

Sensor emplacement testing at Poker Flats, Alaska

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PASSCAL provides equipment and support for temporary seismic projects, often for which the speed and efficiency of deployments are essential. A revised emplacement technique of putting broadband sensors directly into soil (aka direct burial) is being tested, with the first phase (fall 2011 to spring 2013) comparing data quality and sensor stability between the direct burial and the traditional 1 m deep PASSCAL-style vault with a primitive pier, near San Antonio, NM. Results from this test suggest there is little or no difference in sensor performance in the relatively high-noise environment of this initial phase.

The second phase was started in November 2011 with the goal of making the same comparison, but at Poker Flats, Alaska, in a low-noise, high-signal, cold and wet environment, alongside a Transportable Array (TA) deployment to be used as a performance control. This location is in an accessible and secure area with very low cultural and environmental noise. In addition to benefiting future PASSCAL deployments, the Poker Flats experiment serves a secondary purpose of testing modifications necessary to successfully deploy and recover broadband stations in a wet and challenging environment with the limited logistics anticipated for remote Flexible Array (FA) and PASSCAL Program deployments in Alaska. Developing emplacement techniques that maintain high data quality and data return while minimizing logistics is critical to enable FA PIs to effectively and efficiently co-locate within the future TA Alaska footprint.

Three Nanometrics sensors were installed in November 2011 in hand-augered 76 cm-deep holes: an All-Terrain Trillium Compact and two Trillium 120 units (one standard posthole and one enhanced posthole-Q). The Compact and the 120PHQ are delivering data in realtime, while the 120PH is testing a standalone power and data collection system that will be serviced this spring 2013. Currently the data collected from the realtime feeds (YE.PIC2.. and YE.PIC3.01.) compare favorably to each other as well as the nearby Trillium 240 in a traditional TA surface vault and a 120PH in a 5 m machine-drilled borehole (TA.POKR.. and TA.POKR.01.).

Future plans for late this spring involve building two PASSCAL-style surface vaults and installing one Trillium 120PA sensors inside each. These data, the ease of installation and servicing, as well as the install's effects on the instrumentation will be analyzed.



Figure 1: Sunset at the Poker Flats site. The three PASSCAL sensor holes can be seen capped on the right, and the small mound about 50m behind is around and over the TA vault.