

# IODP EXP 358 Daily Geomechanics Report

Report #060 20190108

## RTG Team

RTG Supervisor(s)	David Castillo / Thomas Finkbeiner / Demian Saffer
RTG Watch Lead (00:00-12:00)	Emily Wisbey
RTG Watch Lead (12:00-24:00)	Toby Colson

## Well Status

Site Name:	C0002	Hole Name:	R
Water Depth:	1,939.0 m	RT-MSL:	28.5 m
0600h Hole Depth:	5,052.0 mBRT (5049.0 mTVD)	Section TD:	5,667.5 mBRT (5,664.5 mTVD)
Section #:	1	CSG Depth/Size:	4757.0 mBRT 11-3/4" inches
Static MW:	1.39 sg	Current ECD:	1.426 @600gpm sg
FIT/LOT/ XLOT:	1.46sg FIT @ 4,757mBRT.		
Current formation/ lithology:	Shale		
Sensor Offsets from the Bit:	arcVISION 675: (APWD: 3.604 m, Resistivity: 4.316 m, GR: 4.367 m) TeleScope 675: (IWOB: 8.384m, Direction + Inclination: 11.749 m)		
Other BHA Offsets from the Bit:	8-1/4" Stabilizer: 17.23 – 18.9 m 8-1/4" x 12-1/4" Z-reamer: 28.528-29.62 m 8-1/8" Stabilizer: 39.64 – 41.30 m Top of BHA: 331 m		
Current Operations:	Drilled hole from 4,843mBRT to 4,880mBRT with 8-1/2" x 12-1/4" LWD BHA. Reamed out of hole to 4,739 mBRT, enlarging hole to 12-1/4" as required. Commenced circulating bottoms up.		

## Geomechanics Alert

<b>GREEN</b>	<p><b>Green</b> = Projected model remains accurate                  White = Unanticipated deviation from model which <i>should not</i> affect drilling                  Yellow = Unanticipated deviation from model which <i>may</i> affect drilling                  Red = Imminent requirement to stop drilling</p>
<b>Basis for Alert Level + Recommendations</b>	<p>1.39 sg remains recommended MW for Section 1.                  Observation suggests hole cleaning remains a key factor in current wellbore condition.</p>

## Principal Findings

A drilling break at ~ 4,863 mBRT occurred over a depth interval that resulted in a similar resistivity response seen in both holes R and Q. Initial indication is this drilling break was formation related. Whilst this interval may have softer formation, there remains no indication of increased wellbore instability over this interval to date.

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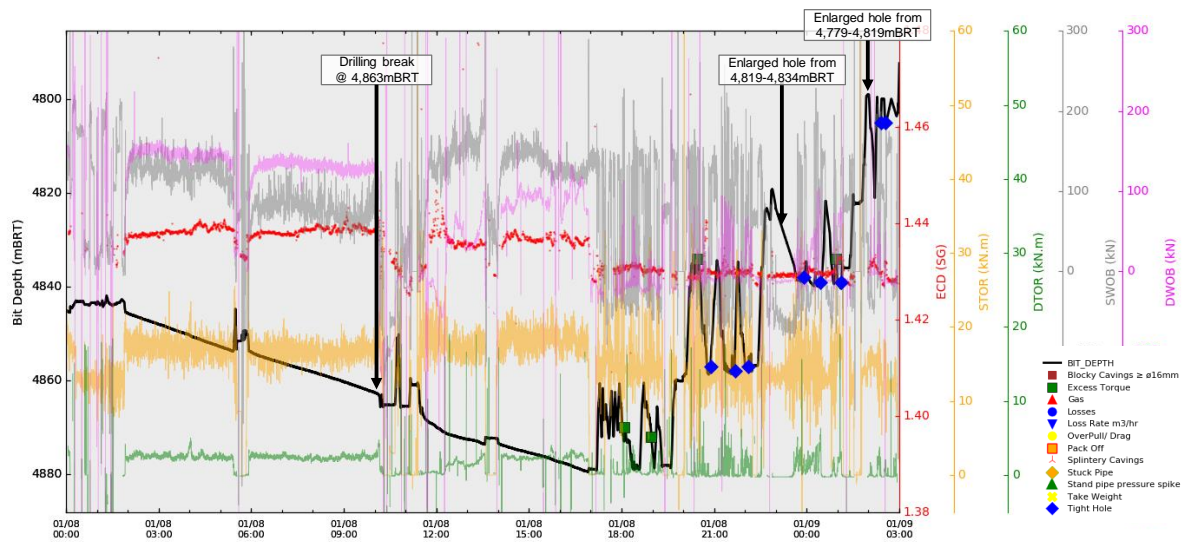
### Observations Summary

Use this space to discuss any observations while drilling, running casing etc.

