-163	--	31-Dec-21	0:15	KBT	93.35	1.100	6.13	716	12.14	5.8	132	84300	--	0.1	--	99.77	1.095	100X dilution for EC and Turbidity. Drill rig flow rate meter is not working, driller provided estimate only
31-Dec-21	2:06	2:31	25	KBT	CR057	213.54	216.54	3.00	21	7.00	8.57	--	2000	200	--	500	2200	19990	19946	22618	22610	-8	--	31-Dec-21	2:25	KBT	92.45	1.102	7.33	940	11.99	4.59	136	69700	--	--	--	91.98	1.092	100X dilution for EC and Turbidity. Drill rig flow rate meter is not working, driller provided estimate only
31-Dec-21	2:56	3:21	25	KBT	CR058	216.54	219.54	3.00	22	7.33	8.18	--	2200	200	--	500	2200	19946	19703	22610	22403	-207	--	31-Dec-21	3:12	KBT	93.05	1.105	7.35	720	12.02	4.82	123	93600	--	--	--	96.81	1.092	100X dilution for EC and Turbidity. Drill rig flow rate meter is not working, driller provided estimate only
31-Dec-21	3:57	4:22	25	KBT	CR059	219.54	222.54	3.00	23	7.67	7.83	--	2000	200	--	500	2200	19703	19637	22403	22372	-31	--	31-Dec-21	4:12	KBT	91.55	1.102	6.58	802	11.95	7.12	120	88800	--	--	--	97.99	1.095	100X dilution for EC and Turbidity. Drill rig flow rate meter is not working, driller provided estimate only
31-Dec-21	5:09	5:32	23	KBT	CR060	222.54	225.54	3.00	21	7.00	8.57	--	2000	200	--	500	2200	19637	19483	22372	22254	-118	--	31-Dec-21	5:25	KBT	92.39	1.097	7.24	494	12.29	6.06	97	44600	--	--	--	90.60	1.092	100X dilution for EC and Turbidity. Drill rig flow rate meter is not working, driller provided estimate only
31-Dec-21	20:31	20:58	27	KBT	CR061	225.54	228.54	3.00	22	7.33	8.18	--	2000	200	68.1	500	2200	19681	19615	22421	22390	-31	--	31-Dec-21	20:47	KBT	103.8	1.112	10.98	405	11.87	9.09	132	94700	--	--	--	96.64	1.092	100X dilution for EC and Turbidity. Drill rig flow rate meter is working now.
31-Dec-21	21:27	21:57	30	KBT	CR062	228.54	231.54	3.00	23	7.67	7.83	--	2000	300	68.1	500	2200	19615	19549	22390	22360	-30	--	31-Dec-21	21:47	KBT	89.38	1.106	7.92	418	11.68	3.82	141	67600	--	--	--	98.78	1.092	200X dilution for EC and Turbidity.
31-Dec-21	22:38	23:04	26	KBT	CR063	231.54	234.54	3.00	20	6.67	9.00	--	2000	200	68.1	400	2200	19549	19483	22360	22329	-31	--	31-Dec-21	22:54	KBT	90.46	1.110	8.06	466	11.80	6.45	137	182800	--	--	--	103.1	1.093	200X dilution for EC and Turbidity.
31-Dec-21	23:36	23:56	20	KBT	CR064	234.54	237.54	3.00	16	5.33	11.25	--	2

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling
Borehole Summary: DRILLING DEPTH AND DRILLING PARAMETERS

Borehole: SB_BH02

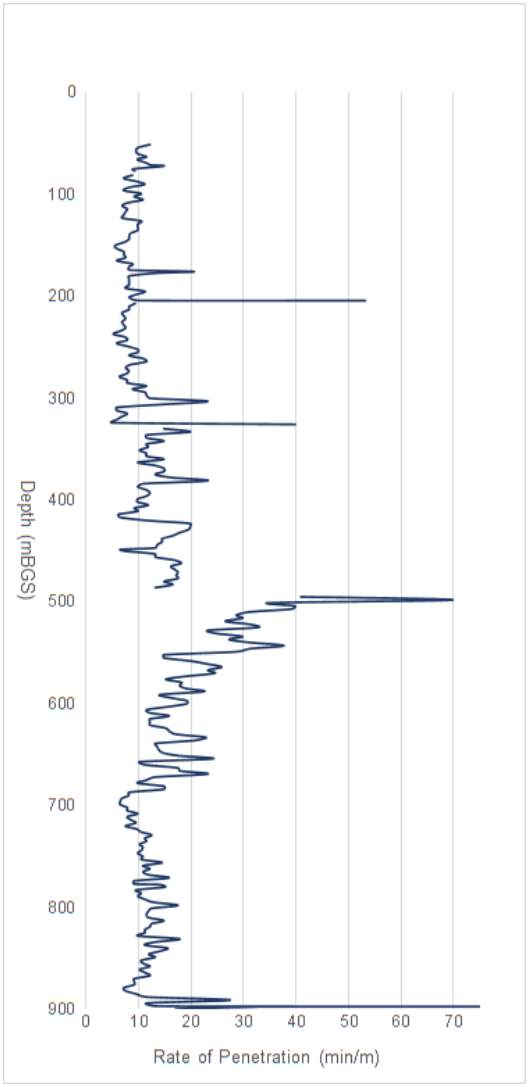
Core Run Information									Drilling Rig Parameters								Drilling Fluid Volume Changes					Drilling Fluid Parameters												Additives			Tank		
Date	Approx Start Time	Approx End Time	Approx Duration	Initials	Core Run #	Top Depth of Run	Bottom Depth of Run	Length of Core Run	Actual Duration of Core Run	Rate of Penetration (ROP)		Bit Rotation Speed (Head RPM)	Torque (Torque Pressure)	Injection Fluid Pressure (H2O Pressure In)	Down hole Fluid Flow Rate (H2O Flow in)	Weight On Bit	Holdback Pressure (Feed Pressure)	Tank #1 - Start of run (Volume)	Tank #1 - End of Run (Volume)	System - Start of run (Volume)	System - End of Run (Volume)	Total Volume Change During Run	Sample ID	Date	Time	Initials	Fluorescein Concentration	Density	Temperature	EC	pH	DO	ORP	Turbidity	Salt	Fluorescein	Freshwater	Fluorescein	Density	Comments
-	-	-	min		-	mBGS	mBGS	m	min	min/m	m/hr	RPM	psi	psi	L/min	lbs	psi	L	L	L	L	L		dd-mmm-yy	hh:mm		ppb	g/cc	`C	mS/cm	-	mg/L	mV	NTU	Bags: Salt;Ca	L of Soln	m3	ppb	g/cc	
3-Jan-22	8:11	8:40	29	MdK	CR094a	324.54	326.25	1.71	120	40.00	1.50	--	1800	200	37.85	300	1700	18846	18890	22762	22823	61	--	3-Jan-22	8:40	MdK	77.35	1.100	7.61	286	11.18	6.32	119	61800	--	--	--	81.44	1.100	100X dilution for EC and Turbidity, taken after drilling was stopped.
3-Jan-22	--	10:05	--	MdK	CR094b	326.25	327.54	1.29				--	1800	200	37.85	300	1700	18890	18956	22823	22907	84	--	3-Jan-22	9:49	MdK	83.29	1.110	8.10	308	11.39	4.18	68	150600	--	0.2	--	82.61	1.102	100X dilution for EC and 200x dilution for Turbidity.
3-Jan-22	11:06	11:52	46	MdK	CR095	327.54	330.54	3.00	45	15	4.00	--	1800	200	37.85	400	1700	18912	18934	22863	22921	58	--	3-Jan-22	11:42	MdK	69.37	1.110	8.79	303	11.11	4.52	116	165400	--	--	--	83.16	1.104	100X dilution for EC and 200x dilution for Turbidity.
3-Jan-22	12:46	13:28	42	MdK	CR096	330.54	333.54	3.00	60	20	3.00	--	1800	200	37.85	350	1700	18780	18846	22767	22869	102	--	3-Jan-22	13:20	MdK	78.48	1.106	9.05	300	11.05	6.46	112	96800	--	0.2	--	81.98	1.104	100X dilution for EC and 200x dilution for Turbidity.
3-Jan-22	14:25	15:09	44	MdK	CR097	333.54	336.54	3.00	35	11.67	5.14	--	1800	200	37.85	300	1700	18780	18868	22803	22926	123	--	3-Jan-22	15:00	MdK	92.31	1.102	8.55	305	11.29	6.5	109	55400	--	--	--	89.48	1.117	100X dilution for EC and Turbidity.
3-Jan-22	15:49	16:23	34	MdK	CR098	336.54	339.54	3.00	35	11.67	5.14	--	1800	200	37.85	350	1700	18802	18693	22860	22786	-74	--	3-Jan-22	16:17	MdK	97.72	1.117	6.35	311	11.01	3.34	8	112800	--	--	--	96.84	1.104	100X dilution for EC and 200x dilution for Turbidity.
3-Jan-22	16:48	17:32	44	MdK	CR099	339.54	342.54	3.00	45	15	4.00	--	1800	200	37.85	300	1700	18963	18561	22786	22691	-95	--	3-Jan-22	17:24	MdK	88.34	1.122	8.75	298	10.95	2.33	65	193200	--	--	--	94.52	1.107	100X dilution for EC and 200x dilution for Turbidity.
3-Jan-22	18:00	18:35	35	MdK	CR100	342.54	345.54	3.00	35	11.67	5.14	--	1800	200	37.85	300	1700	18496	18212	22625	22377	-248	--	3-Jan-22	18:35	MdK	91.35	1.111	9.38	296	10.91	2.44	103	126600	--	--	--	94.51	1.107	100X dilution for EC and 200x dilution for Turbidity.
3-Jan-22	22:41	23:20	39	KBT	CR101	345.54	348.54	3.00	36	12	5.00	--	2000	200	75.7	300-400	1700	18430	18452	22595	22653	58	SB_BH02_DW012	3-Jan-22	22:45	KBT	102.2	1.122	6.11	215	10.22	2.3	109	88500	--	--	--	110.0	1.106	100X dilution for EC and 200x dilution for Turbidity.
4-Jan-22	2:05	2:40	35	KBT	CR102	348.54	351.54	3.00	31	10.33	5.81	--	2000	200	75.7	300-400	1700	18168	18124	22369	22361	-8	--	4-Jan-22	2:14	KBT	92.29	1.106	7.95	348	10.14	3.67	152	123000	--	0.01	--	85.20	1.108	200X dilution for EC and Turbidity.
4-Jan-22	4:29	5:05	36	KBT	CR103	351.54	354.54	3.00	35	11.67	5.14	--	2000	200	75.7	300-400	1700	18168	18103	22404	22375	-29	--	4-Jan-22	4:42	KBT	102.1	1.109	6.67	254	10.97	3.79	145	72700	--	--	--	102.1	1.109	100X dilution for EC and Turbidity.
4-Jan-22	5:58	6:32	34	KBT	CR104	354.54	357.54	3.00	35	11.67	5.14	--	2000	200	75.7	300-400	1700	18146	18081	22418	22388	-30	--	4-Jan-22	6:05	KBT	113.8	1.100	7.57	238	10.47	2.71	155	85400	--	--	--	83.78	1.108	100X dilution for EC and Turbidity.
4-Jan-22	7:47	8:26	39	MdK	CR105	357.54	360.54	3.00	45	15.00	4.00	--	1700	220	37.85	360	1700	17754	17732	22062	22076	14	--	4-Jan-22	8:18	MdK	56.51	1.121	10.10	291	9.28	0.82	110	194800	--	--	--	73.34	1.108	100X dilution for EC and 200x dilution for Turbidity.
4-Jan-22	8:52	9:25	33	MdK	CR106	360.54	363.54	3.00	30	10.00	6.00	--	1700	200	37.85	200	1700	17711	17732	22054	22111	57	--	4-Jan-22	9:09	MdK	41.43	1.124	9.10	288	10.04	1.23	136	249200	--	0.5	--	65.95	1.109	100X dilution for EC and 200x dilution for Turbidity.
4-Jan-22	10:03	10:44	41	MdK	CR107	363.54	366.54	3.00	40	13.33	4.50	--	1700	200-220	37.85	250	1700	17689	17667	22068	22082	14	--	4-Jan-22	10:36	MdK	64.34	1.117	10.20	286	10.00	0.8	129	167200	--	--	--	88.10	1.108	100X dilution for EC and 200x dilution for Turbidity.
4-Jan-22	11:13	11:58	45	MdK	CR108	366.54	369.54	3.00	45	15.00	4.00	--	1700	200	37.85	250	1700	17493	17450	21908	21900	-8	--	4-Jan-22	11:30	MdK	65.08	1.124	10.02	262	10.23	0.73	123	194000	--	0.2	--	87.52	1.110	100X dilution for EC and 200x dilution for Turbidity.
4-Jan-22	12:21	13:03	42	MdK	CR109	369.54	372.54	3.00	45	15.00	4.00	--	1700	150-200	37.85	200	1700	17537	17428	21987	21914	-73	--	4-Jan-22	12:55	MdK	55.21	1.130	9.44	259	10.07	0.37	107	196400	--	0.3	--	79.87	1.110	100X dilution for EC and 200x dilution for Turbidity.
4-Jan-22	13:36	14:11	35	MdK	CR110	372.54	375.54	3.00	40	13.33	4.50	--	1700	150-200	37.85	200	1700	17341	17428	21827	21950	123	--	4-Jan-22	14:04	MdK	65.99	1.120	9.77	284	9.96	0.54	115	176600	--	--	--	102.08	1.111	100X dilution for EC and 200x dilution for Turbidity.
4-Jan-22	14:39	15:28	49	MdK	CR111	375.54	378.54	3.00	50	16.67	3.60	--	1800-2000	300-400	37.85	200-240	1700	17363	17298	21885	21855	-30	--	4-Jan-22	15:20	MdK	84.54	1.106	9.90	283	10.58	1.68	125	109600	--	0.3	--	83.31	1.112	100X dilution for EC and 200x dilution for Turbidity.
4-Jan-22	15:54	17:01	67	MdK	CR112	378.54	381.54	3.00	70	23.33	2.57	--	1700-1800	150-200	37.85	150-200	1700	17233	17146	21790	21739	-51	--	4-Jan-22	16:54	MdK	87.47	1.129	10.17	296	10.17	0.58	133	228000	--	0.7	--	84.81	1.111	100X dilution for EC and 400x dilution for Turbidity.
4-Jan-22	17:25	18:04	39	MdK	CR113	381.54	384.54	3.00	33	11.00	5.45	--	1700	200	37.85	200	1700	17168	17146	21761	21775	14	--	4-Jan-22	17:57	MdK	91.90	1.115	10.94	298	9.99	0.49	129	153200	--	--	--	102.1	1.113	100X dilution for EC and 200x dilution for Turbidity.
4-Jan-22	20:28	21:01	33	KBT	CR114	384.54	387.54	3.00	30	10.00	6.00	--	1500	200	75.7	200	1700	16973	16952	21602	21616	14	--	4-Jan-22	20:43	KBT	111.6	1.122	10.46	214	9.69	3.07	139	130800	--	--	--	110.3	1.114	200X dilution for EC and Turbidity.
4-Jan-22	23:03	23:35	32	KBT	CR115	387.54	390.54	3.00	35	11.67	5.14	--	1500	200	75.7	200	1700	--	16671	21465	21371	-94	--	4-Jan-22	23:10	KBT	98.65	1.116	9.29	204	9.97	3.45	148	101800	--	--	--	102.9	1.116	200X dilution for EC and Turbidity.
5-Jan-22	1:17	2:26	69	KBT	CR116	390.54	393.54	3.00	37	12.33	4.86	--	1500	200	75.7	200	1700	16477	16348	21177	21084	-72	--	5-Jan-22	1:32	KBT	96.95	1.118	7.86	206	10.39	1.82	71	131000	--	--	--	102.2	1.116	Drilling restarted after backing after 30cm. 200X dilution for EC and Turbidity.
5-Jan-22	2:56	3:28	32	KBT	CR117	393.54	396.54	3.00	35	11.67	5.14	--	1500	200	75.7	200	1700	16241	16155	20976	20926	-50	--	5-Jan-22	3:07	KBT	106.1	1.124	8.84	202	10.05	2.39	132	104200	--	--	--	102.7	1.114	200X dilution for EC and Turbidity.
5-Jan-22	4:01	4:33	32	KBT	CR118	396.54	399.54	3.00	30	10.00	6.00	--	1500	200	75.7	200	1700	16091	16005	20862	20812	-50	SB_BH02_DW013	5-Jan-22	4:09	KBT	101.4	1.122	8.58	232	10.02	3.1	136	154800	--	--	--	99.05	1.116	200X dilution for EC and Turbidity.
