

HEYCO

PETROLEUM PRODUCERS



HARVEY E. YATES COMPANY

P.O. BOX 1933

ONE SUNWEST CENTRE

505 / 623-6601

FAX 505 / 622-4221

ROSWELL, NEW MEXICO 88202-1933

December 23, 1987

DEC 30 '87

O. C. D.
ARTESIA, OFFICE

B.L.M. Carlsbad Resource Center
Shannon Shaw, Petroleum Engineer
P.O. Box 1778
Carlsbad, New Mexico 88220

RE: Surface Disposal into Unlined Pits within R-3221-B

Dear Shannon,

As per our conversation please note the exhibits we spoke of.
Purpose:

Heyco would like to dispose up to 250 BWPD into 3 unlined surface pits on location of our Hale "11" Federal #1 well. This area is marginally economic, i.e. 110 BOPD, 65 BWPD from our Hale "11" Federal #1 well, 12/18/87. Cost of disposal is 2-3 thousand dollars per month and will become more expensive throughout the lifetime of the well. (Based on decline curve analysis). The hydrology of the area is of a nature that is suitable for disposal into unlined pits with no degradation of ground water, simply that the potash brines that infiltrate the shallow ground water are of considerably greater chloride content than produced Bone Spring water. In essence we would be diluting the ground water. As per the State Engineer Office Com. , potash mines have shallow water wells that produce in excess of 200,000 ppm with a T.D.S. of >265,000 ppm. The area is within R-3221-B, providing for disposal of produced oil field brines. On the fact sheet I provided, note regional hydrology and geology facts with assorted facts on disposal, evaporation, and percolation animal life watering systems.

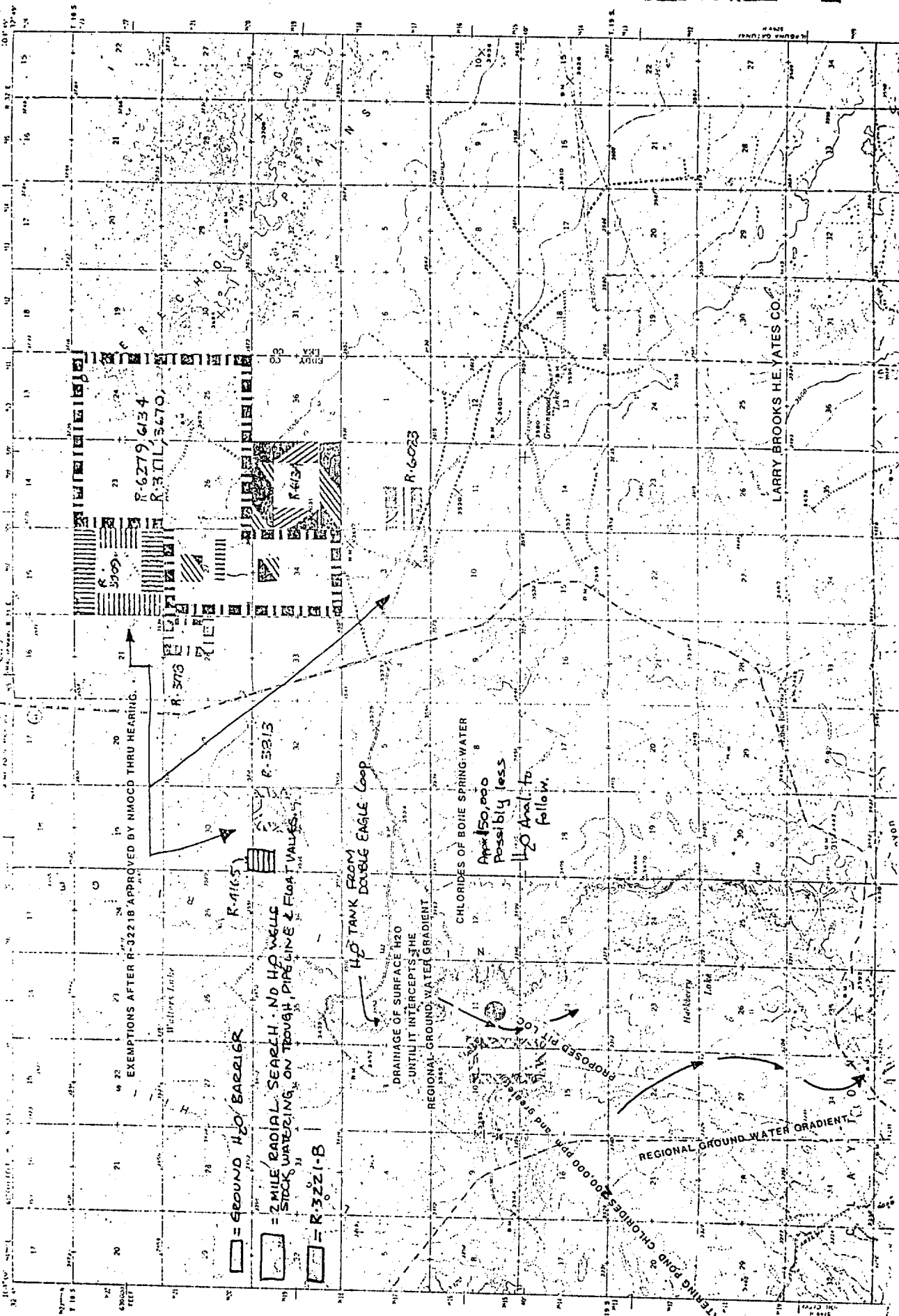
If you need any more information, please do not hesitate to ask.

