STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: ☐ Secondary Recovery ☐ Pressure Maintenance ☒ Disposal ☐ Storage
Application qualifies for administrative approval? ☒ yes ☐ no

II. Operator: Blackwood & Nichols Co., Ltd.

Address: P. O. Box 1237, Durango, Colorado

Contact party: William F. Clark Phone: 303-247-0728

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.
See Attachments #1 & #4

IV. Is this an expansion of an existing project? ☐ yes ☒ no
If yes, give the Division order number authorizing the project _____.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review. See Attachment #2

* VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail. See Attachment #3

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.). See Attachment #4

*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval. See Attachment #4

IX. Describe the proposed stimulation program, if any. See Attachment #4

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.) To be submitted at completion.

* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken. See Attachment #4

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water. See Attachment #4

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: William F. Clark Title Operations Manager

Signature: William F. Clark Date: April 25, 1988

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal. _____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division district office.

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells:

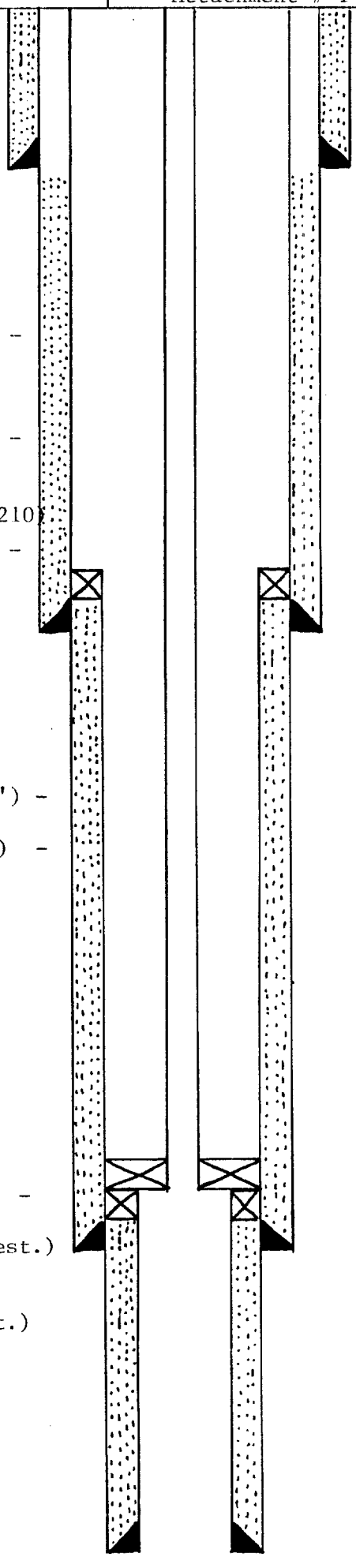
(3) the formation name and depth with expected maximum injection rates and pressures; and

(4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

Attachment # 1



24-26" hole

20",94#, H-40 set at 300'

Ojo Alamo(2100') -

Fruitland(2820') -

14 3/4" hole

Pictured Cliffs(3210')

Lewis(3440') -

10 3/4" , 40.5& 45.5#, J-55 set at 4000'.

Cliff House(5100') -

Pt. Lookout(5440') -

9 7/8" hole

Dakota(7710') -

3 1/2" tubing set in permanent pkr.

Morrison(8000' est.)