5-Jan-22	5:05	5:35	30	KBT	CR119	399.54	402.54	3.00	30	10.00	6.00	--	1500	200	75.7	200	1700	15984	15578	20791	20420	-371	--	5-Jan-22	5:17	KBT	102.3	1.122	9.31	330	9.90	3.29	--	175800	--	--	--	97.29	1.116	200X dilution for EC and Turbidity.
5-Jan-22	8:47	9:19	32	MdK	CR120	402.54	405.54	3.00	36	12.00	5.00	--	1700	200	37.85	200	1700	22163	22096	27005	26974	-31	--	5-Jan-22	9:19	MdK	93.75	--	8.90	306	9.08	0.72	-9	251200	--	--	--	105.1	1.102	Topped up half round tank with pre-mixed fluid; 100X dilution for EC and 400x dilution for Turbidity.
5-Jan-22	9:47	10:17	30	MdK	CR121	405.54	408.54	3.00	28	9.33	6.43	--	1700	180-200	37.85	200	1700	22052	22052	26930	26965	35	--	5-Jan-22	10:16	MdK	102.2	1.116	9.30	256	11.01	1.33	103	176800	--	--	--	104.8	1.103	100X dilution for EC and 200x dilution for Turbidity.
5-Jan-22	10:42	11:14	32	MdK	CR122	408.54	411.54	3.00	30	10.00	6.00	--	1600	200	37.85	200	1700	21940	21785	26854	26734	-120	--	5-Jan-22	11:13	MdK	105.6	1.114	9.48	260	11.24	1.94	115	198400	--	--	--	106.0	1.104	100X dilution for EC and 400x dilution for Turbidity.
5-Jan-22	11:42	12:05	23	MdK	CR123	411.54	414.54	3.00	19	6.33	9.47	--	1700	220	37.85	150-200	1700	21696	21696	26645	26681	36	--	5-Jan-22	12:01	MdK	98.47	1.125	10.04	267	10.93	1.96	117	264400	--	--	--	104.3	1.104	100X dilution for EC and 400x dilution for Turbidity.
5-Jan-22	12:31	12:54	23	MdK	CR124	414.54	417.54	3.00	20	6.67	9.00	--	1700	220	37.85	200-250	1700	21696	21585	26681	26605	-76	--	5-Jan-22	12:48	MdK	103.6	1.131	9.92	257	10.93	0.87	114	272000	--	--	--	101.5	1.101	100X dilution for EC and 400x dilution for Turbidity.
5-Jan-22	13:24	14:05	41	MdK	CR125	417.54	420.54	3.00	35	11.67	5.14	--	1800	220	37.85	350	1700	21429	21318	26450	26374	-76	--	5-Jan-22	13:59	MdK	101.3	1.106	10.75	251	11.00	1.43	117	144600	--	--	--	104.4	1.104	100X dilution for EC and 400x dilution for Turbidity.
5-Jan-22	14:33	15:50	77	MdK	CR126	420.54	423.54	3.00	60	20.00	3.00	--	1700	180-220	37.85	500	1700	21385	21274	26441	26366	-75	--	5-Jan-22	15:39	MdK	70.87	1.085	10.18	266	10.95	2.28	119	58500	--	--	--	97.71	1.098	100X dilution for EC and Turbidity.
5-Jan-22	16:21	17:32	71	MdK	CR127	423.54	426.54	3.00	60	20.00	3.00	--	1700	200	37.85	300	1700	21185	20919	26277	26046	-231	--	5-Jan-22	17:23	MdK	97.12	1.090	8.17	264	10.05	1.28	83	83700	--	--	--	98.04	1.096	100X dilution for EC and Turbidity.
5-Jan-22	19:49	20:49	60	KBT	CR128	426.54	429.54	3.00	59	19.67	3.05	--	1500	200	75.7	200	1500	20587	20609	25714	25772	58	--	5-Jan-22	20:00	KBT	105.2	1.104	8.26	170.2	8.52	3.15	120	113400	--	--	--	103.5	1.105	200X dilution for EC and Turbidity.
5-Jan-22	21:20	22:18	58	KBT	CR129	429.54	432.54	3.00	54	18.00	3.33	--	1500	200	75.7	200	1500	20587	20255	25750	25454	-296	--	5-Jan-22	21:30	KBT	100.2	1.128	8.67	202	10.73	2.93	149	143800	--	--	--	99.87	1.104	200X dilution for EC and Turbidity.
5-Jan-22	23:09	0:08	59	KBT	CR130	432.54	435.54	3.00	50	16.67	3.60	--	1700	200	75.7	300	1600	20056	19924	25255	25158	-97	--	5-Jan-22	23:17	KBT	98.13	1.124	9.83	210	10.66	2.7	155	175400	--	--	--	98.17	1.104	200X dilution for EC and Turbidity.
6-Jan-22	1:26	2:23	57	KBT	CR131	435.54	438.54	3.00	44	14.67	4.09	--	1700	250	75.7	300	1600	19880	19593	25114	24863	-251	--	6-Jan-22	1:31	KBT	96.75	1.124	8.69	141.8	10.79	3.44	154	107600	--	--	--	99.87	1.106	200X dilution for EC and Turbidity.
6-Jan-22	3:04	3:55	51	KBT	CR132	438.54	441.54	3.00	44	14.67	4.09	--	1700	250	75.7	300	1600	19637	19395	24907	24701	-206	--	6-Jan-22	3:15	KBT	96.19	1.120	9.83	284	10.57	1.15	148	196400	--	--	--	97.58	1.109	200X dilution for EC and Turbidity.
6-Jan-22	5:23	6:09	46	KBT	CR133	441.54	444.54	3.00	41	13.67	4.39	--	1700	250	75.7	300	1600	19153	18956	24459	24297	-162	--	6-Jan-22	5:33	KBT	106.6	1.112	9.68	212	10.65	2.79	158	146600	--	--	--	94.79	1.109	200X dilution for EC and Turbidity.
6-Jan-22	8:50	9:31	41	MdK	CR134	444.54	447.54	3.00	40	13.33	4.50	--	1800	200	37.85	2500	1700	18561	18430	23903	23807	-96	--	6-Jan-22	9:25	MdK	86.15	1.124	9.83	278	9.47	0.52	14	325600	--	--	--	92.47	1.110	100X dilution for EC and 400x dilution for Turbidity.
6-Jan-22	10:08	-	--	MdK	CR135a	447.54	449.11	1.57	20	6.67	9.00	--	1800	200	37.85	300	1700	18233	18190	23646	23602	-44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	95.11	1.112	No parameters measured due to drilling stop for equipment maintenance. Parameters measured as a part of 135b.
6-Jan-22	12:23	12:44	21	CRS	CR135b	449.11	450.54	1.43	22	7.33	8.18	--	1800	230	37.85	300	1700	18059	18081	23472	23493	21	--	6-Jan-22	12:36	CRS	89.31	1.118	8.15	332	10.73	1.16	105	274400	--	--	--	87.77	1.114	100X dilution for EC and 400x dilution for Turbidity.
6-Jan-22	13:15	14:08	53	CRS	CR136	450.54	453.54	3.00	40	13.33	4.50	--	1700	230	37.85	350	1700	17994	17906	23442	23355	-87	SB_BH02_DW014	6-Jan-22	13:56	CRS	83.45	1.120	8.52	255	10.12	0.3	117	259600	--	--	--	78.02	1.110	100X dilution for EC and 400x dilution for Turbidity.
6-Jan-22	14:20	17:05	45	CRS	CR137	453.54	456.54	3.00	40	13.33	4.50	--	1800	200	37.85	400	1700	17775	17580	23260	23064	-196	--	6-Jan-22	17:05	CRS	83.79	1.120	8.90	290	10.10	0.72	56	305200	--	--	--	98.91	1.114	100X dilution for EC and 400x dilution for Turbidity.
6-Jan-22	19:57	20:50	53	KBT	CR138	456.54	459.54	3.00	51	17.00	3.53	--	1500	200	75.7	200	1600	17190	17081	22674	22601	-73	--	6-Jan-22	20:20	KBT	87.07	1.120	9.08	103.4	9.21	1.47	173	122000	--	--	--	94.59	1.112	200X dilution for EC and Turbidity.
6-Jan-22	21:27	22:22	55	KBT	CR139	459.54	462.54	3.00	55	18.33	3.27	--	1500	200	75.7	200	1600	16973	16844	22493	22399	-94	--	6-Jan-22	21:36	KBT	93.96	1.122	9.82	167.2	10.07	2.2	152	171200	--	--	--	93.18	1.112	200X dilution for EC and Turbidity.
6-Jan-22	23:56	0:48	52	KBT	CR140	462.54	465.54	3.00	49	16.33	3.67	--	1500	200	75.7	200	1600	16757	16585	22313	22176	-137	--	7-Jan-22	0:01	KBT	88.05	1.118	7.93	148.6	10.26	2.43	192	147600	--	--	--	92.24	1.112	200X dilution for EC and Turbidity.
7-Jan-22	2:08	3:01	53	KBT	CR141	465.54	468.49	2.95	51	17.00	3.53	--	1500	200	75.7	200	1600	16348	16134	21939	21760	-179	--	7-Jan-22	2:32	KBT	86.68	1.132	7.37	177	9.56	1.87	156	258800	--	--	--	92.93	1.114	200X dilution for EC and Turbidity.
7-Jan-22	3:33	4:28	55	KBT	CR142	468.49	471.54	3.05	53	17.67	3.40	--	1500	200	75.7	200	1600	16112	15941	21739	21603	-136	--	7-Jan-22	3:45	KBT	78.91	1.128	7.54	178.4	9.78	2.01	167	170600	--	--	--	94.15	1.118	200X dilution for EC and Turbidity.
7-Jan-22	4:58	5:53	55	KBT	CR143	471.54	474.54	3.00	52	17.33	3.46	--	1500	200	75.7	200	1600	15813	15727	21475	21389	-86	--	7-Jan-22	5:12	KBT	76.02	1.128	8.18	186.6	9.77	2.25	158	393200	--	--	--	90.46	1.118	200X dilution for EC and Turbidity.
7-Jan-22	8:24	9:17	53	CRS	CR144	474.54	477.54	3.00	53	17.67	3.40	--	1800	200	37.85	400	1700	15450	15344	21184	21077	-107	--	7-Jan-22	9:03	CRS	100.1	1.126	7.98	260	9.29	0.53	-30	282000	--	--	--	93.19	1.124	100X dilution for EC and 400x dilution for Turbidity.
7-Jan-22	12:58	13:48	50	CRS	CR146	480.54	483.54	3.00	50	16.67	3.60	--	1800	220	37.85	400	1700	14898	14729	20703	20594	-109	--	7-Jan-22	13:24	CRS	85.01	1.130	8.26	288	9.56	0.45	107	372400	--	--	--	88.06	1.126	100X dilution for EC and 400x dilution for Turbidity.
7-Jan-22	15:18	15:58	40	CRS	CR147	483.54	486.54	3.00	40	13.33	4.50	--	1800	220	37.85	400	1700	14497	14329	20338	20170	-168	--	7-Jan-22	15:45	CRS	91.82	1.146	6.22	309	9.70	0.74	149	358400	--	--	--	91.35	1.130	100X dilution for EC and 400x dilution for Turbidity.
24-Feb-22	--	--	--	MdK	CR148	486.54	489.42	2.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Unknown missing core
24-Feb-22	15:30	15:56	26	MdK	CR149a	489.42	489.90	0.48	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
24-Feb-22	17:10	17:48	38	MdK	CR149b	489.90	492.77	2.87	--	--	--	--	3400	--	37.85	1500	0	16995	16909	22871	22820	-51	--	24-Feb-22	17:38	MdK	89.65	1.087	7.27	242	9.44	9.16	30	19500	--	--	--	90.29	1.082	100X dilution for EC and Turbidity.
24-Feb-22	20:51	23:30	159	KBT	CR150	492.77	495.57	2.80	115	41.07	1.46	--	1400	100	37.85	300	2000	16048	16027	21960	21974	14	--	24-Feb-22	21:12	KBT	94.95	1.089	4.25	374	9.62	5.03	179	34100	--	0.45	--	102.3	1.085	100X dilution for EC and Turbidity.
28-Feb-22	18:45	23:01	256	KBT	CR151	495.57	498.57	3.00	210	70.00	0.86	--	1500	140-160	37.85-56.78	300	1700	20366	19814	26313	25797	-516	--	28-Feb-22	19:21	KBT	76.75	1.102	8.38	1210	5.99	1.35	323	86400	--	--	--	96.07	1.096	100X dilution for EC and Turbidity.
28-Feb-22	23:46	2:17	151	KBT	CR152	498.57	501.57	3.00	105	35.00	1.71	--	1400	140	37.85	500	1700	19549	19131	25532	25150	-382	SB_BH02_DW015	1-Mar-22	0:54	KBT	76.15	1.099	5.00	847	7.69	4.16	-116	66900	--	0.25	--	78.59	1.096	100X dilution for EC and Turbidity.
1-Mar-22	4:31	6:44	133	KBT	CR153	501.57	504.57	3.00	120	40.00	1.50	--	1400	140-160	37.85-52.99	600	1700	18780	18518	24799	24572	-227	--	1-Mar-22	4:54	KBT	103.8	1.101	4.48	1440	7.80	1.39	-139	35100	--	0.2	--	81.85	1.094	100X dilution for EC and Turbidity.
1-Mar-22	8:34	10:42	128	MdK	CR154	504.57	507.57	3.00	118	39.33	1.53	--	3000	150	45.42	300	0	18255	17994	24310	24084	-226	--	1-Mar-22	10:13	MdK	95.26	1.101	6.98	286	7.54	0.99	-72	27100	--	0.45	--	88.87	1.094	100X dilution for EC and Turbidity.
1-Mar-22	7:16	9:13	117	MdK	CR155	507.57	510.44	2.87	90	31.36	1.91	--	2500	150	45.42	300	1800	17146	16822	23236	22948	-288	--	2-Mar-22	8:42	MdK	74.36	1.103	6.39	347	7.29	0.00	-98	58100	--	--	--	102.9	1.094	100X dilution for EC and Turbidity.
2-Mar-22	10:40	12:21	101	MdK	CR156	510.44	513.57	3.13	90	28.75	2.09	--	2700	150	45.42	300	1800	16650	16348	22775	22510	-265	--	2-Mar-22	11:53	MdK	66.86	1.102	9.84	362	7.67	0.00	-152	41700	--	0.15	--	69.16	1.096	100X dilution for EC and Turbidity.
2-Mar-22	13:27	14:56	89	MdK	CR157	513.57	516.57	3.00	90	30.00	2.00	--	3000	150	45.42	300	1800	16198	15920	22359	22117	-242	--	2-Mar-22	14:39	MdK	83.26	1.102	10.38	305	7.66	0.00	-150	34000	--	--	--	102.1	1.095	100X dilution for EC and Turbidity.
2-Mar-22	15:44	17:16	92	MdK	CR158	516.57	519.57	3.00	80	26.67	2.25	--	2700	150	45.42	300