Sincerely,

Larry Brooks
Geologist-Harvey E. Yates Company

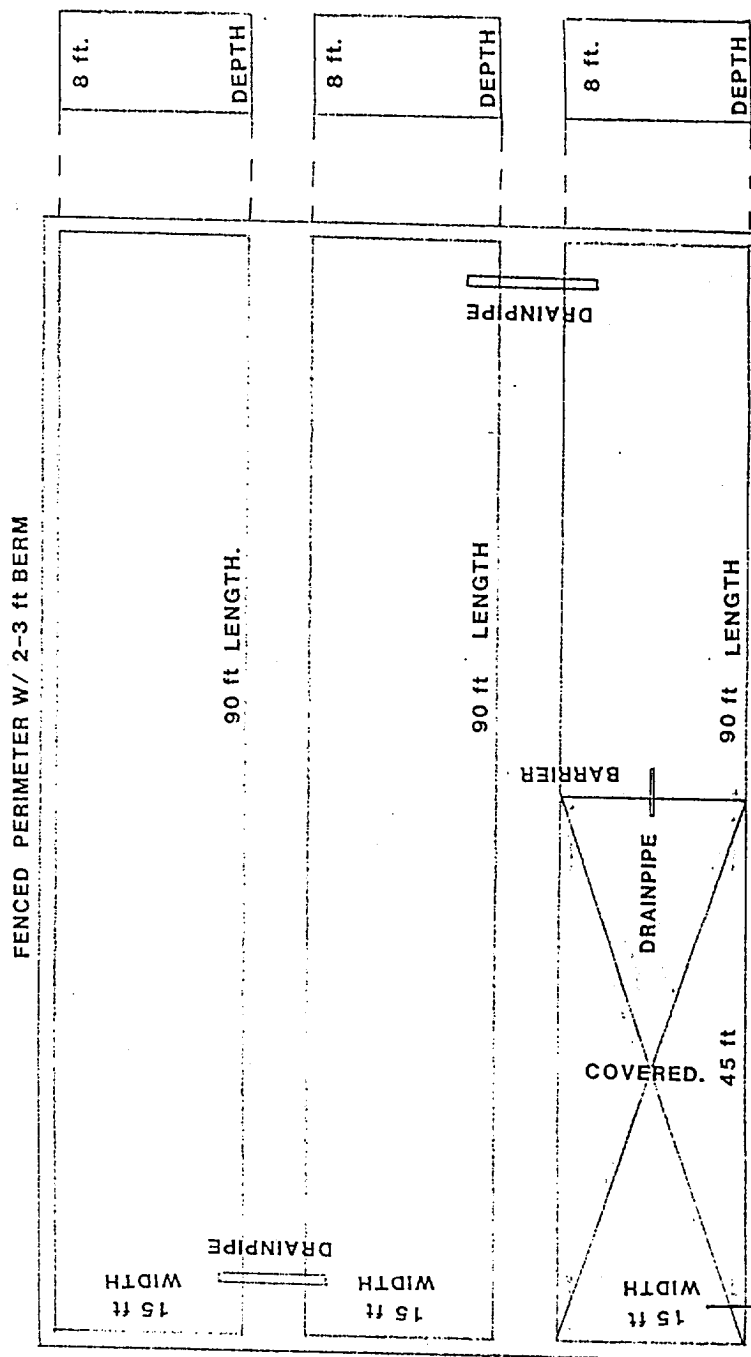
LB/vt
enclosure

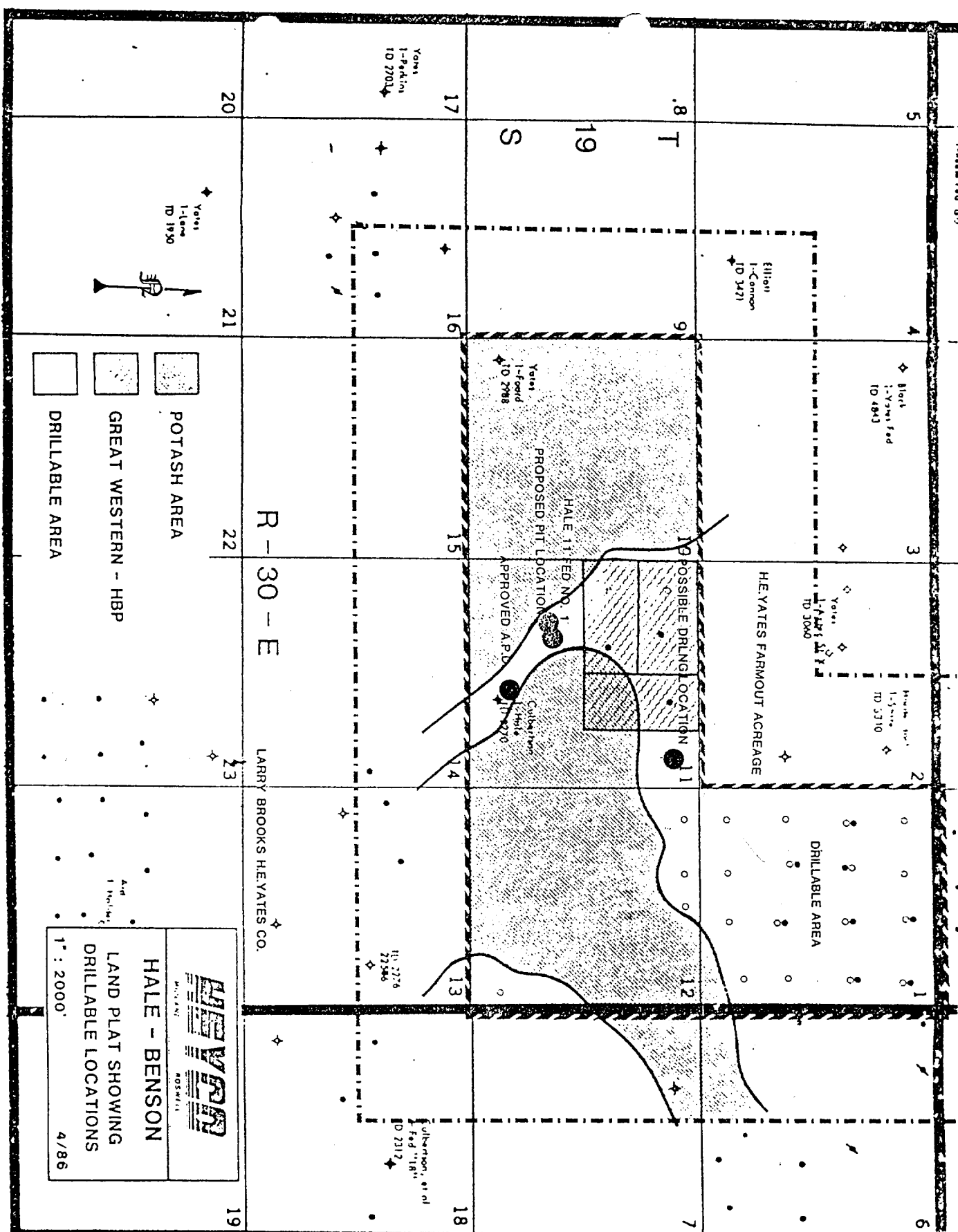
NEW MEXICO
CLAYTON BASIN QUADRANGLE
15-MINUTE SERIES





LARRY BROOKS H.E. YATES CO.





HALE - BENSON
LAND PLAY SHOWING
DRILLABLE LOCATIONS
1" = 2000'
4/86

- POTASH AREA
- GREAT WESTERN - HBP
- DRILLABLE AREA

R - 30 - E

LARRY BROOKS HEYATES CO.