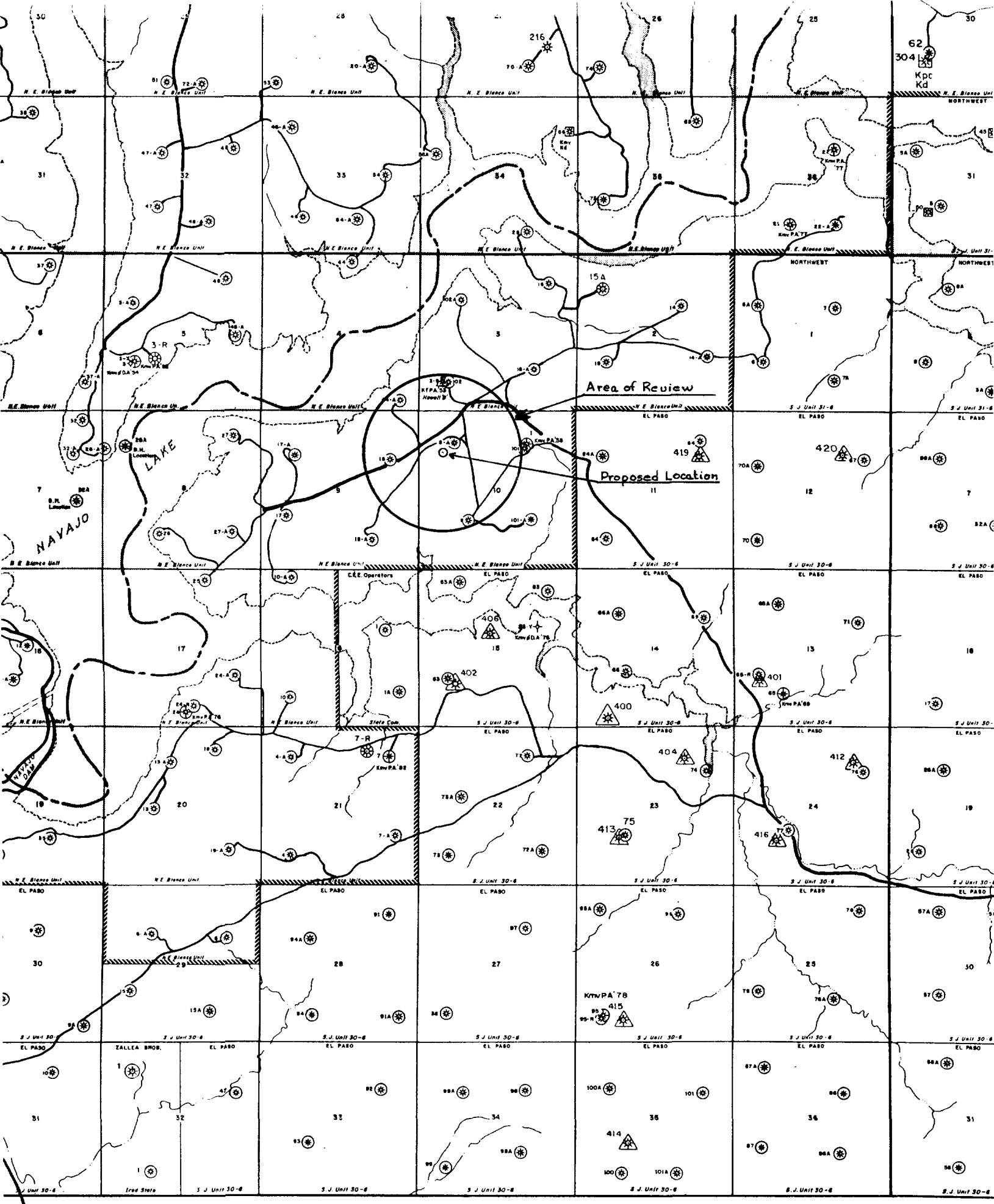
7 5/8", 26.4#, N-80 set from 3700' to 8000'.

Entrada(8760'est.)

6 3/4" hole

5 1/2",17#, N-80 set from 7700' to 9500'.

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD


Area of Review
Proposed Location
LAKE
NAVAJO
R 7 W
TO
VAJO CITY
- LEGEND —
Attachment # 2
— ROAD LEGEND —
PAVED OR MAIN ROADS

