

DISTRICT I

P.O. Box 1980, Hobbs, NM 88241-1980

DISTRICT II

811 South First St., Artesia, NM 88210-2838

DISTRICT III

1000 Rio Brazos Rd, Aztec, NM 87410-1893

State of New Mexico
Energy, Minerals and Natural Resources Department

AUG 20 1998

OIL CONSERVATION DIVISION

2040 S. Pacheco
Santa Fe, New Mexico 87505-6429Form C-107-A
New 3-12-96

APPROVAL PROCESS:

Administrative ☒ Hearing

EXISTING WELLBORE

YES ☐ NO ☒

APPLICATION FOR DOWNHOLE COMMINGLING

RICHARDSON OPERATING COMPANY 1700 Lincoln St., Suite 1700 Denver, CO 80203

Operator

Address

W.F. Federal

20-1

N 20 30N 14W

San Juan

Lease

Well No.

Unit Ltr. - Sec - Twp - Rge

County

OGRID NO. 019219

Property Code

API NO.

Spacing Unit Lease Types: (check 1 or more)

Federal ☒ State ☐ Landlord Fee ☐

The following facts are submitted in support of downhole commingling:	Upper Zone	Intermediate Zone	Lower Zone
1. Pool Name and Pool Code	71629 Basin Fruitland Coal		86620 Twin Mounds FT-PC
2. Top and Bottom of Pay Section (Perforations)	640-650		660-670
3. Type of production (Oil or Gas)	Gas		Gas
4. Method of Production (Flowing or Artificial Lift)	Pumping		Pumping
5. Bottomhole Pressure	a. (Current)	a.	a.
Oil Zones - Artificial Lift: Gas & Oil - Flowing: All Gas Zones: <u>Estimated</u> Or Measured Original	b. (Original) 200	b.	b. 200
6. Oil Gravity ($^{\circ}$ API) or Gas BTU Content	1000		1000
7. Producing or Shut-in?			
Production Marginal? (yes or no)	Yes		Yes
• If Shut-in, give date and oil/gas/water rates of last production	Date: Rates:	Date: Rates:	Date: Rates:
Note: For new zones with no production history, applicant shall be required to attach production estimates and supporting data			
• If Producing, give date and oil/gas/water rates of recent test (within 60 days)	Date: Rates:	Date: Rates:	Date: Rates:
8. Fixed Percentage Allocation Formula - % for each zone	Oil: % Gas: %	Oil: % Gas: %	Oil: % Gas: %

9. If allocation formula is based upon something other than current or past production, or is based upon some other method, submit attachments with supporting data and/or explaining method and providing rate projections or other required data.

10. Are all working, overriding, and royalty interests identical in all commingled zones? ☒ Yes ☐ No
If not, have all working, overriding, and royalty interests been notified by certified mail? ☒ Yes ☐ No
Have all offset operators been given written notice of the proposed downhole commingling? ☒ Yes ☐ No11. Will cross-flow occur? ☐ Yes ☒ No If yes, are fluids compatible, will the formations not be damaged, will any cross-flowed production be recovered, and will the allocation formula be reliable. ☐ Yes ☐ No (If No, attach explanation)12. Are all produced fluids from all commingled zones compatible with each other? ☒ Yes ☐ No13. Will the value of production be decreased by commingling? ☒ Yes ☐ No (If Yes, attach explanation)14. If this well is on, or communitized with, state or federal lands, either the Commissioner of Public Lands or the United States Bureau of Land Management has been notified in writing of this application. ☒ Yes ☐ No

15. NMOCD Reference Cases for Rule 303(D) Exceptions: ORDER NO(S).

16. ATTACHMENTS:

- C-102 for each zone to be commingled showing its spacing unit and acreage dedication.
- Production curve for each zone for at least one year. (If not available, attach explanation.)
- For zones with no production history, estimated production rates and supporting data.
- Data to support allocation method or formula.
- Notification list of all offset operators.
- Notification list of working, overriding, and royalty interests for uncommon interest cases.
- Any additional statements, data, or documents required to support commingling.

