



Norman H. Bangertter  
Governor

Dee C. Hansen  
Executive Director

Dianne R. Nielson, Ph.D.  
Division Director

# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

355 West North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203  
801-538-5340

November 1, 1989

TO: File

From: David W. Darby, Geologist 

RE: Technical Analysis, Skyline Mine, ACT/007/005, Utah Fuel Company, Folder No. 2, Carbon County, Utah

## Summary

A technical analysis was been conducted on the Skyline Mine Mining and Reclamation Plan (MRP) for the five-year permit term of May 1, 1987 to May 1, 1992. This review accounts for the geologic, hydrologic and subsidence portions of the application package. This review was conducted to ensure that the information presented in the MRP is complete, concise and consistent with current mining rules and regulations outlined in Utah's Coal Mining Regulations and the federal regulatory program under 30 CFR regulations.

This review was conducted for the geologic, ground water and subsidence sections of Utah Fuel Company's Mining and Reclamation Permit application for the Skyline Mine .

## Summary of Permit Review

The following comments indicate the status of technical issues and their completeness for the following regulations over the next 5-year permit period. The conditions derived from this review are based on the mine schedule and assumptions that full seam mining will only take place east of the drainage divide which separates the Price River drainage system from the Huntington Canyon drainage system. As pointed out in previous reviews detailed ground water and subsidence information will be required if mining should be proposed west of the drainage divide other than what has been proposed and outlined in Maps 3.1-1 and 3.1-2.

The geologic characteristics in the vicinity of the mine plan area are described in Volume 1, Section 2.2 ; Volume A-3, under the Geotechnical, Geology sections and Volume A-4, which lists confidential information of coal reserves and borehole data.

The ground water regime is discussed in Volume 1, Section 2.3-2.5, Volume 4, Volume A-1 and Volume A-3, Section 5.3.2.

The subsidence control plan is presented in Volume 3, Section 4.17.

## UMC 817.52 Hydrologic Balance

### GROUND WATER

#### Applicants Proposal

Coal will be mined from three seams in the basal coal zone of the upper coal-bearing member of the Blackhawk Formation, a unit of the Cretaceous Mesaverde Group which is prominent throughout the Wasatch Plateau. The Skyline area is situated along the axis of the Clear Creek anticline, a major structural feature of the northern Wasatch Plateau.

Major faults (Plates 2 and 2.2-1) border the minesite. The largest of these is the Connelville Fault, which is near the eastern boundary of the permit area. The Valentine Fault is located approximately mid way between the eastern and western borders of the permit area. Both the Connelville and Valentine faults have displacements which diminish to the north. Their displacements are on the order of 20 to 30 feet and 200 feet respectively. The north Joe's Valley trends along the west side of the permit area where it disappears beneath the alluvial deposits of Huntington Canyon. It has a displacement of 80 to 100 feet south of the permit area. Other smaller faults lie in echelon with the major faults over the permit area.

Geochemical samples of the roof and floor strata of the three seams intended for mining were collected and analyzed (Volume 1, Section 2.2.8). Conclusions from the tests revealed that the sulfur content in the coal seams and surrounding rock would not be sufficient to cause acid mine drainage.

Ground water sources were studied by monitoring spring and wells on and adjacent to the mine plan area. Baseline data necessary to validate the long term hydrologic consequences has been collected. Ongoing ground water and subsidence monitoring programs (pages 18 and 19) designed to monitor the impacts of mining on the hydrologic balance are being conducted. The ground water monitoring program is outlined in Volume 1, Section 2.3.7, whereas, the locations for the monitoring sites are shown on Plate 2.3.6-1.

Mining impacts are addressed in Volume 1, section 2.5. Ground water intercepted in the mine is utilized in the mining process or discharged to the surface where it is treated via a sedimentation pond. The amount of water discharged from each mine on each monitoring occasion will be monitored at the mine mouth through the use of totalizing flow meters. Totals and water quality will be recorded and submitted to the Division.

### Compliance

The applicant has submitted sufficient ground water and subsidence information to the Division so that an assessment of the probable hydrologic consequences from mining could be conducted over the current five year permit term.

