BISON BASIN PROJECT

DEQ PERMIT TO MINE NO. 504

NRC DOCKET NO. 40-8745
SUA-1396

PROPOSED MODIFICATION

TO

MINE PLAN

JULY 14, 1981

OGLE PETROLEUM INC.

1.0 INTRODUCTION

The original application for the Bison Basin Project was prepared in late 1978 and the first half of 1979, and submitted to the NRC in August, 1979 and to the DEQ in November, 1979. At that time, Ogle Petroleum Inc. (OPI) intended to start mining at 400 GPM and then increase production to 800 GPM and finally, if desired, increase to the full 1200 GPM by the time we were in the second mining unit (and still operating some wells in mining unit No. 1). The original mining unit No. 1 was sized to provide approximately 800 GPM at an average recovery well flow rate of nine GPM each.

The change in the uranium market since OPI submitted its applications ($43/lb. to $24.25/lb.) dictates that OPI reach a full 1200 GPM flow rate as rapidly as possible due to the economy of scale associated with increasing flow rates. As an example, the same number of operator personnel are required to run the processing plant at 400 GPM as are required to run the plant at 1200 GPM.

In view of the current uranium market coupled with the economy of scale of increased flow rates, OPI urgently requests that the size of mining unit No. 1 be increased to provide a production flow rate of 1200 GPM. One additional factor precipitating this request is that the recovery rate was estimated at 9 to 12 GPM per well and the injection rate was estimated at 4 to 7 GPM per well at the time the applications were submitted. Information gained from R & D operations indicates that the recovery rate will probably be more on the order of 7 to 8 GPM, and the injection rate will be approximately 4 GPM, making it necessary to have more wells (more wellfield area) operating to achieve a given production flow rate. Specifics of the requested change in the mine plan are presented in the following sections.

2.0 ORIGINAL MINE PLAN

The mine plan submitted with the initial application partitioned the approximate 40 acre orebody into four units as depicted in the FES (Docket No. 40-8745), Figure 2.2, page 2-25 (see attachment 1). The four units were to be mined in the sequence shown in attachment 1.

3.0 DELINEATION OF ADDITIONAL RESERVES

The outline of the orebody as determined by OPI at the time of the submittal of the NRC and DEQ application, based on the data then available, is depicted in the FES Figure 2.2 and in the DEQ application Figure 15-6. Subsequent exploratory drilling in the permit area coupled with a re-evaluation of existing data have since resulted in a change in the orebody outline. The outline of the orebody as OPI can best determine based on all data currently available is represented in attachment 2.

This change in the orebody outline, as more data become available, is typical for uranium deposits in Wyoming. An examination of attachment 2 reveals that the "new" areas are logical extensions of the previously defined orebody. The total orebody area as shown in attachment 2 is approximately 75 acres. All of the additional orebody area is within the present permit boundary, and the previous environmental baseline studies (soils, vegetation, geology, archaeology, etc.) included the new areas shown on attachment 2.

4.0 REVISED MINE PLAN

The revised mine plan, based on the orebody outline presented in attachment 2 is shown on a map included with this document and identified as attachment 3. The mining sequence will be mining unit No. 1, mining unit No. 2 and mining unit No. 3. The surface areas of these three units are 29 acres, 25 acres and 21 acres; respectfully.

The revised mining unit No. 1 will have approximately 300 injection wells and 171 recovery wells. This number of wells will produce around 1200 GPM (171 wells x 7 GPM = 1197 GPM and 300 wells x 4 GPM = 1200 GPM). As an economic measure, pattern spacing in the new portion of mining unit No. 1 will be increased slightly to about 55 feet between each well instead of the present 50 feet.

