ACT/007/007 Mine file
J Whitehead

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KAISER COAL

KAISER COAL CORPORATION
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January 18, 1987

Letter only to mine file.
Letter & copies of inserts to J. Whitehead

Mr. Lowell P. Braxton, Administrator
Mineral Resource Development & Reclamation Program
Utah Division of Oil, Gas & Mining
355 W. North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Re: Subsidence Monitoring
Sunnyside Mines
ACT/007/007

Dear Mr. Braxton:

On page 33, chapter III of the Sunnyside MRP is a commitment to report to the Division the results of subsidence monitoring at the Sunnyside Mines within thirty days of the subsidence survey. After discussing this reporting time frame with Mr. John Whitehead, Kaiser requests that this reporting be consolidated with the annual report due March 31 of each year.

To facilitate this, three copies of revised pages 32, 33 and 33a of Chapter III are attached.The only content change is to page 33. However, the word processor has slightly modified the printing format of the other two pages, so they are included.

If you have any questions on this, please contact me.

Sincerely,

Carl W. Winters

Carl W. Winters
Senior Mining Engineer

att

cc: J. J. Whitehead w/o att
B. J. Bourquin w/o att

3.4.8 Subsidence Control Plan

Subsidence is expected to occur over much of the permit area as a result of controlled caving during the mining process. For economic and safety reasons, full extraction is required during mining. If a surface feature must be protected from subsidence, the area under the feature is not mined or is only first mined depending upon depth of cover.

Visual surface mapping surveys for subsidence features over the Sunnyside Mine workings were made by the U.S. Geological Survey (Osterwald, 1962). Evidence of subsidence was found primarily in one area located on the steeply rising east wall of Whitmore Canyon, between the office complex and the mouth of Pasture Canyon. This is consistent with a later U.S. Geological Survey report which states that most subsidence cracks are formed on spurs or noses above mine workings and tend to be subparallel to joints. Joint orientation controls alignment of subsidence cracks because many en echelon subsidence cracks closely parallel joint trends (Mayberry, 1971, p. 3). The regional joint pattern is characterized by two major sets of joints at nearly right angles to each other, striking N. 75^{o}-85^{o} W. and N. 12^{o}-20^{o} W. (Osterwald and Eggleton, 1958, p. 13; Maberry, 1968, p. 9).

A subsidence base net was surveyed in May 1982 to determine the vertical extent of subsidence in an area with the least amount of overburden and the highest coal height left to mine in the permit area. This should be the area that will have the greatest amount of subsidence. In August of 1983 two of the net points were mined under and the net was resurveyed to determine the amount of subsidence. The results of the survey are in Table III-21. Points S-1 and S-2 showed no visible signs of subsidence. The maximum amount of subsidence was 0.53 feet for point S-1 which is seven times less than 3.5 feet, the amount predicted in Figure 3 of the Subsidence Engineer's Handbook for a 550' wide coal face and 1,050 feet of overburden. This may be accounted for by the geologically massive 150-foot thick Castlegate Sandstone that is about 200 feet above the Upper Sunnyside seam (see Figure IV-1) which could react as a monolithic slab to the caving that occurs under it or may be a result of incomplete subsidence at the time of the survey. Plate III-38 shows the thickness of the Castle Gate Sandstone beneath and adjacent to Grassytrail Creek. The Castlegate Sandstone may limit the vertical extent of the cave and reduce the total amount of subsidence that is seen. Damage on the surface is reduced as evidenced by finding and mapping less than 35 acres with surficial subsidence cracks when over 4,000 acres were mined under at the time of the survey (Osterwald, 1962). The full extent of subsidence will be measured as the net is periodically monitored.

An electronic distance meter and a theodolite is used to measure subsidence movement. Permanent monuments are set in Pasture Canyon and will be set in Whitmore Canyon below the reservoir along the creek. There will be 22 new monitoring points approximately every 500 feet on or near the road (within 150 feet of the creek) between the mouth of Bear Canyon and the crest of Whitmore Dam. Each of the new points will be installed and surveyed when a new mining area approaches or will approach within 1500 feet of a proposed subsidence monument before the next annual survey is conducted. When mining activities approach within 1500 feet of Grassytrail Dam, 5 additional monuments now in place along the crest of the dam will be added to the survey net. During the annual survey in 1986, 12 of the monuments will be installed from the mouth of Bear Canyon to a point near the west quarter corner of Section 18, T. 14 So. R. 13 E. SLBM. Results of the annual surveys with the locations of new monitoring points plotted on a map will be submitted to the Division each year. The monuments are and will be 6 foot long roof bolts driven 5.5 feet into the ground.

Within the permit and adjacent areas are renewable resource lands which are aquifers, area for the recharge of aquifers and grazing lands. Other features over the coal seam that could be affected by subsidence are wild habitats, a perennial stream, cultural resources and surface structures. Effects of subsidence on each and mitigation if needed are covered below. Subsidence over the mining area will be monitored annually in August.

Surficial alluvial joint aquifers overlie part of the permit area (see Chapter VII). These are located in north facing slopes and at the head of canyons covered with deep soils. Recharge occurs primarily from melting snow pack on the immediate surface. Past mining in an area with overburden ranging between 500 feet to 2000 feet between Pasture Canyon and Fan Canyon to the south from 1915 to 1965 was under surficial aquifers and recharge areas. There is little or no inflow from these mined out areas into the mine at the present time. Springs and seeps presently flowing in this area are are of good quality (see Chapter VII). Lack of quality and quantity before mining took place prevents the actual comparison with present data. However, no evidence can be seen that the aquifer or recharge area were damaged by mining. Therefore future mining and related subsidence will not cause material damage or diminution of reasonably foreseeable use of the aquifers or areas of recharge if overburden is over 500 feet. Flow of surface and underground water will be monitored to provide actual measurments of impacts of mining on these resources (see Chapter VII).

In the unpredictable event of material damage or diminution of reasonably foreseeable use of aquifers, areas of recharge and spring flow, Kaiser Coal Corporation will restore or rehabilitate

spring flow, Kaiser Coal Corporation will restore or rehabilitate the resource to the extent technologically and economically feasible.