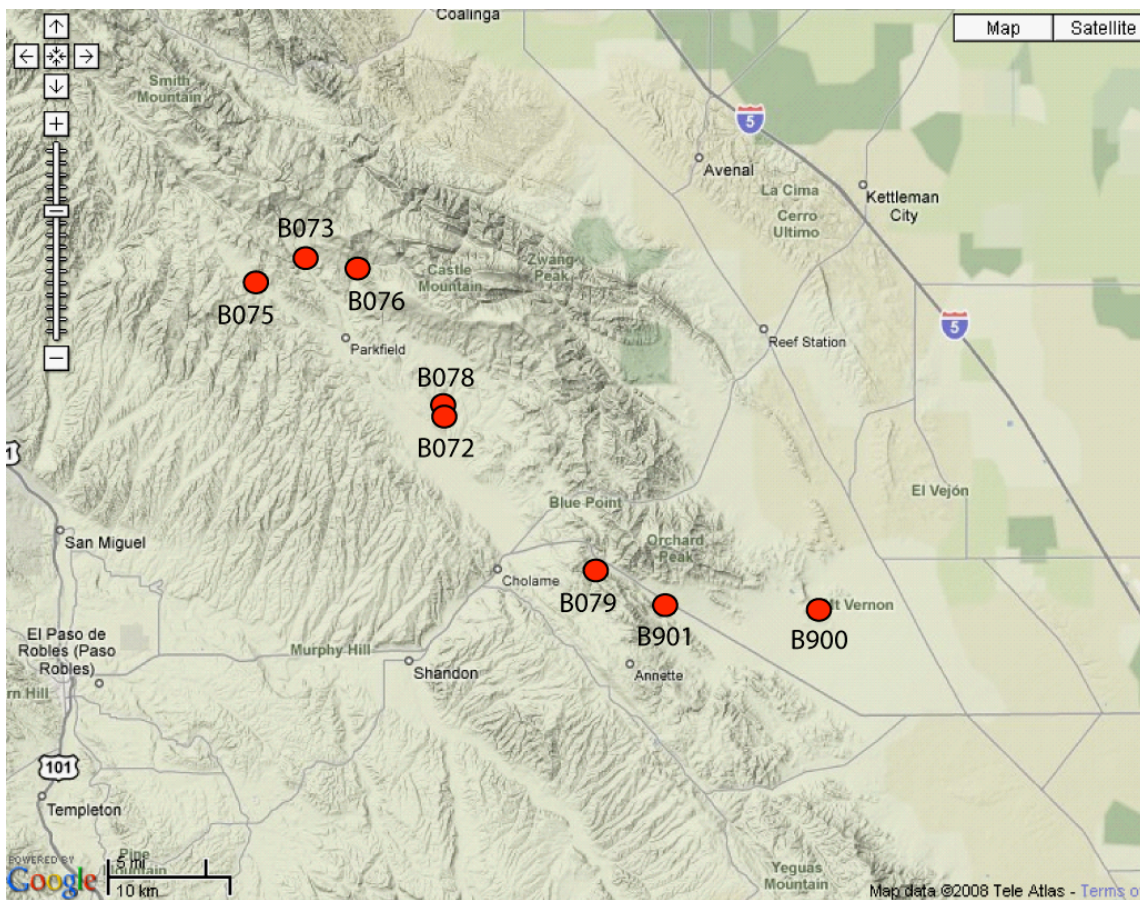


Station Notes for B078, Gold Hill, GoldH1078GCS2006

Latitude:	35.8377 (WGS 84)
Longitude:	-120.3452 (WGS 84)
Elevation:	386.8 m / 4469 ft
Install Depth:	181.5m / 597 ft
Orientations:	CH0=279.7, CH1=219.7, CH2=159.7, CH3=129.7
Install Date:	12 October 2006
GTSM Technologies #:	US28
Executive Process Software:	Version 1.14
Logger Software:	Version 2.02.2
Home Page:	www.unavco.org/instrumentation/networks/status/pbo/overview/B078
Notes Last Updated:	July 29, 2019

Install depth is from the top of the casing to the bottom of the strainmeter.