The length of time to mine the revised orebody is about the same as planned for the original 40-acre orebody. The reason that the time to mine is about the same, even though the acreage has increased, is that under the revised mine plan production will be at 1200 GPM nearly all the time whereas under the original mine plan, the beginning and ending flow rates were considerably less than 1200 GPM. The time schedule for mining is as follows:

PERIOD	UNIT BEING MINED
Year one	One
Year two (first half)	One
Year two (second half)	Two
Year Three	Two
Year Four	Three
Year five (first half)	Three

5.0 HYDROLOGIC MONITORING AND TESTING

The additional hydrogeologic testing required outside of the original mining unit No. 1 specified in the DEQ permit application (page 179 A) and the NRC source material license will be performed in the new portion of the mining unit No. 1 near the fault shown in Figure 3.9 (page 3-25) of the FES and also shown in Figure 8-14 (page 48) of the DEQ application. A copy of Figure 3.9 is included with this report as attachment 4, with the above mentioned fault circled in red.

The proposed locations of the monitor wells for the new portion of mining unit No. 1 (as well as the locations of existing mining unit No. 1 monitor wells that would also be used for the revised unit No. 1) are shown in attachment 5. The location of monitor wells for the original mining unit No. 1 are presented in the OPI baseline data submittal dated May 18, 1981. The horizontal monitor well spacing of up to 300 feet from the wellfield and up to 600 feet between monitor wells used for the original mining unit No. 1 has also been used in the design of the monitor well locations for the revised mining unit No. 1. No mining will take place in the new portion of mining unit No. 1 until the baseline data from the additional monitor wells and the hydrogeologic tests results have been approved by the DEQ and NRC. The proposed location of the monitor wells for revised mining units 2 and 3 will be submitted to the NRC and DEQ for approval within six months.

6.0 REVISED RESTORATION PLAN

The restoration plan will remain the same in that restoration of a mining unit will commence as soon as practicable after mining of a unit is completed as specified in the DEQ permit and NRC license. Restoration

operations will sequentially follow the mining operations. A map showing the restoration plan is presented in the report as attachment 6. Restoration procedures and techniques will be the same as stated in the DEQ permit and the NRC license. The time schedule for restoration is as follows:

PERIOD	UNIT BEING RESTORED
Year one	None
Year two (first half)	None
Year two (second half)	One
Year three	One
Year four	Two
Year five (first half)	Two
Year five (second half)	Three
Year six	Three

7.0 SUMMARY

This report presents information on OPI's request for a change in its mine plan. The reason for the amendment request is to bring previously undiscovered portions of the orebody into production (resource conservation) and to achieve the full 1200 GPM flow rate as soon as possible in order to take advantage of economy of scale during the current depressed market conditions. All of the newly delineated orebody is within the area that was environmentally analyzed in the original applications. OPI is not proposing any change in the permit area, the process, the facilities, the equipment, the drilling procedures or the monitoring programs. Only a change in the area to be mined, the size of each mining unit and the number of units is being requested.