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

SIGNATURE Paul C. Thompson TITLE Agent DATE 4/23/98TYPE OR PRINT NAME Paul C. Thompson TELEPHONE NO. (505) 327-4892

Exhibit "A"
Division Order DHC-2099

Monthly Gas Production Allocation Formula
W. F. Federal No. 20-1

- 1) Perform well test on the Fruitland Coal formation and on the total well production.
- 2) Determine the initial production rate from the Pictured Cliffs formation from the actual first months production from the following relation:

$$Q_{PCi} = 1^{\text{st}} \text{ Month Production} * (\text{Total well test} - \text{Fruitland coal test}) / \text{Total well test}$$

- 3) Determine Pictured Cliffs decline from the following equation:

$$D = (Q_{PCi} - Q_{PCa}) / \text{Estimated Total Pictured Cliffs Gas Reserves}$$

where:

Q_{PCa} = Pictured Cliffs rate at abandonment (304 MCF/Month)
Total Pictured Cliffs Gas Reserves = 108,950 MCF (Average of eight offset wells)

- 4) Calculate Pictured Cliffs rate at any time from the following:

$$Q_{PC} = Q_{PCi} * e^{(-Dt)} \text{ where } t \text{ is time in months since first delivery.}$$

- 5) The Fruitland Coal production will be calculated monthly from the actual measured well production for that month minus Q_{PC} .

District I
PO Box 1988, Hobbs, NM 88241-1988
District II
PO Drawer DD, Artesia, NM 88211-8719
District III
1608 Rio Grande Rd., Aztec, NM 87410
District IV
PO Box 2088, Santa Fe, NM 87504-2088

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
PO Box 2088
Santa Fe, NM 87504-2088

Form C-102
Revised February 21, 1994
Instructions on back
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

APN Number	Pool Code 86620	Pool Name Twin Mounds Fruitland Sand - Pictured Cliffs
Property Code	Property Name WF Federal	Well Number 20-1
OGRID No. 019219	Operator Name Richardson Operating Co.	Elevation 5587'

18 Surface Location

UL or lot no. N	Section 20	Township 30 N	Range 14 W	Lot Ids	Feet from the	North/South line South	Feet from the	East/West line West	County San Juan
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19 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Ids	Feet from the	North/South line	Feet from the	East/West line	County
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10 Dedicated Acreage 160	11 Joint or Infill Y	12 Consolidation Code	13 Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

15						17 OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief. David B. Richardson Signature David B. Richardson Printed Name President Title Date April 22, 1998
						18 SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. Date of Survey Signature and Seal of Professional Surveyor 6844 Certificate Number

District I
PO Box 1908, Hobbs, NM 88241-1908
District II
PO Drawer DD, Artoche, NM 88211-0719
District III
1000 E. Brown Rd., Aztec, NM 87410
District IV
PO Box 2088, Santa Fe, NM 87504-2088

State of New Mexico
Geology, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
PO Box 2088
Santa Fe, NM 87504-2088

Form C-102
Revised February 21, 1994
Instructions on back
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

* APT Number		* Pool Code 71629	* Pool Name Basin Fruitland Coal
* Property Code	* Property Name WF Federal		* Well Number 20-1
* OGRID No. 019219	* Operator Name Richardson Operating Co.		* Elevation 5587'

