**Oman Drilling Project – BA1B – Lead Scientist On-Site Log (LSOS).**

**24th January 2018 to 12th February 2018**

This is an electronic version of the blue on-site logbook.

**BA1 22.881231ºN, 58.70059ºE, Altitude 583 m**

Hole BA1B. Vertical hole

***Overview***

**DAILY UPDATES**

**24th January 2018, Wednesday**

**On-site: NW, PK, LC, LN, EM, EG, ARE and DCO film crew + Doug**

**Setting up the site**

**LT, AT, EE, KR, JN arrived at 11:00 on site**

**LSOS: Peter Kelemen**

Arrived on site: 09:00

Rig started:

Rotation started: 14:02

Summary of the day:

Water Table: 1st Feb ~11 m

5th Feb ~ 11.4 m

We cored ~50 cm of gravel/alluvium and then (happily) we get in the “hard rock”: altered brownish/reddish serp. Harzburgite and dunite with gabbroic dykes.

As some core boxes broke yesterday, this morning (24/01/18) Luca and Alireza printed new labels for pristine lids and boxes used to replace those that were damaged. The server was therefore switched on at arrival on sit at around 09:00.

**25th January 2018, Thursday**

**On-site: NW, PK, LC, LN, EM, EG, ARE, JN, LT, OIU, AT, EE, KR and DCO film crew**

**LSOS: Peter Kelemen**

Arrived on site: 07:11

Rig started:

Rotation started: 07:20

Summary of the day:

Extended HW surface casing from 2.70 mbgl to 5.70 mbgl @ 09:18 (6 m total [30 cm stick up])

Water loss at 19.20 mbgl. No return of flow. Loss of circulation 🡪 Extended the casing again from 5.70 mbgl to 11.70 mbgl. Fluid circulation returns resumes after the surface casing extension.

Today we cored 21.00 m of altered reddish/brown serp. Harzburgite, dunite and gabbro dykes. All the lithologies are cut by vein networks (serpentine, calcite, sulphides, carbonates…) and a few cataclastic zones and highly fractured intervals.

**27th January 2018, Saturday**

**On-site: NW, PK, DT, LC, EM, EG, ARE, JN, LT, OIU and DCO film crew**

**Microbio: AT, EE, KR**

**LSOS: Peter Kelemen / Damon Teagle**

Arrived on site: 07:05

Rig started:

Rotation started:

Summary of the day:

10:25 Still running SW casing from 11.7 m to >19 m (target 20.7 m)

10:30 Start to RIH the HQ drill assembly to start coring

12:15 Spectacular pot of curry mutton and chicken & rice for team lunch supplied by DCO film team.

Top surface of core piece in 17Z (piece 2) has mark of diamond bit from 11Z offset by ~ 4cm. Red blue line is probably close to continuous with core 11Z based on dip of microgabbro dyke margin in 17Z [cores 13M to 16M = re-drilled interval with deviation of hole].

Most of the day spent putting in SW casing and then re-drilling from 20.70 m. Eventually got to 32.7 m and then took two long cores of dunite with gabbro dykes ~ gently dipping.

Dawn, Dan and the other guy [Alex Sousa] arrived on site.

**28th January 2018, Sunday**

**On-site: Huge Team – Max OmanDP**

**LSOS: Peter Kelemen / Damon Teagle**

Arrived on site: 07:10

Rig started:

Rotation started: ~07:25

Summary of the day:

Issue with DIS client left behind (core description left behind)

Large amount of Black Muddy Goop in bottom of hole – from faultzone at ~30 m. Not recovered/wash out yesterday 🡨 Cement?

Backfill = 60 cm

Highlight of the day was the visit of the Oman Steering Committee to the BA1B hole and the other neighbouring holes. Their visit included a lavish lunch of lamb stew with rice and chic peas.

LC nad EM departed site. Gretchen F-G returned for another stint on the drill site.

A day of fairly routine operations. Fairly slow (~1 hr) coring of dunite with highly altered gabbro dykes. Good liason and cooperation between curation and microbio teams.