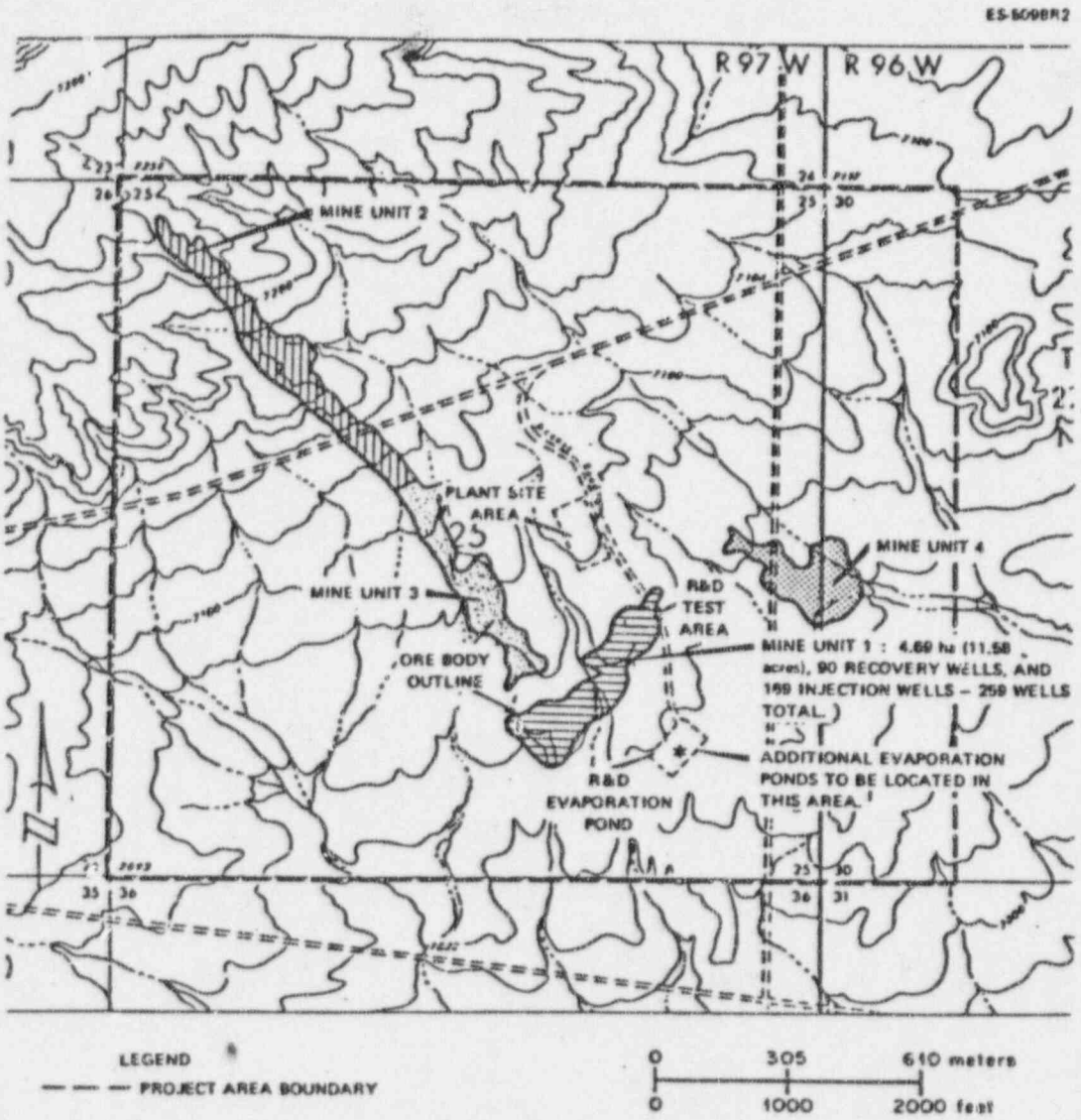

Fig. 2.2. Bison Basin Project mining plan. For a detailed view of first mining unit, see Fig. 2.3. Source: ER, Fig. 3.2-1.

may be routed through ion exchange columns to remove some of the residual mobilized uranium. During the transfer, lixiviant from the spent mining area will be pumped into injection wells in the inner portion of the virgin mining area. Simultaneously, groundwater will be drawn from the outer recovery wells of the virgin area and pumped into the outer injection wells of the spent mining area. Water quality parameters (conductivity and uranium and sodium content) will be monitored in the virgin field. When the monitored parameters indicate the beginning of lixiviant breakthrough, the transfer will be terminated (Fig. 2.4) and aquifer solution mining will commence in the next mining area. It is presently planned that this water exchange or transfer between spent and virgin mining areas will be utilized throughout the life of the project.

Although the total number of production and injection wells required to solution mine the Bison Basin ore body will depend on local hydrologic conditions and estimates from final results of the research and development operation, well requirements to mine the presently defined ore body [about 16 ha (40 acres)] are estimated as follows:

ATTACHMENT 1

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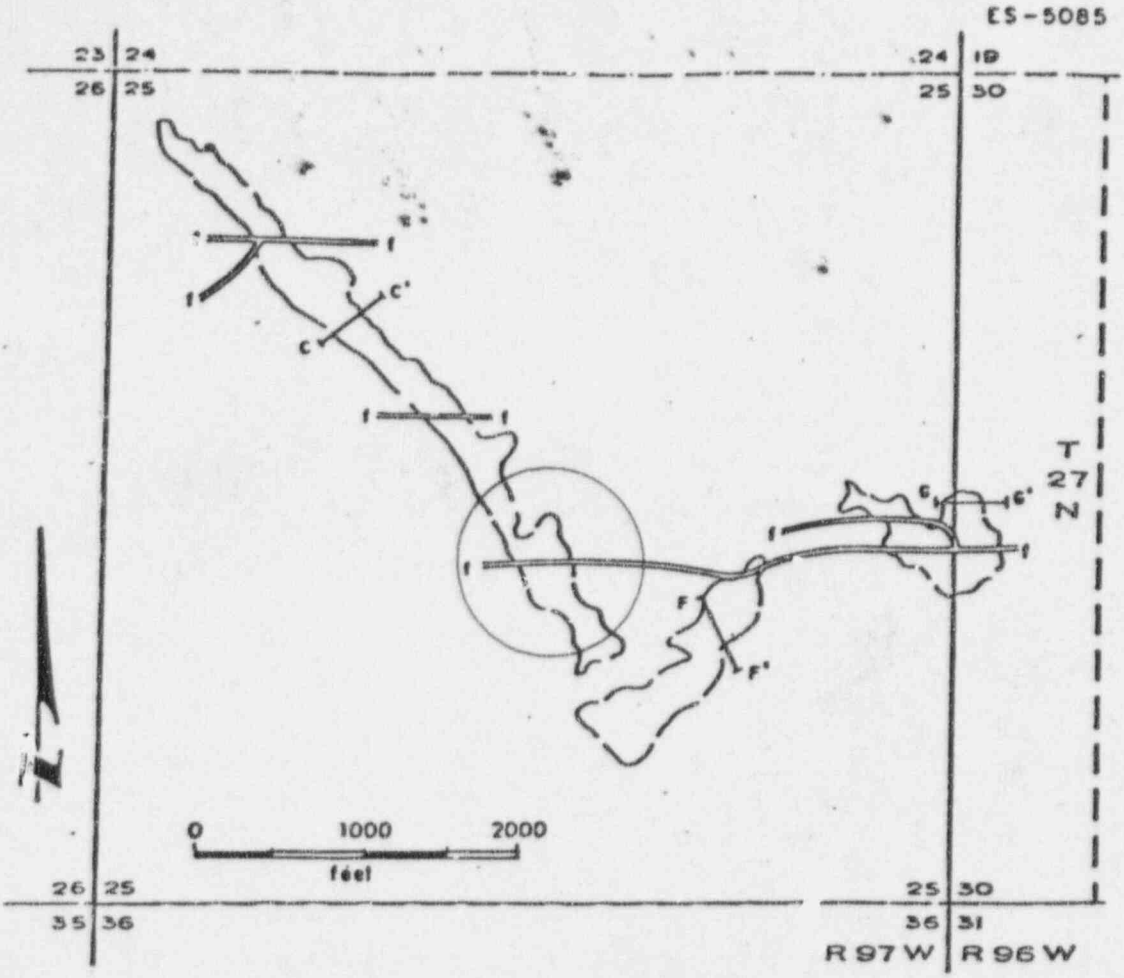


Fig. 3.9. Location of faults (f) transecting the ore body. Geologic section of C-C' will be presented in Fig. 3.16, F-F' in Fig. 3.17, and G-G' in Fig. 3.18. Source: ER, Fig. 2.4-3.

