

**Daily Operational and Science Report**  
**UT-GOM2-2 Coring Expedition**  
**Terrebonne Basin, Gulf of Mexico Outer Continental Slope**

1. **DATE:** 23-August-2023, 0000-2400hr

2. **LOCATION:**

2400 hr, 23-August-2023

Hole: *Helix D/V Q4000* was located over Hole UT-GOM2-2-H002

**Last Drill/Core depth: 9132 ft MD RKB**

RKB to Mud line: 6506 ft on Drill pipe measurements

Water depth: 6454 ft

Per Datum: 52 ft

Lat 26°39'44.2229"N, Long 091°40'33.8972"W NAD27 BLM15 Feet

3. **DESCRIPTION OF OPERATIONS:**

**0000-2400 At Hole UT-GOM2-2-H002**

General Operations/Maintenance: General housekeeping on weather deck and complete daily crane review/report.

0000-0000 The Q4000 was positioned over **Hole UT-GOM2-2-H002** and was preparing to wash/jet into hole (re-entering operations).

0000-0600 Re-enter advance **Hole UT-GOM2-2-H002** F/ 6506 T/6829 ft RKB

0112: 1 stab-in and advance, with weight on bit (WOB) (inferred from hook load)

Move vessel, wait for visibility to clear

0149: 2 stab-ins and advance, with WOB

Move vessel, wait for visibility to clear

0414: 1 stab-ins and advance, with WOB

Move vessel, wait for visibility to clear

0448: 1 stab-ins and advance, with WOB

0550: 4 stab-ins and advance, with WOB

0600: At a depth of 6829 ft RKB. Able to slack off drill string with no WOB and no rotation. Confirmed re-entry into **Hole UT-GOM2-2-H002**.

0600-1020 Continue to RIH **Hole UT-GOM2-2-H002** F/6829 T/8617 ft RKB.

1020-1200 Washed and reamed from F/8617 T/8748 ft RKB, pumping 10.3 ppg water-based mud (WBM) at 7 bpm with 71 psi.

1200-1230 Drilled ahead from F/8748 T/8776 ft RKB, pumping 10.3 ppg WBM at 300 GPM with 50 psi.

1230-1330 Repair TDS brake and release brake friction.

1330-2030 Drilled ahead from F/8776 T/9132 ft RKB (core point), pumping 10.5 ppg WBM with 50 psi at 300 GPM, 70 RPM, 3-4k torque. Pumping high viscosity sweeps every 100 ft.

2030-2045 Rig down (R/D) Night Cap, rig up (R/U) Pack off, Cable head, R/U upper wireline (W/L) sheave, and slick line in sheave on TDS.

2045-2245 Pick up (P/U) and RIH Geotek Center Bit Retrieval Tool, latch into Center Bit, and POOH.

2245-2400 Prepare and RIH the PCTB-CS coring tool.

**4. OPERATIONAL PLAN (Next 24 Hours):**

Acquire approximately four of the eight planned consecutive PCTB-CS pressure cores in **Hole UT-GOM2-2-H002** associated with the Orange Sand within depth interval from 9132 to 9212 ft RKB:

Core UT-GOM2-2-H003-05CS, 2626.0 to 2636.0 fbsf

Core UT-GOM2-2-H003-06CS, 2636.0 to 2646.0 fbsf

Core UT-GOM2-2-H003-07CS, 2646.0 to 2656.0 fbsf

Core UT-GOM2-2-H003-08CS, 2656.0 to 2666.0 fbsf

*Orange Sand (and bounding mud) Coring Campaign*

<b>Activity</b>	<b>Ft RKB</b>	<b>fbsf</b>	<b>Completed</b>
H002-05CS Start	9132	2626	
H002-05CS End	9142	2636	
H002-06CS Start	9142	2636	
H002-06CS End	9152	2646	
H002-07CS Start	9152	2646	
H002-07CS End	9162	2656	
H002-08CS Start	9162	2656	
H002-08CS End	9172	2666	
H002-09CS Start	9172	2666	
H002-09CS End	9182	2676	
H002-10CS Start	9182	2676	
H002-10CS End	9192	2686	
H002-11CS Start	9192	2686	
H002-11CS End	9202	2696	
H002-12CS Start	9202	2696	
H002-12CS End	9212	2706	