**29th January 2018, Monday**

**On-site: NW, PK, JM, DT, GFG, EG, ARE, JN, LT, OIU, CA**

**Guest: DCO film crew**

**Microbio: EE, KR, DC, DN, AS**

**Trainees: Anwaar Al-Hajri and Sara Al Wahaibi (3rd year Applied Geoscience, GUtech)**

**Hydro: 2 x SolExperts, JM, MS, PG, Richard La Provost**

**LSOS: Damon Teagle**

Arrived on site: 07:20

Rig started:

Rotation started: 07:15

Summary of the day:

A “routine” day of good core recovery and microbio sampling. Some unnecessary ‘key’ experiences with generator key with Bios and then Apart 3 key also with camping bios. This needs better organization.

SolExperts group turn up with Phillippe Gouze and started to erect megatripod for packer testing training.

**30th January 2018, Tuesday**

**On-site: NW, PK, DT, GFG, EG, ARE, JN, LT, OIU, CA**

**Microbio: AT, DC, EB, EE, KR, DN, AS, EF (LF)**

**Trainees: Anwaar Al-Hajri and Sara Al Wahaibi**

**LSOS: Damon Teagle**

Arrived on site: 07:20

Rig started:

Rotation started: already started

Summary of the day:

37Z: first wireline trip left ~40 cm stump at BOH. Re-run wireline for full recovery.

Asked Wali about water table – felt water pressure change between 15-18 m 🡨 current best guess of water table. Will check tomorrow.

~ Routine day with good core. Some technical/server issues but logging programme holding together! Spectacular v large 15 mm open space filled euhedral equant calcite crystals in cores 43 & 44 growing in highly altered gabbros with some fault zones.

**31st January 2018, Wednesday**

**On-site: NW, DT, GFG, EG, ARE, JN, LT, OIU, CA**

**Microbio: AT, DC, EB, EE, KR, DN, AS, LF**

**Trainees: Anwaar Al-Hajri and Sara Al Wahaibi**

**LSOS: Damon Teagle**

Arrived on site: 07:15

Rig started:

Rotation started: 07:20

Summary of the day:

Good progress & cooperation between geo and bio crews

Hydrology training continues.

Starting to rotate groups around the different tasks.

Core still mostly dunite with some gabbro veins – probably decreasing in frequency.

\*SUPER BLOOD BLUE MOON LUNAR ECLIPSE!\*

**1st February 2018, Thursday**

**On-site: NW, DT, GFG, ARE, JN, LT, OIU, CA, BC, JM**

**Microbio: DC, LF, AS**

**Trainees: Anwaar Al-Hajri and Sara Al Wahaibi**

**LSOS: Damon Teagle**

Arrived on site: Late! Greek goodbyes: 07:15

Rig started: already started

Rotation started: already started

Summary of the day:

Alexis and Katie Leave Bio team. Maolis off to airport. BC arrives with JMM.

Expect Generator service engineer ~16:00.

Final day of Hydrotraining. Still no rig at rotary site [BA1C].

Lalvol rotary rig arrived 14:30.

Trainees from GUtech last day.

Julie leaves ☹ Au revoir! bon chance

Lead Scientist Report:

A quiet efficient day with many fewer hands on site. Bio chief Alexis and Eric, Manolis, Julie, Alireza and our two GUTech interns Sara and Anwaar final day.

Previous night Blood Super Blue Moon Lunar Eclipse.

More and more dunite with fewer veins – very few tiny carbonates since large open spaced filled with Toenail Diamond ~100 m.

Hydro training continued with JM, & Solexperts.

Rotary Rig finally arrived on site but wasn’t erected. DT & JMM check out BA4 site – put cairn in proposed site.

**3rd February 2018, Saturday**

**On-site: NW, DT, GFG, MG, LT, OIU, CA, BC, JM**

**Microbio: DC, LF, AS**

**Trainees: Mazin Al Salamani & Saif Al Shamsi (SQU)**

**LSOS: Damon Teagle**

Arrived on site: 07:20

Rig started:

Rotation started: 06:50

Summary of the day:

Margot joined the team. New Interns

Rotary rig erected (yesterday?) but not drilling as yet (08:27)

DT took GPS of rotary rig. BA1C rig turned on 09:35

Shear zone and highly fractured intervals in core 62Z, where lithology changes from dunite to harzburgite.

