

## **PROJECT SITUATION REPORT**

### **DISC Drill 2011-12 Season**

**Project:** T-350-M

**Project Principal Investigator:** Dr. Charles Bentley

**Report No. 7 for period:** 12-25-11 **through:** 12-31-11

**Prepared by:** Kristina Dahnert **Date:** 1-1-12

#### **IDDO Personnel Onsite:**

- Kristina Dahnert
- Josh Goetz
- Mike Jayred
- Elizabeth Morton
- Paul Sendelbach
- Chuck Zander
- Chris Gibson (arrived in McMurdo on 12/29/11)
- Jay Johnson (arrived in McMurdo on 12/29/11)

#### **ACTIVITIES DURING PERIOD**

- First things first...we have completed drilling of the WAIS Divide main borehole! On December 31, 2011, the final ice core was collected, a momentous occasion that was long in the making. Our initial deepening schedule consisted of drilling approximately 43 meters to a depth of 3375 meters after which Jakob Schwander's pinger was deployed down hole using Gary Clow's logging winch. Results were inconclusive and the pinger was only receiving reflections from the bottom of the borehole. The drill was then placed back on the tower and 30 more meters were drilled. The pinger was again deployed with inconclusive results. Per Chief Scientist Jeff Severinghaus, the main borehole has been completed at a driller's depth of 3405.077 meters. A small celebration was held upon receipt of the last core and was enjoyed by camp staff, core handlers, loggers and drillers.
- On Sunday, 12/25/11, two pressure transducers were installed in the DISC Drill screen barrel and sent to the bottom of the borehole. Results show that the borehole is only 21 meters underbalanced. This will be corrected by raising the fluid level to 47 meters.
- Chris Gibson and Jay Johnson arrived in Christchurch on Sunday, 12/25/11, Christmas Day.
- Reaming runs in the borehole were completed late last week and our first core was collected on Monday, 12/26/11.
- Drilled in two shifts of 12 hours each; the first shift team of Elizabeth, Krissy and Paul operated from 6:00am-6:00pm and the second shift team of Chuck, Josh and Mike ran from 6:00pm-6:00am. Drilling and two shift operations ran from Monday, 12/26/11 through Friday, 12/30/11.

- The levelwind assembly became stuck at one end of travel during a descent on Monday. The levelwind was driven off of the limit switches using the remote operator panel and the levelwind forks bent back to their original operating position. The levelwind has since been functioning well at usual tripping speeds.
- Due to the amount of cable filler shedding off of the new cable, the chips from the first two days of runs were coming up quite black. After centrifuging, these chips were then packed in barrels for transport back to McMurdo as 'dirty snow' as opposed to being disposed of in the chip hopper at WAIS Divide.
- Temperatures as recorded by the drill at the bottom of the hole continue to track Gary Clow's temperature profile with an offset of 1.5 degrees. The drill has been recording ~8°C when arriving at bottom and -4°C after coring is complete.
- The borehole loggers presented several talks and show-and-tell sessions at our Monday night science lecture series.
- Moose door excavation was completed in time for drilling of the first core
- Several fluid batches were mixed to the correct density and dumped into the borehole this week. On two occasions, the casing immediately popped up several inches after fluid dumping, causing interference with the hole cover. The hole cover and its central brushes were cut back and rubber strips installed across the front of the hole cover to prevent unwanted items from entering the borehole. Shortly after the second occasion of the casing popping up, the casing settled back down several inches.
  - In consultation with Jay Johnson and Chris Gibson in McMurdo, we believe that the warm temperatures at WAIS Divide in recent days and thus the 'warmer' temperatures of our drill fluid batches on the surface may be impacting the casing. It is possible that the 260 foot long casing begins to stretch when the warm fluid is added to the hole. Since the bottom of the casing has a larger diameter lip and is stabilized in the ice, stretching of the casing might be causing it to protrude further at the surface.
  - Since the drill tower and the configuration of the replicate drill will be shorter, we do not anticipate any further negative consequences should this behavior recur with future fluid dumps.
- Borehole camera, additional electrical parts hardigg, and replicate screen and core barrels received from McMurdo
- Major cleaning of the drill Arch including slot and winch drip pans; borehole drip pan releveled
- Organized MECC machine shop
- Chris Gibson and Jay Johnson flew to McMurdo on Wednesday, 12/28/11, on the C-17, but the flight circled McMurdo due to fog and boomeranged back to Christchurch. They then made it to McMurdo the next day (Thursday) via LC-130 Herc.
- Anti-torque section 'B' opened up to investigate the non-functioning weight-on-bit (WOB); this is believed to be a mismatched wiring issue; the engineering model will be modified and tested before actual drill sections are altered
- Fluid sample collected from the borehole; the density is as expected at .92
- New Year's Eve dinner and celebration held on Saturday night

## **SAFETY**

- Daily safety checklists completed
- Visitor Safety Analysis forms completed for all Arch visitors
- Ventilation raised from 45 Hz to 50 Hz
- Arch emergency medical equipment demonstrated for drillers and core handlers; Arch evacuation protocol discussed with camp medical personnel

## **COMMENTS**

### **(Problems, Concerns, Recommendations, Etc.)**

- The D4 is still down, awaiting parts from McMurdo. Poor weather in McMurdo delayed flights from Christchurch earlier last week.
- The main borehole is complete! Thank you to everyone...and this is a very large group...for all of your support. We could not have asked for a better reason to celebrate on New Year's Eve.