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

**1. DATE:** 13-August-2023, 0000-2400hr

**2. LOCATION:**

2400 hr, 13-August-2023
Hole: *Helix D/V Q4000* was located over Hole UT-GOM2-2-H003

**Last Drill/Core depth: 7015 ft RKB**

RKB to Mud line: 6506 ft on Drill pipe measurements
Water depth: 6454 ft (updated 05-AUG-2023)
Per Datum: 52 ft
Lat 26°39'46.50488"N, Long 091°40'33.82464"W

**3. DESCRIPTION OF OPERATIONS:**

**0000-2400 At Hole UT-GOM2-2-H003**

General Maintenance: Performed corrosion maintenance in misc. areas and "weekly" maintenance on the vessel cranes.

0000-0130 Monitor the well while circulating 8.6 ppg SW at 70 psi while reciprocating drill string
1300-0300 Pump 25 bbl 10.5 ppg Hi-Vis sweep at 75 psi while reciprocating drill string
0300-0730 Monitor the well while circulating 8.6 ppg SW at 87 psi while reciprocating drill string
0730-0900 Pump 25 bbl 10.5 ppg Hi-Vis sweep at 75 psi while reciprocating drill string
0900-1330 Monitor the well while circulating 8.6 ppg SW at 70 psi while reciprocating drill string
1330-1500 Pump 25 bbl 10.5 ppg Hi-Vis sweep at 75 psi while reciprocating drill string
1500-1530 Monitor the well while circulating 8.6 ppg SW at 70 psi while reciprocating drill string
1530-1845 Installing replacement blower motor in the TDS
1845-1930 Testing replacement blower motor in the TDS
1930-2015 Wash and Ream from 6992 ft RKB to 7015 ft RKB (former hole TD)
2015-2028 M/U Geotek center bit and deploy in the hole
2028-2200 Geotek center bit failed to land out in the BHA
2200-2225 Geotek M/U wireline to CBRT tool then lower into drill pipe
2225-2314 RIH w/CBRT to top of the center bit while pumping 5 bpm at 101 psi
2314-2400 Latch into center bit and continue to RIH

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

Advance the hole by drilling from 509.0 fbsf to 914.0 fbsf. Conduct wireline directional survey. Acquire one G-XCB core and three additional PCTB-CS pressure cores in Hole UT-GOM2-2-H003 with the following planned core runs:
**Core UT-GOM2-2-H003-26X**, 914.0 to 942.0 fbsf
**Core UT-GOM2-2-H003-27CS**, 942.0 to 952.0 fbsf
**Core UT-GOM2-2-H003-28CS**, 952.0 to 962.0 fbsf
**Core UT-GOM2-2-H003-29CS**, 962.0 to 972.0 fbsf

**5. DOWNHOLE LOGGING OPERATIONS:**

**Hole:** NA

**Wireline Totals (directional)**: NA

**6. CORE OPERATIONS AND DATA:**

**Hole:** UT-GOM2-2-H003

**G-APC Coring Totals:** NA

**G-XCB Coring Totals:** NA

**PCTB-CS Coring Totals:** NA

**PCTB-FB Coring Totals:** NA

**7. DOWNHOLE MEASUREMENTS**

**Hole:** UT-GOM2-2-H003

**Pressure and Temperature Tool Deployment (T2P):** NA

**Temperature Tool Deployment (APCT-3):** NA

**8. SCIENCE ACTIVITES**

The Q4000 replacement TDS blower motor arrived in Houston this morning and was loaded to an hotshot delivery. The replacement blower motor arrived at the Bristow Houma Heliport 1300 hr and was flow out to the Vessel by helicopter, arriving on the rig around 1530 hr. Helix expedited the installation of the new blower motor in the TDS, which was operational and tested by 1930 hr.

After consultation with the onboard scientists and Geotech, it was decided to advance the hole from its current depth of 7015 ft RKB (509.0 fbsf) by drilling (without coring) to a core point depth of 7420 ft RKB (914.0 fbsf) to just above the Red Sand, where one G-XCB core and three PCTB-CS pressure cores will be acquired. The Red sand will be cored to examine methane migration mechanisms and gas hydrate formation in fine-grained marine sediments that also contain coarse-grained gas hydrate-bearing sedimentary units. In intervals dominated by fine-grained sediments, with coarse-grained layers, gas hydrate is found disseminated in the pore space. Hydrate can form from microbial methane that is believed to have diffused from adjacent fine-grained sediments as in short-range migration, which will be tested with the cores targeting the Red Sands.

In support of the ongoing microbiological research program being conducted on the Q4000, pressure cores are being cryo frozen in liquid nitrogen within a Geotek core processing device that allows pressure cores while still under controlled pressure conditions to be frozen. This system involves immersing and cryo-freezing a pressure core subsample in liquid nitrogen while still under pressure before releasing the pressure for longer term storage and transportation once the sample has been frozen. This development has allowed many more pristine gas hydrate-bearing samples to be shipped to different laboratories worldwide for special analysis. On this expedition, liquid nitrogen frozen cryo cores have been collected for specialized post-expedition microbiological subsampling and analysis (Figure 1).