**5. DOWNHOLE LOGGING OPERATIONS:**

Hole: NA

Wireline Totals (directional): NA

**6. CORE OPERATIONS AND DATA:**

Hole: NA

G-APC Coring Totals: NA

G-XCB Coring Totals: NA

PCTB-CS Coring Totals: NA

PCTB-FB Coring Totals: NA

**7. DOWNHOLE MEASUREMENTS**

Hole: NA

Pressure and Temperature Tool Deployment (T2P): NA

Temperature Tool Deployment (APCT-3): NA

## 8. SCIENCE ACTIVITIES

The last 24 hours of operations on the *Helix D/V Q4000* has included the successful completion of one of the most critical phases of the GOM2-02 Expedition with the re-entry of **Hole UT-GOM2-2-H002** at 0600 hr. As recorded above in this report, the PCTB-CS deployed BHA (with Geotek Center Bit) reached the seafloor over the location of the well head for **Hole UT-GOM2-2-H002** just after midnight of 22-AUG-23. Both of the *Helix D/V Q4000* ROVs had been deployed to the seafloor to assist with the **Hole UT-GOM2-2-H002** re-entry. The visual examination of the surveyed location of the expected well head revealed a large, elongated, crater like feature with dimensions exceeding 20 by 40 ft in size. The crater was filled with a soup-like mixture of drilling mud and borehole cuttings; with no visible evidence of the well head opening. The decision was made to move ahead with the borehole re-entry, with the bit being moved into position over the well head associated crater by making small, controlled movements of the Q4000. The specific location for the first attempted stab-in of the hole was based on the comparison of the physical appearance of the site with ROV images obtained during previous drilling operations. The first attempted stab into the hole involved advancing the drill bit about 30 ft into the subsurface where the Q4000 rig monitoring system detected weight on bit (as inferred from the hook load coming off), which indicated that we had not entered the hole. Over the next ~5 hours there were multiple attempts to enter the hole through a series of ship moves and additional stab-in attempts, which often required long waiting periods to allow the visibility in and around the site to clear after sediment was suspended in the water column during previous re-entry attempts. Finally, at 0600 hr and at a bit depth of 6829 ft RKB it was observed that the drill string was hanging freely in open hole with no weight on bit; thus confirming that we had successfully re-entered **Hole UT-GOM2-2-H002**. The successful re-entry of **Hole UT-GOM2-2-H002** allowed the resumption of operations that would now allow the expedition to move ahead and acquire pressure cores from critical Orange Sand stratigraphic section.

After successfully re-entering **Hole UT-GOM2-2-H002**, the PCTB-CS BHA was advanced to the previous total depth of the hole at 8748 ft RKB relatively quickly. The hole was then advanced by drilling to a depth of 9132 ft RKB which was the core point for the first PCTB-CS core associated with the Orange Sand continuous pressure coring campaign.

The onboard scientific party also moved ahead with processing of **Cores UT-GOM2-2-H003-02FB and -03FB**. **Core UT-GOM2-2-H003-02FB** was processed according to the cut plan with one 96 cm section stored under pressure for onshore analysis. A 20 cm cryo sample was cut, frozen, depressurized, and stored at -80 °C for microbiological analyses. A short 15 cm sample was degassed and stored for later sediment description. **Core UT-GOM2-2-H003-03FB** was cut into a 96 cm section stored in a pressurized storage chamber for onshore analyses and a 35 cm section for quantitative degassing. This degassing, from a mud interval, revealed a concentration of methane lower than solubility with no methane hydrate. After depressurization, this section was subsampled for interstitial water (IW) squeezing, leaving remaining core for sediment description and vane-shear/pocket penetrometer measurements. Other subsamples were collected for cell counts, headspace gas, and micropaleontology.