<b>Fracture Gradient</b>	N/A
<b>Pore Pressure</b>	No indications of overpressure observed. Gas peak of 1.68% observed from drilling break does not indicate elevated formation pressure.
<b>Wellbore Breakout</b>	N/A
<b>Tensile Failure</b>	N/A
<b>Drilling Parameters</b>	<ul style="list-style-type: none"> <li>- A drilling break was experience at ~4,863 mBRT. Below the drilling break, the softer formation resulted in greater weight being transferred to the reamer and the drilling string.</li> <li>- The difference between surface and downhole WOB also increased past this drilling break.</li> <li>- Surface and downhole torque difference continues, indicating significant friction remains along the drillstring.</li> </ul>
<b>Other</b>	N/A

### Analysis

#### Drilling Experience Analysis



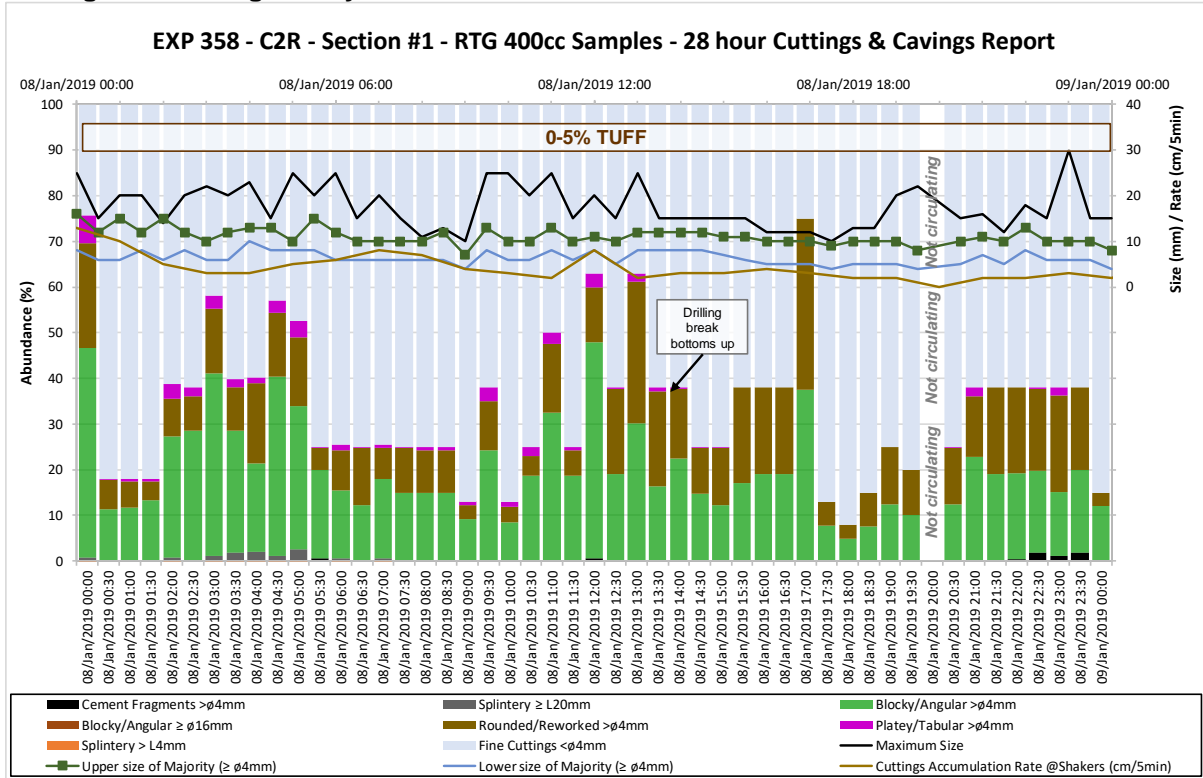
**Figure 1 Drilling experiences over the last 24 hrs**

- Drilled / enlarged hole to TD at 4,880 mBRT with 8-1/2" x 12-1/4" LWD BHA.
- Pulled / reamed out of hole to 4,819mBRT then enlarged hole down to 4,834 mBRT. Unable to pass further than 4,834 mBRT.
- Pulled / reamed out of hole to 4,779mBRT then enlarged hole down to 4,805 mBRT. Unable to pass further than 4,805 mBRT.

