Tenneco Oil
A Tenneco Company

Suite 1200
Lincoln Tower Building
Denver, Colorado 80203
(303) 292-9920

September 13, 1973

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

RE: Proposed Waterflood
Northern Minerals, Inc.
W½NE¼ Section 29, T16N, R6W
San Miguel North Area
McKinley County, New Mexico

Gentlemen:

With reference to a letter directed to you from Northern Minerals, Inc. dated August 30, 1973 pertaining to a proposed waterflood on the subject acreage, kindly be advised that Tenneco Oil Company as a working interest owner in all of the acreage offsetting the proposed flood has no objection to said waterflood as proposed by Northern Minerals in the above letter.

Sincerely,

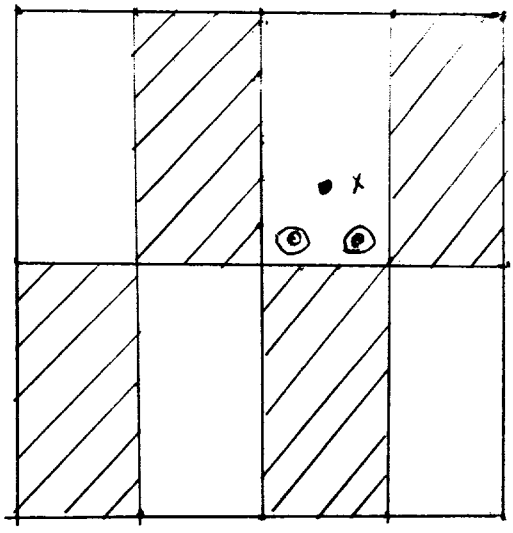
TENNECO OIL COMPANY

R. E. Winckler,
Division Landman

REW:vds

cc: Northern Minerals, Inc.
P. O. Box 2182
Santa Fe, New Mexico 87501

Section 29, T16N-R6W. Showing proposed producing wells, injection well and water well; and lease ownership.



• - Injection well

X - Water well

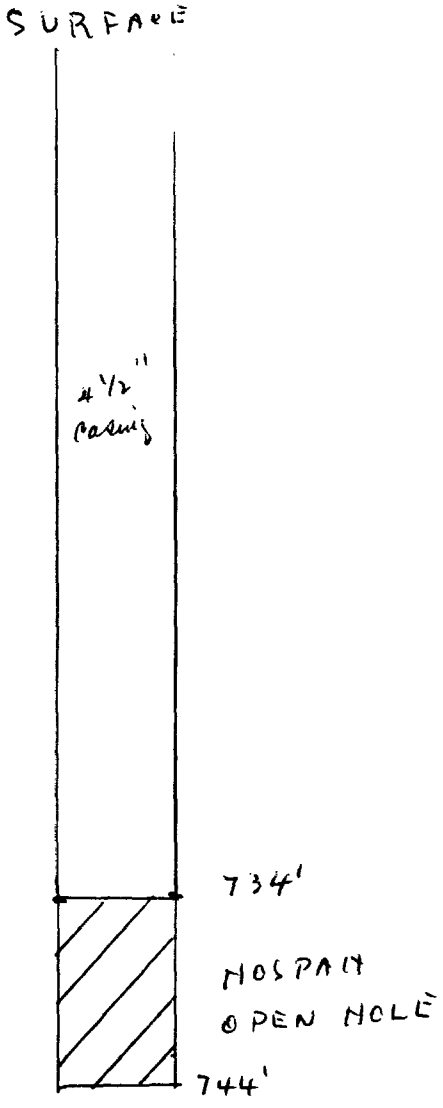
Producing oil wells

Northern Minerals, Inc. acreage

Tenneco Oil Company acreage

Case 5072

INJECTION WELL



COLORADO PLATEAU GEOLOGICAL SERVICES, INC.