ATTACHMENT #3

WELL NAME	LOCATION	STATUS	SPUD DATE	COMP. DATE	TOTAL DEPTH	CASING/CEMENTING RECORD				PERFORATIONS	STIMULATION
						OH	CSG.	DEPTH	CEMENT TOC		
NORTHEAST BLANCO UNIT #8A	1020' FNL -1190' FWL SEC. 10, T30N, R7W	PGW	8-21-78	9-10-78	5925'	12 1/4"	9 5/8", 36#	233'	175 SXS CIRC.	5110'-5310' (36 HOLES)	SWF W/84,330 GALS. WATER & 70,000# 20/40 SAND
						8 3/4"	7", 23#	3561'	300 SXS 1400'(TS)		
						6 1/4"	4 1/2"	3411-5923'	300 SXS 3411'	5456'-5754' (60 HOLES)	SWF W/97,830 GALS. WATER & 80,000# 20/40 SAND
NORTHEAST BLANCO UNIT #8	1650' FSL - 1650' FWL SEC. 10, T30N, R7W	PGW	8-8-53	9-20-53	5530'		10 3/4", 32.75#	206'	200 SXS CIRC	5380' - 5470' (180 HOLES)	SWF W/63,210 GALS. WATER & 50,000# SAND
							7", 20 & 23#	4963'	400 SXS 3050'(TS)		
							5 1/2", 15.5#	4828-5529'	300 SXS 4828'	5056' - 5348' (160 HOLES)	SWF W/52,600 GALS. WATER & 40,000# SAND
							SQUEEZED HOLES IN 7" @486'-755' W/250 SXS.				
							SQUEEZED HOLES IN 7" @185'-1210' W/600 SXS				
NORTHEAST BLANCO UNIT #18	1650' FNL - 950' FEL SEC. 9, T30N, R7W	PGW	7-22-54	8-25-54	5507'	12 1/4-	10 3/4, 32.75#	215'	175 SXS CIRC.	5092' - 5344' (192 HOLES)	SWF W/55,250 GALS. WATER & 40,000# SAND
						8 3/4"	7", 20 & 23#	5081'	250 SXS 3330'(TS)		
						6 1/4"	4 1/2, 10.5#	5676'	470 SXS CIRC.	5430 - 5652' (196 HOLES)	SWF W/46,390 GALS. WATER & 40,000# SAND
						SQUEEZE W/350 SXS. THRU SQUEEZE HOLES @2550'					
						SQUEEZED 150 SXS. IN 10 3/4 X 7" ANNULUS					
NORTHEAST BLANCO UNIT #44A	270' FSL - 535' FEL SEC. 4, T30N, R7W	PGW	8-12-78	8-29-78	5830'	12 1/4"	9 5/8", 36#	235'	175 SXS CIRC.	5026' - 5268' (44 HOLES)	SWF W/83,282 GALS. WATER & 70,000# 20/40 SAND
						8 3/4"	7", 23#	3338'	300 SXS 1300'(TS)		
						6 1/4"	4 1/2"	3219-5830'	300 SXS 3300'	5364' - 5718' (56 HOLES)	SWF W/94,775 GALS. WATER & 80,000# 20/40 SAND
NORTHEAST BLANCO UNIT #101	1230'FNL - 1750'FEL SEC. 10, T30N, R7W	PGW	8-07-57	10-06-57	5807'		10 3/4", 32.75#	143'	200 SXS CIRC.	5060' - 5283'	SWF W/42,000 GALS. WATER & 25,000# SAND
							7 5/8", 26.4#	3478'	225 SXS		
							5 1/2", 15.5#	5784'	175 SXS 3340'(TS)	5356' - 5578'	SWF W/42,000 GALS. WATER & 30,000# SAND
						SQUEEZED HOLES IN 5 1/2 FROM 1520-1820' W/400 SXS.					
						CIRC. CEMENT TO SURFACE IN 7 5/8 X 5 1/2" ANNULUS					
NORTHEAST BLANCO UNIT #102	990' FSL - 990' FWL SEC. 3, T30N, R7W	PGW	11-23-51	1-19-52	5700'		12 3/4", 45.5#	286'	295 SXS CIRC.	5117' - 5226' (72 HOLES)	SWF W/51,660 GALS. WATER & 25,000# SAND
							9 5/8", 36#	3225'	68 SXS 2750'(TS)		
							7", 20#	4920'	300 SXS 3005'(TS)	5454 - 5584' (168 HOLES)	SWF W/54,580 GAL. WATER & 21,000# SAND
						SQUEEZE HOLE IN 7" @1566 W/415 SXS.					
						FOUND CASING APART @1577'					
						SET 4 1/2", 9.5# - 5624' - 400 SXS.					
HOWELL #1B	1129' F/NL - 1650' FEL SEC. 10, T30N, R7W	P&A	4-05-51				9 5/8", 36#	354'	150 SXS CIRC.		
							7", 20-23#	4287'	200 SXS 4200'(TS)		
							5 1/2", 15#	4209-4930'	100 SXS 4325'		
						SQUEEZED LINER TOP W/25 SXS.					
						7" PARTED & COLLAPSED @2269'					
						SET RETAINER @2125'. CEMENTED WITH 100 SXS.					
						PERF'D 3 - 1/2" HOLES @200' IN 7". CIRC.					
						CEMENT TO SURFACE IN 9 5/8 X 7" ANNULUS.					