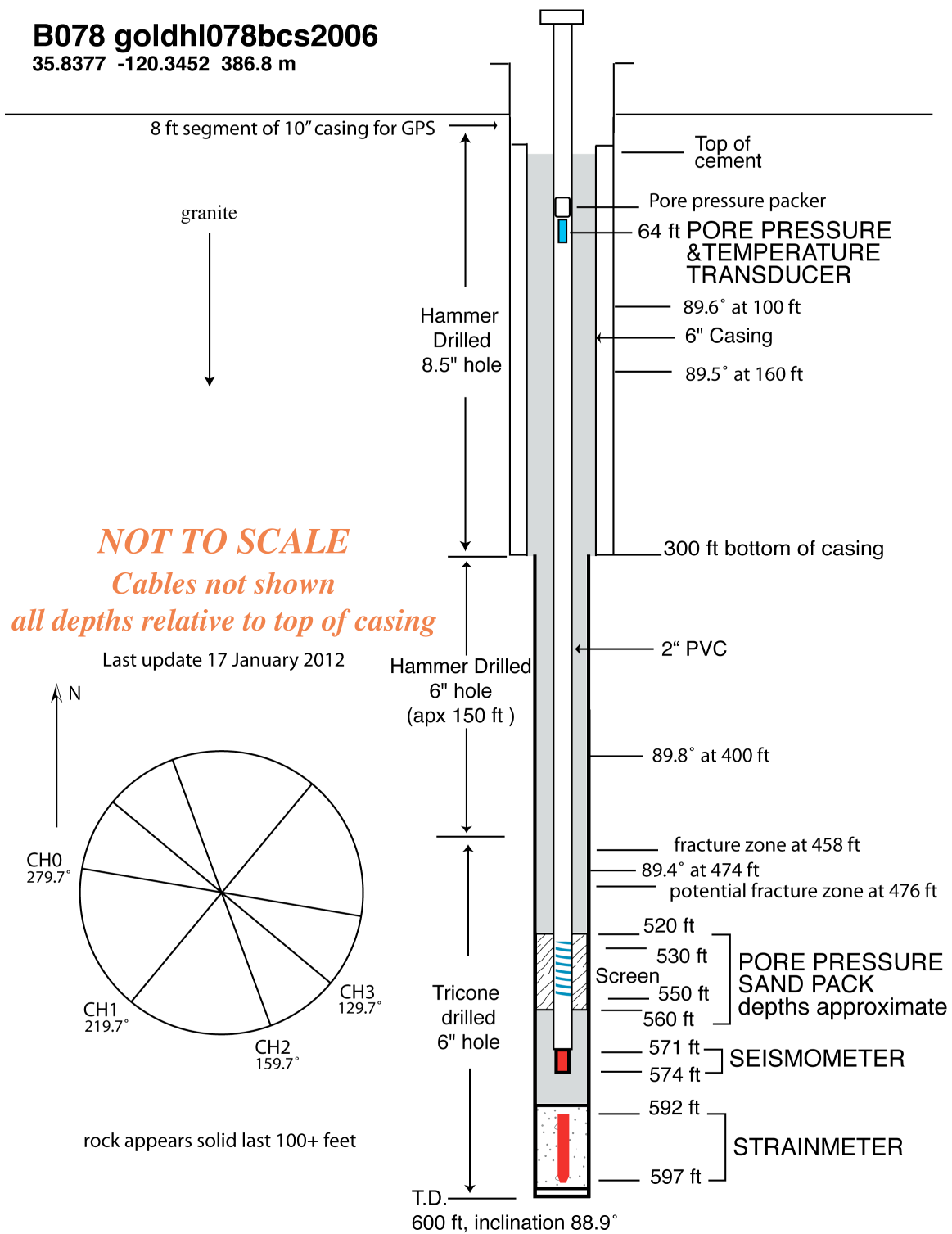
Orientations are in degrees East of North.



Parkfield PBO strainmeter network, July, 2008

B078 goldhl078bcs2006

35.8377 -120.3452 386.8 m



Instrumentation at Strainmeter

Instrument	Units	Bottle/ASCII Scale Factor	SEED Scale Factor
Pore Pressure	Hecto Pascals	1.0	N/A
GTSM Barometer	Kilopascals	1.0	0.0001
Rain Gauge	Millimeters/hour	1.0	0.252
Down hole Temperature Sensor	Degrees Celsius	1.0	0.0001
Logger Temperature Sensor	Degrees Celsius	1.0	0.0001
Setra Barometer	Hecto Pascals	Not installed at this time	

1. Installation notes

This site is located 7 miles south of Parkfield, CA. The site is collocated with the Gold Hill GPS site. The geology consist of granite that was rafted up from south of LA on the SAF. The hole was drilled to 600ft (597 logger). The drill rig was re-mobed to clean out a blockage at 350ft. The hole was logged on the 12th of Oct, 2006. While cloudy the OTV seemed to show enough detail to rule out major fractures. The full wave form Sonic indicated that the rock at the bottom was the most competent.