SUITE 2D
413 WEST MAIN STREET
FARMINGTON, NEW MEXICO 87401

(505) 325-9671
(505) 325-3641
(505) 325-7855

☆ Surface & Sub-Surface Studies
☆ Well Site Supervision
☆ Exploration Program Planning & Supervision
☆ Property Development and Management

October 5, 1973

Mr. Lloyd Davidson
Northern Minerals, Inc.
P. O. Box 2182
Santa Fe, New Mexico 87501

RE: Miguel Creek Dome
Pilot Hospah Water Flood
Fracture Pressure Data

Dear Mr. Davidson:

I submit the following data for your transmittal to Mr. Richard Stamets, Examiner for the New Mexico Oil Conservation Commission, in response to his request made at the hearing on your Case 5072, October 3, 1973.

Based on data obtained from service companies on breakdown and treating pressures for the Hospah sand in Hospah and South Hospah fields, the fracture gradient for this formation ranges from a minimum of 1.07 PSI/ft. to a maximum of 1.40 PIS/ft. Therefore, fracture pressure for the Hospah sand in SFP-6Y (injection well) calculates to be in the range from about 790 PSI minimum to 1,035 PSI maximum. I expect to obtain adequate injection rates for the pilot flood well below these pressures. As mentioned in our application, we do not plan to exceed 750 PSI.

Water analysis on Gallup injection water will be forwarded to you in the near future.

Yours very truly,

Mark E. Weidler

Mark E. Weidler,
Vice President

MEW:no

COLORADO PLATEAU GEOLOGICAL SERVICES, INC.

SUITE 2D
413 WEST MAIN STREET
FARMINGTON, NEW MEXICO 87401

(505) 325-9671
(505) 325-3641
(505) 325-7855

☆ Surface & Sub-Surface Studies
☆ Well Site Supervision
☆ Exploration Program Planning & Supervision
☆ Property Development and Management

October 10, 1973

Mr. Lloyd Davidson
President, Northern Minerals, Inc.
P. O. Box 2182
Santa Fe, New Mexico 87501

Re: Water Analysis
Injection Water
Pilot Water Flood

Dear Mr. Davidson:

Further to my letter of October 5, 1973, I submit the following results of analysis of a water sample collected October 8, 1973, from your Gallup sand water supply well at Miguel Creek Dome. The analysis was made by Mr. John Alexander, District Engineer for Halliburton Services in Farmington.

Resistivity	7.58 ohms @ 62° F.
Specific Gravity	1.01
pH	7.5
Calcium and Magnesium	0
Chlorides	50.6 ppm
Sulphates	1500 ppm
Bicarbonate	293 mg/l
Iron	Nil

This analysis was requested by Mr. Richard Stamets, Examiner for NMOCC, at the hearing on your water flood application (Case 5072) October 3, 1973.

Please let me know if I can be of further assistance.

Very truly yours,

Mark E. Weidler

Mark E. Weidler
Consultant Petroleum Geologist

MEW:no

case No 5072

TO Northern Minerals, Inc.
P. O. Box 2182
Santa Fe, New Mexico 87501

Submitted by Mark E. Weidler Date Received 10-9-73

Well No. Water Supply Well Depth 810-885 Formation Massive Gallup

County McKinley Field Unnamed (Miguel Creek Dome) Source

	C.C.'s	
Res.		7.58 ohms @ 62° F
S. G.		1.01 @ 62°F
pH		7.5
Ca		0
Mg		0
Cl		50.6 ppm
SO_4		1500 ppm
HCO_3		293 mg/l
Fe		nil
Na		

Analysis made by John Alexander, Halliburton Services

Northern Minerals, Inc.

TELEPHONE (505) 983-9689

LLOYD DAVIDSON
President

P. O. Box 2182
SANTA FE, NEW MEXICO 87501

October 8, 1973

Mr. Richard L. Stamets
Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico 87501

Dear Sir:

Re: Case No. 5072
Application of Northern Minerals, Inc. for Waterflood, McKinley County.

