

# TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

---

October 13, 2004

OK

TO: Internal File

THRU: Wayne Hedberg, Permit Supervisor *WH*

FROM: Steve M. Fluke, Reclamation Hydrogeologist  
*SF*

RE: Shelter Inspection, SUFCO Mine, C/041/0002

On May 14, 2004, Mike Davis, Chris Hansen (SUFCO), Tom Lloyd, Bruce Ellis (Manti-LaSal N.F.), Stan Perks (BLM), Susan White, Jerriann Ernsten, and myself (DOGM) visited three rock shelter sites located in the 150-acre lease modification of the SUFCO mine's Pines tract. The shelter sites are identified as 42SV2434 (Little Mac Shelter), 42SV2433 (Big Mac Shelter), and 42SV2492. The sites were undermined between 2001 and 2002 and each sustained some damage from spalling caused by subsidence. Prior to the undermining of the sites, the sites were evaluated and designated eligible for the National Register. The purpose of our visit was to determine if any action should be taken to protect the sites from erosion or damage due to surface runoff. Observations and recommendations for each site are listed below.

## OBSERVATIONS:

### 42SV2434 (Little Mac Shelter)

This rock shelter is located approximately 200 feet north of Forest Service Road 007 at the head of an unnamed drainage that leads to the main fork of Box Canyon. The shelter consists of a cave within a sandstone ledge with an entrance approximately 10 feet across and a roof height of approximately 3 feet. Spalling at the lip of the shelter entrance due to subsidence has created a rubble pile consisting of sandstone boulders and cobbles that somewhat obscure the shelter entrance. Some of the rubble southwest of the shelter entrance was reportedly present prior to mining. We examined the area around the shelter to determine if it appeared likely that surface runoff could enter the shelter through newly formed fractures and/or the newly exposed area at the shelter entrance. Of particular concern was the potential for water flowing over the lip of the shelter to scour the entrance floor and backflow into the shelter. It appeared that the rubble at the shelter entrance would protect the entrance floor and reduce the energy of water flowing over the lip of the shelter thus minimizing the potential for scouring and backflow. In addition, it did not appear that the drainage area leading to the shelter was sufficient to produce high flows. We discussed reinforcing the entrance area with nearby rubble but decided it was not necessary at this time.

**TECHNICAL MEMO**

---

42SV2433 (Big Mac Shelter)

This rock shelter is located approximately 500 feet down drainage (northwest) of the Little Mac Shelter. The shelter consists of a cave within a sandstone ledge with an entrance approximately 15 feet across and a roof height of approximately two to four feet. Spalling at the shelter's lip and inside roof due to subsidence has left behind sandstone boulders at the entrance area and sandstone slabs covering the shelter floor. These boulders and slabs appear to act as protection for the floor of the shelter from water erosion due to scouring and backflow. Cracks in the roof of the shelter were likely caused by subsidence and may provide a source for seeps and drips into the shelter increasing overall moisture.

42SV2492

This unnamed rock shelter is located at the head of a Box Canyon drainage that is at the end of the Forest Service road within the southwest quarter of section 10. The shelter consists of an entrance approximately 25 feet across and a roof height of approximately 10 to 15 feet. Some spalling and damage has occurred due to subsidence. A large surface fracture is located above and southeast of the shelter within the drainage. This fracture may alter the surface flow to the drainage and potentially divert some flow away from the shelter area.

**RECOMMENDATIONS:**

42SV2434 (Little Mac Shelter)

No action at this time. Continue monitoring for erosional impacts and consider reinforcement of the entrance area if scouring is evident.

42SV2433 (Big Mac Shelter)

No action at this time. Continue monitoring for erosional impacts and moisture seeping from cracks in roof.

42SV2492

No action at this time. Continue monitoring for erosional impacts and changes to drainage pattern due to large surface fracture.