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling
Borehole Summary: DRILLING DEPTH AND DRILLING PARAMETERS

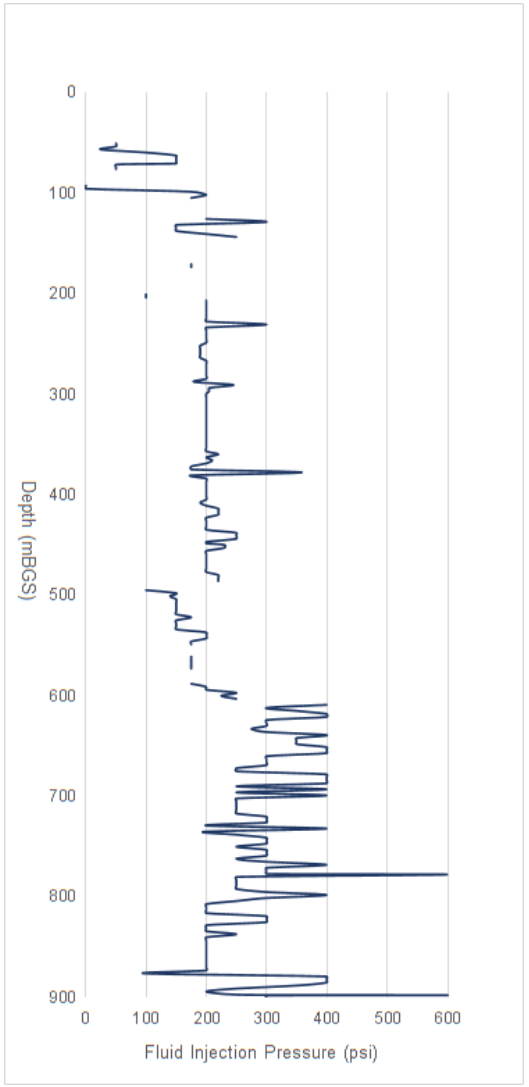
Borehole: SB_BH02

Core Run Information									Drilling Rig Parameters								Drilling Fluid Volume Changes					Drilling Fluid Parameters													Additives			Tank		Comments
Date	Approx Start Time	Approx End Time	Approx Duration	Initials	Core Run #	Top Depth of Run	Bottom Depth of Run	Length of Core Run	Actual Duration of Core Run	Rate of Penetration (ROP)		Bit Rotation Speed (Head RPM)	Torque (Torque Pressure)	Injection Fluid Pressure (H2O Pressure In)	Down hole Fluid Flow Rate (H2O Flow in)	Weight On Bit	Holdback Pressure (Feed Pressure)	Tank #1 - Start of run (Volume)	Tank #1 - End of Run (Volume)	System - Start of run (Volume)	System - End of Run (Volume)	Total Volume Change During Run	Sample ID	Date	Time	Initials	Fluorescein Concentration	Density	Temperature	EC	pH	DO	ORP	Turbidity	Salt	Fluorescein	Freshwater	Fluorescein	Density	
-	-	-	min		-	mBGS	mBGS	m	min	min/m	m/hr	RPM	psi	psi	L/min	lbs	psi	L	L	L	L	L		dd-mmm-yy	hh:mm		ppb	g/cc	`C	mS/cm	-	mg/L	mV	NTU	Bags: Salt/Ca	L of Soln	m3	ppb	g/cc	
11-Mar-22	1:52	3:10	78	MEOR	CR196	630.57	633.57	3.00	69	23.00	2.61	--	2300	275	56.78	600	1800	21785	21696	29336	29283	-53	--	11-Mar-22	2:41	MEOR	28.89	1.086	7.93	278	7.56	0.00	-256	37300	10:05	0.3	8.6	76.16	1.086	100X dilution for EC and Turbidity.
11-Mar-22	4:09	5:21	72	MEOR	CR197	633.57	636.57	3.00	63	21.00	2.86	--	2400	300	56.78	550	1800	21674	21363	29261	28985	-276	--	11-Mar-22	4:59	MEOR	57.43	1.112	9.60	207	7.29	0.00	-212	59200	--	0.15	--	116.5	1.112	100X dilution for EC and Turbidity.
11-Mar-22	7:34	8:18	44	AMSC	CR198	636.57	639.57	3.00	40	13.33	4.50	--	3000	400	56.78	400	1800	21008	20875	28666	28533	-133	--	11-Mar-22	8:22	AMSC	90.78	1.106	9.23	738	6.85	0.00	-125	157000	--	--	--	103.2	1.106	100X dilution for EC and 200X dilution for turbidity. High EC is due to operator error (probe not rinsed enough before dilution)
11-Mar-22	8:52	9:36	44	AMSC	CR199	639.57	642.57	3.00	41	13.67	4.39	--	3200	350	56.78	350	1800	20852	20675	28547	28369	-178	--	11-Mar-22	9:40	AMSC	68.12	1.108	9.95	1010	7.48	0.00	-273	185600	--	--	--	87.06	1.108	100X dilution for EC and 200X dilution for turbidity. Unreliable NaFl measurement from return, very turbid, hard to filter. High EC is due to operator error (probe not rinsed enough before dilution)
11-Mar-22	10:13	10:55	42	AMSC	CR200	642.57	645.57	3.00	42	14.00	4.29	--	3200	350	56.78	350	1800	20587	20410	28316	28139	-177	--	11-Mar-22	10:55	AMSC	83.06	1.108	10.51	411	7.49	0.00	-295	87000	--	--	--	86.92	1.108	100X dilution for EC ans Turbidity.High EC is due to operator error (probe not rinsed enough before dilution)
11-Mar-22	11:55	12:40	45	AMSC	CR201	645.57	648.57	3.00	44	14.67	4.09	--	3300	350	56.78	300	1800	20343	20189	28109	27954	-155	--	11-Mar-22	12:40	AMSC	86.63	1.108	10.83	625	7.55	0.00	-216	139400	--	--	--	82.04	1.108	100X dilution for EC and 200X dilution for turbidity. High EC is due to operator error (probe not rinsed enough before dilution)
11-Mar-22	13:18	14:00	42	AMSC	CR202	648.57	651.57	3.00	53	17.67	3.40	--	3300	400	56.78	400	1800	20100	19990	27901	27791	-110	SB_BH02_DW020	11-Mar-22	13:50	AMSC	73.82	1.107	11.31	529	7.43	0.00	-275	154000	--	0.2	--	73.66	1.108	100X dilution for EC and 200X dilution for turbidity.High EC is due to operator error (probe not rinsed enough before dilution). Collected DW archive sample and gyro at end of CR. Added 0.2L of NaFl stock solution at end of run.
11-Mar-22	15:02	16:04	62	AMSC	CR203	651.57	654.57	3.00	73	24.33	2.47	--	3200	400	56.78	300	1800	19880	19681	27716	27518	-198	--	11-Mar-22	16:00	AMSC	44.96	1.108	11.76	421	7.30	0.00	-170	92800	--	--	--	63.98	1.108	100X dilution for EC and Turbidity. High EC is due to operator error (probe not rinsed enough before dilution). Low NaFl due to pump in tank not on, so inadequate circulation in tank.
11-Mar-22	16:48	17:17	29	AMSC	CR204	654.57	657.57	3.00	31	10.33	5.81	--	3500	400	56.78	500	1800	19571	19395	27443	27267	-176	--	11-Mar-22	17:10	AMSC	66.92	1.102	11.25	600	7.61	0.00	-217	71200	--	--	--	72.10	1.106	100X dilution for EC and Turbidity. High EC is due to operator error (probe not rinsed enough before dilution)
11-Mar-22	17:50	18:28	38	AMSC	CR205	657.57	660.57	3.00	34	11.33	5.29	--	3200	300	56.78	300	1800	19351	19241	27259	27149	-110	--	11-Mar-22	18:23	AMSC	57.98	1.112	12.04	862	7.24	1.28	-251	113100	--	--	--	69.17	1.106	100X dilution for EC and 200X dilution for turbidity. High EC is due to operator error (probe not rinsed enough before dilution)
11-Mar-22	20:33	21:40	67	MEOR	CR206	660.57	663.57	3.00	53	17.67	3.40	--	2800	300	56.78	400	1800	19241	19131	27149	27075	-74	--	11-Mar-22	21:03	MEOR	51.58	1.112	11.73	259	6.97	0.00	-307	76400	--	0.6	--	79.16	1.102	100X dilution for EC and Turbidity.
11-Mar-22	22:27	23:24	57	MEOR	CR207	663.57	666.57	3.00	54	18.00	3.33	--	2800	300	56.78	300	1800	19109	19087	27053	27045	-8	--	11-Mar-22	23:00	MEOR	55.61	1.111	13.71	219	6.99	0.00	-358	127600	--	--	--	69.03	1.102	100X dilution for EC and 200X dilution for turbidity.
12-Mar-22	4:36	5:50	74	MEOR	CR208	666.57	669.57	3.00	70	23.33	2.57	--	2800	300	56.78	400	1800	17711	17602	25654	25581	-73	--	12-Mar-22	5:30	MEOR	72.48	1.114	11.64	257	7.02	0.00	-222	64000	--	0.4	--	94.15	1.102	100X dilution for EC and Turbidity.
13-Mar-22	3:21	4:02	41	MEOR	CR209	669.57	672.57	3.00	40	13.33	4.50	--	2900	250	56.78	400	1800	17928	17602	25943	25652	-291	--	13-Mar-22	3:55	MEOR	70.01	1.111	11.08	331	7.05	0.00	-46	86400	--	0.35	--	88.06	1.108	100X dilution for EC and Turbidity.
13-Mar-22	4:58	5:39	41	MEOR	CR210	672.57	675.57	3.00	35	11.67	5.14	--	2900	250	56.78	350	1800	17493	17276	25544	25363	-181	--	13-Mar-22	5:24	MEOR	77.16	1.118	10.57	223	7.18	0.00	-57	58100	--	--	--	79.26	1.108	100X dilution for EC and 200X dilution for turbidity.
13-Mar-22	7:14	7:45	31	AMSC	CR211	675.57	678.57	3.00	30	10.00	6.00	--	3000	400	56.78	300	1800	16844	16801	25001	24958	-43	--	13-Mar-22	8:05	AMSC	69.18	1.112	9.14	538	6.46	0.00	46	167000	--	0.4	--	58.92	1.108	100X dilution for EC and 200X dilution for turbidity.
13-Mar-22	8:32	9:15	43	AMSC	CR212	678.57	681.57	3.00	45	15.00	4.00	--	3200	400	56.78	400	1800	16714	16628	24872	24786	-86	--	13-Mar-22	9:20	AMSC	65.09	1.113	9.17	275	6.40	0.00	-9	98500	--	--	--	75.21	1.110	100X dilution for EC and Turbidity.
13-Mar-22	10:58	11:40	42	AMSC	CR213	681.57	684.57	3.00	45	15.00	4.00	--	3200	400	56.78	300	1800	18233	18233	26427	26427	0	--	13-Mar-22	11:35	AMSC	68.34	1.106	8.46	263	7.15	0.00	-83	86100	--	0.25	--	76.36	1.102	100X dilution for EC and Turbidity. Refille half round before CR
13-Mar-22	11:57	12:25	28	AMSC	CR214	684.57	687.57	3.00	25	8.33	7.20	--	3300	400	56.78	400	1800	19703	19725	27932	27954	22	--	13-Mar-22	12:20	AMSC	61.86	1.120	9.16	267	7.23	0.00	-92	166400	--	0.1	--	85.72	1.110	100X dilution for EC and Turbidity.
13-Mar-22	13:50	14:27	37	AMSC	CR215	687.57	690.57	3.00	25	8.33	7.20	--	3000	250	56.78	300	1800	19439	19329	27704	27594	-110	--	13-Mar-22	14:25	AMSC	87.6	1.110	9.65	331	7.59	0.00	24	149000	--	--	--	72.98	1.110	100X dilution for EC and 200X dilution for turbidity.
13-Mar-22	14:58	15:23	25	AMSC	CR216	690.57	693.57	3.00	21	7.00	8.57	--	3200	400	56.78	300	1800	19285	19241	27585	27541	-44	--	13-Mar-22	15:20	AMSC	84.58	1.112	9.33	272	7.74	0.00	113	161600	--	--	--	72.09	1.110	100X dilution for EC and 200X dilution for turbidity.
13-Mar-22	15:55	16:15	20	AMSC	CR217	693.57	696.57	3.00	20	6.67	9.00	--	3400	250	56.78	500	1800	191131	19087	27467	27423	-44	--	13-Mar-22	16:12	AMSC	48.08	1.130	8.77	256	7.12	0.00	-153	186600	--	--	--	55.97	1.114	100X dilution for EC and 200X dilution for turbidity.
13-Mar-22	17:20	17:40	20	AMSC	CR218	696.57	699.57	3.00	20	6.67	9.00	--	3500	400	56.78	400	1800	19637	19527	28009	27898	-111	--	13-Mar-22	17:35	AMSC	47.46	1.130	9.92	265	7.07	0.00	-17	230700	--	0.2	0.5	72.58	1.102	100X dilution for EC and 300X dilution for turbidity. Added NaFl and freshwater to dilute brine before CR
13-Mar-22	21:40	22:08	28	MEOR	CR219	699.57	702.57	3.00	24	8.00	7.50	--	3000	250	56.78	450	1800	19527	19351	27916	27758	-158	SB_BH02_DW023	13-Mar-22	21:58	MEOR	58.12	1.112	10.73	226	6.85	0.00	-122	97900	--	0.15	--	84.91	1.108	100X dilution for EC and Turbidity.
13-Mar-22	23:39	0:04	25	MEOR	CR220	702.57	705.57	3.00	24	8.00	7.50	--	3000	250	56.78	450	1800	18452	18365	26859	26807	-52	--	13-Mar-22	23:51	MEOR	56.36	1.108	9.44	281	7.09	0.00	-19	138400	--	--	--	80.83	1.104	100X dilution for EC and 200X dilution for turbidity.
14-Mar-22	0:59	1:35	36	MEOR	CR221	705.57	708.57	3.00	30	10.00	6.00	--	2800	250	56.78	400	1800	18365	18190	26807	26668	-139	--	14-Mar-22	1:17	MEOR	51.31	1.108	11.95	274	7.19	0.00	-110	125800	--	--	--	71.21	1.104	100X dilution for EC and 200X dilution for turbidity.
14-Mar-22	2:39	3:06	27	MEOR	CR222	708.57	711.57	3.00	24	8.00	7.50	--	2800	250	56.78	550	1800	18103	18037	26581	26551	-30	--	14-Mar-22	3:01	MEOR	73.43	1.116	10.21	262	7.08	0.00	-79	157200	--	0.2	--	81.96	1.112	100X dilution for EC and 200X dilution for turbidity.
14-Mar-22	4:50	5:17	27	MEOR	CR223	711.57	714.57	3.00	26	8.67	6.92	--	3100	250	56.78	500	1800	21229	21119	29743	29668	-75	--	14-Mar-22	5:10	MEOR	77.64	1.118	11.13	252	7.20	0.00	-90	135800	--	0.5	3.3	96.36	1.101	100X dilution for EC and 200X dilution for turbidity.
14-Mar-22	6:06	6:37	31	MEOR	CR224	714.57	717.57	3.00	29	9.67	6.21	--	3000	250	56.78	200	1800	21096	20693	29646	29549	-97	--	14-Mar-22	6:16	MEOR	59.27	1.120	9.13	253	7.08	0.00	-27	174600	--	--	--	75.05	1.108	100X dilution for EC and 200X dilution for turbidity.
14-Mar-22	9:24	9:50	26	AMSC	CR225	717.57	720.70	3.13	24	7.67	7.82	--	3100	300	56.78	200	1800	20587	20565	29208	29186	-22	--	14-Mar-22	9:45	AMSC	74.46	1.112	8.16	257	6.82	0.00	-65	111400	--	0.2	--	76.80	1.106	100X dilution for EC and 200X dilution for turbidity.
14-Mar-22	10:44	11:20	36	AMSC	CR226	720.70	723.57	2.87	28	9.76	6.15	--	3000	300	56.78	200	1800	20454	20388	29111	29044	-67	--	14-Mar-22	11:10	AMSC	89.21	1.110	10.37	288	7.22	0.00	-37	156000	--	--	--	94.83	1.104	100X dilution for EC and 200X dilution for turbidity.
14-Mar-22	12:53	13:25	32	AMSC	CR227	723.57	726.57	3.00	32	10.67	5.63	--	3100	300	56.78	200	1800	20233	20145	28925	28837	-88	--	14-Mar-22	12:15	AMSC	75.72	1.110	11.65	209	7.10	0.00	-74	156400	--	0.2	--	68.42	1.102	100X dilution for EC and 200X dilution for turbidity.
14-Mar-22	15:03	15:40	37	AMSC	CR228	726.57	729.57	3.00	38	12.67	4.74	--	3200	200	56.78	200	1800	20034	19968	28762	28696	-66	--	14-Mar-22	15:35	AMSC	90.58	1.112	13.18	223	7.03	0.00	-105	155800	--	--	--	105.9	1.102	100X dilution for EC and 200X dilution for turbidity.
14-Mar-22	16:30	17:05	35	AMSC	CR229	729.57	732.57	3.00	34	11.33	5.29	--	3300	400	56.78	300	1800	19946	19791	28709	28555	-154	--	14-Mar-22	17:00	AMSC	70.82	1.112	13.81	253	7.02	0.00	-103	149400	--	0.15	--	82.25	1.102	100X dilution for EC and 200X dilution for turbidity.
14-Mar-22	17:48	18:25	37	AMSC	CR230	732.57	735.57	3.00	35	11.67	5.14	--	3400	200	56.78	200	1800	19461	19307	28260	28106	-154	--	14-Mar-22	18:15	AMSC	88.27	1.110	13.20	240	7.25	0.00	-60	141600	--	--	--	117.6	1.106	100X dilution for EC and 200X dilution for turbidity.
14-Mar-22	20:22	20:56	34	MEOR	CR231	735.57	738.57	3.00	31	10.33	5.81	--	2900	250	56.78	450	1800	19219	19175	28018	28010	-8	--	14-Mar-22	20:41	MEOR	81.73	1.108	13.10	176	6.90	0.00	-66	94000	--	--	--	90.57	1.098	100X dilution for EC and 200X dilution for turbidity.
14-Mar-22	21:55	22:29	34	MEOR	CR232	738.57	741.57	3.00	33	11.00	5.45	--	2900	300	56.78	450	1800	19022	18934	27856	27840	-16	--	14-Mar-22	22:16	MEOR	80.44	1.106	13.67	205	7.07	0.00	-124	176200	--	--	--	86.14	1.106	100X dilution for EC and 200X dilution for turbidity.
14-Mar-22	23:28	0:04	36	MEOR	CR233	741.57	744.57	3.00	32	10.67	5.63	--	2900	300	56.78	450	1800	18890	18802	27796	27744	-52	--	14-Mar-22	23:53	MEOR	78.16	1.108	14.15	284	7.09	0.00	-151	178200	--	--	--	78.84	1.102	100X dilution for EC and 200X dilution for turbidity.
15-Mar-22	1:02	1:37	35	MEOR	CR234	744.57	747.57	3.00	30	10.00	6.00	--	3000	300	56.78	500	1500	18715	18496	27621	27437	-184	--	15-Mar-22	1:26	MEOR	69.73	1.112	13.44	212	7.19	0.00	-109	195200	--	0.4	--	96.21	1.106	100X dilution for EC and 200X dilution for turbidity.
16-Mar-22	19:34	20:11	37	MEOR	CR235	747.57	750.57	3.00	33	11.00	5.45	--	3000	250	56.78	500	1500	24215	24104	33193	33081	-112	SB_BH02_DW024	16-Mar-22	19:50	MEOR	76.32	1.096	9.24	283	7.43	0.00	-173	15100	--	--	4.5	85.52	1.094	100X dilution for EC and Turbidity.
16-Mar-22	21:14	21:49	35	MEOR	CR236	750.57	753.57	3.00	32	10.67	5.63	--	3000	300	56.78	550	1500	24014	23903	32992	32916	-76	--	16-Mar-22	21:36	MEOR	72.22	1.100	9.56	386	7.59	0.00	-141	21900	--	--	--	73.74	1.094	100X dilution for EC and Turbidity.
16-Mar-22	23:35	0:21	46	MEOR	CR237	753.57	756.57	3.00	44	14.67	4.09	--	2800	300	56.78	450	1500	23813	23746	32826	32795	-31	--	16-Mar-22	23:57	MEOR	73.51	1.100	10.43	316	7.44	0.00	-156	24900	--	0.6	--	90.21	1.096	100X dilution for EC and Turbidity.
17-Mar-22	1:24	2:05	41	MEOR	CR238	756.57	759.57	3.00	33	11.00	5.45	--	2900	300	56.78	450	1500	23568	23456	32616	32540	-76	--	17-Mar-22	1:45	MEOR	74.58	1.096	10.15	313	7.38	0.00	-118	17500	--	--	--	83.03	1.094	100X dilution for EC and Turbidity.
17-Mar-22	3:00	3:39	39	MEOR	CR239	759.57	762.57	3.00	37	12.33	4.86	--	2900	250	56.78	450	1500	23367	23211	32451	32331	-120	--	17-Mar-22	3:26	MEOR	90.05	1.100	11.15	327	7.51	0.00	-144	33300	--	0.4	--	95.01	1.096	100X dilution for EC and Turbidity.
17-Mar-22	4:47	5:17	30	MEOR	CR240	762.57	765.57	3.00	33	11.00	5.45	--	3000	300	56.78	450	1500	23114	23010	32264	32165	-99	--	17-Mar-22	5:03	MEOR	81.76	1.098	10.89	292	7.49	0.00	163	31000	--	--	--	89.05	1.095	100X dilution for EC and Turbidity.
17-Mar-22	7:36	8:00	24	KBT	CR241	765.57	768.57	3.00	36	12.00	5.00	--	3100	400	56.78	200	1500	22497	22430	31653	31622	-31	--	17-Mar-22	7:48	KBT	85.26	1.098	11.94	753	6.44	0.00	-15	40000	--	0.1	--	95.10	1.094	100X dilution for EC and 200x dilution for Turbidity.
17-Mar-22	15:49	16:39	50	KBT	CR242	768.57	771.57	3.00	48	16.00	3.75	--	3100	300	56.78	200	1500	21918	21852	31110	31078	-32	--	17-Mar-22	16:05	KBT	88.62	1.096	14.75	449	7.31	0.00	-193	47700	--	0.3	--	92.75	1.092	100X dilution for EC and Turbidity.
17-Mar-22	17:22	17:53	31	KBT	CR243	771.57	774.57	3.00	28	9.33	6.43	--	3200	300	56.78	200	1500	21718	21651	30945	30914	-31	--	17-Mar-22	17:27	KBT	99.63	1.098	14.95	300	7.44	0.00	-183	43500	--	--	--	92.80	1.092	100X dilution for EC and Turbidity.
17-Mar-22	19:30	20:02	32	MEOR	CR244	774.57	777.57	3.00	28	9.33	6.43	--	3100	300	56.78	550	1500	21654	21518	30914	30816	-98	--	17-Mar-22	19:47	MEOR	88.80	1.096	14.84	338	7.41	0.00	-66	15600	--	--	--	98.80	1.092	100X dilution for EC and Turbidity.
17-Mar-22	20:56	21:10	14	MEOR	CR245A	777.57	778.27	0.70	10	14.29	4.20	--	2500	600	56.78	700	1500	21451	21429	30750	30727	-23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	90.33	1.100	Blockage in the core barrel. Retrieved at surface. Drilled 0.70m. Parameters measured as a part of 245B.
17-Mar-22	21:59	22:40	41	MEOR	CR245B	778.27	780.57	2.30	35	15.22	3.94	--	3000	250	56.78	450	1500	21429	21385	30727	30719	-8	--	17-Mar-22	22:21	MEOR	79.74	1.100	14.74	391	7.41	0.00	-178	37600	--	--	--	80.75	1.099	100X dilution for EC and Turbidity. Extra 2.30m drilled
17-Mar-22	23:32	23:58	26	MEOR	CR246	780.57	783.57	3.00	29	9.67	6.21	--	3100	250	56.78	500	1500	21340	21141	30674	30510	-164	--	17-Mar-22	23:49	MEOR	95.78	1.104	13.79	224	7.74	0.00	-146	21900	--	0.4	--	103.6	1.100	100X dilution for EC and Turbidity.
18-Mar-22	0:55	1:35	40	MEOR	CR247	783.57	786.57	3.00	32	10.67	5.63	--	3200	250	56.78	450	1500	21030	20919	30399	30324	-75	--	18-Mar-22	1:22	MEOR	63.55	1.122	14.68	350	7.25	0.00	-160	83200	--	--	--	92.14	1.102	100X dilution for EC and Turbidity. Change of colour of the return fluid from borehole from brown to gray. High turbidity and density compared to the previous CR.
18-Mar-22	2:41	3:10	29	MEOR	CR248	786.57	789.57	3.00	30	10.00	6.00	--	2900	250	56.78	500	1500	20875	20786	30280	30227	-53	--	18-Mar-22	3:01	MEOR	87.00	1.100	14.30	216	7.26	0.00	-106	44600	--	--	--	83.97	1.094	100X dilution for EC and Turbidity.
18-Mar-22	4:56	5:35	39	MEOR	CR249	789.57	792.57	3.00	34	11.33	5.29	--	2900	250	56.78	450	1500	20565	20454	30005	29930	-75	--	18-Mar-22	5:15	MEOR	87.99	1.104	13.70	370	7.33	0.00	-126	64500	--	0.4	--	91.83	1.102	100X dilution for EC and Turbidity.
18-Mar-22	7:57	8:41	44	KBT	CR250	792.57	795.57	3.00	39	13.00	4.62	--	2800	300	56.78	200	1500	19968	19836	29444	29348	-96	--	18-Mar-22	8:16	KBT	80.74	1.104	13.69	372	6.55	0.00	43	80200	--	0.1	--	92.40	1.092	100X dilution for EC and Turbidity.
18-Mar-22	9:34	10:30	56	KBT	CR251	795.57	798.57	3.00	53	17.67	3.40	--	3100	400	56.78	100	1500	19681	19549	29193	29097	-96	--	18-Mar-22	9:53	KBT	89.44	1.098	13.38	323	6.95	0.00	-62	21900	--	--	--	104.5	1.092	100X dilution for EC and Turbidity.
18-Mar-22	17:41	18:27	46	KBT	CR252	798.57	801.57	3.00	38	12.67	4.74	--	3000	300	56.78	100	1500	18802	18780	28350	28364	14	SB_BH02_DW025	18-Mar-22	17:59	KBT	97.45	1.106	13.66	345	7.00	0.00	-119	99100	--	--	--	88.96	1.094	100X dilution for EC and Turbidity.
18-Mar-22	21:20	21:56	36	MEOR	CR253	801.57	804.57	3.00	36	12.00	5.00	--	3300	250	56.78	450	1500	18780	18693	28364	28312	-52	--	18-Mar-22	21:39	MEOR	71.92	1.098	13.24	266	7.07	0.00	-119	64000	--	0.2	--	86.73	1.100	100X dilution for EC and 200X dilution for turbidity.
18-Mar-22	22:50	23:31	41	MEOR	CR254	804.57	807.57	3.00	35	11.67	5.14	--	3000	200	56.78	450	1300	18583	18469	28202	28150	-52	--	18-Mar-22	23:16	MEOR	73.36	1.108	13.51	261	7.00	0.00	-132	58100	--	0.2	--	96.87	1.102	100X dilution for EC and Turbidity.
19-Mar-22	0:30	1:10	40	MEOR	CR255	807.57	810.57	3.00	36	12.00	5.00	--	3100	200	56.78	400	1300	18430	18233	28085	27924	-161	--	19-Mar-22	0:58	MEOR	78.10	1.104	13.57	304	6.89	0.00	-86	92300	--	--	--	83.67	1.096	100X dilution for EC and Turbidity.
19-Mar-22	3:24	4:10	46	MEOR	CR256	810.57	813.57	3.00	45	15.00	4.00	--	2900	200	56.78	450	1300	18037	17819	27727	27545	-182	--	19-Mar-22	3:49	MEOR	82.43	1.104	13.09	300	6.89	0.00	-95	126500	--	0.1	--	96.06	1.100	100X dilution for EC and 200X dilution for Turbidity.
19-Mar-22	5:14	5:54	40	MEOR	CR257	813.57	816.57	3.00	38	12.67	4.74	--	3000	200	56.78	500	1300	17645	17493	27371	27255	-116	--	19-Mar-22	5:41	MEOR	90.53	1.104	12.73	245	6.95	0.00	-83	49400	--	--	--	95.52	1.094	100X dilution for EC and Turbidity.
19-Mar-22	7:54	8:43	49	KBT	CR258	816.57	819.57	3.00	37	12.33	4.86	--	3000	300	56.78	200	1300	21207	21096	30969	30894	-75	--	19-Mar-22	8:19	KBT	99.21	1.106	12.08	293	6.79