HEYATES FARMOUT ACRES

DRILLABLE AREA

HALE 11 FED NO. 1
PROPOSED PIT LOCATION
APPROVED A.P.D.

POSSIBLE DRILLING LOCATION

HALE - BENSON
LAND PLAY SHOWING
DRILLABLE LOCATIONS
1" = 2000'
4/86



DOWELL DIVISION OF DOW CHEMICAL U.S.A.

An Operating Unit of The Dow Chemical Company

API WATER ANALYSIS REPORT FORM

LABORATORY LOCATION

DATE

LAB NO

Company <u>HEYCO</u>		Sample No. <u>1</u>		Date Sampled <u>12-16-87</u>	
Field		Legal Description		County or Parish <u>Ecclg</u>	
State <u>N.M.</u>		Lease or Unit <u>Hale</u>		Well <u>10 Fed #1</u>	
Depth		Formation <u>B-5</u>		Water, H/D	
Type of Water (Produced, Supply, etc.) <u>Produced</u>		Sampling Point		Sampled By <u>G.C.</u>	

DISSOLVED SOLIDS

CATIONS	mg/L	me/L
Sodium, Na (calc.)	<u>65908</u>	<u>2867</u>
Calcium, Ca	<u>14000</u>	<u>699</u>
Magnesium, Mg	<u>3042</u>	<u>250</u>
Barium, Ba		

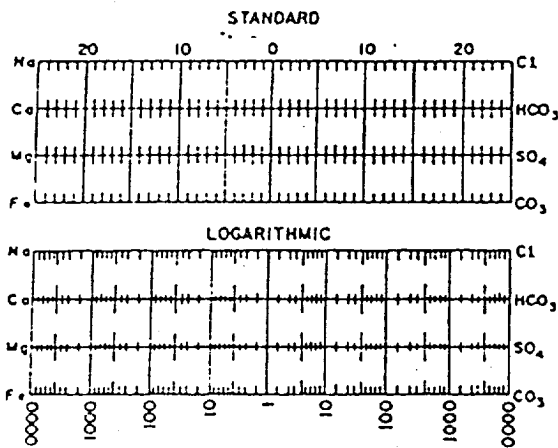
OTHER PROPERTIES

pH	<u>6</u>
Specific Gravity, 60/60 F.	<u>1.150</u>
Resistivity (ohm-meters) <u>60°</u> F.	
<u>NITRATES</u>	<u>8.8</u>

ANIONS

Chloride, Cl	<u>134900</u>	<u>3504</u>
Sulfate, SO ₄	<u>400</u>	<u>8</u>
Carbonate, CO ₃		
Bicarbonate, HCO ₃	<u>122</u>	<u>2</u>

WATER PATTERNS — me/L



Total Dissolved Solids (calc.)

Iron, Fe (total)

Sulfide, as H₂S

REMARKS & RECOMMENDATIONS:

60°

LUSK RANCH — NO NOTIFICATION TO
SNYDER RANCHES
L. SQUIRES.

393-3571 (H)
393-7544 (W)

TYPE WELL: [DEWITT-TAYLOR]
FED. K#1

K-23-19-51, H₂O ZONE AT 182-200

TENNECO BACON FEO 8-1

H-22-19-31

H₂O ZONE AT 185-230

Pit disposal facts

1.) Pit capacity 5770 bbls

standing full.

2.) Evaporation rates 3180

bbls/ac.

3.) pit size combined 2.8 AC.

4.) PERC. RATES 65-83% of H₂O Disp

If no Evaporation occurs.

w/evaporation 20-33%

5.) Potash shallow wells pump brine 200,000+

>200,000 ppm chlorides; T.D.S. > 200,000 ppm.

6.) oil scum taken
out thru fiberglass
tank on loc.

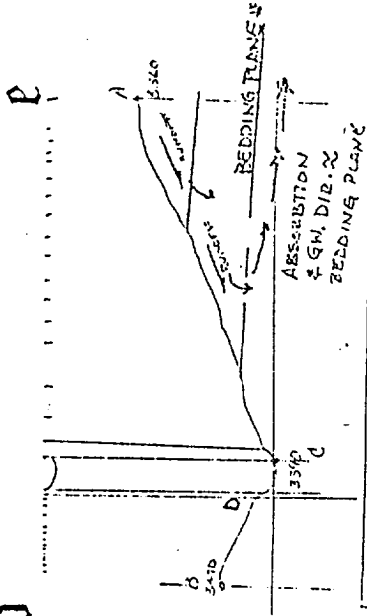
7.) H₂O quality in the area
as exhibited is
of greater chloride content than disposal H₂O

8.) Stock watering achieved through trough,
pipeline from water co-op tanks, float
valve. system.