3.6.2.4 Potentiometric surface

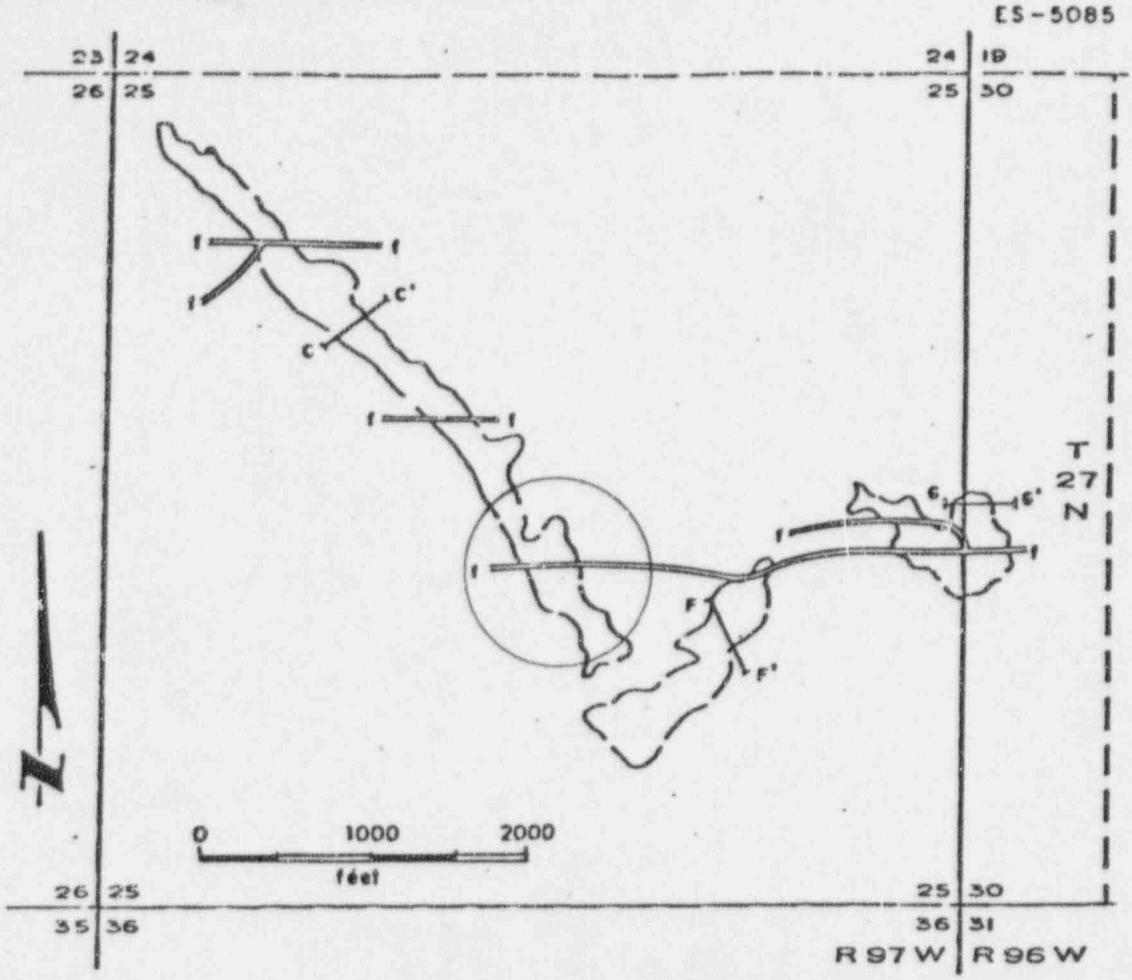
The static potentiometric elevations in wells OP-94, OP-95, and OP-136 (see Figs. 3.11 and 3.12) and wells OP-41 and OP-132 (see Figs. 3.12 and 3.13) that penetrate the ore zone aquifer were monitored periodically between June and September 1977. The results in terms of potentiometric level are shown in Fig. 3.12 and are listed in Table 3.16.

Assuming that hydraulic communication exists across the other faults, as it does in unit 1, Fig. 3.12 presents the potentiometric contour map of the ore zone aquifer based on data from the previously mentioned wells. The contour map indicates that the groundwater in the ore zone aquifer is moving southeast under a hydraulic gradient of about 0.0027 m/m (0.0027 ft/ft), producing a groundwater velocity of approximately 2.7 m (9 ft) per year.

3.6.2.5 Site-specific groundwater quality

All sampling for baseline groundwater quality values for the ore zone aquifer was performed in connection with feasibility push-pull tests conducted in June 1977 and with baseline monitoring in late 1978, preceding commencement of the 0.1 m^3/min (25 gpm) demonstration project.

ATTACHMENT 4



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