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SIMON

**Environmental
Services**

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September 25, 1991

Mr. Wayne Price
Staff Engineer
Regulatory/Environmental Affairs
Unichem International Inc.
P.O. Box 1499
Hobbs, New Mexico 88241

Subject: Carlsbad Brine Well Collapse and Subsidence Investigation
Simon Environmental Services Project No. 502-939-01

Dear Mr. Price:

Per your request, we have investigated the collapse/subsidence potential at the Carlsbad brine well. Based on that investigation, the likelihood that collapse and/or subsidence will occur due to future brine extraction at the Carlsbad well is low.

Our conclusion is based upon application of the model developed by Lee Wilson and Associates, Inc. in their report "UIC Evaluation of Salt Extraction Wells in New Mexico" which was prepared for the New Mexico Oil Conservation Division, Department of Energy and Minerals in 1982. The approach developed in this report is similar to that employed by us in reviews of solution mining permit applications for EPA Regions II and VIII.

In regard to potential collapse/subsidence, the Lee Wilson report concludes that "cavity stability is 'relatively high' if the cavity has at least 50 feet of overburden per million cubic feet of capacity." Based on actual and estimated brine production since 1976 (see attached), approximately 3,378,000 cubic feet of salt has been dissolved. Given the well depth of 710 feet, the depth/cavity volume ratio is 210 feet per million cubic feet, which is approximately 4 times greater than 50 feet per million cubic feet.

At the average cavity growth rate of 225,000 cubic feet per year the critical ratio of 50 feet per million cubic feet will not be reached for approximately 50 years. Presently, monitoring cavity growth while keeping the cavity full of fluid is recommended to minimize the chance of collapse/subsidence. Contingency and remedial plans, while not likely to be necessary, are always a good idea.

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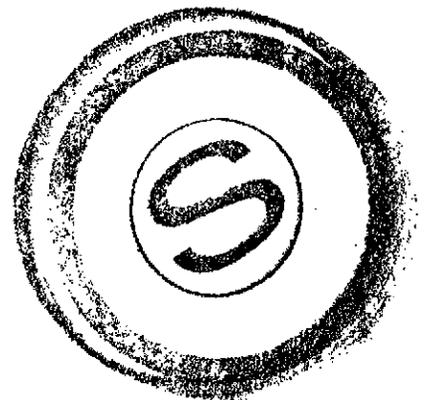
Thank you for having us look into this for you. Please contact me
if you have any questions or additional needs.

Sincerely,

J.L. Gray
Project Manager

/ns

cc: Talib Syed
Sheila Baber



CARLSBAD BRINE WELL

	Time	Brine Sales	Sales Rate	Cavity Increase'
1	1976-81 (yrs.)	1,946,441 bbls	390,000/year	1,782,000 ft ³
2	1982-86 (yrs.)	1,250,000 bbls ??	250,000/year??	1,145,000 ft ³ ??
3	1987-91 (yrs.)	490,982	110,000/year	450,000 ft ³
	TOTAL			3,378,000 ft³

Depth = 710'

Depth/Volume Ratio = 210 ft. per million ft³

* Based on net change in TDS of 350,000 mg/L from Lee Wilson report.
1 bbl of brine production = .9157 ft³ of salt.

?? Average of time periods 1 and 3.

