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October 15, 1993

Mr. Tom Munson
Utah Department of Natural Resources
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

RECEIVED

OCT 25 1993

DIVISION OF
OIL, GAS & MINING

ACT/007/006 #2
(Copy text for Tom)
put all in file #2

Dear Mr. Munson,

RE: GENTRY RIDGE GROUND WATER DRAWDOWN CONCERN

We have investigated the question you had regarding the drawdown of the water table by mining and it's possible impact on springs on the north end of Gentry Mountain.

There are seven springs and seeps issuing from the Starpoint Sandstone in Corner Canyon as can be seen on Map 722.100a, Identified Seeps And Springs And Surface Geology. These springs are on the east side of the Bear Canyon Graben opposite from the Castle Valley Ridge and Gentry Ridge mining zone. These springs have numbers 504 through 507 and two seeps, all issuing from approximately the middle of the Starpoint Sandstone formation. Another spring (number 508) issues from the contact of the Starpoint Sandstone and Mancos Shale farther down Corner Canyon. At the closest point of potential mining, spring 504 is approximately 4,000 feet from the mining zone in Castle Valley Ridge where the water table is a minimum of 150 feet below the coal seam.

Two of these springs may have U.S. Forest Service water rights attached to them. Map 731.800a, Ground Water Rights shows two water rights in the area (numbers 91-4190 and 91-4340). The records at the State Water Rights office are not specific enough as to location to verify which springs are associated with these rights. Our locations are felt to be very accurate since we located the springs in the field and mapped them using accurate topographic maps.

The attached map is a copy of a portion of Map 722.100c, 1993 Piezometric Surface Regional Aquifer System, with the following added:

1. Ground water contours have been extrapolated to the north and east assuming the ground water follows the pattern documented with data in the mining zone.
2. Springs 504 through 507, two seeps and spring 508.
3. Mining in Gentry Ridge has been outlined.
4. Cross section A-A' through Gentry Ridge and the springs in Corner Canyon has been plotted.

The pre-mining water table level has been plotted on Cross Section A-A' attached. Drawdown at well P92-04-WD as of July, 1993 was 101 feet. Mining has progressed north of the P92-04-WD well area in the Castle Valley Ridge lease area only in the main entries, which are dry and above the water table. As can be seen on Cross Section A-A', the projected water table drops below the top of the Starpoint Sandstone north of well P92-04-WD. This is confirmed in well 92-10-1 (surface well), and by the new in-mine well P93-01-WD recently completed. The water level in both of these wells is below the top of the Starpoint.

As can be seen on Cross Section A-A', the projected water table intercepts the surface of the ground above the location of spring 504. If the Starpoint Sandstone was a significant source of ground water in this area, one would expect more springs with higher flows. Spring 504 had a flow of 9.6 GPM in July 1986 and 0.17 GPM in August 1991; the other springs and seeps near spring 504 had combined flows of 4.2 GPM in 1986 and 0.83 GPM in 1991. Since the strata dips to the south away from the north end of Gentry Mountain, there are few springs in the area.

The Bear Canyon Graben has been judged to be a discharge point southward for the Gentry Ridge aquifer in previous MRP work by David Hansen of Hansen, Allen and Luce. Since the Bear Canyon Graben lies between the Castle Valley Ridge and Gentry Ridge mining zone and the springs in Corner Canyon it is more likely that ground water in the vicinity of these springs is moving south, away from the area. However, the faults crossed by our mining in the northwest corner of Section 13, Township 15 South, Range 7 East and in the southwest corner of Section 12, Township 15 South, Range 7 East may continue north and intercept Corner Canyon at the location of the springs. If this is the case, these faults may be the source of the springs. If this is the case, mining 4,000 feet away across the Bear Canyon Graben to the west is not likely to impact the spring flows.

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At the southernmost extent of mining in Gentry Ridge, the coal seam elevation is 7950. Assuming dewatering occurs to this elevation, the water table may be drawn down in the vicinity of mining much as a normal pumping well would, however, the Corner Canyon springs are approximately 11,000 feet north and east of the top of the water table where it was first encountered by mining near underground wells P92-01-WD, P92-02-WD, and P92-04-WD. It is very unlikely that the drawdown would reach this far from mining.

The attached graph titled Gentry Ridge Ground Water Elevation Change As Mining Progresses shows the average water elevation in underground monitoring wells P92-01C-WD, P92-02-WD, and P92-04-WD in relationship to the average elevation of the mine face (or active mining area) as mining progresses downdip to the south in Gentry Ridge. It is interesting to note that since About August of 1992, the water level has followed the same general trend as the mine elevation. This may indicate a leveling off of dewatering, and that the maximum expected volume of water flowing into the mine has been reached, and that recharge to the area equals dewatering. The average discharge volume from the Gentry Ridge area, as measured by a flow meter, has shown an increase of only about 10 to 15 GPM over the past 4 months. This may confirm that the maximum expected volume of water flowing into the mine has been reached, and that recharge now approximately equals discharge. In addition, this graph may indicate that the water table will not be drawn down more than approximately 110 feet.

Keep in mind also that dewatering is a temporary event, when mining is completed at the south end of Gentry Ridge in approximately the first quarter of 1995, the ground water will cease to be dewatered. The water table seems to be reacting very rapidly to dewatering, and thus it is expected that recharge to the system will also be rapid.