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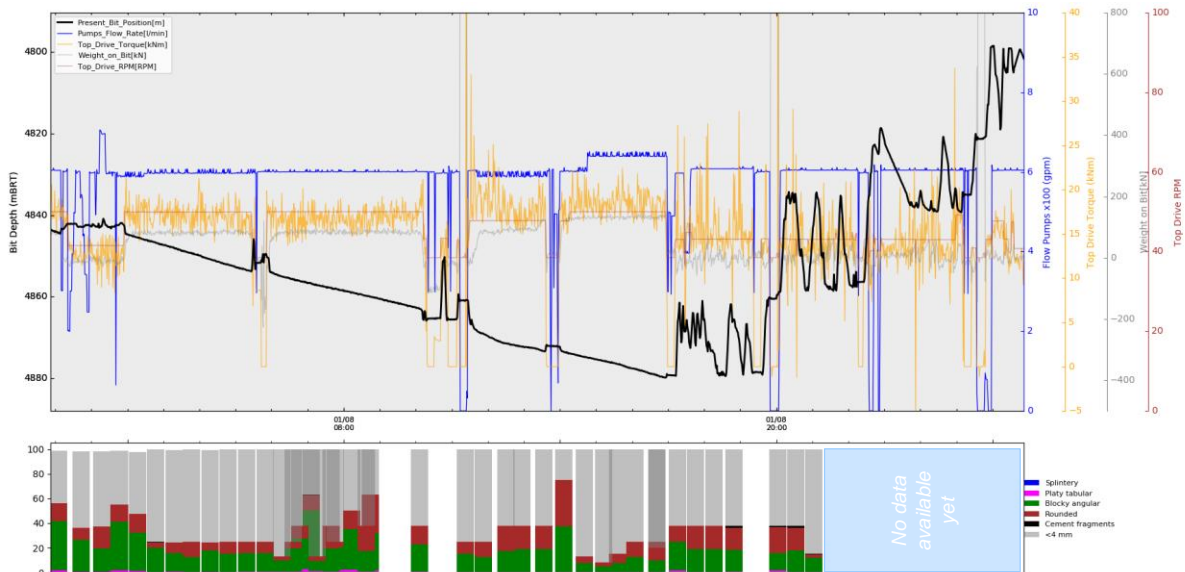
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### Cuttings and Cavings Analysis



**Figure 2 Analysis of cuttings/cavings > ø 4mm (taken from 400cc RTG Samples) over last 24 hrs. Not corrected for lag-time**

- Coarser shale/mudstone fragments > ø4mm with sharp edges remain blocky with minor occurrence of platy fragments.
- Tuff fragments with rounded shapes were minor in occurrence (between 1 and 5%). There was a higher proportion of round reworked fragments (40 to 50%) throughout the underreaming operation compared to normal drilling.
- General abundance of cuttings was low during the reaming and reworking of the difficult section around 4,840 mBRT. This suggests little additional hole opening was occurring above 4,840 mBRT.



**Figure 3 Correlation between drilling events and lag corrected cuttings/cavings occurrences**

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**Figure 4 Example of cuttings/cavings >  $\phi$  4mm (taken from 400cc RTG Samples).**