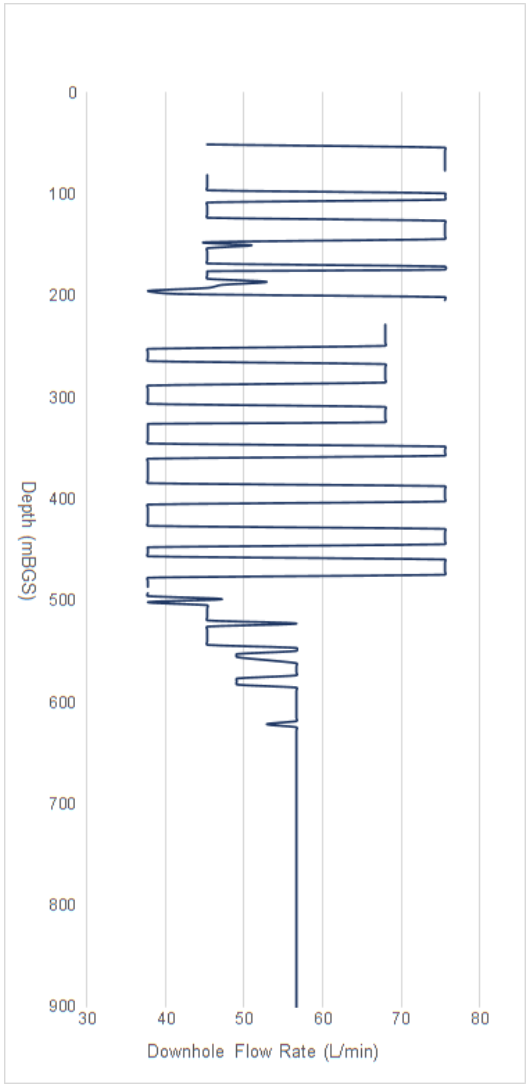
Rate of Penetration



Fluid Injection Pressure



Downhole Flow Rate



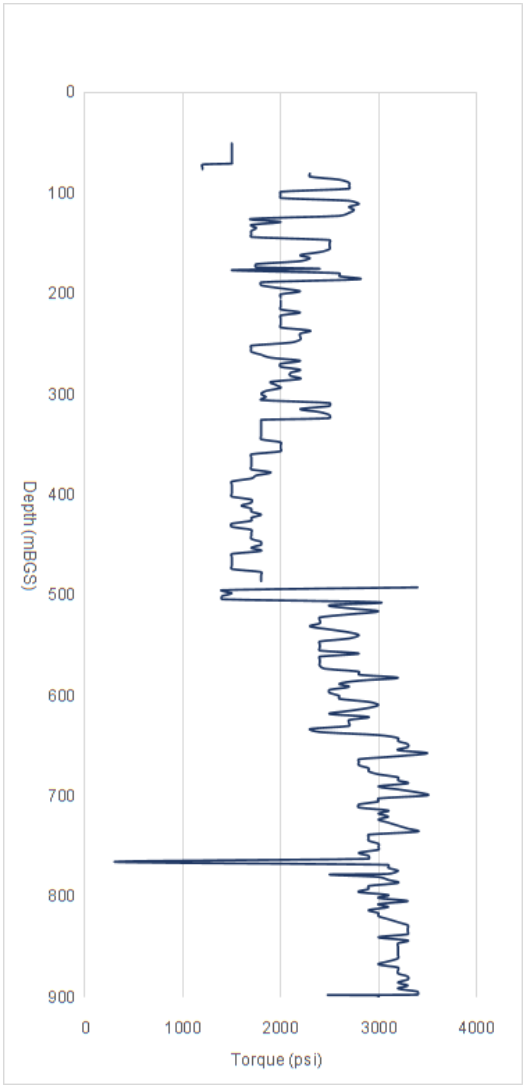
Drilling Parameters for SB_BH02

Project 20-211-1 Phase 2 Initial Borehole Drilling and Testing, South Bruce

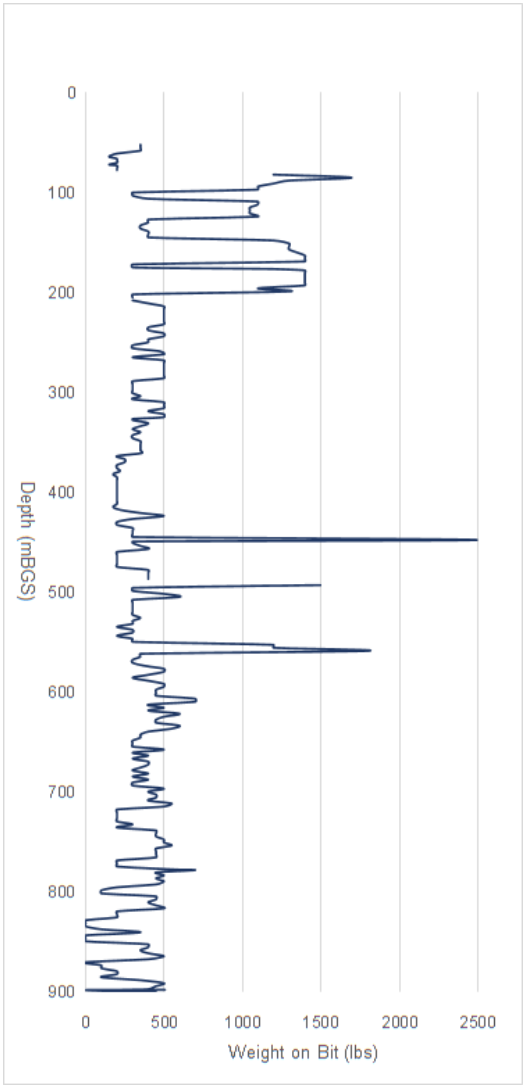
Appendix B	Doc: SB_BH02_Drill_Fluid_Parameters_R0	Prepared by: MdK Reviewed by: SNS Date: 01-Dec-22

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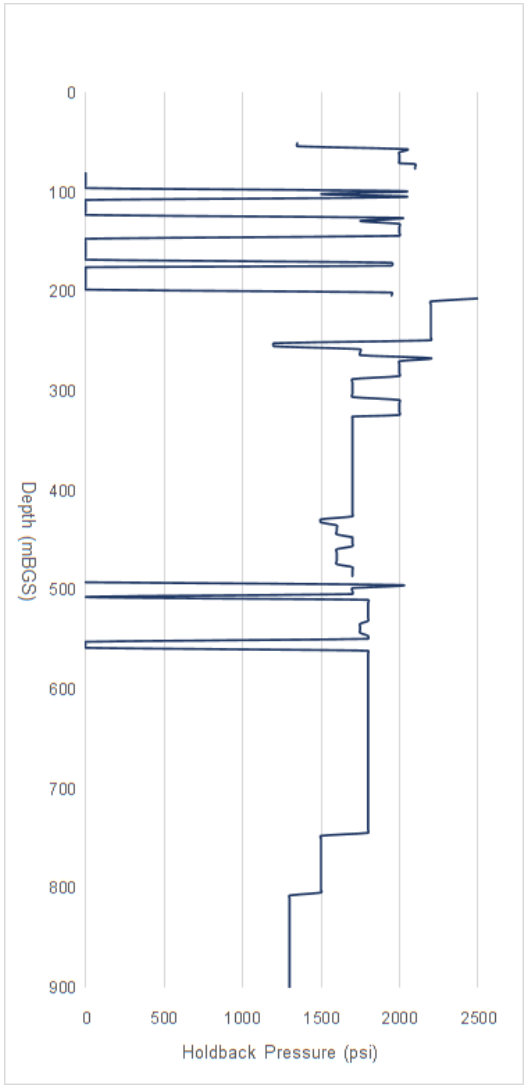
Torque



Weight on Bit



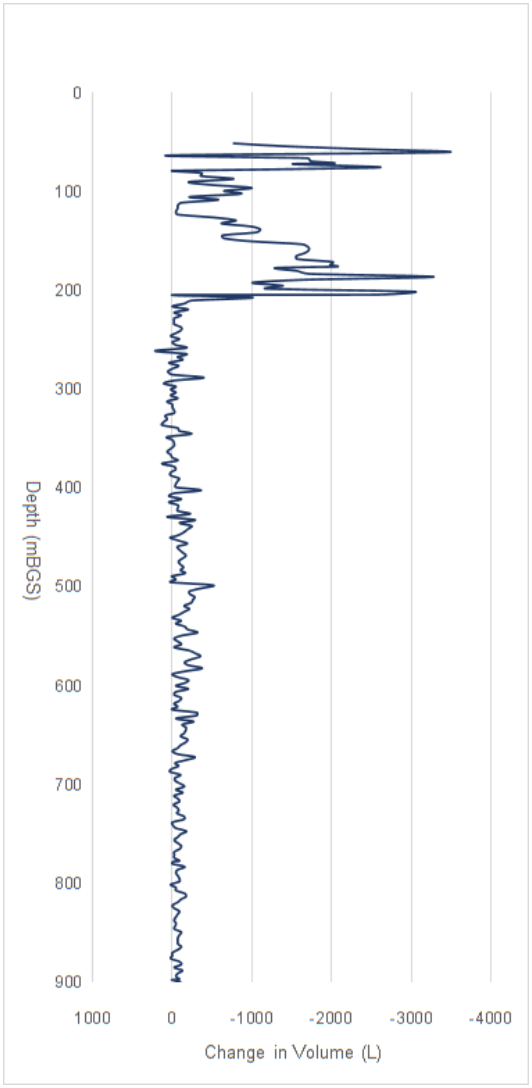
Holdback Pressure

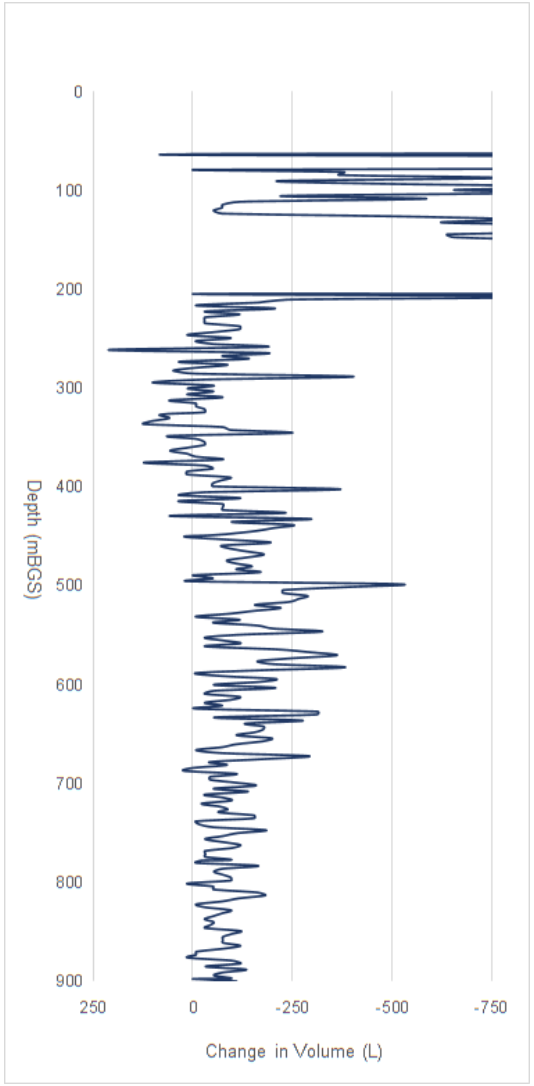


Drilling Parameters for SB_BH02 **Project 20-211-1 Phase 2 Initial Borehole Drilling and Testing, South Bruce**		Prepared by: MdK Reviewed by: SNS Date: 01-Dec-22
Appendix B	Doc: SB_BH02_Drill_Fluid_Parameters_R0	

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Change in System Volume

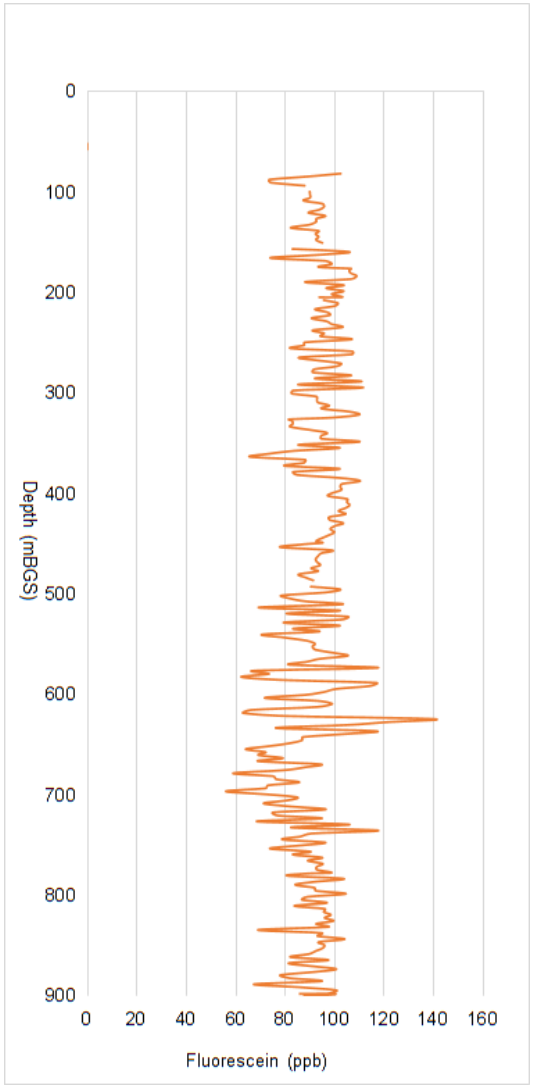




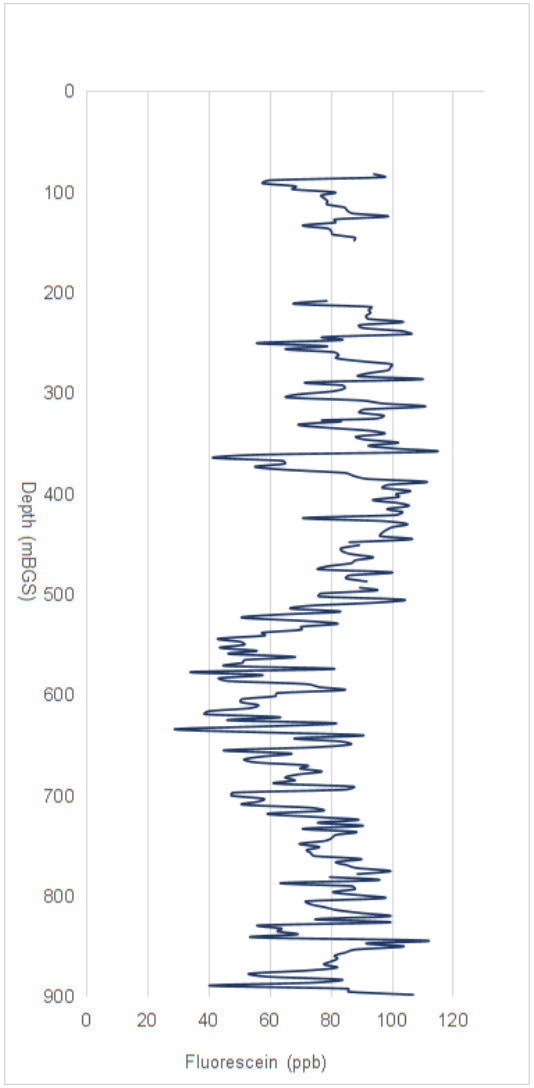
Drilling Fluid Parameters for SB_BH02 **Project 20-211-1 Phase 2 Initial Borehole Drilling and Testing, South Bruce**		Prepared by: MdK Reviewed by: SNS Date: 01-Dec-22
Appendix B	Doc: SB_BH02_Drill_Fluid_Parameters_R0	

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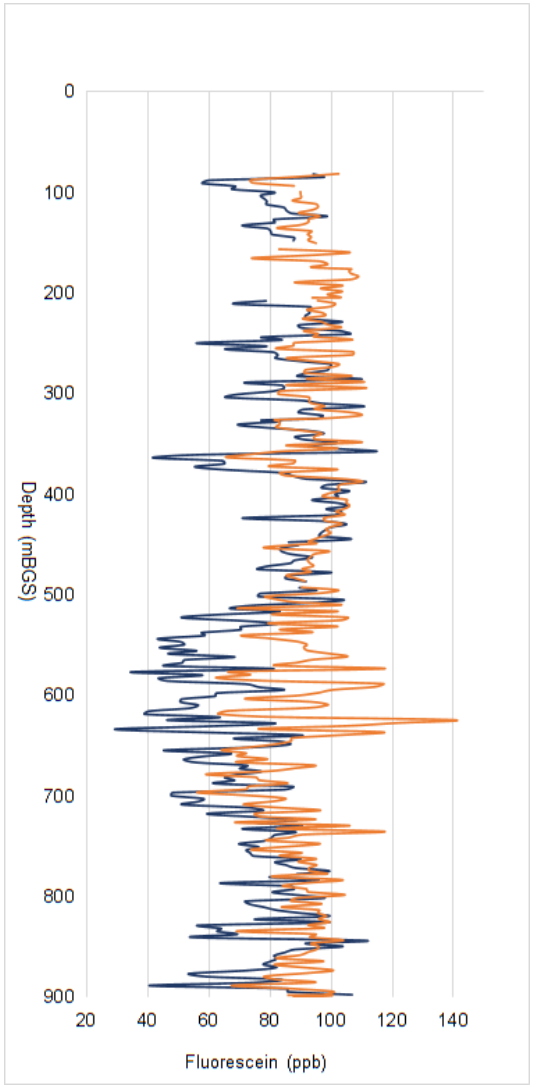
Fluorescein in Fluid Tank



Fluorescein of Fluid Returns



Fluorescein Comparison



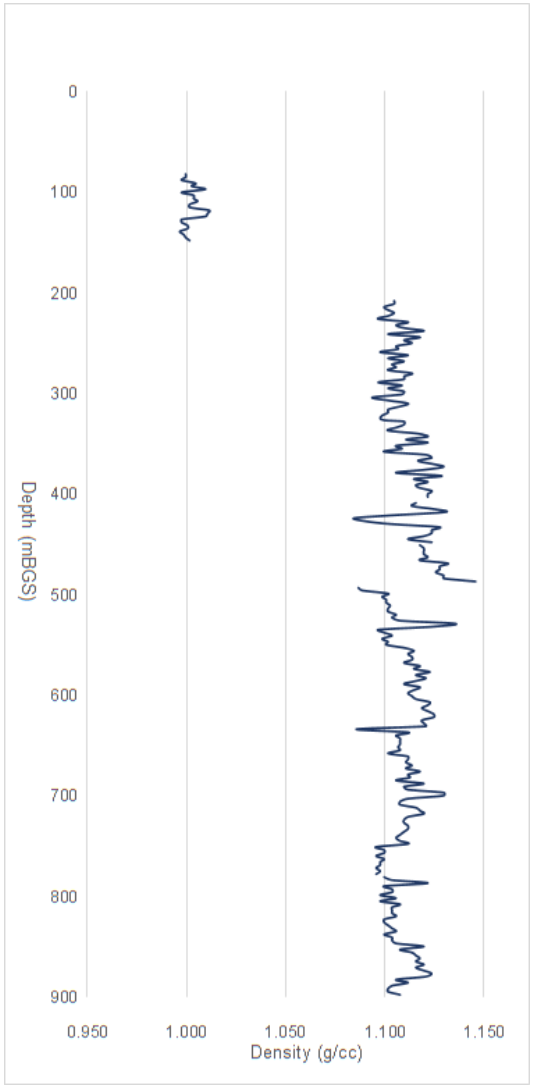
Drilling Fluid Parameters for SB_BH02

Project 20-211-1 Phase 2 Initial Borehole Drilling and Testing, South Bruce

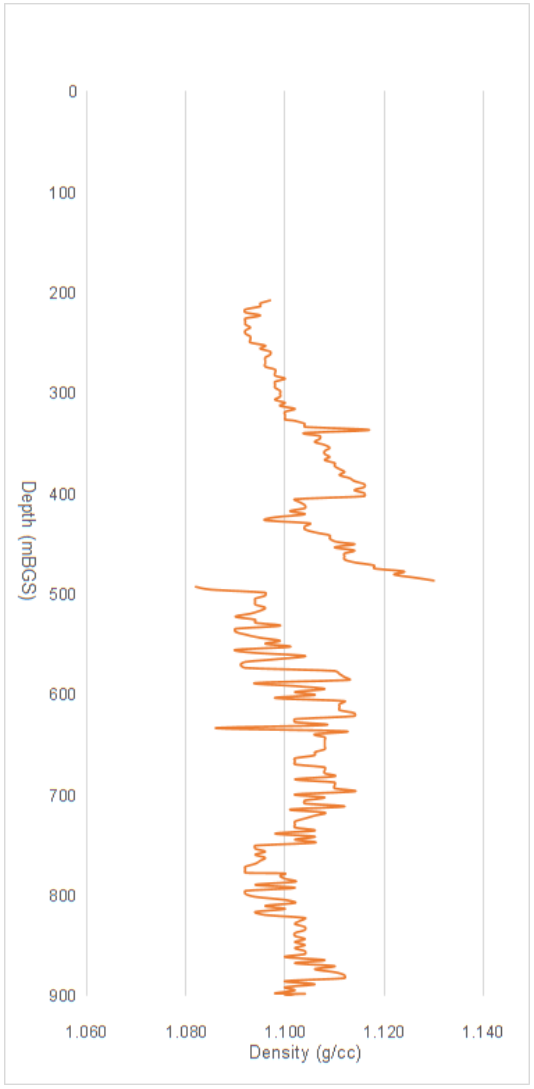
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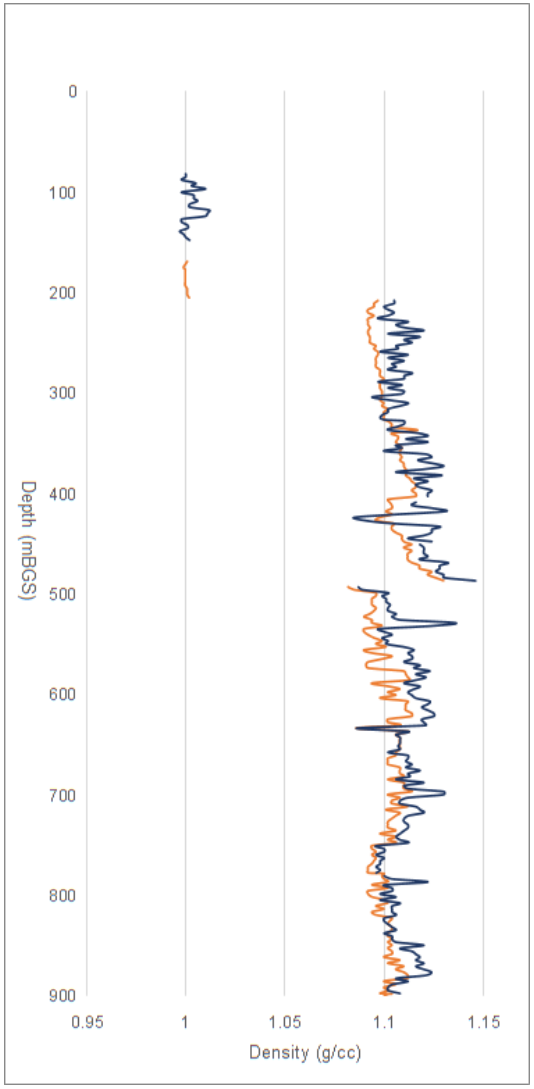
Density in Fluid Tank