LARRY BROOKS H.E. YATES CO.

9.) No H₂O wells in area
10.) MINING STATE APPROVED R-3221-B

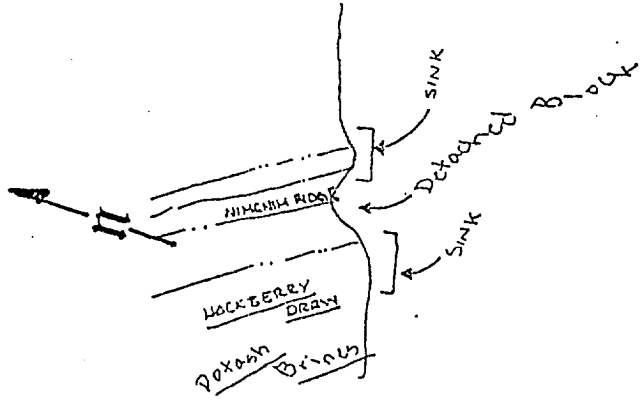
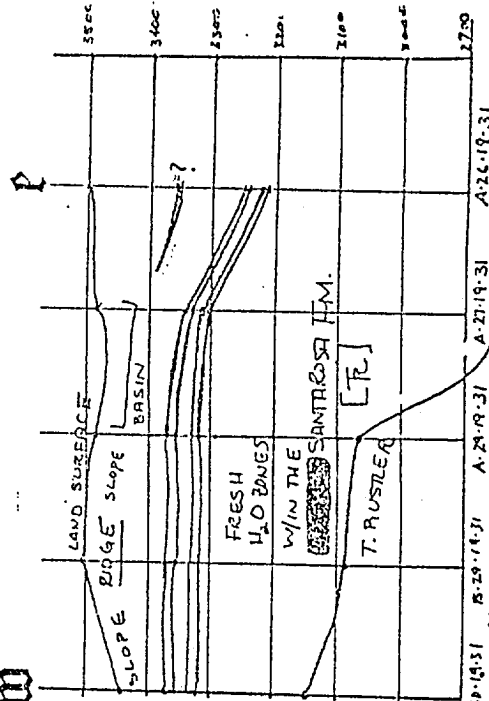
W



Slope A-B = 56'/mi
Slope B-C = .11C'/mi
56/5280 = .6076° = 32' 27.5"
11/5280 = 1.258° = 1° 15' 30.8"

is ESSENTIALLY FLAT MAYBE .3° dip to SE.

W



Hydrologic factors:

- 1.) CAPACITY OF PITS = 5770 Bbls. STANDING FULL.
- 2.) EVAPORATION RATE = 3100 Bbls/AC : $\approx$ TO MALAGA BEND.
- 3.) PIT SIZE = 2.8 AC. [COMBINED]
- 4.) PERCOLATION RATES INTO SURFACE = 65% - 83%
OF H_2O DISPOSED [IF NO EVAPORATION WERE TO OCCUR]
W/EVAPORATION = 20 - 33%
- 5.) POTASH SHALLOW WELLS PUMP BRING H_2O W/ $> 200,000$
ppm chlorides and T.D.S of $> 265,000$ ppm. $\pm 30,000$
- 6.) H_2O quality of the area as exhibited is of greater
chloride content than produced Bone Spring H_2O
- 7.) STOCK WATERING IS DONE BY TROUGH, FLOAT VALVE
PIPED IN FROM DOUBLE EAGLE AND CAPROCK WATER
COOPS. CLOSED SYSTEM TO TROUGHS.
- 8.) NO WATER WELLS IN AREA OTHER THAN POTASH CO.'S
SHALLOW SUPPLY WELLS. AS PER ST. ENGINEER'S
OFFICE
- 9.) WITHIN STATE APPROVED R. 3221.B.
- 10.) A FIBER GLASS TANK WILL BE ON SITE TO SKIM
OFF HYDROCARBONS AND RETURN TO TANK BATTERY. KEEPING
A FREE EVAP. SURFACE.
- 11.) PITS WILL BE MAINTAINED