Inclination is 88.9 degrees at the bottom of hole Static H2O level in unknown due to drillers cleaning out hole 10/11/06 and adding water 10/12/06

We used 9gal water with 8 bags set grout. Nothing unusual happened during the install.

2. General Information

- Oct 13 – Nov 2, 2006 Logger went into standby and restarted almost every day
- Door opened Oct 16-18,21,31 – Nov 2, 9, 16-17, 2006
- Sensitivities of all EH channels corrected on March 4, 2010.
- The pore pressure sensor is installed at 64 feet with the packer inflated directly above the sensor.

3. Strainmeter Maintenance

- 17 November 2006
Wade Johnson and Alan visited the site they “retrofitted the GTSM charging system with Flex chargers and also tested the wiring of the seismometers.”
- December 5, 2006
Mike Gottlieb visited the site at 12:35 PST.
- 17 December 2006 - Michael Hasting visited the site to test and check the power system.
- December 18, 2006 - Michael Hasting updated the RT firmware to 1.17 and the GPS to 135_309.s3. Timing is now accurate. (Dec 19 - Time Difference: 2 seconds - within error of check)
- March 25, 2007 – Tim and Michael Hasting replaced/upgraded the power system at B078 and hooked the GTSM21 power box to the DC/DC converter. They also upgraded the RT Controller Boards firmware from Version 1.17 to 1.18.
- October 2 & 5, 2007 – Warren Gallaher visited the site to perform some maintenance. The site was cleaned up and reorganized for better access. The power box was adjusted for proper

charge voltage. Also the quadrature and delay were set. A Marmot was also installed. The solar regulator was found to be causing radiated noise on the GTSM system. As a temporary solution one set of solar panels was hooked directly to the GTSM power box and the wires were re-routed to provide physical separation.

- December 17, 2007 UTC – Mike Gottlieb visited the site to swap out the fiber optic modems. 18:40 On site, swapped fiber optic modems. 19:15 GTSM back online, off site.
- July 17, 2008 – Chuck Kurnik visited the site at ~4:45 PM PDT to install a new Q330. Pore pressure is now being recorded with the Q330 instead of the NETRS.
- March 27, 2009 – The logger software was upgraded from 1.15 to the correct version of 2.02.2 that matches the compact flash size.
- August 2, 2009 - All Rt Boards were upgraded to Firmware 1.20. Quadrature was adjusted.
- November 19, 2009 – Liz visited the site, but was unable to get it back online. The site needs a new IDU. The rain gauge was cleaned out.
- December 10, 2009 – Liz replaced both fiber optic modems.
- Jan 11-12, 2010 – The ODU was replaced as the previous one no longer had the plastic film from birds pecking at it. The ODU satellite information had to be manually entered for the transmit to work. Quadratures were adjusted on the BSM on Jan. 12 (roughly noon PT). Chan 0 & 3 were off by >2/3 and readjusted. Chan 1 & 2 were still in phase.
- March 9, 2010 – Liz visited the site from 18:01 to 20:10 local time. Gophers were living under the enclosure a chewing on wiring. Pellets were left to discourage the current gopher home. Solar panels were cleaned.
- June 16, 2010 – The Q330 was replaced, and the station will be monitored to see if this corrects the issue of gaps in the pore pressure data. Birds had pecked through the plastic film on the ODU. The ODU was replaced with a spare. All solar panels were cleaned to remove all the bird excrement. All solar panels on the top of each rack were completely coated. Cleaned out the rain gauge as it was clogged from birds. They have removed the screen. There is on large gopher hole on the east side of the enclosure. Pellets were left to encourage the gophers to live elsewhere.
- July 18, 2010 – After connecting to the Pore Pressure, the downhole instrument is sending data. A new Serial cord was connected to the Q330 and Pore Pressure. The BOD rate and other settings were checked and corrected on the Q330 but no pore pressure data came in on Serial Port 1 or 2. The Q330 firmware was upgraded to 1.137. The Pore Pressure data now is retrieved through Serial 2. Serial 1 still would not retrieve data after the firmware upgrade.
- October 21, 2010 – Solar power system was checked. The solar panels and GTSM battery bank were fine. The main battery bank of 8 was split into two smaller banks of 4. The last battery on the end of each bank had no, to very low current flow. The other three batteries of each bank were fine. The battery banks should be re-wired or replaced.
- November 2, 2010 – A broadband seismometer, marmot and Q330 were temporarily deployed at the site. The seismometer will be used to orient the borehole seismometer.