Density of Fluid Returns



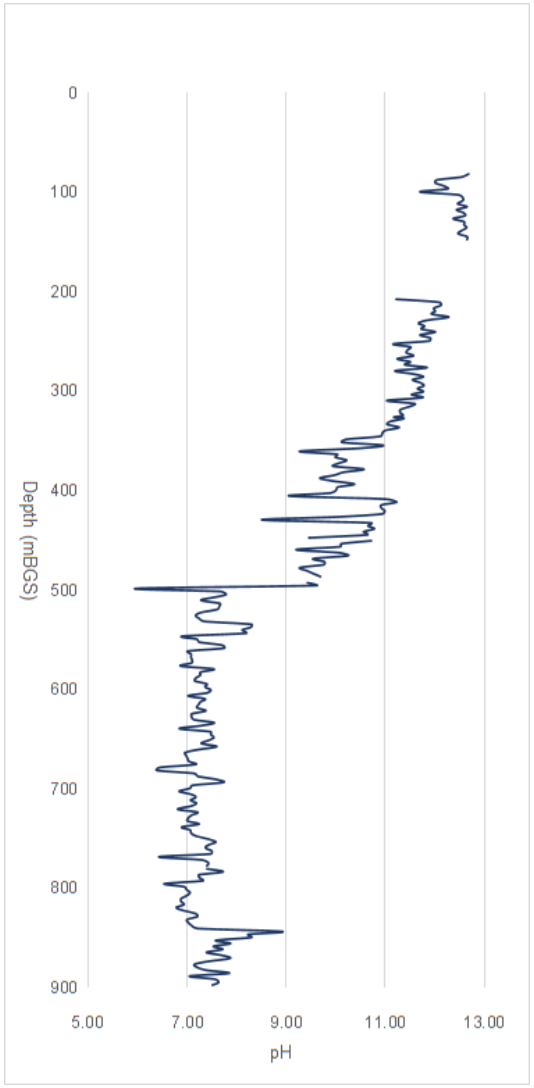
Density Comparison



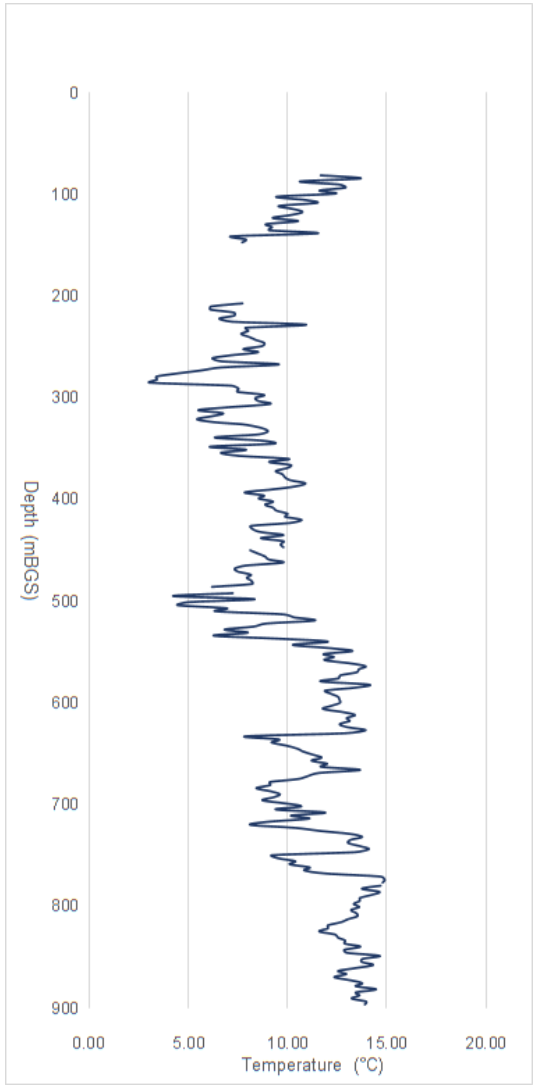
Drilling Fluid Parameters for SB_BH02 - Turbidity **Project 20-211-1 Phase 2 Initial Borehole Drilling and Testing, South Bruce**		Prepared by: MdK Reviewed by: SNS Date: 01-Dec-22
Appendix B	Doc: SB_BH02_Drill_Fluid_Parameters_R0	

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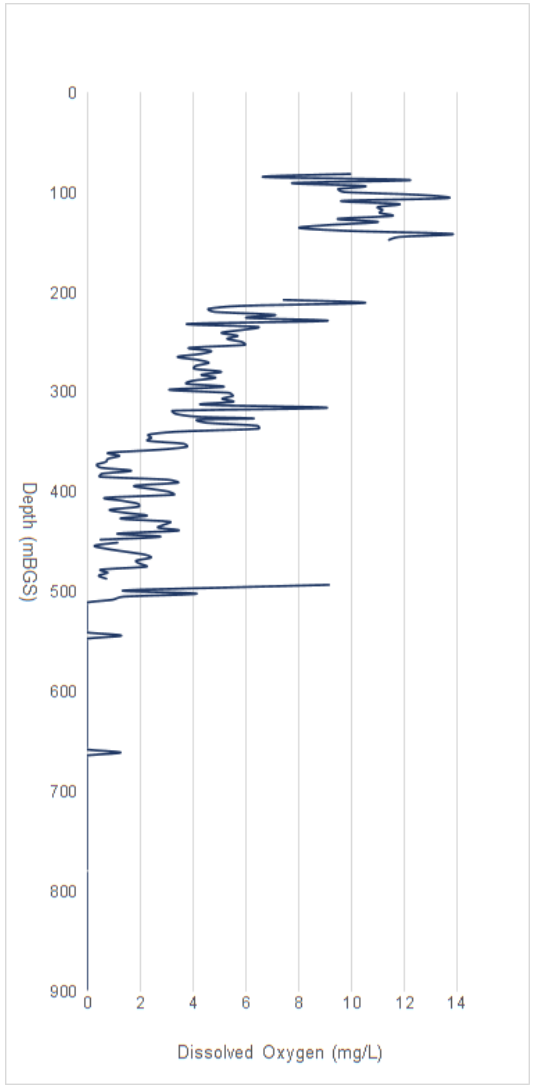
pH



Temperature



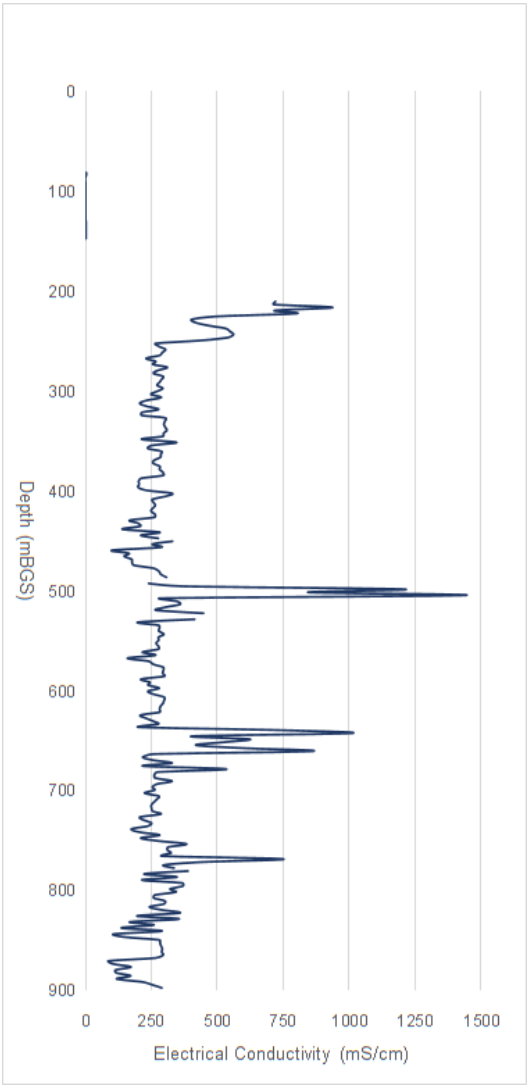
Dissolved Oxygen



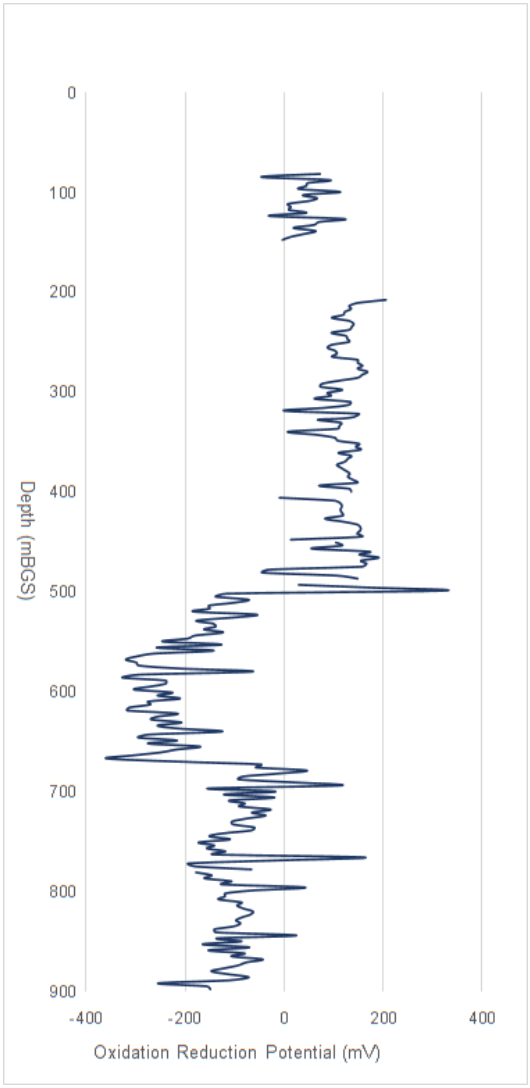
Drilling Fluid Parameters for SB_BH02 **Project 20-211-1 Phase 2 Initial Borehole Drilling and Testing, South Bruce**		Prepared by: MdK Reviewed by: SNS Date: 01-Dec-22
Appendix B	Doc: SB_BH02_Drill_Fluid_Parameters_R0	

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Electrical Conductivity



Oxidation Reduction Potential



Drilling Fluid Parameters for SB_BH02

Project 20-211-1 Phase 2 Initial Borehole Drilling and Testing, South Bruce

Appendix B	Doc: SB_BH02_Drill_Fluid_Parameters_R0

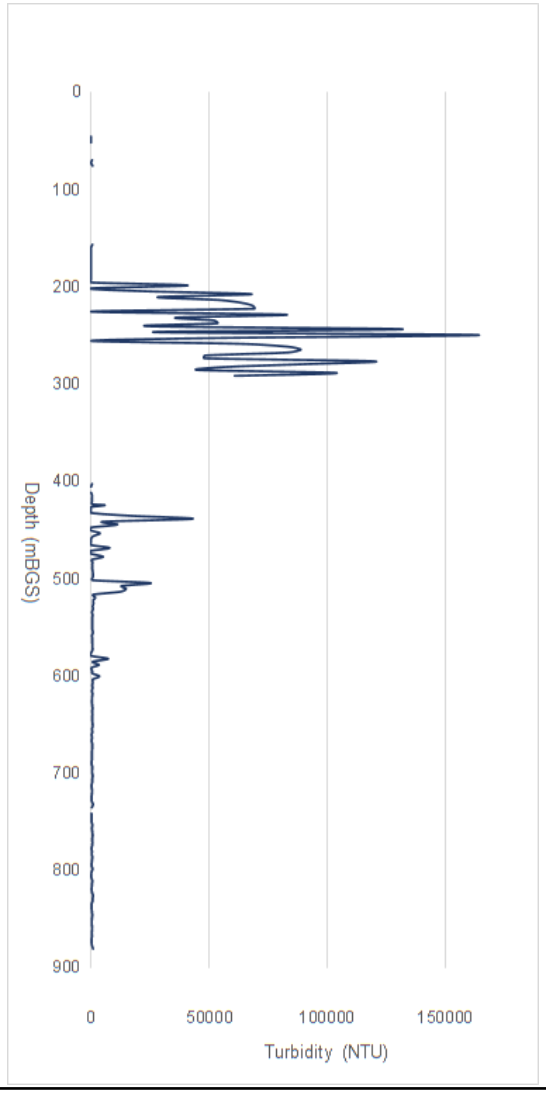
Prepared by: MdK

Reviewed by: SNS

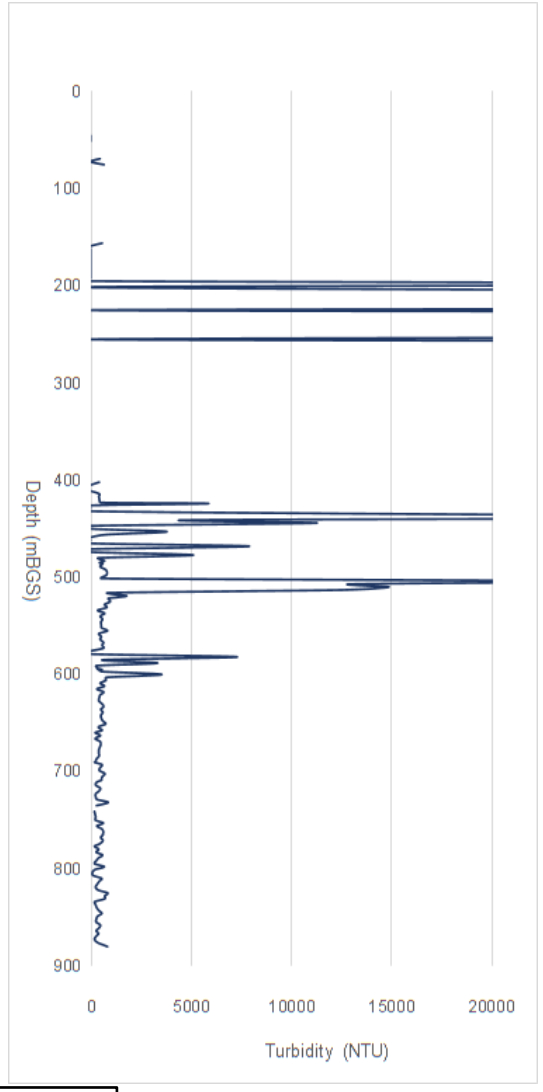
Date: 01-Dec-22

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Turbidity



Turbidity – 0 to 20 000 NTU



Drilling Fluid Parameters for SB_BH02

Project 20-211-1 Phase 2 Initial Borehole Drilling and Testing, South Bruce

Appendix B	Doc: SB_BH02_Drill_Fluid_Parameters_R0	Prepared by: MdK Reviewed by: SNS Date: 01-Dec-22

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Appendix C

Borehole Orientation Data

SB_BH02

WP02: DRILLING - BOREHOLE DEVIATION

Geofirma Project Reference: 20-211
Completed: 23-Mar-2022

Equipment: Champ Gyro probe - #14680
Geofirma personnel onsite: KBT / CRS

Depth		Dip	Azimuth
mBKB	mBGS	(°)	(°)
0	-2.63	-90.00	360.00
10	7.37	-89.45	1.25
20	17.37	-89.47	353.26
30	27.37	-89.09	356.94
40	37.37	-89.10	4.09
50	47.37	-89.16	27.64
60	57.37	-88.45	37.25
70	67.37	-88.65	33.46
80	77.37	-88.17	62.75
90	87.37	-87.33	45.71
100	97.37	-86.87	36.64
110	107.37	-86.89	36.47
120	117.37	-87.18	41.46
130	127.37	-87.28	35.98
140	137.37	-87.11	41.05
150	147.37	-87.11	36.46
160	157.37	-86.95	40.94
170	167.37	-86.99	42.03
180	177.37	-86.81	38.34
190	187.37	-86.97	40.61
200	197.37	-86.90	38.65
210	207.37	-86.94	39.11
220	217.37	-86.95	36.13
230	227.37	-86.88	39.95
240	237.37	-87.19	42.70
250	247.37	-87.20	35.15
260	257.37	-87.00	40.35
270	267.37	-87.03	40.62
280	277.37	-87.00	38.56
290	287.37	-87.02	41.70
300	297.37	-87.04	39.31
310	307.37	-87.09	41.47
320	317.37	-87.02	39.94
330	327.37	-87.30	42.98
340	337.37	-87.05	43.26
350	347.37	-87.08	42.90
360	357.37	-87.09	41.71
370	367.37	-87.07	44.99
380	377.37	-87.08	41.85
390	387.37	-87.09	44.81
400	397.37	-87.02	39.68
410	407.37	-87.12	44.95
420	417.37	-87.27	45.84
430	427.37	-87.28	39.74
440	437.37	-87.46	47.62
450	447.37	-87.33	41.12
460	457.37	-87.12	47.94
470	467.37	-87.19	48.04
480	477.37	-87.31	42.18
490	487.37	-87.12	44.56
500	497.37	-87.20	39.88
510	507.37	-87.18	46.77
520	517.37	-87.12	49.69
530	527.37	-87.17	48.09
540	537.37	-87.21	48.81
550	547.37	-87.17	49.72
560	557.37	-87.20	49.17
570	567.37	-87.17	48.56
580	577.37	-87.43	48.86
590	587.37	-87.19	47.37
600	597.37	-87.12	48.71
610	607.37	-87.19	48.43
620	617.37	-87.15	45.48
630	627.37	-87.29	42.05
640	637.37	-87.18	49.07
650	647.37	-87.19	44.98
660	657.37	-87.12	50.40
670	667.37	-87.11	48.91
680	677.37	-87.12	47.24
690	687.37	-87.01	46.58
700	697.37	-87.14	50.05
710	707.37	-87.13	49.42
720	717.37	-87.07	50.75
730	727.37	-87.19	51.11
740	737.37	-87.12	48.30
750	747.37	-86.99	45.68
760	757.37	-86.94	47.59
770	767.37	-87.13	49.62
780	777.37	-87.00	50.64
790	787.37	-87.05	50.35
800	797.37	-87.09	50.59
810	807.37	-87.08	51.26
820	817.37	-87.08	51.78
830	827.37	-87.17	53.51
840	837.37	-87.06	51.26
850	847.37	-87.34	49.67
860	857.37	-87.12	52.37
870	867.37	-86.99	48.49
880	877.37	-86.98	48.00
890	887.37	-87.32	48.83
900	897.37	-87.21	49.05