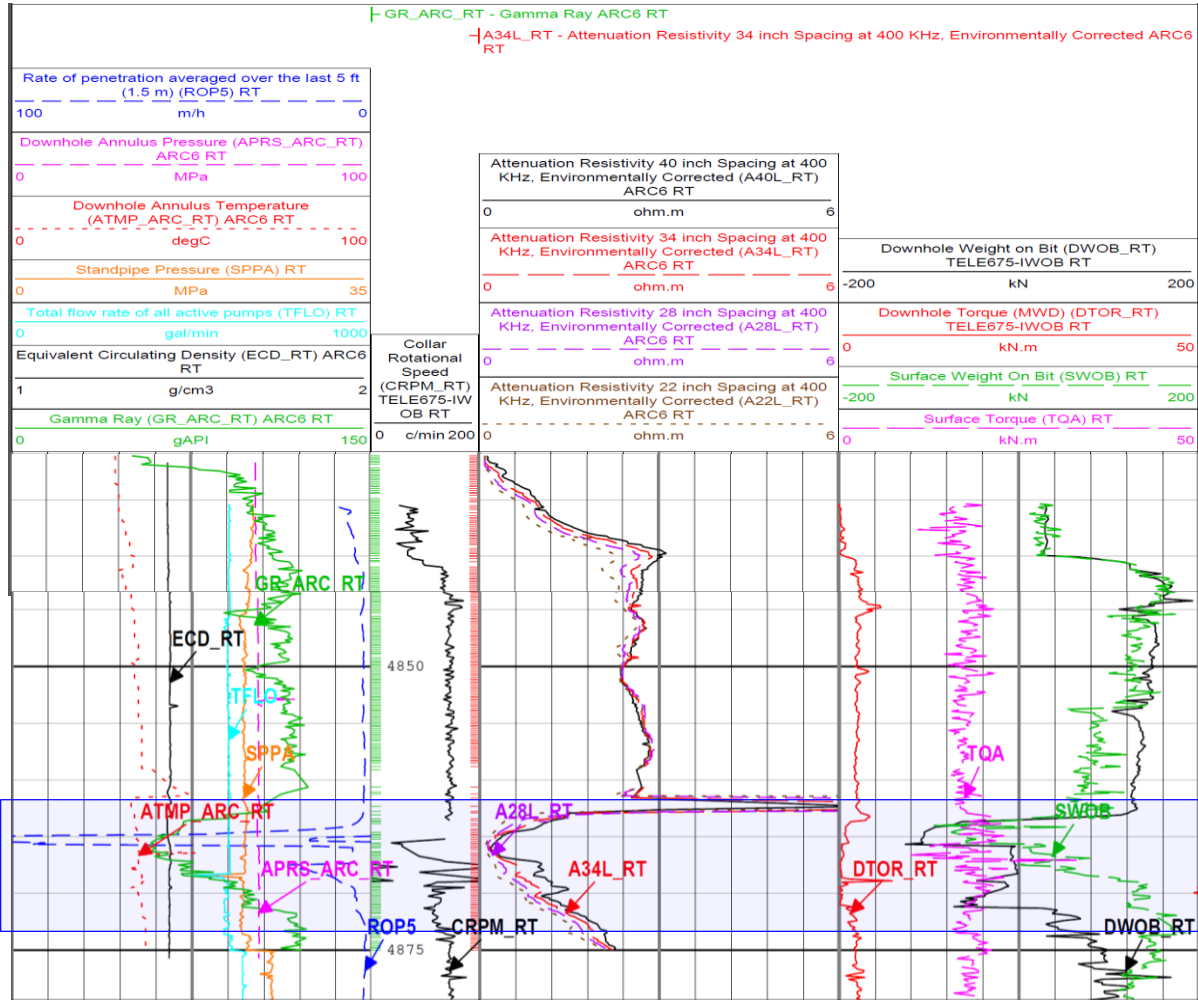
The predominant cuttings below 4,840 mBRT are a mix of rounded and fresh small blocky cuttings  $\leq$   $\phi$ 10 mm.

Figure 4 shows the RTG sample at 1300hrs on the 8<sup>th</sup> January 2019, corresponding to the lag time of the drilling break and arrived with a minor drilled gas peak (~1.6%). Large rounded blocky fragments of tuff are present in sample.

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### LWD Data Analysis



**Figure 5 LWD resistivity data over last 24hrs**

A drilling break that occurred at 4,865 mBRT correlates to a low resistivity zone and increased separation over the interval 4,863 – 4,870 mBRT (Blue box in Figure 5). There was no major difference in cuttings volume and lithology over this interval.