- November 18, 2010 – The main battery bank of eight was replaced. Both the main bank and GTSM batteries were rewired so that each bank (of four) has the negative (black wire) attached on one end of the bank and the positive (red wire) feeds to the other end of the bank.
- June 2, 2011 – Replaced ODU.
- August 18, 2011 – Power system upgraded. Replaced 10AWG battery jumpers with 4AWG battery jumpers.
- December 20, 2011 – Upgraded power system, and added a Tristar MPPT solar controller.
- ~March 27, 2013 – Chad visited the site to check the power system. A loose connection was found for panels 6 and 7. Panels 8 and 9 have low current and should be replaced. There are only 10 batteries at the site, and they were installed in 2007. 2 batteries were added. They LVD setting were also tested. LVD2 will be changed on the next site visit.
- August 6, 2014 – Adjusted LVD2, swapped RT board, cleaned solar panels, replaced ODU horn, and added bird netting. Adjusted quads and chop.
- August 26, 2014 – CH2 data was still noisy. Swapped RT board and upgraded FW version to 1.20.
- October 7, 2014 – The data quality for CH2 had been degrading despite multiple RT board swaps. On September 13, 2014 the CH2 flatlined. Chad again swapped the RT with a new one. The swap was unsuccessful: the new board was stuck in G2, and would not respond to quad box pot adjustments. He then swapped RT boards between CH2 and CH3, but the CH3 board also showed the same behavior (G2, no response to quad adjustment). After swapping the boards back, he checked and cleaned the flex cable connections between the GTSM cable and environmental box. It's possible that there is a problem in the quad box or back plane, which may require an environmental box swap.
- March 17, 2015 – The oscillator board was swapped in an attempt to address the noise issues on CH1 and CH2. Unfortunately, the oscillator board does not appear to be the source of the noise. CH1 is still in Gain 0, and Chad was unable to adjust quadrature/chop. He swapped RT boards between CH1 -> CH3 (good), and saw the same behavior. He also swapped CH1 -> CH2, with no discernible change. The CH1 RT behaved normally when placed in the other positions (CH2, CH3). The CH2 and CH3 RT boards showed the same behavior (G0, funky trace) when placed in the CH1 position. The CH2 board was in G2 when Chad arrived. He was able to adjust quadrature/chop.
- April 14, 2015 – Swapped out environmental box and all boards (except logger) as a test to see if data quality improves. Environmental box will be left in place for one month.
- July 23, 2015 – Switched comms to an LS300. Left VSAT dish for now, if comms are stable, VSAT will be removed during the next visit. Adjusted quadrature and chop. CH0 and CH3 looked normal. Ch1 was stuck in G2, signal was jumpy and unstable, not responsive to adjustment. Ch2 was stuck in G2. Signal looked ok, but not responsive to adjustment. CH2 also had a tap step = 0.
- March 31, 2016 - Measured resistance and capacitance on all four GTSM channels.
- July 31, 2016 – Gathered resistance and capacitance data for all GTSM circuits.
- March 30, 2017 – Swapped batteries.

- April 19, 2017 – Continued GTSM testing with dummy load cell. All uphole equipment confirmed to be functioning properly. Set quad/chop for CH0 and CH3. CH1 and CH2 were non-responsive
- April 11, 2018 – Investigated poor data quality on CH1 and CH2. CH0 and CH3 were working well, G3, responded to quad adjust. CH1 and CH2 had no tap step, no quad response, could not manually balance, no amp i/p response to RT changes. Down hole failures on both channels. Dummy cell was normal for all channels.
- July 11, 2018 – LS300 was replaced with a RV50. EB6 radio was swapped for a Ubiquiti AirMax Rocket M2 base station.
- July 16, 2019 – Cleaned dirty solar panels. Pore pressure sensor had failed. Removed air from packer. Pulled on steel cable, but it was rusted and broke. Pulled on copper tube, would not budge. Rigged up truck winch on copper tube, it pulled out of the top of the packer. Used winch on sense cable, and was able to get old sensor and packer out of the hole. New sensor installed at 64' depth, no packer, lowered with 1/8" steel cable.