Attachment #4

1. Proposed Well Data -
   Blackwood & Nichols Co., Ltd. proposes to drill the Northeast Blanco Unit No. 501 from a surface location of 1450' FNL - 790' FWL of Section 10, T30N, R7W, to a depth sufficient to penetrate the Entrada section. 20" surface casing will be set at 300' and cemented with sufficient cement to circulate to surface. A 14 3/4" hole will be drilled into the Lewis shale. Maximum mud weight anticipated is 11.5 PPG. Logs will be run and 10 3/4" casing will be set from surface to TD of approximately 4000'.This casing will be cemented with a volume adequate to cover to 1500'. A 9 7/8" hole will be drilled to a TD of 8000' (±) with gas. This hole will penetrate the Dakota section and stop at the top of the Morrison. A 7 5/8" liner will be run after logging from 3700' to 8000'. It will be cemented with a volume adequate to circulate the liner. A 6 3/4" hole will be drilled to an approximate TD of 9500' or until the entire Entrada section is penetrated. Logs will be run from TD to 8000' and a 5 1/2" liner will be run from 9500' to 7700'. The liner will be cemented with a volume adequate to circulate the liner. The Entrada and Morrison will be evaluated from logs. Any prospective hydrocarbon zone will be perforated, fractured, and tested. If shows are non-commercial, additional zones may be selected for stimulation in preparation for water disposal conversion.

   There are no known oil or gas pools underlying the proposed injection interval in this area. The only tests were non-commercial shows in the Pennsylvania Barker Creek at the San Juan 30-6 Unit #112Y, located in A-26-30-6.

   The nearest overlying oil or gas pool is the Basin Dakota approximately 1500' above the Entrada and immediately above the Morrison. The closest Dakota producer is the NEBU #56 approximately 1 1/2 miles north of this location.

2. The proposed injection intervals will be used to dispose of proposed water from the Northeast Blanco Unit wells. The rate of disposal will be determined by a step rate injection test. Primary use of the facility will be disposal of produced water from Fruitland Coal development wells. The amount of water to be disposed of will depend on this development.

3. The proposed injection system will be designed as a closed system.

4. Maximum injection pressure will be determined by a step rate injection test. Average injection pressure will be kept below this maximum pressure.

5. The latest produced water analysis from comparative Fruitland wells in the Northeast Blanco Unit are: (all values in mg/l)

Well Name	Na	Ca	Mg	K	Cl	HCO_3	SO_4	CO_3	tds
NEBU #211	3660	40	11	28	5060	2440	<10	0	11,000
NEBU #212	3639	29	20	20	520	7970	<10	696	9,410
NEBU #213	3110	8	15	22	920	6680	11	612	8,223
NEBU #214	3950	24	23	29	2330	7860	<10	0	10,190
NEBU #215	2570	22	5	21	3310	1790	<10	0	7,260
NEBU #216	5070	43	32	37	4160	7170	<10	168	11,498
NEBU #218	3196	27	20	24	440	8930	<10	0	8,600
								Average -	9,454

6. There are no samples of Entrada or Morrison water in the immediate vicinity of this well. Analysis from the Meridian Oil Inc., San Juan 30-6 Unit #112Y is the closest known source for an analysis of Morrison and Entrada water. These analyses should be on file with the NMOCD.

7. No detailed geologic information on the Morrison/Entrada in this well is available. Data from this well will be supplied to the NMOCD as available. The closest overlying aquifers are the Ojo Alamo, Animas, San Jose, and Naciemento. The Ojo Alamo should be encountered in this well from 2100' to 2320'. There are no known aquifers below the Entrada.

8. Stimulation will consist of perforating select porous intervals in the Morrison and Entrada and stimulating using a sand water frac treatment. Details will be provided to the District NMOCD office prior to stimulation.

9. Logs and test information will be filed as available.

10. There are no known fresh water wells in the vicinity of this well.

11. I hereby certify that I have examined available geologic and engineering data and can find no evidence of connection between the disposal zone and underground drinking water sources.

BLACKWOOD & NICHOLS CO., LTD.

April 25, 1988
Date

William F. Clark
William F. Clark
Operations Manager