Core 64 – two long pieces of the Hz w/ gb and Px dykes

Harzburgitic cores contain more gabbroic dykes + intervals w/ rodingite. Native copper in core 71.

Record coring for this site! Total advance 42.0 m!

An epic day at Site BA1 with 3 operations working together. Rotary coring started at BA1C – to about 16 m and the [truck??] Hydro crew continued to practice with new packer equipment. The drilling rate in BA1B changed from the tranquil 24 m/day to 42 m – with a change of host rock from dunite to harzburgite about 162 m (core 62Z). Rather frantic in the logging tent with new trainees on site for the first time.

- Need to sort out N2 deliveries. We have 5 tanks on site – 2 empty, 1 in use for MBio, 1 requested by Hydro and 1 more tank. It would be good to replace empty tanks in next day or so.

**4th February 2018, Sunday**

**On-site: NW, DT, GFG, MG, LT, OIU, CA, BC**

**Microbio: DC, LF, AS**

**Trainees: Mazin Al Salamani & Saif Al Shamsi (SQU)**

**LSOS: Damon Teagle**

Arrived on site: 07:10

Rig started:

Rotation started: 07:05

Summary of the day:

Rotary rig started ~08:20

Core 79Z ~20 cm wide gb dyke / 1 large ~1.7 m coherent section at bottom of core.

Dunitic domains tent to be associated with thicker gabbro dykes.

Another day of solid core flow (36 m advance) but with geo and mbio working smoothly it feels like we’ve forgotten to do something! Sketching & description (just) keeping up with coreflow.

Lotta and Ben trained in cuttings observations and sampling. Only limited rotary drilling today.

🡪 suggest daily shopping list is good practice.

**5th February 2018, Monday**

**On-site: NW, DT, GFG, MG, LT, OIU, CA, BC**

**Microbio: DC, LF, AS**

**Trainees: Mazin Al Salamani & Saif Al Shamsi (SQU)**

**LSOS: Damon Teagle**

Arrived on site: 07:10

Rig started:

Rotation started: 07:05

Summary of the day:

Surface casing extended upto 23.70 mbgl (24 m)

Good-bye Damon! (DT last day…)

Another 24 m of core in BA1B – mostly in very good simple sections.

Casing at BA1C will be set to 25.5 m – need to mix up core descriptions to catch up but just about keeping pace.

SQU interns and DT leave site. Dr Jude takes over tomorrow.

Good Luck, Good drilling

- keep safe

Damon

**6th February 2018, Tuesday**

**On-site: NW, JC, GFG, MG, LT, OIU, CA, BC**

**Microbio: DC, LF, AS**

**Trainees: Majid Al Jabri (MRMWR)**

**LSOS: Jude Coggon**

Arrived on site: 07:15

Rig started:

Rotation started:

Summary of the day:

Dr Jude is back!

Continued in harzburgite with variable thick gabbroic veins, some anorthositic. Excellent core quality with numerous pieces >1.5 m long 🡪 core description still in backlog.

**7th February 2018, Wednesday**

**On-site: NW, JC, GFG, MG, LT, OIU, CA, BC**

**Microbio: DC, LF, AS**

**Trainees: Majid Al Jabri (MRMWR)**

**LSOS: Jude Coggon**

Arrived on site: 07:10

Rig started:

Rotation started: 07:10

Summary of the day:

Another day of good recovery of harzburgite with gabbroic dykes. Excellent quality of core with long coherent pieces.