- This response appears formation related as the same response occurred at the same depth interval in hole C0002Q, and there is no evidence to date of any increase in wellbore stability.
- This response was not evident on the C0002P well.

### SFIB Analysis

No further updates.

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### Geomechanical Model Review

No change in the current stress model.

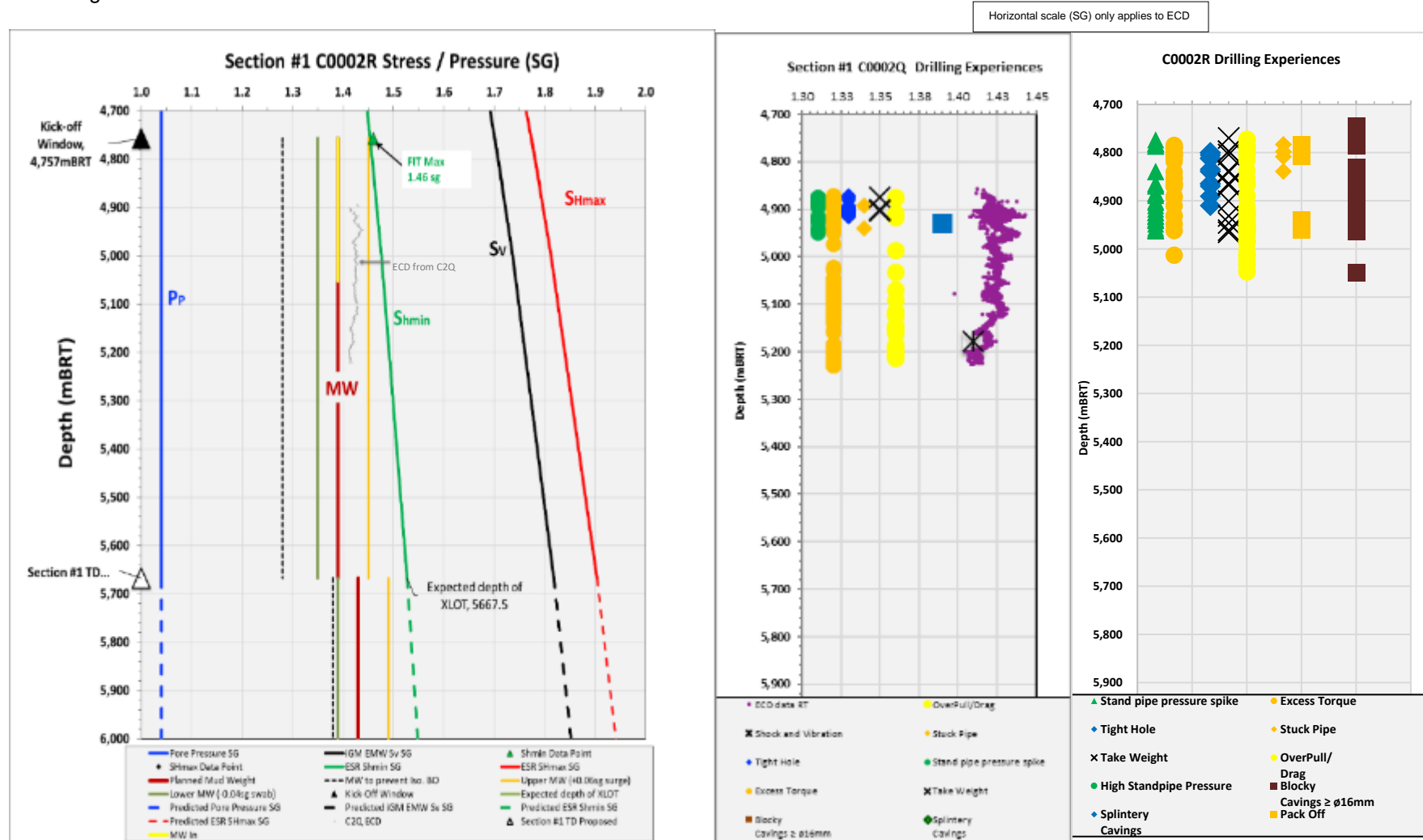


Figure 6 Current stress model for Section #1

Figure 7 C0002Q Drilling Experiences

Figure 8 C0002R Drilling Experiences