Enclosed is statement by Mark E. Weidler regarding the calculated fracture pressure of the Hospah sand at the location of the Northern Minerals, Inc. No. 6-Y SFPRR (injection well) in the SWNE section 29, T16N-R6W.

Sincerely,

Northern Minerals, Inc.

Lloyd Davidson

By: Lloyd Davidson

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

GOVERNOR
BRUCE KING
CHAIRMAN

LAND COMMISSIONER
ALEX J. ARMIJO
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

November 7, 1973

Re: Case No. 5072
Order No. R-4649
Applicant:
Northern Minerals, Inc.

Mr. Lloyd Davidson, President
Northern Minerals, Inc.
Post Office Box 2182
Santa Fe, New Mexico

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC x

Other State Engineer Office

Northern Minerals, Inc.

TELEPHONE (505) 983-9689

P. O. Box 2182
SANTA FE, NEW MEXICO 87501

LLOYD DAVIDSON
President

June 20, 1974

Mr. A. L. Porter, Jr.
Secretary-Director
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Case No. 5072
Order No. R-4649

Dear Sir:

Applicant in this case, Northern Minerals, Inc., requests permission to continue injecting water in it's 6-Y well, without tubing, for an additional six months period.

To date 40,470 barrels water have been injected into the Hospah formation and 3,404 barrels oil produced. None of this oil would have been produced without the water flood.

At no time has the injection pressure exceeded 680 pounds. One of the things we have learned in this pilot program is that we get better performance when the pressure is kept under 600 pounds. Also, in the beginning we were injecting on the order of 300 to 500 barrels water daily. This has been cut back to about 200 barrels per day.

We have had no indication that the injected water is getting into any other formation but the Hospah. We received response in the oil producing wells after only 3,000 barrels water had been injected.

We are continuing our testing program. We have recently installed a timer on the injection well whereby water is injected for one hour - four times per day. This holds down the injection pressure and allows the water to disperse in the Hospah more evenly. We believe this will result in greater oil and less water production.

To force us now, right in the middle of our pilot program, to open the well up and run tubing would mean the loss of the pressure we have built up and make for an uneven distribution of the water injected.

We feel that an additional period of operating as we are now, for a period of six months, will tell us the facts we need in order to know if the program will produce oil in commercial amounts.

Very truly yours,

Northern Minerals, Inc.

By: Lloyd Davidson, President

NEW MEXICO OIL CONSERVATION COMMISSION
GAS – OIL RATIO TESTS

C-116
Revised 1-1-65

Operator	Pool	County
Northern Minerals, Inc.	Unnamed	McKinley

Address	TYPE OF TEST – (X)	Scheduled ☐	Completion ☑	Special ☐
P. O. Box 2182, Santa Fe, New Mexico 87501				

LEASE NAME	WELL NO.	LOCATION U	S	T	R	DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOW-ABLE	LENGTH OF TEST HOURS	PROD. DURING TEST WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	GAS – OIL RATIO CU.FT/BB
SFPRR	7	G	29	16N	6W	11-22-73		Open Hole	0	8	24	8	31	8	0	0/8

NOTE: THE SFP NO. 7 WILL BE THE MOST AFFECTED WELL IF THE NO. 8 WELL IF CONVERTED TO AN INJECTION WELL. THE NO. 7 WELL PRODUCED NO OIL PRIOR TO WATER INJECTION IN THE NO. 6-Y. AFTER INJECTION THE WELL PRODUCED 8 BARRELS OIL PER DAY.

No well will be assigned an allowable greater than the amount of oil produced on the official test.

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Commission.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.

Report casing pressure in lieu of tubing pressure for any well producing through casing.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Commission in accordance with Rule 301 and appropriate pool rules.