10 Surface Location

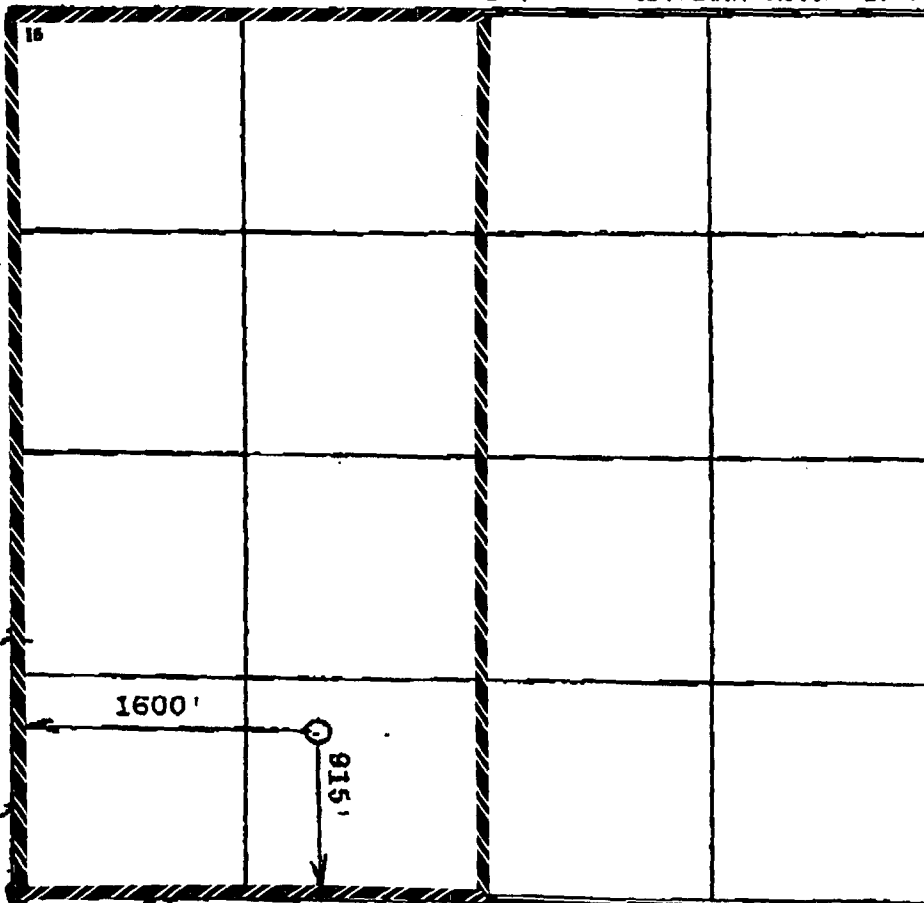
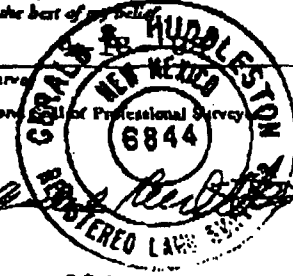
UL or lot no.	Section	Township	Range	Lot Ids	Feet from the	North/South line	Feet from the	East/West line	County
N	20	30 N	14 W		915	South	1600	West	San Juan

11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Ids	Feet from the	North/South line	Feet from the	East/West line	County

12 Ducted Area 320	13 Joint or Infill Y	14 Consolidation Code	15 Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

<div>16</div> 	<div>17 OPERATOR CERTIFICATION</div> <p>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.</p> <p><i>David B. Richardson</i> Signature David B. Richardson Printed Name President Title April 22, 1998 Date</p>	
	<div>18 SURVEYOR CERTIFICATION</div> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>Date of Survey Signature and Seal of Professional Surveyor  6844 Certificate Number</p>	

Richardson Operating
WF Federal #20-1
Section 20, T30N, R14W

Allocation Formula

The proposed well is a new drill so there is no production data available. There are several Twin Mounds Fruitland Sand - Pictured Cliffs that have produced in this township in the offsetting sections. Please refer to Attachment 1 for a summary of the Fruitland Sand - PC offset wells. The closest Basin Fruitland Coal completion is in Section 31, 30N 14W and has not reported any production.

With the exception of the Russell #2 (33-30N-14W), all of the offsetting Pictured Cliffs wells appear to only be capable of marginal production. Since the production characteristics of the Fruitland Coal formation are unknown at this time, Richardson Operating Company, proposes to down hole commingle the production.

Based on the Bushman #1 (6-29N-14W) both the Pictured Cliffs and the Fruitland Coal zones have very similar bottom hole pressures of approximately 180 psig. Therefore, cross flow will not be a factor. It is anticipated that both zones will produce some water. Neither zone is fluid sensitive and the fluids from the two zones should be compatible.

