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RETURN ORIGINAL TO PDR, HQ.

Petrotomics Company

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January 13, 1993

Mr. Ramon E. Hall
Director
U.S. Nuclear Regulatory Commission
Uranium Recovery Field Office
Region IV
P.O. Box 25325
Denver, CO 80225

Re: Corrective Action, Source Material License SUA 551, Addendum to January 8, 1993 Additional Information Letter

Dear Mr. Hall:

The following additional information is furnished in response to the request on January 11, 1993, by Ms. Cynthia Miller-Corbett, concerning the injection/collection simulations presented in the corrective action modification proposal.

The simulations were performed using the WELFLO program by Walton, which sums the water level change from each injection or collection source over a fixed grid. This analytical model is based on the Theis equation.

The grid used for the simulations contained 50 rows and 50 columns at a spacing of 100 feet. The zero reference point was Petrotomics coordinate 612,000N, 805,000E. The simulation grid was offset, however, such that grid node I-1, J-1 was located at 612,900N, 805,100E.

The result of the WELFLO simulations is the summation of water level changes at each grid node, from which gradients are obtained.

Appendix A of the corrective action modification proposal presents the input data (Table A-1 for the one year simulation) and the results (Table A-2 for the one year simulation). Exhibit 2-2 presents the results as water level change contours.

Injection and collection rates were determined and used in the computer calculations as follows:

1. The injection rates used in the simulations were based on estimates of injectivity into the Upper Wind River sands. The water level rises in the area of the recharge lines were limited to the potential rise in their respective area.

2. The collection rates were based on rates that were needed to maintain the water levels close to existing conditions in the area of the collection.

For example, pages A-1 and A-2 present the fourteen locations and injection rates which were used to simulate the north recharge line. The fifteenth well, presented on page A-2 is for injection well 61SC. The tabulation on the right side of page A-1 shows the site designation for each simulation input well number. The pumping in year one from the horizontal drain is presented as wells 41-45. This drain was simulated at five locations, each pumping at a rate of 7 gal/min, for a total collection rate of 35 gal/min. The five drain inputs are presented on pages A-5 and A-6. Well number 41 is located 690 feet east and 970 feet south of the reference point. This well is therefore located at coordinate 611030N, 805690E (see Exhibit 2-2 for location). The well's corresponding location on the grid is near node I column 7 and between the J rows 19 and 20. The four additional wells used to simulate the horizontal drain are located to the east and slightly to the north of well number 41.

In the output on Table A-2 (page A-9) the average gradient of 0.08 was obtained between the nodes to the north of this horizontal drain and south of the recharge line. As an example, the node I-8, J-15 has a water level rise of 31.22 feet and the node I-8, J-17 has a rise of 15.22 feet. The difference of 16 feet divided by 200 feet between the nodes yields a gradient of 0.08 feet/foot. Gradients (i) were similarly computed for each of the areas in the results section of Table 2-1.

Also presented in Table 2-1 are ground-water velocities computed using these gradients and Darcy's equation. Then, travel times were determined using the computed velocities. An example of these computations for velocity and travel time between the north line and the horizontal drain is:

Velocity equals Gradient (0.08) times average permeability (5) divided by effective porosity (0.1) = 4.0 feet/day

Travel Time equals Distance in feet between the north line and the horizontal drain (450) divided by velocity (4) divided by days per year (365) = 0.31 years.

Based on the average travel times presented on Table 2-1 and experience at other sites, we have estimated that the restoration will take from five to seven years at Petrotomics' site. A restoration time of six years is used to compute the estimated collection volumes. The actual restoration time could vary

significantly due to variations in injection and collection rates and the specific response of each hazardous constituent. For some constituents, it is believed that concentrations after restoration to levels as low as reasonably achievable may be above the predetermined standards, requiring consideration of alternate concentration limits. Better definition of restoration time will be possible after monitoring of the operating system for a period of time.

Please contact me if you have further questions.

Sincerely,

R. A. Juday
Supervisor