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

Lloyd Davidson
Lloyd Davidson
(Signature)
President
(Title)
12-10-73

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

CORE ANALYSIS RESULTS

Company NORTHERN MINERALS, INC. Formation HOSPAH File 9103 RP-3-2600
Well SFPRR NO. 8 Core Type DIAMOND 2-1/8" Date Report 9-20-73
Field WILDCAT Drilling Fluid WATER BASE MUD Analysts RG
County MC KINLEY State NEW MEX. Elev. 6424'GL Location SW SW NE SEC 29-T16N-R6W

Lithological Abbreviations

SAND-SD, SHALE-SH, LIME-LM, DOLOMITE-DOL, CHERT-CH, GYPSUM-GYP, ANHYDRITE-ANHY, CONGLOMERATE-CONG, FOSSILIFEROUS-FOSS, SANDY-SDY, SHALY-SHY, LIMY-LMY, FINE-FN, MEDIUM-MED, COARSE-CSE, CRYSTALLINE-XLN, GRAIN-GRN, GRANULAR-GRNL, BROWN-BRN, GRAY-GY, VUGGY-VGY, FRACTURED-FRAC, LAMINATION-LAM, STYLOLITIC-STY, SLIGHTLY-SL, VERY-V/, WITH-W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS (K_A)	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE: OIL	RESIDUAL SATURATION PER CENT PORE: TOTAL WATER	SAMPLE DESCRIPTION AND REMARKS
			(CONVENTIONAL ANALYSIS)			
1	735.6	47	23.3	0.0	19.3	Sd Gy Fn Grn Clay
2	737.5-38	47	23.3	18.2	27.3	Sd Gy Fn Grn Sl/Clay
3	738.7	35	21.1	15.3	24.4	Sd Gy Fn Grn Sl/Clay
4	740.5-41	32	16.2	4.6	13.0	Sd Gy Fn Grn Sl/Clay
5	41-42	82	25.5	22.2	37.0	Sd Gy Fn Grn Sl/Clay
6	42-43	141	26.8	26.3	24.8	Sd Gy Fn Grn Sl/Clay
7	43-44	122	26.0	26.2	18.3	Sd Gy Fn Grn Sl/Clay
8	44-45	209	25.6	24.4	22.8	Sd Gy Fn Grn Sl/Clay
9	45-46	169	25.3	33.2	15.8	Sd Gy Fn Grn Sl/Clay
10	46-47	255	23.5	24.7	10.6	Sd Gy Fn Grn Sl/Clay

Service No. 5-A

NO. 0 COPIES RECEIVED		
DISTRIBUTION		
SANTA FE		
FILE		
U.S.G.S.		
LAND OFFICE		
OPERATOR		

NEW MEXICO OIL CONSERVATION COMMISSION

Form C-103
Supersedes Old C-102 and C-103
Effective 1-1-65

5a. Indicate Type of Lease
State ☐ Fee ☒

5. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT —" (FORM C-101) FOR SUCH PROPOSALS.)

1. OIL WELL ☒ GAS WELL ☐ OTHER-

7. Unit Agreement Name

2. Name of Operator
Northern Minerals, Inc.

8. Farm or Lease Name
SFPRR

3. Address of Operator
P. O. Box 2182, Santa Fe, New Mexico 87501

9. Well No.
11

4. Location of Well
UNIT LETTER G, 1660 FEET FROM THE North LINE AND 1650 FEET FROM THE East LINE, SECTION 29 TOWNSHIP 16N RANGE 6W NMPM.

10. Field and Pool, or Wildcat
Undesignated Gallup

15. Elevation *(Show whether DF, RT, GR, etc.)*
6424 GL, 6429 RT

12. County
McKinley

16. Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK ☐	PLUG AND ABANDON ☐	REMEDIAL WORK ☐	ALTERING CASING ☐
TEMPORARILY ABANDON ☐		COMMENCE DRILLING OPNS. ☒	PLUG AND ABANDONMENT ☐
PULL OR ALTER CASING ☐	CHANGE PLANS ☐	CASING TEST AND CEMENT JOB ☒	
OTHER ☐		OTHER Plugging Back ☐	

17. Describe Proposed or Completed Operations *(Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work)* SEE RULE 1103.