Due to the lack of production data from the two zones, Richardson Operating proposes to allocate the production according to the following method.

1. Perform well a test on the Fruitland Coal formation and on the total well production.
2. Determine the initial production rate from the Pictured Cliffs formation from the actual first months production from the following relation:

$$Q_{PCi} = \text{1st Month Production} * \left(\frac{\text{Total Well Test} - \text{FTC Well Test}}{\text{Total Well Test}} \right)$$

3. Determine Pictured Cliff decline from the following equation:

$$D = (Q_{PCi} - Q_{PCa}) / \text{Estimated Total Pictured Cliffs Reserves}$$

where:

Q_{PCa} = Pictured Cliffs rate at abandonment = 304 MCF/Mo.

Total Pictured Cliffs Reserves = 108,950 MCF which is the average of eight offset wells. (Does not include Russell #2)

4. Calculate Pictured Cliffs rate at any time from the following:

$$Q_{PC} = Q_{PCi} * e^{(-Dt)} \text{ where } t \text{ is time in months since first delivery.}$$

5. The Fruitland Coal production can be calculated from the actual measured production for any month minus Q_{PC} .

ATTACHMENT 1.

RICHARDSON OPERATING

OFFSET FRUITLAND COAL - PICTURED CLIFFS WELLS

Well Name	Location S-T-R	Date of First Production	Cumulative Production MCF	Status
Mayre #1	31P-30-14	May-75	89,573	Active
Bi-Knobs #1	32H-30-14	Sep-87	124,180	Active
State Com #45	32I-30-14	Jan-79	95,047	P&A
Cline #1	33O-30-14	Jun-71	236,970	INA
Aztec 35 #3	35D-30-14	May-79	59,375	INA
Winifred #2	35G-30-14	Jul-79	69,966	INA
Aztec 35 #4	35N-30-14	Nov-80	195,777	Active
Aztec 35 #5	35O-30-14	Feb-81	<u>718</u>	P&A
Average			108,951	
Russell #2	33N-30-14	Oct-54	1,629,189	P&A

Richardson Operating Company
W.F. Federal 20 #1
990' FSL & 1520' FWL
Sec. 20, T30N, R14W
San Juan County, New Mexico

The following offset Operators have received written notice of the down hole commingling application.

Mr. Chuck Moran
Yates Petroleum Corporation
105 South Fourth Street
Artesia, NM 88210

Mr. Garth Berkeland
Celsius Energy Company
1331 17th Street, Suite 800
Denver, CO 80202

Mr. David Poage
Dugan Production Company
P.O. Box 420
Farmington, NM 87499-0420

Amoco Production Company
P.O. Box 800
Denver, CO 80201

I certify that copies of the Application for a non-standard Fruitland Coal well has been mailed to the above Operators.


Paul C. Thompson

San Juan County)
) ss
State of New Mexico)

The following instrument was acknowledged before me this 23rd day of April 1998 by Paul C. Thompson


Notary Public

My Commission Expires:
July 31, 2001

RICHARDSON OPERATING COMPANY

WF FEDERAL 20-1

SB/48H/4-section 20-T30N-R14H

990' EST and 1520' EST.

SAN JUAN COUNTY, New Mexico

Formation and Spacing Unit:

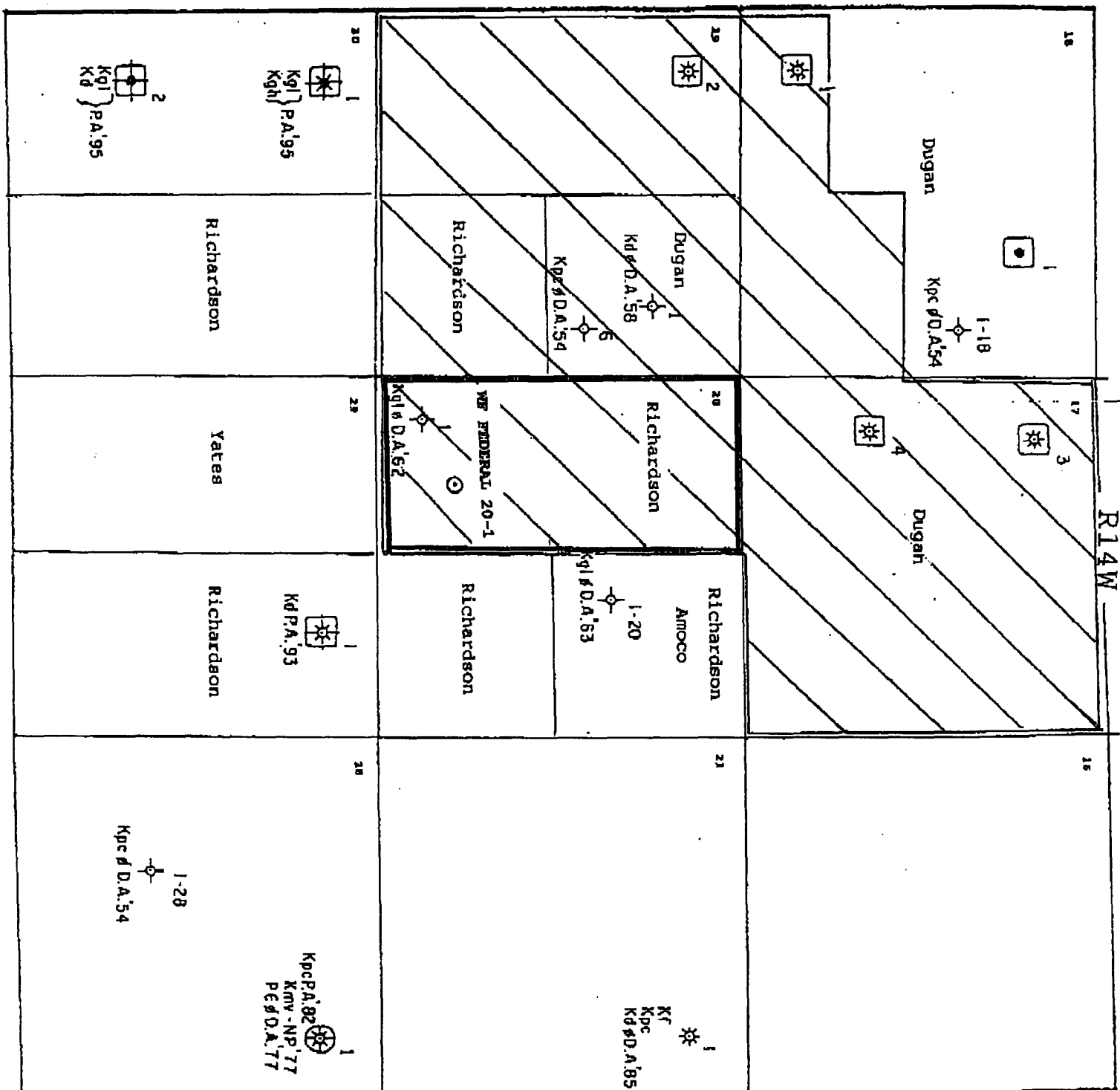
Fruitland Coal

W/2
SW/4

SM/d

SM/d

T 30 N



**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting
Lease Management
Contract Pumping7415 East Main
Farmington, New Mexico 87402
(505) 327-4882CERTIFIED- RETURN RECEIPT

April 23, 1998

Mr. David Poage
Dugan Production Company
P.O. Box 420
Farmington, NM 87499-0420

Re: Richardson Operating Company
Down Hole Commingling Application
W.F. Federal 20 #1
990' FSL & 1520' FWL
Sec. 20, T30N, R14W
San Juan County, New Mexico

Dear Mr. Poage,

Richardson Operating Company has applied to the New Mexico Oil and Gas Conservation Division for administrative approval to down hole commingle the production from the Basin Fruitland Coal and Twin Mounds Fruitland Sand - Pictured Cliffs pools in the above referred well. As an offset operator you are being notified of this application pursuant to NMOC rules.