* Parameters collected from final post-drilling 10m survey

Appendix D

Water Source Quality Data

Table D.1 – Measured In-Field Parameters

Table D.2 – Summary of Lab Results

Table D:1 SB_BH02 Field Parameters and Analysis for Water Source Samples

Sample ID	Borehole Depth (at time of sample)	Sample Date and Time	Sampled by	Multiparameter Probe Measurements							In-Field Lab Analysis						Notes/Comments
				pH	Total Dissolved Solids	Temp	Dissolved Oxygen	Electrical Conductivity	ORP	Turbidity	Alkalinity (Total as CaCO3)	Sulfide	Ferrous Iron	Fluorescein	DO	Specific Gravity	
	mBGS			--	g/L	°C	mg/L	mS/cm	mV	NTU	mg/L	mg/L	mg/L	ppb	mg/L		
SB_BH02_WS001	0	8/18/2021 20:32	MdK	7.53	0.135	23.94	9.35	0.207	595	0	65	<0.020	0.04	0	>1	0.998	Sulphide sent to lab
SB_BH02_WS002	37.52	9/29/2021 10:20	MOR	7.59	0.166	16.88	11.30	0.255	128	0	79	0	0.02	0.001	>1	0.998	
SB_BH02_WS003	48.53	10/22/2021 13:40	MOR	7.52	0.415	14.38	6.48	0.649	296	8.4	69	0	0.02	0.008	>1	1.002	
SB_BH02_WS004	77.23	10/28/2021 3:50	MOR	7.21	0.156	14.01	5.63	0.241	578	0	78	0	0.01	0.014	>1	1	
SB_BH02_WS005	79.14	11/13/2021 8:03	MOR	7.48	0.189	12.57	8.51	0.291	379	0	69	0	0.01	0.199	>1	1	
SB_BH02_WS006	186.55	11/24/2021 16:15	LMB	7.04	0.168	9.96	8.04	0.258	491	8.8	73	0	0	0	>1	1	
SB_BH02_WS007	204.69	12/5/2021 11:00	AMC	6.59	0.164	8.30	8.82	0.252	632	5.7	65	0	0.05	0.177	>1	0.997	
SB_BH02_WS008	204.69	12/5/2021 16:00	FJH	7.22	0.185	5.34	12.33	0.285	494	8.7	74	0	0	0.125	>1	0.998	
SB_BH02_WS009	204.69	12/7/2021 6:20	LIM	6.11	0.179	11.23	10.72	0.275	658	0	65	0.01	0.07	0	>1	0.998	
SB_BH02_WS010	205.54	12/23/2021 12:00	MdK	6.40	0.177	7.52	7.62	0.273	782	2.4	80	0.01	0	0.012	>1	0.996	
SB_BH02_WS011	519.57	3/2/2022 18:00	MdK	6.35	0.168	2.93	7.62	0.258	679	0	71	0.003	0	0	>1	0.998	
SB_BH02_WS012	747.57	3/16/2022 14:55	KBT	6.87	0.167	3.64	6.98	0.257	686	3.8	95	0	0.02	0.088	>1	1	
SB_BH02_WS013	897.57	3/22/2022 16:45	LIM	7.31	0.162	7.73	13.08	0.250	508	0	100	0	0.05	0	>1	1	

Table D:2 SB_BH02 Lab Parameters for Water Source Samples

Sample ID	pH-Lab	Alkalinity-Bicarbonate	Alkalinity Total as CaCO3	Total Ammonia as N (NH4+NH3)	Bromide (Br)	Chloride (Cl)	Fluoride (F)	Iodide (I)	Nitrate (NO3)	Nitrite (NO2)	Nitrate + Nitrite	Total Kjeldahl Nitrogen	Total Nitrogen	OrthoPhosphate (PO4)	Total Phosphorus (Ptot)	Sulphate (SO4)	Sulphide as S	Dissolved Organic Carbon (DOC)	Total Organic Carbon (TOC)	Reactive Silica (SiO2)	Aluminum (Al) diss.	Boron (B) diss.	Calcium (Ca) diss.	Iron (Fe) diss.	Lithium (Li) diss.	Magnesium (Mg) diss.	Potassium (K) diss.	Ruthenium (Ru) diss.	Silicon (Si) diss	Sodium (Na) diss.	Strontium (Sr) diss.	Sulfur (S) diss
units	--	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Detection Limit	--	1	1	0.05	1	1	0.1	0.1	0.1	0.01	0.1	0.1	0.1	0.01	0.004	1	0.02	0.4	0.4	0.05	0.0049	0.01	0.2	0.02	0.005	0.05	0.2	0.002	0.05	0.1	0.001	0.5
SB_BH02_WS001	7.81	65	66	<0.050	<1.0	9.8	<0.10	<0.10	0.30	<0.010	0.30	<0.10	0.30	<0.010	<0.004	27	<0.020	1.2	1.2	1.8	0.053	0.013	24	<0.02	<0.0050	7.0	0.9	<0.0020	0.74	4.4	0.11	9.0
SB_BH02_WS002	7.82	73	73	<0.050	<1.0	12	<0.10	<0.10	0.54	<0.010	0.54	<0.10	0.54	<0.010	<0.004	30	<0.020	1.2	1.3	2.1	0.059	0.015	29	<0.02	<0.0050	8.1	1.1	<0.0020	0.98	4.9	0.14	9.9
SB_BH02_WS003	7.81	78	78	<0.050	<1.0	130	<0.10	<0.10	0.49	<0.010	0.49	0.14	0.63	<0.010	0.005	34	<0.020	1.8	1.8	2.3	0.039	0.031	71	<0.02	0.04	8.2	2.6	<0.0020	0.96	37	0.76	10
SB_BH02_WS004	7.74	70	70	<0.050	<1.0	11	<0.10	<0.10	0.52	<0.010	0.52	0.10	0.62	<0.010	<0.004	30	<0.020	1.0	1.2	2.2	0.041	0.014	28	<0.02	<0.0050	7.5	1.0	<0.0020	0.91	4.9	0.13	9.4
SB_BH02_WS005	7.72	70	70	<0.050	<1.0	12	<0.10	<0.10	0.37	<0.010	0.37	0.19	0.56	<0.010	<0.004	27	<0.020	1.0	1.3	1.9	0.042	0.014	27	<0.02	<0.0050	7.4	1.0	<0.0020	0.85	4.6	0.12	9.2
SB_BH02_WS006	7.59	77	77	0.053	<1.0	12	<0.10	<0.10	0.73	<0.010	0.73	0.14	0.87	<0.010	<0.020	33	<0.020	1.1	1.2	2.0	0.026	0.015	31	<0.02	<0.0050	8.3	1.0	<0.0020	0.98	4.7	0.14	11
SB_BH02_WS007	7.98	76	77	<0.050	<1.0	11	<0.10	<0.10	0.60	<0.010	0.60	<0.10	0.60	<0.010	0.004	30	<0.020	1.2	1.2	2.1	0.025	0.013	30	<0.02	<0.0050	7.7	1.1	<0.0020	0.89	5.1	0.13	10
SB_BH02_WS008	7.96	75	76	<0.050	<1.0	11	<0.10	<0.10	0.58	<0.010	0.58	<0.10	0.58	<0.010	<0.004	33	<0.020	1.2	1.2	3.2	0.037	0.013	30	0.02	<0.0050	7.8	1.0	<0.0020	0.88	4.9	0.13	11
SB_BH02_WS009	7.85	76	77	<0.050	<1.0	11	<0.10	<0.10	0.81	<0.010	0.81	0.14	0.95	<0.010	<0.004	34	<0.020	1.1	1.2	2.2	0.025	0.013	32	<0.02	<0.0050	8.6	1.1	<0.0020	0.95	5.2	0.13	11
SB_BH02_WS010	7.68	84	84	<0.050	<1.0	14	<0.10	<0.10	0.95	<0.010	0.95	<0.10	0.95	<0.010	<0.004	37	<0.020	1.1	1.1	2.3	0.038	0.015	36	<0.02	<0.0050	10.0	1.2	<0.0020	1.00	5.7	0.17	12
SB_BH02_WS011	7.66	74	74	<0.050	<1.0	2.5	<0.10	<0.10	0.50	<0.010	0.50	<0.10	0.50	<0.010	<0.004	6.2	<0.020	1.1	1.2	2.3	0.021	0.014	30	<0.02	<0.0050	8.3	1.1	<0.0020	0.98	5.5	0.14	11
SB_BH02_WS012	7.66	74	74	<0.050	<1.0	13	<0.10	<0.10	0.58	<0.010	0.58	0.14	0.72	<0.010	<0.004	31	<0.020	1.5	1.4	2.2	0.016	0.014	30	0.03	<0.0050	8.3	1.0	<0.0020	0.97	6.6	0.14	9.9
SB_BH02_WS013	7.67	73	74	<0.050	<1.0	11	<0.10	<0.10	0.52	<0.010	0.52	0.15	0.67	<0.010	0.004	30	<0.020	1.2	1.4	2.2	0.032	0.017	30	<0.02	<0.0050	8.7	1.1	<0.0020	0.99	6.0	0.13	9.9

Appendix E

Drilling Fluid Water Quality Data

Table E.1 - Measured In-Field Parameters

Table E: SB_BH02 Field Parameters and Analysis for Drill Water Samples

Sample ID	Sample Depth Interval		Sample Date and Time	Sampled by	Multiparameter Probe Measurements							In-Field Lab Analysis						Notes/Comments
					pH	Total Dissolved Solids	Temp	Dissolved Oxygen	Electrical Conductivity	ORP	Turbidity	Alkalinity (Total as CaCO3)	Sulfide	Ferrous Iron	Fluorescein	DO	Specific Gravity	
	mBGS					g/L	°C	mg/L	mS/cm	mV	NTU	mg/L	mg/L	mg/L	ppb	mg/L		
SB_BH02_DW001	48.53	51.53	10/25/2021 1:29	MOR	12.90	5250	10.44	9.39	7.69	31	30800	423	0.2	1.91	0.075	>1	1.006	100x dilution for turbidity, 5x dilution for Ferrous Iron
SB_BH02_DW004	99.54	102.54	11/18/2021 15:55	MOR	12.49	--	9.49	12.63	2.19	39	82700	406	0.09	1.72	76.99	>1	1.004	100x dilution for turbidity.
SB_BH02_DW006	153.54	153.54	11/20/2021 3:30	MdK	12.59	1890	5.86	11.24	2.96	54	701	290	0	2.66	96.55	>1	0.999	No return fluid, sample was taken from half round tank.
SB_BH02_DW007	165.02	174.54	11/23/2021 11:55	MOR	8.20	265	6.08	8.93	0.407	346	309	93	0.17	0	80.91	>1	1	No return fluid, samples collected from main drilling half round. Sample bottles discarded of as per NWMO's request (ACMC/FJH)
SB_BH02_DW009	198.54	198.54	11/26/2021 3:00	MdK	9.15	297	5.15	13.15	0.457	124	405	94	0.17	0.06	115.8	>1	1.001	No fluid returns, sample taken from half round tank. The fluorescein of the sample was slightly high, however the average value in the tank was 109.7 ppb.
SB_BH02_DW010	246.54	249.54	1/1/2022 5:30	KBT	11.90	272000	8.76	5.86	440	132	156600	292	0.18	1.86	55.74	>1	1.114	
SB_BH02_DW011	297.54	300.54	1/2/2022 13:00	MdK	11.78	175000	8.41	5.37	273	88	77500	148	0.18	0.78	69.4	>1	1.109	
SB_BH02_DW012	345.54	348.54	1/3/2022 22:45	KBT	10.22	110000	6.11	2.30	215	109	88500	52	0.3	0.74	102.2	>1	1.122	
SB_BH02_DW013	396.54	399.54	1/5/2022 4:09	KBT	10.02	152600	8.58	3.10	232	136	154800	85	0	0.82	101.4	>1	1.122	200X dilution for EC, turbidity, and TDS due to high turbidity.
SB_BH02_DW014	449.11	450.54	1/6/2022 12:31	CRS	8.15	--	8.15	1.16	332	105	274400	144	0	1.45	89.31	>1	1.118	100x dilution for EC, 400x dilution for turbidity
SB_BH02_DW015	498.57	501.57	3/1/2022 0:54	KBT	7.69	527	5.00	4.16	847	-116	66900	15	0	18.1	76.15	0.151	1.099	100x dilution for EC, turbidity, TDS. 10x Dilution for ferrous iron and sulfide
SB_BH02_DW016	546.57	549.57	3/5/2022 0:19	MOR	7.21	180000	13.32	0	280	-245	168000	44	0.02	2.27	51.73	>1	1.101	100x dilution for EC and TDS. 200x dilution for Turbidity. 2x dilution for Sulfide.
SB_BH02_DW019	597.57	600.57	3/9/2022 4:40	MOR	7.49	153000	12.69	0	239	-226	87100	12	0.18	0.05	62.05	>1	1.114	100x dilution EC, TDS and Turbidity. 2x dilution sulfide
SB_BH02_DW020	648.57	651.57	3/11/2022 16:49	ASC	7.43	33300	11.31	0	529	-275	154000	30	>0.70	>3.00	73.82	>1	1.107	100x dilution for EC and TDS, 200x dilution for Turbidity. High EC due to operator error (probe not rinsed well enough before dilution).
SB_BH02_DW023	699.57	702.57	3/13/2022 22:25	MOR	6.85	143000	10.73	0	226	-122	97900	31	0.3	4.85	58.12	>1	1.112	100X dilution for EC and Turbidity. 2X dilution for infield sulphide and ferrous iron analysis.
SB_BH02_DW024	747.57	750.57	3/16/2022 19:50	MOR	7.43	181000	9.24	0	283	-173	15100	63	0.15	6.85	85.52	>1	1.096	100X dilution for EC and Turbidity. 2X dilution for infield sulphide, 5X ferrous iron analysis.
SB_BH02_DW025	798.57	801.57	3/18/2022 17:59	KBT	7.00	221000	13.66	0	345	-119	99100	9	0	3.5	97.45	0.073	1.106	100X dilution for EC and Turbidity; 10X dilution for infield sulphide; 2X dilution for ferrous iron analysis.
SB_BH02_DW026	849.57	850.57	3/20/2022 21:20	MOR	7.59	183000	13.83	0	285	-165	161200	62	0.1	2.2	88.18	>1	1.108	100X dilution for EC, 200x dilution for turbidity. 5X dilution for infield sulphide.
SB_BH02_DW029	897.57	898.18	3/22/2022 4:50	MOR	7.53	175000	13.15	0	273	-197	156400	58	0	0.23	110.9	>1	1.12	100x dilution for EC and TDS; 200x dilution for turbidity; 10x dilution for Sulphide.

Appendix F

Air Quality and Noise Monitoring

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling
AIR MONITORING LOG

Borehole: SB_BH02

Date	Time	Initials	Air Monitor #	CO (ppm)		H_2S (ppm)		O_2 (%)	CH4 (LEL %) / COMB EX	Date of Last Calibration	Comments
				Peak	TWA	Peak	TWA	Peak	Peak		
23-Aug-21	16:30	KBT	#00195845	10	0	1	0	23.5	8	23-Aug-21	At Rig Surface
24-Aug-21	15:15	KBT	#00195905	3	0	0	0	21.8	0	24-Aug-21	At Rig Surface
26-Aug-21	17:14	KBT	#00195905	5	0	1	0	20.8	0	26-Aug-21	At Rig Surface
27-Aug-21	2:37	KBT	#00195845	47	0	1	0	20.8	0	27-Aug-21	At Rig Surface
30-Aug-21	16:50	CRS	#00195905	0	0	0	0	20.8	0	30-Aug-21	At Rig Surface, breezy weather
31-Aug-21	8:10	CRS	#00195892	2	0	0	0	20.8	0	31-Aug-21	At Rig Surface
1-Sep-21	16:20	CRS	#00195905	37	0	1	0	20.8	0	1-Sep-21	At Rig Surface
2-Sep-21	15:00	CRS	#00195892	3	0	0	0	20.8	0	2-Sep-21	At Rig Surface
7-Sep-21	16:00	CJS	#00195854	0	0	0	0	20.8	5	7-Sep-21	At Rig Surface
8-Sep-21	16:30	CJS	#00195854	117	0	1	0	20.8	5	8-Sep-21	Very Brief detection of CO during nearby trash pump operation.
9-Sep-21	17:30	JKW	#00195854	43	0	1	0	20.8	2	9-Sep-21	At rig surface
10-Sep-21	14:30	JKW	#00195854	12	0	1	0	20.8	5	10-Sep-21	At rig surface
13-Sep-21	17:00	JKW	#00195854	--	--	--	--	--	--	13-Sep-21	Very high readings - inferred monitor malfunction
14-Sep-21	16:30	CRS	#00195892	10	0	1	0	20.8	0	14-Sep-21	At rig surface, windy weather
15-Sep-21	14:00	CRS	#00195845	8	0	1	0	20.8	2	15-Sep-21	At rig surface
16-Sep-21	17:00	CRS	#00195845	23	0	1	0	20.8	0	16-Sep-21	At rig surface
17-Sep-21	14:00	CRS	#00195854	40	0	1	0	20.8	8	17-Sep-21	At rig surface- CO peak when pump operating
20-Sep-21	16:45	CRS	--	--	--	--	--	--	--	--	No air monitor brought to site today.
21-Sep-21	16:50	CRS	#00195905	1	0	1	0	20.8	0	21-Sep-21	At rig surface
23-Sep-21	17:30	CRS	#00195845	12	0	1	0	20.8	7	23-Sep-21	At rig surface
24-Set-21	15:00	CRS	#00195905	9	0	1	0	20.8	2	24-Sep-21	At rig surface
27-Sep-21	17:00	MEOR	#00195854	2	0	1	0	20.8	0	27-Sep-21	At rig surface
28-Sep-21	16:50	MEOR	#00195905	71	0	1	0	20.8	0	28-Sep-21	At rig surface
30-Sep-21	16:46	KBT	#00195845	86	0	1	0	20.8	4	30-Sep-21	At rig surface
1-Oct-21	16:19	KBT	#00195845	14	0	6	0	20.8	4	1-Oct-21	At rig surface
4-Oct-21	16:47	KBT	#00195845	95	0	1	0	20.8	0	4-Oct-21	At rig surface
5-Oct-21	16:12	KBT	#00195845	69	0	1	0	20.8	0	5-Oct-21	At rig surface - near trash pump
6-Oct-21	16:23	KBT	#00195845	--	--	--	--	--	--	6-Oct-21	Very high readings - inferred monitor malfunction
7-Oct-21	--	--	--	--	--	--	--	--	--	--	no drilling, removed cable tool rig, no air monitor installed
8-Oct-21	--	--	--	--	--	--	--	--	--	--	no drilling, no air monitor installed
12-Oct-21	--	--	--	--	--	--	--	--	--	--	no drilling, no air monitor installed
13-Oct-21	--	--	--	--	--	--	--	--	--	--	no drilling, no air monitor installed
14-Oct-21	--	--	--	--	--	--	--	--	--	--	no drilling, no air monitor installed
15-Oct-21	--	--	--	--	--	--	--	--	--	--	no drilling, no air monitor installed
16-Oct-21	--	--	--	--	--	--	--	--	--	--	no drilling, no air monitor installed
17-Oct-21	--	--	--	--	--	--	--	--	--	--	no drilling, no air monitor installed
18-Oct-21	--	--	--	--	--	--	--	--	--	--	no drilling, no air monitor installed
19-Oct-21	--	--	--	--	--	--	--	--	--	--	no drilling, no air monitor installed
20-Oct-21	--	--	--	--	--	--	--	--	--	--	no drilling, no air monitor installed
21-Oct-21	--	--	--	--	--	--	--	--	--	--	no drilling, no air monitor installed
22-Oct-21	--	--	--	--	--	--	--	--	--	--	no drilling, no air monitor installed
23-Oct-21	--	KBT	#00195845	--	--	--	--	--	--	23-Oct-21 (Bump)	no drilling, air monitor installed above cellar due to BOP work, moved by Vital to BH01 midshift
23-Oct-21	6:00	MEOR	#00115959	1	0	1	0	20.8	0	23-Oct-21	Air monitor installed above cellar due to BOP work
24-Oct-21	19:09	KBT	#00115938	1	0	1	0	20.8	0	24-Oct-21	At rig surface
25-Oct-21	6:15	MEOR	#00115959	1	0	1	0	20.8	0	24-Oct-21	At rig surface
25-Oct-21	18:00	MdK	#00115959	1	0	1	0	20.8	0	25-Oct-21 (Bump)	At rig surface
26-Oct-21	1:20	MEOR	#00115938	1	0	1	0	20.8	0	26-Oct-21 (Bump)	At rig surface
26-Oct-21	18:50	MdK	#00115938	1	0	1	0	20.8	0	26-Oct-21 (Bump)	At rig surface
27-Oct-21	6:00	MEOR	#00115959	1	0	1	0	20.8	0	26-Oct-21 (Bump)	At rig surface
27-Oct-21	18:30	MdK	#00115959	1	0	1	0	20.8	0	27-Oct-21 (Bump)	At rig surface