Well spudded 5-1-74. Set 64' of 7" surface casing with 12 sacks cement. Drilled to TD of 3062' in Entrada sandstone. TD reached 5-12-74. Ran E-Log and Gamma Ray. DST 3009' to 3062'. Recovered 2770' water. Cores were taken in Hospah-Gallup sandstone 730'-750', Todilto limestone 3022'-2042' and Todilto-Entrada 3042'-3062'. On 5-14-74 cement plugs were spotted as follows: 50' on bottom from 3012 to 3062', plug across Dakota "D" from 1780' to 1880' and from 920' to surface with 175 sacks. WOC 24 hours. 5-15-74 drilled out cement plug to 754'. 5-16-74 ran and cemented 24 joints (731') of 4½", 9.5# casing with 75 sacks cement. WOC 48 hours. 5-18-74 Drilled out plug and worked to bottom. 5-19-74 fracture treated open hole 731' to 754' with 5,000 gal lease crude and 4,000# 10-20 mesh sand. Back flowed load oil to tank truck. 5-21-74 hooked up flow lines and flowed well to tanks. SICP 180 PSI. FCP 80#. Took potential test from 2 P. M 5-22-74 to 5 P. M. 5-23-74 (27 hours). Flowed 16 barrels oil and 48 barrels water. Well completed flowing 5-23-74.

18. I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNED Lloyd Davidson TITLE President DATE 5-25-74

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

NO. OF COPIES RECEIVED		
DISTRIBUTION		
SANTA FE	1	
FILE	1	
U.S.G.S.	2	
LAND OFFICE		
OPERATOR	1	

Form C-105
Revised 1-1-65

NEW MEXICO OIL CONSERVATION COMMISSION
WELL COMPLETION OR RECOMPLETION REPORT AND LOG

5a. Indicate Type of Lease: State ☐ Fee ☒

5. State Oil & Gas Lease No.:

1a. TYPE OF WELL: OIL WELL ☒ GAS WELL ☐ DRY ☐ OTHER

b. TYPE OF COMPLETION: NEW WELL ☐ WORK OVER ☐ DEEPEN ☐ PLUG BACK ☐ DIFF. RESVR. ☐ OTHER

7. Unit Agreement Name:

8. Farm or Lease Name: SFPRR

2. Name of Operator: Northern Minerals, Inc.

9. Well No.: 11

3. Address of Operator: P. O. Box 2182, Santa Fe, New Mexico 87501

10. Field and Pool, or Wildcat: Undesignated Gallu

4. Location of Well: UNIT LETTER G LOCATED 1660 FEET FROM THE North LINE AND 1650 FEET FROM THE East LINE OF SEC. 29 TWP. 16N RGE. 6W NMPM

12. County: McKinley

15. Date Spudded	16. Date T.D. Reached	17. Date Compl. (Ready to Prod.)	18. Elevations (DF, RKB, RT, GR, etc.)	19. Elev. Cashinghead
5-1-74	5-12-74	5-23-74	6424 GL, 6429 RT	6425.5

20. Total Depth	21. Plug Back T.D.	22. If Multiple Compl., How Many	23. Intervals Drilled By	Rotary Tools	Cable Tools
3062'	754'		→	All	

24. Producing Interval(s), of this completion — Top, Bottom, Name: 738-751 Hospah-Gallup sandstone

25. Was Directional Survey Made: No

26. Type Electric and Other Logs Run: SP, Gamma Ray, Single Point Resistivity

27. Was Well Cored: Yes 730-50

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
7"	20	64'	9-5/8"	12 Sacks - Circulated	None
4½"	9.5	731'	6-1/4"	75 Sacks - Circulated	None

29. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN

30. TUBING RECORD

SIZE	DEPTH SET	PACKER SET
2-3/8 EUE	744'	

