



### **EGS Collab: Downhole Camera Survey Procedure During Injection on 4850L**

In preparation for injection, downhole instrumentation was removed from the production well (E1-P) to make way for the downhole camera system (Fig 1). Next, the water in E1-P was lifted out of the well by applying air pressure. After this was done, the downhole camera was conveyed into E1-P. Finally, water was injected into the injection well (E1-I), and the camera was used to scan for fluid entry in E1-P (Fig 2). This exercise was performed twice: once on 25 May 2018 and once on 21 December 2018.

On May 25<sup>th</sup>, water was injected at the previously-stimulated (hydrofractured) depth of 164 feet in E1-I. During this injection, there was significant hydraulic connection between E1-I and E1-P, on the order of ~1.5 liters per minute into E1-P when pumping 5 liters per minute into E1-I. Jetting was observed in E1-P at depths of approximately 127 to 129 feet (Fig 3).

On Dec 21<sup>st</sup>, water was injected at the previously-stimulated (hydrofractured) depth of 142 feet in E1-I. The water was injected at increasing rates of up to 3.2 liters per minute into E1-I while searching for signs of flow into the E1-P. In monitoring the footage, E1-P was found distinctly flowing up to 1.1 liters per minute due to the injection into E1-I. There were 2 to 3 distinct locations of flow in E1-P with multiple jets at depths of approximately 100 to 102 feet.



Figure 1: Removal of downhole instrumentation from production well (E1-P).

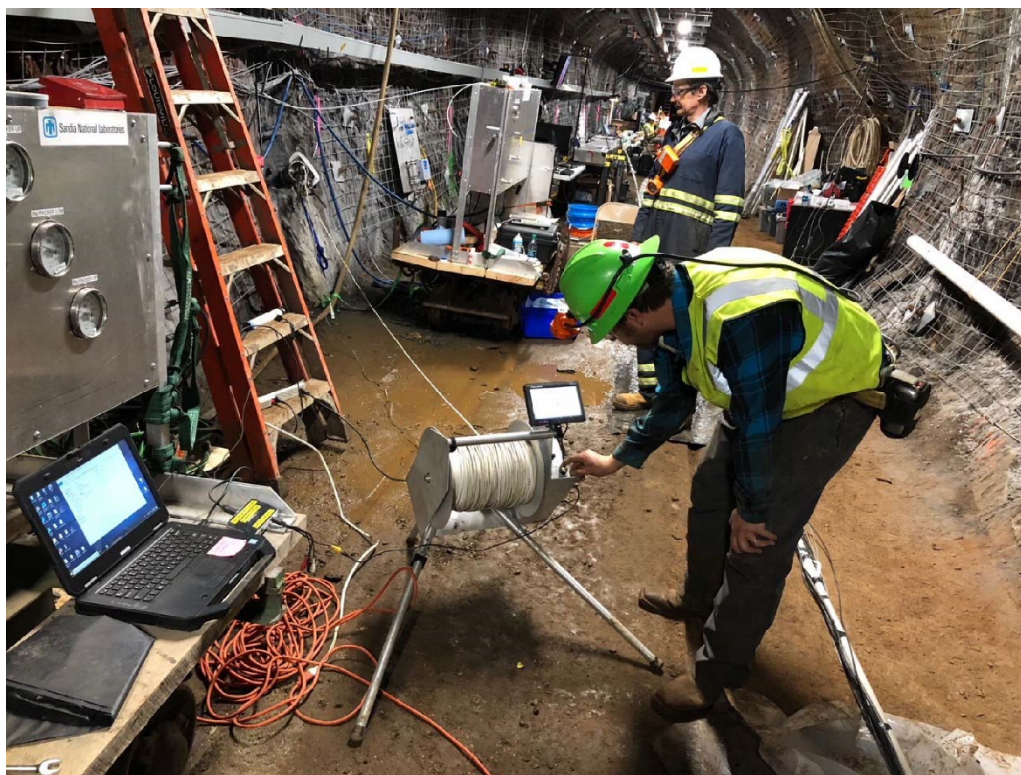


Figure 2: Borehole camera operation at E1-P.





Figure 3: Water leaking (jetting) into E1-P on May 25<sup>th</sup> (note depth registration in this image is approximate, +/- 1 foot).



Figure 4: Water leaking (jetting) into E1-P on December 21<sup>st</sup> (note depth registration in this image is approximate, +/- 1 foot).