HAWAI‘I UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT (QLR) for *Pisces* and *RCV-150*

DIVE: *Pisces 4:* 161

(*Extend length of sections as needed/appropriate*)

MISSION STATUS

Location: Loihi summit

Latitude: 18° 54.974 **Longitude:** 155° 15.853

Mission Date: 10/8/2006 **Duration: 7** hours 49 mins

Maximum Depth: 1351 meters

Project Title: Loihi’s volcaniclastic deposits: Interpreting explosive submarine eruptions

Principal Investigator: Bruce Houghton

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Observer 1: Bruce Houghton **Observer 2:** Penny Larin

Address: As above **Address:** As above

Pilot 1: Terry Kerby **Pilot 2:**

Scientific Data Acquired: Prepare an abstract outlining your objectives, techniques, findings, etc.

Objectives:

Our objective was traverse a previously unstudied area from Pisces Peak to the eastern wall of East Pit to look for further cone-forming pyroclastic deposits and sample any candidates for inclusion in the study of size distributions amongst vesicle (bubble) and crystal populations in the pyroclasts to establish the history of ascent and degassing of the magma in comparison to subaerial Hawaiian and Strombolian eruptions.

Observations, findings, etc:
We first ascended the steep talus slope west of Pisces Peak reaching the summit at 10:12 am. A traverse along the scarp showed no trace of any pyroclastic material simply and alternation of talus with subordinate amounts of lavas, principally pillow lavas. There is also no clearly recognizable block layer dating from the 1996 event.

We then tracked east approximately 2 km and descended to the floor of the East Pit, at N 18° 54.812' W 155° 14.984'. The floor consisted of laminated and rippled veneers of fine rock dust (and flocculant material) partially covering pebble/boulder material which is mostly pillow-derived. We sampled this volcaniclastic material as P4-163-1A using a scoop to drop material into 2 jars in the bio box.

We then ascended the eastern wall of the pit through an alternation of very coarse talus and buttresses of coarsely columnar lava. Our second sampling point was at the southeastern rim of the East Pit at N 18° 54.751' W 155° 14.739'. This sample was from a layer of lapilli tuff characterized by fresh basaltic clasts with smooth and sometimes apparently fluidal shapes but apparently non-vesicular walls. The scoop became blocked and so the sample was split across two jars in the bio box, the scoop and valve scoop 5.

We then crossed a broad, gently sloping surface leading to the outer eastern wall passing an area where smoker vents and partially buried by the 1996 rock dust and then reaching on the steeper slopes a zone of intact pillow lavas alternating with broken pillow breccia. No pyroclastic material was observed. Our end point was close to the mid point of the eastern wall at N 18° 55.309' W 155° 14.451'

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

Descent was delayed for 30 minutes due to a monitor failure..

Recommendations for corrective action or improvement:

None needed.

In your opinion, did the mission essentially achieve its purpose? Compare actual work accomplished with the work that was expected to be accomplished:

The dive was successful in the sense that we covered a large area of previously unstudied terrain and also because the two samples from this dive are both highly unusual and very interesting. The result was a negative one only in that there are no further thick pyroclastic deposits in this region. The two collected samples appear to define a second style of explosive eruption at Loihi, distinct from that seen at sites J and D, in particular. These two samples we collected proved, in the laboratory, to be dominated by dense clasts but with textures indicating that they were formed from fluidal melt that quenched rapidly but in some cases underwent limited vesiculation after initial quenching. Both complex fluidal

shapes and bread-crusting are present amongst the clasts, sometimes on a single clast. These features are particularly evident for sample P4-163-1A. the 163 samples are a very useful counterpoint to samples from all other dives in this series.

List specimens or samples collected on the mission:

bulk samples of uncompacted pyroclastic material for vesicularity work:

P-4-163-1A	floor of East Pit
P-4-163-2A	eastern wall of East Pit

QLR continued

DATA RELEASE

Data may be retained by the project leader for up to 2 years after the mission date with the following exception. NOAA may request to use photos for publication or publicity purposes at any time.

Fill in the appropriate statement below and sign this form.

I hereby release the data archived by HURL for public consumption following mission (Project title):

_____

_____

Held on _____ (date) in the following way:

a. CTD data by _____ (date)

b. Video and images by _____ (date)

c. Other _____(date)

d. I will give my written consent to individuals wishing to use these data prior to the above dates depending on the nature of the request(s).

_____

Principal Investigator