*Figure 1: PCTB-CS pressure core sample from Hole UT-GOM2-2-H003 being converted to a liquid nitrogen frozen microbiological cryo core, which will be stored in an* -80°C freezer on the Q4000.

We have 4 members of the ship crew with COVID and 4 members of the UT crew with COVID. All are deemed to be stable and recuperating while isolated. We hope that two of our science colleagues will be able to return to work this coming Wednesday.

The Scientific Party continued to work on organizing and writing the "Methods" section of the Expedition Report and processing samples and data that has been collected during the expedition.

**9. ACRONYMS**

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|---|---|
| bpm | Barrels per minute |
| Fish | The object to be recovered from the borehole/BHA |
| 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 |
| RIH | Run in hole |
| RKB | Depth measured from the rig floor |
| SLB | Schlumberger |
| Slickline | Wireline used to deploy and recover core, etc. |
| TD | Total depth |
| TDS | Top drive system |

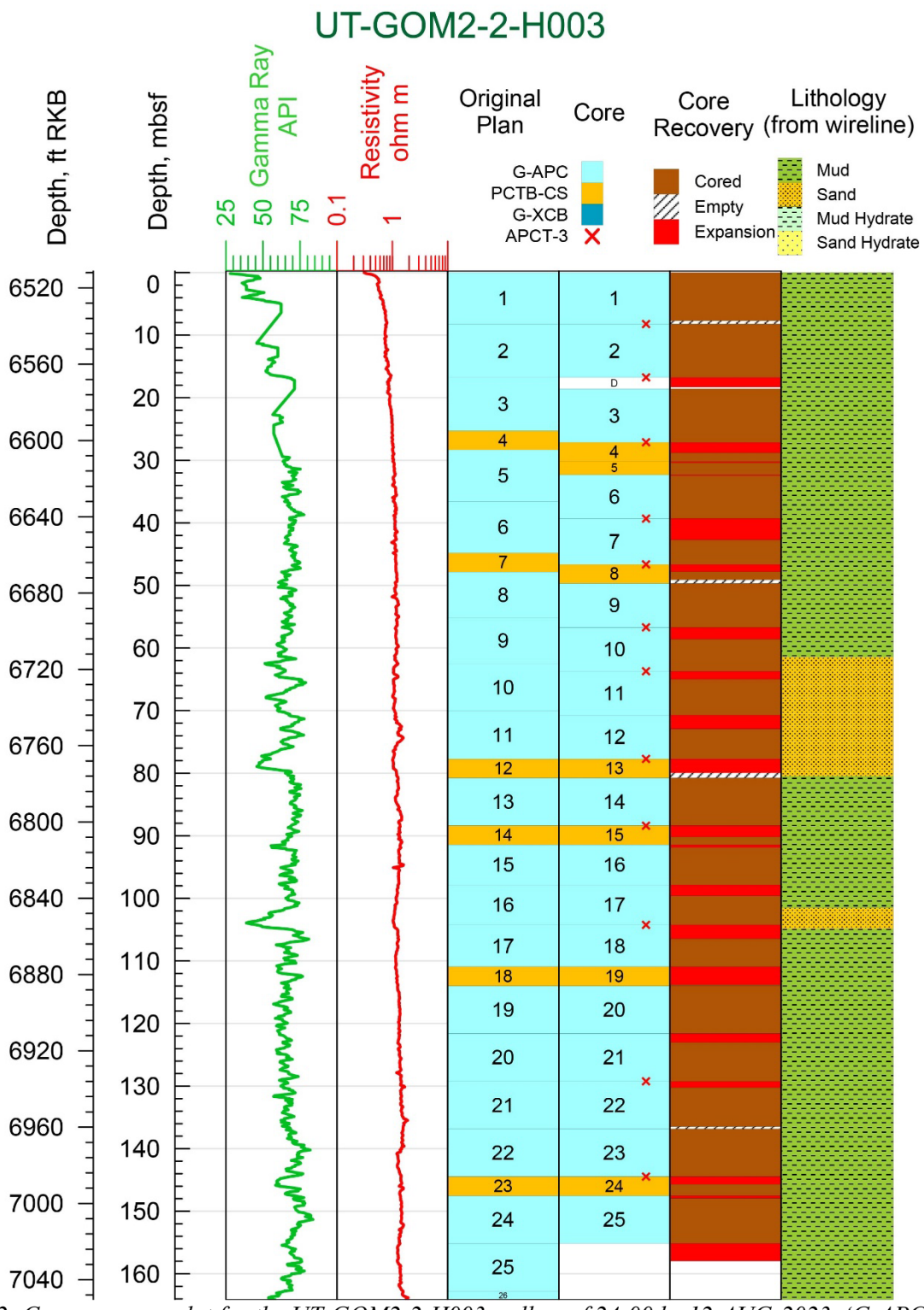


*Figure 2: Core recovery plot for the UT-GOM2-2-H003 well as of 24:00 hr 12-AUG-2023. 'G-APC' records core recovered by the Geotek Advanced Piston Corer. 'G-XCB' records core recovered by the Geotech cutting shoe coring cool (the G-XCB core systems has not yet been deployed). 'PCTB-CS' records core recovered by the cutting shoe version of the Pressure Coring Tool with Ball (PCTB).*