If you desire to submit remarks concerning the application, please send them to Ms. Lori Wrotenberry, Director, New Mexico Oil Conservation Division, Santa Fe, New Mexico, within 20 days from the receipt of this notice. If you have no objection to the proposal, no action is required on your part.

Thank you for your consideration in this matter and if you have any questions, please do not hesitate to call upon me.

Sincerely,

Paul C. Thompson, P.E.

**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting
Lease Management
Contract Pumping7415 East Main
Farmington, New Mexico 87402
(505) 327-4882CERTIFIED- RETURN RECEIPT

April 23, 1998

Amoco Production Company
P.O. Box 800
Denver, CO 80201Re: Richardson Operating Company
Down Hole Commingling Application
W.F. Federal 20 #1
990' FSL & 1520' FWL
Sec. 20, T30N, R14W
San Juan County, New Mexico

Dear Land Manager,

Richardson Operating Company has applied to the New Mexico Oil and Gas Conservation Division for administrative approval to down hole commingle the production from the Basin Fruitland Coal and Twin Mounds Fruitland Sand - Pictured Cliffs pools in the above referred well. As an offset operator you are being notified of this application pursuant to NMOC rules.

If you desire to submit remarks concerning the application, please send them to Ms. Lori Wrotenberry, Director, New Mexico Oil Conservation Division, Santa Fe, New Mexico, within 20 days from the receipt of this notice. If you have no objection to the proposal, no action is required on your part.

Thank you for your consideration in this matter and if you have any questions, please do not hesitate to call upon me.

Sincerely,

Paul C. Thompson, P.E.

**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting
Lease Management
Contract Pumping7415 East Main
Farmington, New Mexico 87402
(505) 327-4892CERTIFIED- RETURN RECEIPT

April 23, 1998

Mr. Chuck Moran
Yates Petroleum Corporation
105 South Fourth Street
Artesia, NM 88210

Re: Richardson Operating Company
Down Hole Commingling Application
W.F. Federal 20 #1
990' FSL & 1520' FWL
Sec. 20, T30N, R14W
San Juan County, New Mexico

Dear Mr. Moran,

Richardson Operating Company has applied to the New Mexico Oil and Gas Conservation Division for administrative approval to down hole commingle the production from the Basin Fruitland Coal and Twin Mounds Fruitland Sand - Pictured Cliffs pools in the above referred well. As an offset operator you are being notified of this application pursuant to NMOCD rules.

If you desire to submit remarks concerning the application, please send them to Ms. Lori Wrotenberry, Director, New Mexico Oil Conservation Division, Santa Fe, New Mexico, within 20 days from the receipt of this notice. If you have no objection to the proposal, no action is required on your part.

Thank you for your consideration in this matter and if you have any questions, please do not hesitate to call upon me.

Sincerely,

Paul C. Thompson, P.E.

**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting
Lease Management
Contract Pumping7415 East Main
Farmington, New Mexico 87402
(505) 327-4892CERTIFIED- RETURN RECEIPT

April 23, 1998

Mr. Garth Berkeland
Celsius Energy Company
1331 17th Street, Suite 800
Denver, CO 80202

Re: Richardson Operating Company
Down Hole Commingling Application
W.F. Federal 20 #1
990' FSL & 1520' FWL
Sec. 20, T30N, R14W
San Juan County, New Mexico

Dear Mr. Berkeland,

Richardson Operating Company has applied to the New Mexico Oil and Gas Conservation Division for administrative approval to down hole commingle the production from the Basin Fruitland Coal and Twin Mounds Fruitland Sand - Pictured Cliffs pools in the above referred well. As an offset operator you are being notified of this application pursuant to NMOCD rules.

If you desire to submit remarks concerning the application, please send them to Ms. Lori Wrotenberry, Director, New Mexico Oil Conservation Division, Santa Fe, New Mexico, within 20 days from the receipt of this notice. If you have no objection to the proposal, no action is required on your part.

Thank you for your consideration in this matter and if you have any questions, please do not hesitate to call upon me.

Sincerely,

Paul C. Thompson, P.E.