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling
AIR MONITORING LOG

Borehole: SB_BH02

Date	Time	Initials	Air Monitor #	CO (ppm)		H_2S (ppm)		O_2 (%)	CH4 (LEL %) / COMB EX	Date of Last Calibration	Comments
				Peak	TWA	Peak	TWA	Peak	Peak		
28-Oct-21	6:00	MEOR	#00115959	1	0	1	0	20.8	0	27-Oct-21 (Bump)	At rig surface
28-Oct-21	12:50	MdK	#00115938	1	0	1	0	20.8	0	28-Oct-21 (Bump)	At rig surface
29-Oct-21	0:23	KBT	#00115959	1	0	1	0	20.8	0	28-Oct-21 (Bump)	At rig surface
29-Oct-21	10:45	MdK	#00195845	11	0	2	0	20.8	0	29-Oct-21 (Calibrated)	At rig surface
29-Oct-21	22:08	KBT	#00115959	1	0	1	0	20.8	0	29-Oct-21 (Bump)	At rig surface
30-Oct-21	7:15	MdK	#00115938	1	0	1	0	20.8	0	29-Oct-21 (Bump)	At rig surface
30-Oct-21	22:04	KBT	#00115938	1	0	1	0	20.8	0	30-Oct-21 (Bump)	At rig surface
31-Oct-21	7:10	MdK	#00115959	1	0	1	0	20.8	0	30-Oct-21 (Bump)	At rig surface
31-Oct-21	19:47	PRT	#00115938	2	0	1	0	20.8	0	31-Oct-21 (Bump)	At rig surface
1-Nov-21	6:13	KBT	#00115959	1	0	1	0	20.8	0	31-Oct-21 (Bump)	At rig surface
1-Nov-21	16:15	MdK	#00115959	1	0	2	0	20.8	0	31-Oct-21 (Bump)	At rig surface
2-Nov-21	6:32	KBT	#00115938	2	0	1	0	20.8	0	1-Nov-21 (Bump)	At rig surface
2-Nov-21	18:30	MdK	#00115959	1	0	1	0	20.8	0	2-Nov-21 (Bump)	At rig surface
2-Nov-21	23:46	KBT	#00115938	1	0	1	0	20.8	0	2-Nov-21 (Bump)	At rig surface
3-Nov-21	15:00	MdK	#00115959	4	0	2	0	20.8	0	2-Nov-21 (Bump)	At rig surface
3-Nov-21	20:37	KBT	#00115938	1	0	1	0	20.8	0	3-Nov-21 (Bump)	At rig surface
4-Nov-21	9:00	MdK	#00115959	1	0	1	0	20.8	0	3-Nov-21 (Bump)	At rig surface
5-Nov-21	1:23	KBT	#00115959	1	0	1	0	20.8	0	4-Nov-21 (Bump)	At rig surface
6-Nov-21	3:31	KBT	#00115959	12	0	2	0	20.8	0	5-Nov-21 (Bump)	At rig surface
6-Nov-21	13:35	AMSC	#00115959	1	0	2	0	20.8	0	6-Nov-21 (Bump)	At rig surface
6-Nov-21	20:44	KBT	#00115959	1	0	1	0	20.8	0	6-Nov-21 (Bump)	At rig surface
7-Nov-21	19:35	KBT	#00115959	1	0	1	0	20.8	0	7-Nov-21 (Bump)	At rig surface
8-Nov-21	5:00	KBT	#00195845	12	0	1	0	20.8	0	7-Nov-21 (Calibration)	At rig surface
8-Nov-21	20:37	KBT	#00115938	1	0	1	0	20.8	0	8-Nov-21 (Bump)	At rig surface
9-Nov-21	17:15	AMSC	#00115938	20	0	1	0	20.8	0	9-Nov-21 (Bump)	At rig floor
10-Nov-21	0:00	KBT	#00115959	1	0	1	0	20.8	0	9-Nov-21 (Bump)	At rig floor
10-Nov-21	17:00	AMSC	#00115959	12	0	1	0	20.8	0	9-Nov-21 (Bump)	At rig floor
11-Nov-21	4:26	KBT	#00115897	3	0	2	0	20.8	0	10-Nov-21 (Bump)	At rig floor
11-Nov-21	17:10	MEOR	#00115959	1	0	1	0	20.8	0	11-Nov-21 (Bump)	At rig floor
12-Nov-21	1:15	AMSC	#00115938	0	0	0	0	20.8	0	11-Nov-21 (Bump)	At rig floor
12-Nov-21	18:20	MEOR	#00115959	0	0	0	0	20.8	0	12-Nov-21 (Bump)	At rig floor
13-Nov-21	4:25	AMSC	#00115938	1	0	1	0	20.8	0	12-Nov-21 (Bump)	At rig floor
13-Nov-21	18:55	MEOR	#00115959	2	0	1	0	20.8	0	13-Nov-21 (Bump)	At rig floor
14-Nov-21	6:30	AMSC	#00115938	1	0	2	0	20.8	0	13-Nov-21 (Bump)	At rig floor
14-Nov-21	18:40	MEOR	#00115959	25	0	1	0	20.8	0	14-Nov-21 (Bump)	At rig floor
15-Nov-21	2:10	AMSC	#00115897	1	0	1	0	20.8	0	14-Nov-21 (Bump)	At rig floor
15-Nov-21	18:40	MEOR	#00115959	15	0	1	0	20.8	0	15-Nov-21 (Bump)	At rig floor
16-Nov-21	5:50	AMSC	#00115897	1	0	1	0	20.8	0	15-Nov-21 (Bump)	At rig floor
16-Nov-21	18:25	MEOR	#00115938	2	0	1	0	20.8	0	16-Nov-21 (Bump)	At rig floor
17-Nov-21	5:00	AMSC	#00115959	1	0	1	0	20.8	0	16-Nov-21 (Bump)	At rig floor
17-Nov-21	18:50	MEOR	#00115938	1	0	1	0	20.8	0	17-Nov-21 (Bump)	At rig floor
18-Nov-21	5:25	AMSC	#00115959	1	0	1	0	20.8	0	17-Nov-21 (Bump)	At rig floor
18-Nov-21	18:50	MEOR	#00115938	1	0	1	0	20.8	0	18-Nov-21 (Bump)	At rig floor
19-Nov-21	1:50	MdK	#00115959	1	0	1	0	20.8	0	18-Nov-21 (Bump)	At rig floor
19-Nov-21	18:40	MEOR	#00115938	1	0	1	0	20.8	0	19-Nov-21 (Bump)	At rig floor
20-Nov-21	1:20	MdK	#00115959	1	0	1	0	20.8	0	19-Nov-21 (Bump)	At rig floor
21-Nov-21	4:20	MdK	#00115938	1	0	1	0	20.8	0	20-Nov-21 (Bump)	At rig floor
21-Nov-21	18:40	MEOR	#00115897	2	0	2	0	20.8	0	21-Nov-21 (Bump)	At rig floor
22-Nov-21	0:30	MdK	#00115897	2	0	2	0	20.8	0	21-Nov-21 (Bump)	At rig floor
22-Nov-21	18:00	MEOR	#00115938	1	0	1	0	20.8	0	22-Nov-21 (Bump)	At rig floor

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling
AIR MONITORING LOG

Borehole: SB_BH02

Date	Time	Initials	Air Monitor #	CO (ppm)		H_2S (ppm)		O_2 (%)	CH4 (LEL %) / COMB EX	Date of Last Calibration	Comments
				Peak	TWA	Peak	TWA	Peak	Peak		
23-Nov-21	1:30	MdK	#00115959	1	0	1	0	20.8	0	22-Nov-21 (Bump)	At rig floor
23-Nov-21	17:30	MEOR	#00115938	1	0	1	0	20.8	0	23-Nov-21 (Bump)	At rig floor
24-Nov-21	4:50	MdK	#00115959	120	0	1	0	20.8	0	23-Nov-21 (Bump)	At rig floor
24-Nov-21	18:00	MEOR	#00115938	20	0	1	0	20.8	0	24-Nov-21 (Bump)	At rig floor
25-Nov-21	5:00	MdK	#00115959	1	0	1	0	20.8	0	24-Nov-21 (Bump)	At rig floor
25-Nov-21	17:11	KBT	#00115897	1	0	1	0	20.8	0	25-Nov-21 (Bump)	At rig floor
26-Nov-21	5:00	MdK	#00195845	20	0	8	0	20.8	0	25-Nov-21 (Cal)	At rig floor
26-Nov-21	9:36	KBT	#00195845	22	0	7	0	20.8	0	25-Nov-21 (Cal)	At rig floor
27-Nov-21	4:00	MdK	#00115897	1	0	1	0	20.8	0	25-Nov-21 (Bump)	At rig floor
27-Nov-21	16:10	KBT	#00115959	1	0	1	0	20.8	0	27-Nov-21 (Bump)	At rig floor
28-Nov-21	6:00	MdK	#00115897	1	0	1	0	20.8	0	27-Nov-21 (Bump)	At rig floor
28-Nov-21	16:32	KBT	#00115959	1	0	1	0	20.8	0	28-Nov-21 (Bump)	At rig floor
29-Nov-21	5:30	MdK	#00115897	1	0	5	0	20.8	0	28-Nov-21 (Bump)	At rig floor
29-Nov-21	17:45	KBT	#00115959	3	0	1	0	20.8	0	29-Nov-21 (Bump)	At rig floor
30-Nov-21	5:45	MdK	#00115897	1	0	1	0	20.8	0	29-Nov-21 (Bump)	At rig floor
30-Nov-21	15:47	KBT	#00115959	1	0	1	0	20.8	0	30-Nov-21 (Bump)	At rig floor
1-Dec-21	5:45	MdK	#00195845	18	0	6	0	20.8	0	30-Nov-21 (Cal)	At rig floor
1-Dec-21	15:19	KBT	#00115897	1	0	1	0	20.8	0	01-Dec-21 (Bump)	At rig floor
2-Dec-21	5:45	MdK	#00115959	2	0	1	0	20.8	0	01-Dec-21 (Bump)	At rig floor
2-Dec-21	15:19	KBT	#00115897	1	0	1	0	20.8	0	02-Dec-21 (Bump)	At rig floor
3-Dec-21	6:00	MdK	#00115959	1	0	1	0	20.8	0	02-Dec-21 (Bump)	At rig floor
3-Dec-21	15:50	KBT	#00115897	8	0	2	0	20.8	0	03-Dec-21 (Cal)	At rig floor
4-Dec-21	5:45	MdK	#00195854	14	0	1	0	20.8	0	03-Dec-21 (Cal)	At rig floor
4-Dec-21	14:46	KBT	#00115959	2	0	1	0	20.8	0	04-Dec-21 (Bump)	At rig floor
5-Dec-21	6:30	MdK	#00115897	1	0	1	0	20.8	0	04-Dec-21 (Bump)	At rig floor
5-Dec-21	15:58	KBT	#00195845	1	0	1	0	20.8	0	05-Dec-21 (Bump)	At rig floor
6-Dec-21	6:00	MdK	#00115897	1	0	2	0	20.8	0	05-Dec-21 (Bump)	At rig floor
6-Dec-21	16:58	KBT	#00195892	1	0	2	0	20.8	0	06-Dec-21 (Cal)	At rig floor
7-Dec-21	6:45	MEOR	#00115897	1	0	1	0	20.8	0	06-Dec-21 (Bump)	At rig floor
7-Dec-21	17:35	KBT	#00195905	60	0	20	0	20.8	58	07-Dec-21 (Cal)	At rig floor, cementing and tripping out. Very high readings Infered monitor error
8-Dec-21	6:05	MEOR	#00115897	1	0	1	0	20.8	0	08-Dec-21 (Bump)	At rig floor
8-Dec-21	15:46	KBT	#00195854	22	0	6	0	20.8	11	08-Dec-21 (Cal)	At rig floor
9-Dec-21	5:50	MEOR	#00115959	1	0	1	0	20.8	0	08-Dec-21 (Bump)	At rig floor
9-Dec-21	18:47	KBT	#00115897	14	0	1	0	20.8	0	09-Dec-21 (Bump)	At rig floor
10-Dec-21	6:20	MEOR	#00115959	1	0	1	0	20.8	0	10-Dec-21 (Bump)	At rig floor
10-Dec-21	18:45	KBT	#00195854	13	0	1	0	20.8	0	10-Dec-21 (Cal)	At rig floor
11-Dec-21	5:45	MEOR	#00115959	1	0	1	0	20.8	0	10-Dec-21 (Cal)	At rig floor
11-Dec-21	18:34	KBT	#00115897	1	0	1	0	20.8	0	11-Dec-21 (Bump)	At rig floor
12-Dec-21	17:40	KBT	#00195892	1	0	2	0	20.8	0	12-Dec-21 (Cal)	At rig floor
13-Dec-21	6:20	MEOR	#00115897	2	0	2	0	20.8	0	13-Dec-21 (Bump)	At rig floor
14-Dec-21	18:15	AMSC	#00115897	1	0	2	0	20.8	0	14-Dec-21 (Bump)	At rig floor
15-Dec-21	5:40	MEOR	#00195892	0	0	1	0	20.8	0	14-Dec-21 (Bump)	At rig floor
15-Dec-21	18:30	AMSC	#00195854	15	0	2	0	20.8	0	15-Dec-21 (Bump)	At rig floor
16-Dec-21	5:55	MEOR	#00115897	1	0	1	0	20.8	0	15-Dec-21 (Bump)	At rig floor
16-Dec-21	18:40	AMSC	#00195854	17	0	1	0	20.8	0	16-Dec-21 (Bump)	At rig floor
17-Dec-21	5:45	MEOR	#00115897	1	0	1	0	20.8	0	16-Dec-21 (Bump)	At rig floor
17-Dec-21	15:30	AMSC	#00195854	12	0	1	0	20.8	0	17-Dec-21 (Bump)	At rig floor
18-Dec-21	6:00	MEOR	#00115897	1	0	2	0	20.8	0	17-Dec-21 (Bump)	At rig floor
18-Dec-21	17:45	AMSC	#00115959	1	0	1	0	20.8	0	18-Dec-21 (Bump)	At rig floor
19-Dec-21	6:20	MEOR	#00195892	3	0	1	0	20.8	0	18-Dec-21 (Bump)	At rig floor

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling
AIR MONITORING LOG

Borehole: SB_BH02

Date	Time	Initials	Air Monitor #	CO (ppm)		H_2S (ppm)		O_2 (%)	CH4 (LEL %) / COMB EX	Date of Last Calibration	Comments
				Peak	TWA	Peak	TWA	Peak	Peak		
19-Dec-21	22:25	MEOR	#00195905	6	0	1	0	20.8	0	19-Dec-21 (Bump)	At rig floor
20-Dec-21	15:15	MdK	#00195854	16	0	2	0	20.8	8	19-Dec-21 (Bump)	At rig floor
21-Dec-21	5:00	MEOR	#00195905	1	0	1	0	20.8	0	20-Dec-21 (Cal)	At rig floor
21-Dec-21	17:05	MdK	#00195854	22	0	5	0	20.8	9	21-Dec-21 (Bump)	At rig floor
22-Dec-21	5:20	MEOR	#00195905	0	0	1	0	20.8	0	21-Dec-21 (Cal)	At rig floor
22-Dec-21	17:30	MdK	#00195854	14	0	2	0	20.8	0	22-Dec-21 (Bump)	At rig floor
31-Dec-21	4:58	KBT	#00195892	2	0	2	0	20.8	0	30-Dec-21 (Cal)	At rig floor
1-Jan-22	4:36	KBT	#00195854	13	0	1	0	20.8	0	31-Dec-21 (Cal)	At rig floor
1-Jan-22	16:30	MdK	#00115897	1	0	1	0	20.8	0	1-Jan-22 (Bump)	At rig floor
2-Jan-22	5:14	KBT	#00195854	12	0	2	0	20.8	0	01-Jan-22 (Cal)	At rig floor
2-Jan-22	15:30	MdK	#00115897	1	0	1	0	20.8	0	2-Jan-22 (Bump)	At rig floor
2-Jan-22	15:30	MdK	#00195892	1	0	1	0	20.8	0	2-Jan-22 (Cal)	At rig floor
3-Jan-22	4:42	KBT	#00195854	1	0	1	0	20.8	0	2-Jan-22 (Cal)	Below rig floor
3-Jan-22	14:00	MdK	#00115897	1	0	1	0	20.8	0	3-Jan-22 (Bump)	At rig floor
3-Jan-22	14:00	MdK	#00195905	1	0	1	0	20.8	0	3-Jan-22 (Cal)	Below rig floor
3-Jan-22	14:00	MdK	#00195845	1	0	1	0	20.8	0	3-Jan-22 (Cal)	Core Logging bench
4-Jan-22	5:58	KBT	#00195854	59	0	20	0	20.8	58	3-Jan-22 (Cal)	At rig floor, Very high readings Infered monitor error
4-Jan-22	18:30	MdK	#00195845	1	0	1	0	20.8	0	4-Jan-22 (Cal)	At rig floor
5-Jan-22	6:26	KBT	#00195845	15	0	5	0	20.8	0	4-Jan-22 (Cal)	At rig floor
5-Jan-22	13:10	MdK	#00115897	1	0	1	0	20.8	4	5-Jan-22 (Bump)	At rig floor
5-Jan-22	18:45	MdK	#00195905	1	0	1	0	20.8	0	5-Jan-22 (Cal)	At rig floor
6-Jan-22	6:31	KBT	#00195845	12	0	1	0	20.8	0	5-Jan-22 (Cal)	At rig floor
6-Jan-22	18:40	PRT	#00115897	11	0	1	0	20.8	5	6-Jan-22 (Bump)	At rig floor
6-Jan-22	20:50	KBT	#00115897	0	0	0	0	20.8	5	6-Jan-22 (Bump)	At rig floor
7-Jan-22	6:13	KBT	#00115897	2	0	5	0	20.8	0	6-Jan-22 (Bump)	At rig floor
7-Jan-22	19:25	KBT	#00195905	1	0	1	0	20.8	0	7-Jan-22 (Cal)	At rig floor
8-Jan-22	5:28	KBT	#00115897	14	0	7	0	20.8	0	7-Jan-22 (Bump)	At rig floor
8-Jan-22	17:34	CRS	#00195845	16	0	2	0	20.8	4	8-Jan-22 (Bump)	At rig floor
9-Jan-22	6:06	KBT	#00195905	1	0	1	0	20.8	0	8-Jan-22 (Bump)	At rig floor
9-Jan-22	18:31	CRS	#00115897	11	0	6	0	20.8	0	9-Jan-22 (Bump)	At rig floor
10-Jan-22	6:25	KBT	#00195845	21	0	5	0	20.8	4	9-Jan-22 (Bump)	At rig floor
12-Jan-22	19:16	KBT	#00115897	1	0	5	0	20.8	0	12-Jan-22 (Bump)	At rig floor
13-Jan-22	6:04	KBT	#00195854	13	0	1	0	20.8	5	12-Jan-22 (Bump)	At rig floor
13-Jan-22	18:55	MEOR	#00115959	1	0	1	0	20.8	0	13-Jan-22 (Bump)	At rig floor
14-Jan-22	5:35	KBT	#00195854	17	0	2	0	20.8	4	13-Jan-22 (Bump)	At rig floor
14-Jan-22	18:45	MEOR	#00115959	1	0	1	0	20.8	0	14-Jan-22 (Bump)	At rig floor
15-Jan-22	6:07	KBT	#00195845	25	0	7	0	20.8	0	14-Jan-22 (Bump)	At rig floor
15-Jan-22	18:40	MEOR	#00115897	13	0	8	0	20.8	0	15-Jan-22 (Bump)	At rig floor
16-Jan-22	5:40	AMSC	#00115897	12	0	2	0	20.8	0	15-Jan-22 (Bump)	At rig floor
16-Jan-22	17:50	MEOR	#00115959	1	0	2	0	20.8	0	16-Jan-22 (Bump)	At rig floor
17-Jan-22	1:20	AMSC	#00195892	1	0	1	0	20.8	0	16-Jan-22 (Bump)	At rig floor
17-Jan-22	18:00	MEOR	#00195845	20	0	5	0	20.8	0	17-Jan-22 (Cal)	At rig floor
18-Jan-22	6:20	AMSC	#00195905	24	0	1	0	20.8	0	17-Jan-22 (Bump)	At rig floor
18-Jan-22	18:35	MEOR	#00195854	14	0	1	0	20.8	0	18-Jan-22 (Cal)	At rig floor
19-Jan-22	6:25	AMSC	#00195845	24	0	6	0	20.8	0	18-Jan-22 (Bump)	At rig floor
19-Jan-22	18:10	MEOR	#00195905	15	0	3	0	20.8	13	19-Jan-22 (Bump)	At rig floor
20-Jan-22	6:30	AMSC	#00195854	16	0	6	0	20.8	13	19-Jan-22 (Bump)	At rig floor
20-Jan-22	18:40	MEOR	#00195892	13	0	5	0	20.8	0	20-Jan-22 (Bump)	At rig floor
21-Jan-22	6:00	AMSC	#00195905	9	0	1	0	20.8	5	20-Jan-22 (Bump)	At rig floor
21-Jan-22	18:20	MEOR	#00195892	15	0	5	0	20.8	0	21-Jan-22 (Bump)	At rig floor