31. Perforation Record (Interval, size and number)

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
OH 731-54	5,000 gal. lease crude &
	4,000# 10-20 sand

RECEIVED
MAY 28 1974
OIL CON. COM.
DIST. 3

33. PRODUCTION

Date First Production	Production Method (Flowing, gas lift, pumping — Size and type pump)	Well Status (Prod. or Shut-in)
5-21-74	Flowing	Producing

Date of Test	Hours Tested	Choke Size	Prod'n. For Test Period →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Gas—Oil Ratio
5/22-23/74	27	open		16	0	48	0

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate →	Oil — Bbl.	Gas — MCF	Water — Bbl.	Oil Gravity — API (Corr.)
0	80 PSIG		14	0	43	33

34. Disposition of Gas (Sold, used for fuel, vented, etc.): None produced

Test Witnessed By: Mark Weidler

35. List of Attachments:

36. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief.

SIGNED Lloyd Davidson TITLE President DATE 5-25-74

INSTRUCTIONS

This form is to be filed with the appropriate District Office of the Commission not later than 20 days after the completion of any newly-drilled or deepened well. It shall be accompanied by one copy of all electrical and radio-activity logs run on the well and a summary of all special tests conducted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, true vertical depths shall also be reported. For multiple completions, Items 30 through 34 shall be reported for each zone. The form is to be filed in quintuplicate except on state land, where six copies are required. See Rule 1105.

INDICATE FORMATION TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE

Southeastern New Mexico				Northwestern New Mexico			
T. Anhy		T. Canyon		T. Ojo Alamo		T. Penn. "B"	
T. Salt		T. Strawn		T. Kirtland-Fruitland		T. Penn. "C"	
B. Salt		T. Atoka		T. Pictured Cliffs		T. Penn. "D"	
T. Yates		T. Miss		T. Cliff House		T. Leadville	
T. 7 Rivers		T. Devonian		T. Menefee		T. Madison	
T. Queen		T. Silurian		T. Point Lookout		T. Elbert	
T. Grayburg		T. Montoya		T. Mancos	Surface	T. McCracken	
T. San Andres		T. Simpson		T. Gallup	815'	T. Ignacio Qtzte	
T. Glorieta		T. McKee		Base Greenhorn	1623'	T. Granite	
T. Paddock		T. Ellenburger		T. Dakota	"D" 1833'	T.	
T. Blinebry		T. Gr. Wash		T. Morrison	2000'	T.	
T. Tubb		T. Granite		T. Todilto	2958'	T.	
T. Drinkard		T. Delaware Sand		T. Entrada	3045'	T.	
T. Abo		T. Bone Springs		T. Wingate		T.	
T. Wolfcamp		T.		T. Chinle		T.	
T. Penn.		T.		T. Permian		T.	
T. Cisco (Bough C)		T.		T. Penn. "A"		T.	

FORMATION RECORD (Attach additional sheets if necessary)

From	To	Thickness in Feet	Formation	From	To	Thickness in Feet	Formation
0	731	731	Upper Mancos Shale				
731	815	84	Hospah-Gallup Zone				
815	907	92	Massive Gallup sand				
907	1586	679	Lower Mancos Shale				
1586	1623	37	Greenhorn limestone				
1623	1660	37	Graneros Shale				
1660	1833	173	Dakota "A" & "B" zone				
1833	1938	105	Dakota "D" zone				
1938	2000	62	Dakota "E" zone				
2000	2850	850	Morrison				
2850	2958	108	Bluff sandstone				
2958	3045	87	Todilto limestone				
3045	3062	17	Entrada sandstone				

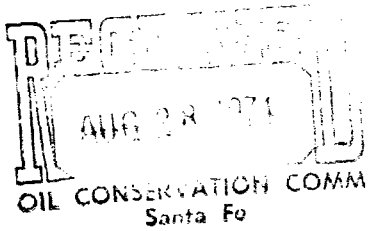
Northern Minerals, Inc.