**8th February 2018, Thursday**

**On-site: NW, JC, GFG, MG, LT, OIU, CA, BC**

**Microbio: DC, LF, AS**

**Trainees: Majid Al Jabri (MRMWR) (Mainly at BA1A with hydro team)**

**LSOS: Jude Coggon**

Arrived on site: 07:13

Rig started:

Rotation started:

Summary of the day:

09:30 Visit from Ibra MRMWR team

Another full day with harzburgite cores cut by gabbroic veins. Cores were more fractured than previously due to inclined fractures. Margot and Lotta had last day.

**10th February 2018, Saturday**

**On-site: NW, JC, GFG, OIU, CA, BC, BJ, DJ, LR, DK**

**Microbio: DC, LF, AS, EB, DN, CG**

**Trainees: Ghassan + Al Muhalab**

**LSOS: Jude Coggon**

Arrived on site: 07:10

Rig started:

Rotation started: 07:05

Summary of the day:

Extended casing at end of day to 30.5 m as it is slipping down the hole – further comment tomorrow on this. Used bentonite to pack and stabilize the casing.

Dawn and Alex have last day. Eric Boyd new lead for bio team.

Continued in harzburgite with variably thick and altered gabbroic veins. Again inclined fractures caused broken up pieces in some sections. Other sections were long coherent pieces >1 m.

**11th February 2018, Sunday**

**On-site: NW, JC, GFG, OIU, CA, BC, BJ, DJ, LR, DK**

**Microbio: EB, DN, LF, CG**

**Trainees: Ghusn + Al Muhalab**

**LSOS: Jude Coggon**

Arrived on site: 07:10

Rig started:

Rotation started: 07:10

Summary of the day:

Casing set to 31 m at start of day

Last day for Gretchen and Ole.

Started drilling as normal but casing dropped further so ~07:30 so stopped drilling to add another 50 cm of casing. Nehal explained that the vibrations, combined with the circulation fluid, have caused the top of the hole to widen, hence the shoe bit & casing keep falling down. The groundwater may also be contributing to this effect.

Extended again after core 130Z to depth of 32.5 m. Nehal says this may be due to the deviation of the hole at the start.

Continued to recover harzburgites with variably thick gabbroic veins. Density of veins slightly less? than in previous cores. Still cut by inclined serp veins, which tend to fracture.

**12th February 2018, Monday**

**On-site: NW, JC, BJ, CA, BC, DJ, LR**

**Microbio: EB, DN, LF, CG**

**Trainees: Ghusn**

**LSOS: Jude Coggon**

Arrived on site: 07:20

Rig started:

Rotation started: 07:05

Summary of the day:

Final casing depth 32.8 mbgl

More serpentinised harzburgite with abundant veining and brecciated zones. Possible trace of native Cu (but may come from drilling equipment).

End of Hole!!! Yippee!!!

Drillers POOHed – complete ~15:15

Cleaning rig and breaking pairs of rods into singles.

~2pm Bio team took Nehal home and headed to Muscat to Oman Pumps, Mubailla store and to take Libby to MCT. Will return to Ibra tonight. Rest of team remain at drill site to clear as much core as possible.

5 boxes left to describe tomorrow & 3 left to sketch. Left site ~17:30.

**13th February 2018, Tuesday**

**On-site: NW, JC, BJ, CA, BC, DJ, LR, DK**

**Microbio: EB, DN, CG**

**Trainees: Yousuf & Ibrahim (PAM)**

**LSOS: Jude Coggon**

Arrived on site: 07:20

Rig started:

Rotation started:

Summary of the day:

Drillers moving rods to BA4

Ground water at 13.35 mbgl – measured this morning by Abdul Rasak

Geo team finishing logging final 5 boxes – sketching (DJ), describing (CA, DK, LR), packing and scanning (BJ).

Bio team demob – emptying their cabin after taking photos of the whole set up.

BC showing trainees around + then at rotary site with them.

LR uploading BA1C cuttings photos to CU\_DIS

Trainees left ~10:00

Loaded scanner onto pick up truck.

Took down tent and tarp

~11:45 – lunch. Dropped rest of lunch for Benoit at BA1C

Moved to BA4. Set up mats, tent, scanner, tarp.

15:15 Geo team left (to rescue Tanja and Max). Bio team still setting up.

Will return at 8am