*'APCT-3' records the location where temperatures were measured with a specially instrumented coring shoe.*

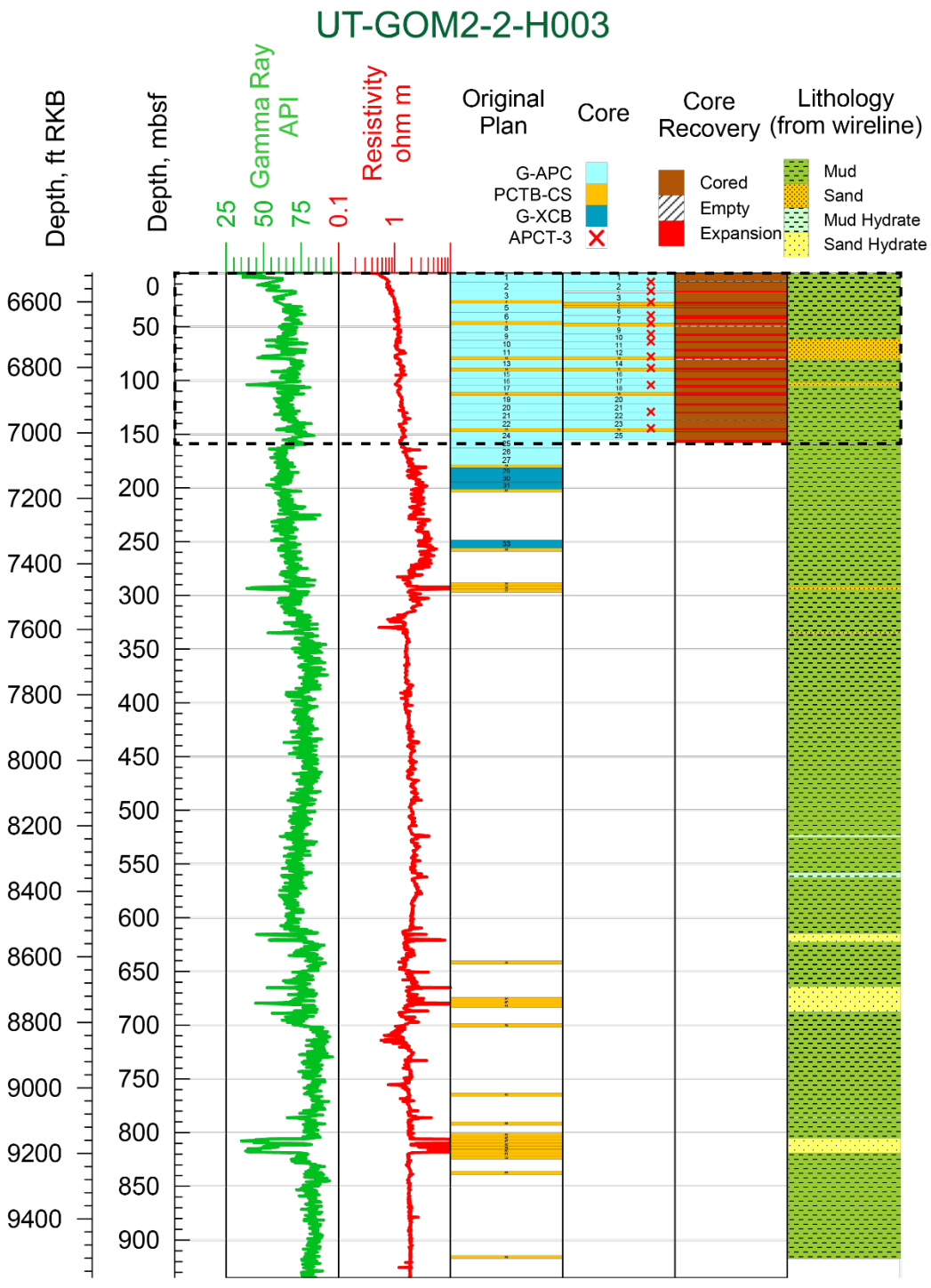


*Figure 3: Planned and actual core recovery for the entire UT-GOM2-2-H003 well. 'G-APC', 'PCTB-CS', G-XCB, and 'APCT-3' are defined in the caption to Figure 2. Dashed box defines the interval cored through 24:00 hr 12-AUG-2023.*