The requirements of UMC 798.14(a)(3) and 784.14(c) are specifically addressed in the Mining and Reclamation Plan (MRP) under Sections 2.3, 2.5 and 4.11. Water rights replacement are covered in Section 4.11.1. Water quality is covered in Sections 4.11.d and 4.11.4 respectively. Water monitoring requirements are addressed in Sections 2.3 and 2.4.

The information submitted to characterize the geology and ground water regime is sufficient to determine the probable hydrologic consequences for the next 5-year permit term, but not for the life of mine operation.

Some hydrologic information, such as spring locations, proposed mining areas, potential subsidence zones and ground flow patterns, indicates that there is potential for mining to disrupt the hydrologic balance if mining continues to the west. The applicant commits to not mining under Electric Lake (Section 4.17.3). Full support room and pillar mining under upper Huntington, Bolger, South Fork of Eccles Creek and Electric Lake buffer zones will not be done unless geotechnical data is consented to by the Regulatory Authority. Full extraction mining techniques under the creek buffer zone and evaluation areas shown on Map 4.17.1-1 will only be proposed if evidence shows surface effects can be mitigated.

### Stipulations

None

### UMC 817.121-126 Subsidence Control Plan

#### Applicant's Proposal

The applicant plans to maximize coal recovery using the most efficient and productive mine design and coal extraction methods. Mine designs have been planned based on all available information concerning project area, geologic, hydrologic and stratigraphic characteristics.

The sequence of extraction has been planned to allow each panel in a successively lower seam to be extracted at least two years later than the panel above it. Mining methods will involve both a continuous miner and longwall. The mines will be developed using a continuous miner to drive entries which are connected with cross cuts. The longwall mining systems will be employed to extract the majority of the coal. Room and pillar mining will take place where longwall mining is not feasible.

The three minable seams are the Upper O'Connor seam (Skyline No. 1 Mine), Lower O'Connor B seam (Skyline No. 2) and the Lower O'Connor A seam (Skyline Mine No. 3). A seam is considered non-minable where the thickness is less than five feet of the interburden between two seams becomes less than 30 feet.

Mining sequence for the Numbers 1 and 3 Mines are provided in Volume 2 on Maps 3.3-1 and 3.3-2.

The applicant lists the following areas that could be harmed if subsidence occurs: the Mountain Fuel Supply Company's pipeline, the upper reaches of Electric Lake Reservoir, perennial streams of the permit area and public roads. Areas of potential subsidence are shown on Map 4.17.1-1 in Volume 3, Section 4.17.

Plans for protecting a Mountain Fuel Supply Company natural gas pipeline are outlined in Volume 2, Section 3.1.7. Reduced extraction beneath the pipe's area of influence. There are no oil or gas wells except for a single abandon test well at the surface facilities site, which has been provided protection.

Prevention measures have been proposed (Volume 3, Section 4.17.3) to protect structures and resources. Support pillars will be left to protect the pipeline. A buffer zone will be left, so full extraction will not take place beneath Electric Lake Reservoir or Upper Huntington Creek inlet.

A mitigation plan (Volume 3, Section 4.17.4) has been developed by the applicant in the event subsidence should cause diminution to water rights or damage to structures. The applicant will arrange for repairs if the pipeline or improved roads are materially effected. The applicant will replace the water supply of any land owner, if such water supply is contaminated, diminished or interrupted as a result of the Skyline mining operation (Volume 3, Section 4.11.1).

A subsidence monitoring program has been established (Volume 3, Section 4.17.5), which incorporates aerial photogrammetrics surveys, which will help in determining the effects of underground coal mining. Baseline and annual surveys will be compared to locate, photograph and document the presence of subsidence effects, tension cracks, and fissures. The annual subsidence monitoring report will be provided to the U. S. Forest Service (as land owner) and to the regulatory authority.

#### Compliance

The applicant has submitted sufficient information to address all subsidence issues for the next 5-year permit term. Again the applicant has not submitted detailed site specific or detailed subsurface information for life of mine operation beneath or adjacent to springs, on the the Huntington Canyon side of the drainage divide.

#### Stipulations

None

dwd/DWD

cc. Sue Linner  
B Team  
1565R