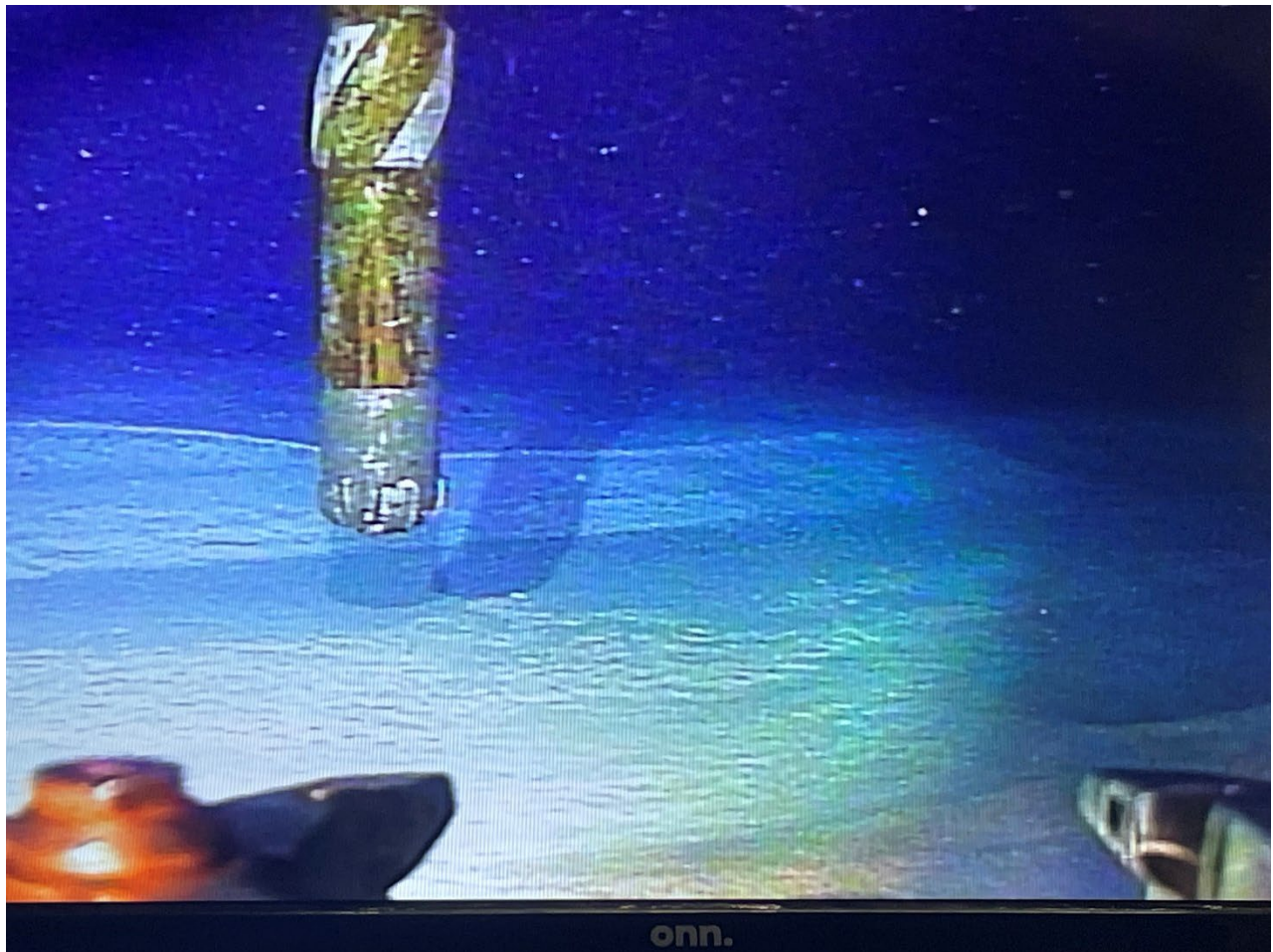
The Scientific Party is working on finalizing the “Methods” section and working on the H003 and H002 “Results” sections of the Expedition Report and processing samples and data that have been collected during the expedition.

There have been no new COVID cases on the *Q4000* in the last nine days.

## 9. ACRONYMS

bpm	Barrels per minute
Fish	The object to be recovered from the borehole/BHA
gpm	Gallons per minute
M/U	Make up

PCATS	Pressure Core Analysis and Transfer System
PCTB-CS	Pressure coring tool with ball-cutting shoe version.
POOH	Pull out of hole
psi	Pounds per square inch
P/U	Pick up
RIH	Run in hole
RKB	Depth measured from the rig floor
rpm	Revolutions per minute
R/U	Rig up
SLB	Schlumberger
Slickline	Wireline used to deploy and recover core, etc.
TD	Total depth
TDS	Top drive system
WOB	Weight on bit



*Figure 1: Helix D/V Q400 ROV acquired image of the re-entry into **Hole UT-GOM2-2-H002**. Visible is the edge of the crater like feature that marked the location of the expected well head at the seafloor; note the lack of any well head like features that was ultimately proven to be the surface location of the hole.*