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M. C. GODBE, III

Geological Engineer

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OIL, GAS & MINING

January 29, 1987

refer to: Sevier Lake Project
Pilot Phase Operation
Plan Review

FILE COPY

Charles G. Dietz, P.E.
Environmental Engineer
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P.O. Box 16690
Salt Lake City, Utah 84116-0690

Dear Mr. Dietz;

In reply to your letter of January 16, 1987, please find the following referenced item requests for additional data.

subparagraph a. Figure 3 (copy attached) at a scale of 1"=3½± miles, showing location of the pilot phase pond area (containment dike) and the main Needlepoint dike in relation to the Sevier lake meander line. This same figure shows Township reference points and sediment size fractions for the basin clays (see subparagraph c. following).

subparagraph b. Map No. U11U-454 (copy attached) at a scale of 1:48,000-plan map portion showing details of evaporation ponds including sections of the containment and interior dikes.

subparagraph c. Figure 3 (referenced under subparagraph a. above) showing contours based upon percent of -250 mesh material from sample drill holes based upon clastic grain and sieving analysis from a depth of 0 to 5 feet. Samples were derived from flyted auger holes and represent actual particule size of the sediment clays. Within the area of the pilot phaes ponds, sediment size represents 94% minus 250 mesh. Based upon existing pond practice at the Great Salt Lake areas with 60% clay fraction are considered to be good evaporation pond sites.

subparagraph d. No discontinuities (springs, sink holes, etc.) occur within the clay bottoms of the Sevier Lake basin area. This statement is accurate for the entire basin below the old meander line (4,523 feet m.s.l.) as well as the specific location of the proposed pilot phase operation. No areas of potential artesian pressure have been identified within the area of the proposed pilot phase operation. Several areas outside of the proposed operations area, but entirely within the lake bottom clays showed evidence of positive hydrostatic pressure (i.e. possible artesian pressure). Some of the cased drill holes would flow over the slotted casing top for a period of time ranging from 30 minutes to several days, at which time flow ceased and brine would stand at or near the lake bottom surface level. All fluids within the holes drilled comprised a non potable saline brine at or near the point of saturation both flowing and non flowing.

It has been estimated by the U.S.G.S. that .1 acre foot per acre per year is lost through evapo-transpiration from the surface of Sevier Dry Lake, an amount substantially greater than will be evaporated from the proposed pilot phase operation. Surface of the Sevier Lake basin is calculated to be 125,000 to 140,000 acres.

Areas of possible artesian pressure are identified as:

1. Central portion of T23S, R12W, SLM
2. SW¼NE¼ T22S, R11W, SLM
3. W½SE¼ T21S, R11W, SLM
4. SE¼ T20S, R11W, SLM

Less than 5% of all holes drilled showed evidence of artesian flow. Based upon drill hole data, horizontal transmissivity-porosity is greater than vertical within the lake basin sediments. All interformational fluids arebrine in character and are contained within and restricted to the Tertiary to Recent sediments of the Sevier Lake basin.

subparagraph e. No chemical agents will be used in the process contemplated. Nothing will be returned to the Sevier Lake basin which did not come from the lake basin. The process contemplates simple evaporation by natural solar processes to extract minerals contained within the brine system.

subparagraph f. Based upon existing experience under like conditions at Wendover, Utah (Kaiser Chemical plant), and the amounts of subsurface brines to be utilized in the proposed pilot phase operation, the ground water system of the Sevier Lake basin (i.e. those brines contained within the Tertiary-Recent Lake Bonneville sediments) should not be substantially impacted or changed.

Plant process water under full utilization will require 1,000 gpm. This is not a continuous use and reflects only peak requirements. Area recharge is expected to more than compensate for any draw from the ground water resource out of which the process water is derived. Impact here is expected to be minimal. Waters within the outside ground water system presently encroach into the Sevier Lake basin sediment fill where they intermix with the brine along a presently undetermined interface. Plant process water does not require it to be potable and thus brackish or marginal quality water can be utilized further lessening the possibility of impact.

The proposed process water well is only a test well and will be utilized only for hydrological studies. No plant process uses will occur during the pilot phase operations.

subparagraph g. Megascopic logs of the deep drill holes SDL-2,3, 3a and 4 are attached (Map Nos. U36U-280 thru 283). All holes

were drilled within the Sevier Lake basin sediments and showed no evidence of waters other than brine in character.

subparagraph h. Location of the plant process test well and the brine recovery test well are shown on Map No.U11U-454 (copy attached). The brine recovery test well is located at an elevation of 4,520± feet m.s.l. within the brine saturated lake sediments. The plant process test well is located at an elevation of 4,640± feet m.s.l. somewhere at or above the expected interface between brine and downward migrating fresh waters at depth. Each well is expected to test separate stratigraphic horizons dependent upon the difference in collar elevations.

Copies of your letter, this response and attachments hereto will be transmitted to Roger Foisy , Central Utah District, Richfield and Jed Finlinson, Central Utah District, Delta as per your instructions.

Respectfully submitted

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NOTE: See Confidential Files for attached map (isopach) grain size + sieve analysis