TELEPHONE (505) 983-9689

P. O. Box 2182
SANTA FE, NEW MEXICO 87501

LLOYD DAVIDSON
President

August 28, 1974



Re: Northern Minerals McKinley
Gallup Waterflood Project
Case No. 5072
Order No. R-4649

Mr. A. L. Porter, Jr.
Secretary-Director
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Dear Sir:

Request is made that Northern Minerals, Inc., be allowed to convert it's SFPRR No. 8 well to an injection well. See Attached maps and plats.

For some months now, during the pilot flood program, water has been injected into the Hospah sand through the No. 6-Y well and oil has been produced through the Nos. 7 and 8 wells. More recently, the No. 11 well was drilled and is producing oil. The water is taken from the Massive Gallup.

Our studies have shown that the approximate limit of water injection through one well, at reasonable pressures, is 350 barrels per day. We have also found that, within reason, the more water injected the more oil is produced.

The No. 8 well is making only about 1 barrel oil per day. The Nos. 7 and 11 produce about 20 barrels per day. It is believed that a channel developed between the injection well and No. 8 because, in the early stages of the pilot program, we attempted to force too much volume at too high pressure into the one well, the No. 6-Y.

The No. 8 well offsets the No. 7 well. It is believed that water injected in the No. 8 will result in a better sweep of the producing area and will materially increase the oil production from No. 7 and No. 11. It is planned to inject about 350 barrels per day in No. 8, a total of 700 barrels through two injection wells.

The present water supply is ample. Both injection wells can be handled with our present injection pump at the 6-Y well. The plan would be to simply lay a line from the 6-Y well to the No. 8, a distance of about 425 feet and begin injecting through the casing. The casing is 4½" O. D. 10.5# and is cemented with 65 sacks. It is set on top of the pay zone. The completion was through open hole. There is at present 2-3/8" tubing in the well and a down hole pump and rods. Efforts have been made to pull the rods and pump but they are stuck. Our plan is to inject through the casing now and, if oil production is increased, to figure out at a later date how to get the pump, rods and tubing out of the hole.

We have a rig on the premises now. This rig is going on a long contract with Phillips Petroleum next week and we don't know where we can get another one. For this reason, we would like permission to do the foregoing work immediately. As the attached map shows, Northern Minerals owns a lease covering all offsetting locations.

Very truly yours,

Northern Minerals, Inc.

Lloyd Davidson

By: Lloyd Davidson, President

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

I. R. TRUJILLO
CHAIRMAN

LAND COMMISSIONER
ALEX J. ARMIJO
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY – DIRECTOR

August 30, 1974

Mr. Lloyd Davidson
Northern Minerals, Inc.
P. O. Box 2182
Santa Fe, New Mexico 87501

Dear Mr. Davidson:

Your request for permission to convert your SFPRR Well No. 8 to an injection well, dated August 28, 1974, has been received and reviewed.

It should be noted that on October 3, 1973, the Oil Conservation Commission, at a public hearing, considered your application for a waterflood project in Case 5072. Subsequently Order No. R-4649 authorized institution of such a project by injection of water into the Gallup formation through the casing of your SFPRR Well No. 6-Y. One of the provisions stipulated that this authorization would be for a six-month period only, at which time injection through casing would terminate. On June 20, 1974, you requested a six-month extension of this order. At that time you were given permission to continue injecting water through the casing of your Well No. 6-Y until such time as another hearing could be held to consider elimination of the requirements for injection of water through tubing set in a packer. This hearing is scheduled for September 18, 1974, and the subject matter will be considered by Case 5321.

In view of the foregoing, it has been determined that you should be granted permission to convert your Well No. 8 to an injection well and inject water through the casing into the Hospah Sand as requested. Furthermore, such authorization is only for the period from date of this letter until Case 5321 has been heard and a decision pertaining thereto has been reached.

Yours truly,

Carl Ulvog

CARL ULVOG
Senior Geologist

CU/og