Based on this evaluation, it is our opinion that dewatering of the Starpoint Sandstone in the Gentry Ridge area will have minimal affect on the springs issuing from the Starpoint Sandstone at the north end of Gentry Mountain. When comparing the flows from the nearly 200 seeps and springs on Gentry Mountain for the years 1986 and 1991 it is apparent that the prolonged drought from 1984 through 1992 has had a very marked impact on virtually all of the 200 springs and seeps (see Table 722.100a, 1986 and 1991 Spring Inventory Field Water Quality Data). Flows in 1986 were much higher than in 1991, in many cases an order of magnitude higher, and many springs and seeps that flowed in 1986 were dry in 1991. The obvious drastic impact from the

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drought makes the speculation that mining may or may not impact springs and seeps seem academic.

If there is further information that we can provide, please contact me.

Respectfully,

A handwritten signature in black ink, appearing to read "Ben Grimes". The signature is fluid and cursive, with the first name "Ben" being more prominent than the last name "Grimes".

Ben Grimes
Environmental Coordinator

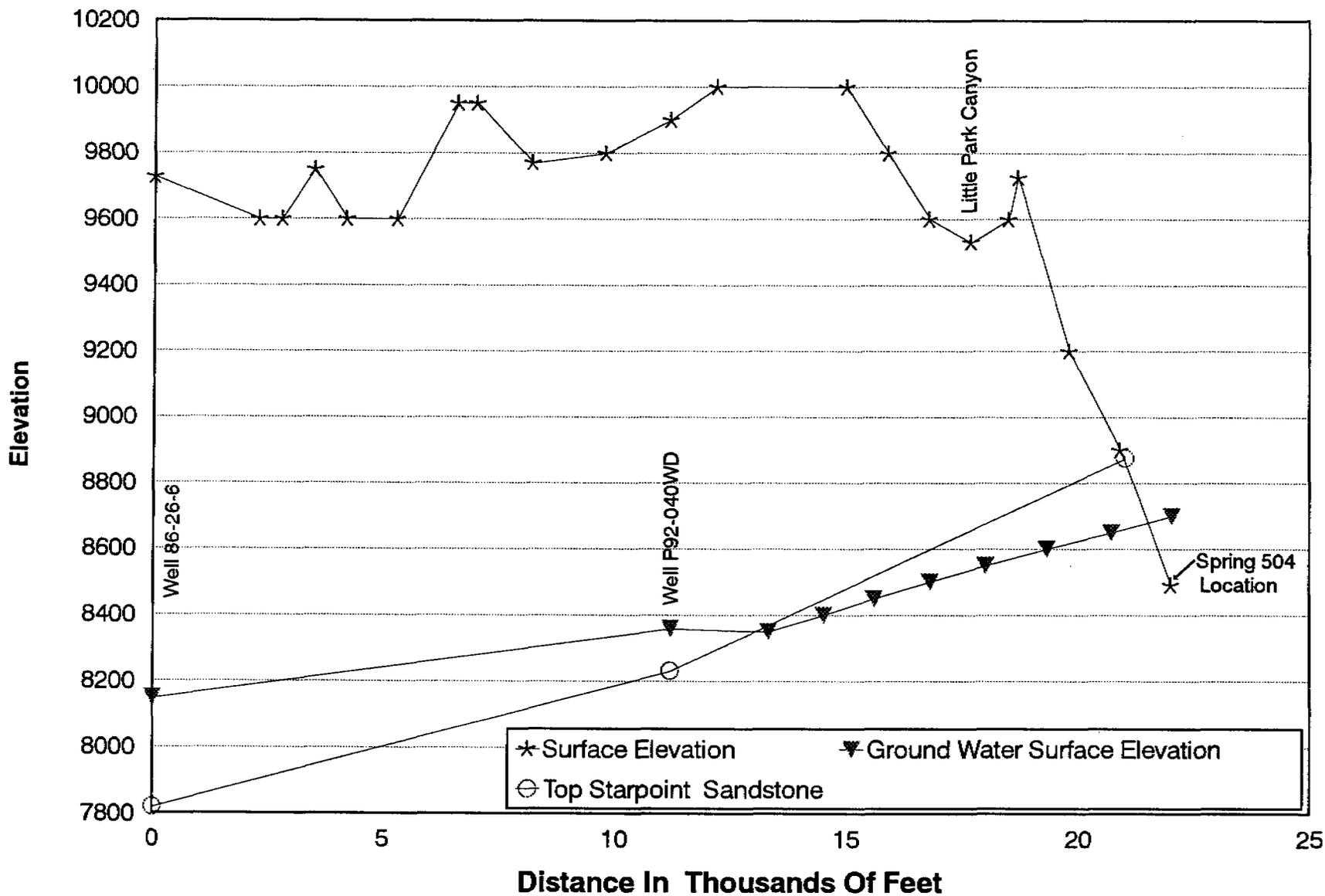
Attachments

c: David Hansen

File: ENV 4-1-6

Chron: BG931008

Cross Section A-A' Ground Water VS Spring Locations In Corner Canyon



Gentry Ridge Ground Water Elevation Change As Mining Progresses