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling
AIR MONITORING LOG

Borehole: SB_BH02

Date	Time	Initials	Air Monitor #	CO (ppm)		H_2S (ppm)		O_2 (%)	CH4 (LEL %) / COMB EX	Date of Last Calibration	Comments
				Peak	TWA	Peak	TWA	Peak	Peak		
22-Jan-22	6:15	AMSC	#00195854	34	0	5	0	20.8	11	21-Jan-22 (Bump)	At rig floor
22-Jan-22	18:40	MEOR	#00195845	22	0	5	0	20.8	0	22-Jan-22 (Bump	At rig floor
23-Jan-22	6:10	AMSC	#00195905	7	0	2	0	20.8	5	22-Jan-22 (Bump	At rig floor
23-Jan-22	18:35	AMSC	#00195892	2	0	1	0	20.8	0	23-Jan-22 (Bump)	At rig floor
24-Jan-22	6:20	MdK	#00195854	18	0	1	0	20.8	0	23-Jan-22 (Bump)	At rig floor
24-Jan-22	19:00	MdK	#00195905	5	0	1	0	20.8	0	24-Jan-22 (Bump)	At rig floor
25-Jan-22	6:00	MdK	#00195845	25	0	7	0	20.8	0	24-Jan-22 (Bump)	At rig floor
25-Jan-22	18:22	KBT	#00195854	15	0	1	0	20.8	0	25-Jan-22 (Bump)	At rig floor
26-Jan-22	6:50	MdK	#00195905	38	0	1	0	20.8	0	25-Jan-22 (Bump)	At rig floor
26-Jan-22	18:09	KBT	#00195854	15	0	1	0	20.8	0	26-Jan-22 (Cal)	At rig floor
27-Jan-22	6:00	MdK	#00195905	1	0	1	0	20.8	0	26-Jan-22 (Cal)	At rig floor
27-Jan-22	18:08	KBT	#00195854	12	0	2	0	20.8	0	27-Jan-22 (Bump)	At rig floor
28-Jan-22	18:47	KBT	#00195854	14	0	2	0	20.8	0	28-Jan-22 (Bump)	At rig floor
29-Jan-22	6:15	MdK	#00195845	25	0	8	0	20.8	0	28-Jan-22 (Cal)	At rig floor
29-Jan-22	18:22	KBT	#00195854	21	0	1	0	20.8	0	29-Jan-22 (Bump)	At rig floor
30-Jan-22	5:45	MdK	#00195905	1	0	1	0	20.8	0	29-Jan-22 (Cal)	At rig floor
30-Jan-22	18:08	KBT	#00195854	14	0	1	0	208	0	30-Jan-22 (Cal)	At rig floor
31-Jan-22	6:15	MdK	#00195845	16	0	2	0	20.8	0	30-Jan-22 (Cal)	At rig floor
31-Jan-22	18:09	KBT	#00195854	13	0	2	0	20.8	0	31-Jan-22 (Bump)	At rig floor
1-Feb-22	5:30	MdK	#00195892	2	0	5	0	20.8	0	31-Jan-22 (Cal)	At rig floor
1-Feb-22	18:12	KBT	#00195854	12	0	1	0	20.8	0	1-Feb-22 (Bump)	At rig floor
2-Feb-22	6:20	MdK	#00195845	18	0	5	0	20.8	0	1-Feb-22 (Cal)	At rig floor
2-Feb-22	18:04	KBT	#00195854	18	0	5	0	20.8	0	2-Feb-22 (Cal)	At rig floor
3-Feb-22	18:40	AMSC	#00195905	2	0	1	0	20.8	0	3-Feb-22 (Bump)	At rig floor
4-Feb-22	6:00	MdK	#00195854	14	0	1	0	20.8	0	3-Feb-22 (Bump)	At rig floor
4-Feb-22	18:20	AMSC	#00195845	25	0	8	0	20.8	0	4-Feb-22 (Bump)	At rig floor
5-Feb-22	5:00	MdK	#00195854	14	0	2	0	20.8	0	4-Feb-22 (Bump)	At rig floor
5-Feb-22	18:00	AMSC	#00195892	11	0	5	0	20.8	0	5-Feb-22 (Cal)	At rig floor
6-Feb-22	5:30	MdK	#00195854	2	0	1	0	20.8	0	5-Feb-22 (Cal)	At rig floor
6-Feb-22	18:20	AMSC	#00195845	11	0	2	0	20.8	0	6-Feb-22 (Bump)	At rig floor
7-Feb-22	5:55	MEOR	#00195854	2	0	1	0	20.8	0	6-Feb-22 (Bump)	At rig floor
7-Feb-22	18:15	AMSC	#00195905	1	0	1	0	20.8	0	7-Feb-22 (Bump)	At rig floor
8-Feb-22	4:30	MEOR	#00195892	2	0	2	0	20.8	0	7-Feb-22 (Bump)	At rig floor
8-Feb-22	18:10	AMSC	#00195854	17	0	2	0	20.8	9	8-Feb-22 (Bump)	At rig floor
9-Feb-22	5:40	MEOR	#00195892	1	0	2	0	20.8	0	8-Feb-22 (Bump)	At rig floor
9-Feb-22	18:15	AMSC	#00195845	5	0	2	0	20.8	12	9-Feb-22 (Bump)	At rig floor
10-Feb-22	6:10	MEOR	#00195892	6	0	2	0	20.8	0	9-Feb-22 (Cal)	At rig floor
10-Feb-22	17:10	AMSC	#00195905	11	0	2	0	20.8	7	10-Feb-22 (Bump)	At rig floor
11-Feb-22	5:25	MEOR	#00195845	2	0	1	0	20.8	0	10-Feb-22 (Cal)	At rig floor
11-Feb-22	17:45	AMSC	#00195905	4	0	1	0	20.8	0	11-Feb-22 (Bump)	At rig floor
12-Feb-22	6:15	MEOR	#00195854	19	0	5	0	20.8	0	11-Feb-22 (Bump)	At rig floor
12-Feb-22	18:10	AMSC	#00195905	14	0	1	0	20.8	10	12-Feb-22 (Bump)	At rig floor
13-Feb-22	5:40	MEOR	#00195892	11	0	5	0	20.8	0	12-Feb-22 (Cal)	At rig floor
13-Feb-22	18:20	AMSC	#00195845	12	0	5	0	20.8	0	13-Feb-22 (Bump)	At rig floor
14-Feb-22	6:05	MEOR	#00195854	13	0	1	0	20.8	0	13-Feb-22 (Cal)	At rig floor
14-Feb-22	18:05	AMSC	#00195905	15	0	1	0	20.8	0	14-Feb-22 (Bump)	At rig floor
15-Feb-22	6:00	MEOR	#00195845	22	0	3	0	20.8	0	14-Feb-22 (Cal)	At rig floor
15-Feb-22	18:15	AMSC	#00195854	12	0	5	0	20.8	0	15-Feb-22 (Bump)	At rig floor
16-Feb-22	6:00	MEOR	#00195845	2	0	1	0	20.8	0	15-Feb-22 (Bump)	At rig floor
16-Feb-22	18:20	AMSC	#00195905	1	0	1	0	20.8	0	16-Feb-22 (Bump)	At rig floor

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling
AIR MONITORING LOG

Borehole: SB_BH02

Date	Time	Initials	Air Monitor #	CO (ppm)		H_2S (ppm)		O_2 (%)	CH4 (LEL %) / COMB EX	Date of Last Calibration	Comments
				Peak	TWA	Peak	TWA	Peak	Peak		
17-Feb-22	6:00	MEOR	#00195892	1	0	5	0	20.8	0	16-Feb-22 (Cal)	At rig floor
17-Feb-22	17:45	MdK	#00195854	66	0	20	0	15.7	58	17-Feb-22 (Cal)	At rig floor
18-Feb-22	6:14	KBT	#00195845	24	0	9	0	20.8	0	17-Feb-22 (Cal)	At rig floor
18-Feb-22	17:50	MdK	#00195854	15	0	2	0	20.8	0	18-Feb-22 (Cal)	At rig floor
19-Feb-22	6:00	KBT	#00195905	1	0	1	0	20.8	0	18-Feb-22 (Cal)	At rig floor
19-Feb-22	17:30	MdK	#00195854	18	0	5	0	20.8	0	19-Feb-22 (Bump)	At rig floor
20-Feb-22	6:11	KBT	#00195892	2	0	5	0	20.8	0	19-Feb-22 (Cal)	At rig floor
20-Feb-22	17:30	MdK	#00195905	1	0	1	0	20.8	0	20-Feb-22 (Bump)	At rig floor
21-Feb-22	6:04	KBT	#00195892	1	0	2	0	20.8	0	20-Feb-22 (Bump)	At rig floor
21-Feb-22	14:00	MdK	#00195854	12	0	2	0	20.8	0	21-Feb-22 (Cal)	At rig floor
22-Feb-22	6:29	KBT	#00195905	24	0	1	0	20.8	0	21-Feb-22 (Bump)	At rig floor
22-Feb-22	18:00	MdK	#00195892	2	0	2	0	20.8	0	22-Feb-22 (Bump)	At rig floor
23-Feb-22	6:24	KBT	#00195905	21	0	1	0	20.8	0	22-Feb-22 (Bump)	At rig floor
23-Feb-22	18:00	MdK	#00195845	25	0	7	0	20.8	0	23-Feb-22 (Bump)	At rig floor
24-Feb-22	5:10	KBT	#00195905	1	0	1	0	20.8	0	23-Feb-22 (Bump)	At rig floor
24-Feb-22	18:00	MdK	#00195892	1	0	5	0	20.8	0	24-Feb-22 (Cal)	At rig floor
25-Feb-22	6:16	KBT	#00195854	16	0	1	0	20.8	0	24-Feb-22 (Cal)	At rig floor
26-Feb-22	18:00	MdK	#00195905	1	0	1	0	20.8	0	26-Feb-22 (Cal)	At rig floor
27-Feb-22	6:02	KBT	#00195892	1	0	2	0	20.8	0	26-Feb-22 (Bump)	At rig floor
27-Feb-22	17:30	MdK	#00195905	1	0	1	0	20.8	0	27-Feb-22 (Cal)	At rig floor
28-Feb-22	6:27	KBT	#00195892	2	0	5	0	20.8	0	27-Feb-22 (Cal)	At rig floor
28-Feb-22	17:45	MdK	#00195854	12	0	1	0	20.7	0	28-Feb-22 (Cal)	At rig floor
1-Mar-22	6:22	KBT	#00115959	1	0	1	0	20.8	0	28-Feb-22 (Bump)	At rig floor
1-Mar-22	17:30	MdK	#00195905	1	0	1	0	20.8	0	1-Mar-22 (Bump)	At rig floor
2-Mar-22	6:00	KBT	#00195892	1	0	5	0	20.8	0	1-Mar-22 (Bump)	At rig floor
2-Mar-22	18:45	MdK	#00195854	12	0	2	0	20.8	0	2-Mar-22 (Cal)	At rig floor
3-Mar-22	6:26	KBT	#00195905	1	0	1	0	20.8	0	2-Mar-22 (Cal)	At rig floor
3-Mar-22	18:00	MdK	#00115959	2	0	1	0	20.8	0	3-Mar-22 (Bump)	At rig floor. O2 Low peak at 20.4
4-Mar-22	5:45	MEOR	#00195892	2	0	5	0	20.8	0	3-Mar-22 (Bump)	At rig floor
4-Mar-22	18:30	MdK	#00195905	1	0	1	0	20.8	0	4-Mar-22 (Bump)	At rig floor
5-Mar-22	6:10	MEOR	#00195854	1	0	1	0	20.8	0	4-Mar-22 (Bump)	At rig floor
5-Mar-22	17:50	MdK	#00195905	7	0	1	0	20.8	2	5-Mar-22 (Bump)	At rig floor
6-Mar-22	5:45	MEOR	#00195892	1	0	5	0	20.8	0	5-Mar-22 (Bump)	At rig floor
6-Mar-22	17:50	MdK	#00195905	19	0	1	0	20.8	0	6-Mar-22 (Bump)	At rig floor. O2 low peak at 19.8
7-Mar-22	6:15	MEOR	#00195854	13	0	2	0	20.8	0	6-Mar-22 (Cal)	At rig floor
7-Mar-22	18:50	MdK	#00195905	1	0	1	0	20.8	1	7-Mar-22 (Bump)	At rig floor
8-Mar-22	5:40	MEOR	#00195854	14	0	2	0	20.8	0	7-Mar-22 (Bump)	At rig floor
8-Mar-22	18:05	MdK	#00195905	10	0	2	0	19.7	0	8-Mar-22 (Bump)	At rig floor
9-Mar-22	6:10	MEOR	#00195854	11	0	1	0	20.8	0	8-Mar-22 (Bump)	At rig floor
9-Mar-22	18:30	MdK	#00195905	10	0	1	0	20.8	0	9-Mar-22 (Bump)	At rig floor. O2% Low peak at 19.5
10-Mar-22	5:35	MEOR	#00195854	3	0	2	0	20.8	0	9-Mar-22 (Cal)	At rig floor
10-Mar-22	18:15	AMSC	#00195905	18	0	6	0	20.8	0	10-Mar-22 (Bump)	At rig floor. O2% Low peak at 18.9
11-Mar-22	5:45	MEOR	#00195854	11	0	1	0	20.8	0	10-Mar-22 (Bump)	At rig floor. O2% Low peak at 20.5
11-Mar-22	18:30	AMSC	#00195905	35	0	6	0	20.8	0	11-Mar-22 (Bump)	At rig floor. O2% low peak at 19.0
12-Mar-22	6:10	MEOR	#00195854	2	0	1	0	20.8	0	11-Mar-22 (Cal)	At rig floor. O2% Low peak at 20.3
12-Mar-22	18:15	AMSC	#00195905	19	0	2	0	20.8	0	12-Mar-22 (Bump)	At rig floor, O2% Low peak at 19.3
13-Mar-22	6:00	MEOR	#00195854	16	0	2	0	20.8	0	12-Mar-22 (Bump)	At rig floor, O2% Low peak at 20.4
13-Mar-22	18:30	AMSC	#00115959	26	0	9	0	20.8	0	13-Mar-22 (Bump)	At rig floor

Geofirma DATA QUALITY CONFIRMATION (DQC) Form: WP02 Drilling
AIR MONITORING LOG

Borehole: SB_BH02

Date	Time	Initials	Air Monitor #	CO (ppm)		H_2S (ppm)		O_2 (%)	CH4 (LEL %) / COMB EX	Date of Last Calibration	Comments
				Peak	TWA	Peak	TWA	Peak	Peak		
14-Mar-22	6:10	MEOR	#00195854	14	0	1	0	20.8	0	13-Mar-22 (Bump)	At rig floor, O2% Low peak at 20.3
14-Mar-22	18:30	AMSC	#00195905	20	0	3	0	20.8	10	14-Mar-22 (Bump)	Ar rig floor, O2% Low peak at 19.1
15-Mar-22	5:45	MEOR	#00195854	12	0	5	0	20.8	0	14-Mar-22 (Bump)	Ar rig floor, O2% Low peak at 20.8
15-Mar-22	18:57	KBT	#00195905	2	0	2	0	20.8	0	15-Mar-22 (Bump)	At rig floor
16-Mar-22	5:50	MEOR	#00195854	13	0	2	0	20.8	0	15-Mar-22 (Cal)	Ar rig floor, O2% Low peak at 20.8
16-Mar-22	18:10	KBT	#00195905	1	0	5	0	20.8	0	16-Mar-22 (Bump)	At rig floor
17-Mar-22	5:45	MEOR	#00195854	1	0	1	0	20.8	0	16-Mar-22 (Cal)	Ar rig floor, O2% Low peak at 20.8
17-Mar-22	18:21	KBT	#00195905	2	0	1	0	20.8	0	17-Mar-22 (Bump)	Ar rig floor, O2% Low peak at 19.6
18-Mar-22	5:55	MEOR	#00195854	1	0	1	0	20.8	0	17-Mar-22 (Bump)	Ar rig floor, O2% Low peak at 20.8
18-Mar-22	18:44	KBT	#00195905	1	0	2	0	20.8	0	18-Mar-22 (Bump)	Ar rig floor, O2% Low peak at 18.7
19-Mar-22	6:10	MEOR	#00195854	12	0	5	0	20.8	0	18-Mar-22 (Cal)	Ar rig floor, O2% Low peak at 20.8
19-Mar-22	17:37	KBT	#00195905	50	0	5	0	20.8	10	19-Mar-22 (Bump)	At rig floor, Very high readings Infered monitor error, O2% Low peak at 19.0
20-Mar-22	5:30	MEOR	#00195854	11	0	5	0	20.8	0	19-Mar-22 (Cal)	Ar rig floor, O2% Low peak at 20.3
20-Mar-22	17:45	KBT	#00195905	3	0	2	0	20.8	0	20-Mar-22 (Bump)	Ar rig floor, O2% Low peak at 20.8
21-Mar-22	6:25	MEOR	#00195854	13	0	5	0	20.8	0	20-Mar-22 (Cal)	Ar rig floor, O2% Low peak at 20.8
21-Mar-22	18:28	KBT	#00195905	1	0	5	0	20.8	0	21-Mar-22 (Bump)	Ar rig floor, O2% Low peak at 19.9
22-Mar-22	5:45	MEOR	#00195854	12	0	5	0	20.8	0	21-Mar-22 (Cal)	Ar rig floor, O2% Low peak at 20.8
22-Mar-22	17:31	KBT	#00195905	36	0	10	0	20.8	0	22-Mar-22 (Bump)	At rig floor, Very high readings Infered monitor error, O2% Low peak at 19.1
23-Mar-22	6:03	CRS	#00195854	11	0	1	0	20.8	0	22-Mar-22 (Bump)	Ar rig floor, O2% Low peak at 20.3
23-Mar-22	18:50	KBT	#00195905	8	0	6	0	20.8	3	23-Mar-22 (Bump)	Ar rig floor, O2% Low peak at 19.8
24-Mar-22	6:30	CRS	#00195854	14	0	2	0	20.8	0	23-Mar-22 (Bump)	Ar rig floor, O2% Low peak at 20.8
24-Mar-22	5:51	KBT	#00195905	1	0	2	0	20.8	1	24-Mar-22 (Bump)	Ar rig floor, O2% Low peak at 20.8

Noise Monitoring Record

SB_BH02

Monitoring Device:

Casella CEL-63X, Sound Level Meter
SN: 2382932

O Reg. 381/15

- No worker exposed to TWA over 85 dBA for an 8 hr shift
- No worker exposed to TWA over 83 dBA for a 12 hr shift
- No unprotected exposures over 115 dBA

Date	Time	Reading (dB)	Location	Activity
24-Oct-21	18:40	79.8	Core Logging Trailer Door	Coring
24-Oct-21	18:40	68.1	South fence line	Coring
24-Oct-21	18:40	73.3	South fence line	Coring
24-Oct-21	18:40	77	Vital Seacan	Coring
24-Oct-21	18:40	81.5	Drilling Monitor Station	Coring
25/Oct/21	10:15	81.1	Core Logging Trailer Door	Coring
25/Oct/21	10:15	85.8	At drill rig	Coring
25/Oct/21	10:15	81.7	At drill rig	Coring
25/Oct/21	10:15	79.7	Vital Seacan	Coring
25/Oct/21	10:15	83.9	Drilling Monitor Station	Coring
25/Oct/21	10:15	72.1	South fence line	Coring
28/Oct/21	5:10	80.3	Core Logging Trailer Door	Coring
28/Oct/21	5:10	86.5	At drill rig	Coring
28/Oct/21	5:10	78.5	Vital Seacan	Coring
28/Oct/21	5:10	83.2	Drilling Monitor Station	Coring
28/Oct/21	5:10	69.9	South fence line	Coring
28/Oct/21	5:10	83	East fence line/Frac Tank	Coring
28/Oct/21	5:10	75.8	Lab trailer	Coring
28-Oct-21	15:15	80.4	Core Logging Trailer Door	Coring
28-Oct-21	15:15	80.2	Lab trailer	Coring
28-Oct-21	15:15	81.4	Drilling Monitor Station	Coring
28-Oct-21	16:30	84.7	At drill rig	Coring
28-Oct-21	16:30	81.7	At drill rig	Coring
28-Oct-21	16:30	69.9	South fence line	Coring
28-Oct-21	16:30	77.4	Vital Seacan	Coring
5-Nov-21	11:45	80.5	Core Logging Trailer Door	Air Hammering
5-Nov-21	11:45	90.8	Compressor	Air Hammering
6-Nov-21	11:45	86.7	At drill rig	Air Hammering
7-Nov-21	11:45	76.2	Office trailer	Air Hammering
5-Nov-21	11:45	78.8	Washrooms	Air Hammering

Location	Average Noise Level Reading (dB)	
	All Drilling Activities	Coring
Core Logging Trailer Door	80	80
East fence line/Frac Tank	83	83
South fence line	71	71
Vital Seacan	78	78
Drilling Monitor Station	83	83
At drill rig	85	84

BH02_NoiseLevel Measurements
Prepared by: MdK
Reviwed by: SNS
Date: 5-Dec-22

GEOFIRMA ENGINEERING