Permian District
Post Office Box 1610
Midland, Texas 79702
Telephone 915 684 0100



November 24, 1986

Mr. Richard L. Stamets New Mexico Oil Conservation Division P.O. Box 2088 Santa Fe. New Mexico 87501

RE: Emma Lawrence Well No. 1

Application for Authorization of Water Disposal Well

Lea County, New Mexico

Dear Mr. Stamets:

ARCO Oil and Gas Company respectfully requests administrative approval to dispose of water in the ARCO-operated Emma Lawrence No. 1. The subject well is located 1980' FSL and 660' FEL, in Section 23, Township 17 South, Range 38 East, Lea County, New Mexico. The Emma Lawrence No. 1 will be used to dispose of produced water from Wolfcamp and Devonian wells in the South Knowles Field in which ARCO owns an interest. A NMOCD Form C-108 is attached along with all of the necessary data required to complete the form. A copy of Form C-108 has been mailed to the surface owner by certified mail. ARCO Oil and Gas Company is the only leasehold operator within 1/2 mile of the Emma Lawrence No. 1.

The ARCO-operated R. F. Fort No. 1 is the only well within a 1/2 mile radius of the Emma Lawrence No. 1. The cement behind the production string in the R. F. Fort No. 1 will be raised to cover the injection interval in the Emma Lawrence No. 1.

If any additional information is needed, please contact me at (915) 688-5557 and I will be happy to provide it to you.

Yours very truly,

Jack J. Lowder

Jack T. Lowder Senior Engineer

JTL:lu Attachments

## OIL CONSERVATION DIVISION

POST OFFICE BOX 2088 STATE LAND OFFICE BUILDING SANTA FE, NEW MEXICO 87501 FORM C-108 Revised 7-1-81

APPLIC	ATION FOR AUTHORIZATION TO INJECT
Ι.	Purpose: Secondary Recovery Pressure Maintenance X Disposal Storage Application qualifies for administrative approval? Xyes no
11.	Operator: ARCO Oil and Gas Company
	Address: P. O. Box 1610, Midland, Texas 79702
	Contact party: <u>Jack T. Lowder</u> Phone: (915) 688-5557
111.	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.
IV.	Is this an expansion of an existing project?  yes  x no If yes, give the Division order number authorizing the project
٧.	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.
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.
.IIv	Attach data on the proposed operation, including:
	<ol> <li>Proposed average and maximum daily rate and volume of fluids to be injected;</li> <li>Whether the system is open or closed;</li> <li>Proposed average and maximum injection pressure;</li> <li>Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and</li> <li>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.).</li> </ol>
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.
IX.	Describe the proposed stimulation program, if any.
х.	Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)
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.
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.
CIII.	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: Jack T. Lowder  Signature:
	Signature: Cack J. Lowden Date: 11-24-86
SUDMI	ne information required under Sections VI, VIII, X, and XI above has been previously itted, it need not be duplicated and resubmitted. Please show the date and circumstance ne earlier submittal.

#### 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.

- 8. 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 sultiple 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 2008, 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 to Form C-108

#### ARCO's Emma Lawrence No. 1

#### Section

- III. Well Data: See attached well diagram and tabular well data sheet.
  - V. Area of Review: See attached plat.
- VI. Well Data in Area of Review:

ARCO's R. F. Fort No. 1 (see attached schematic)
Type: South Knowles Devonian Producer

Date Drilled: 1-1-85

Location: 2310' FSL, 330' FWL, Sec. 24-T17S-R38E

Depth: 12225'

Record of Completion: Perf'd Devonian 12208-12223'

w/2 JSPF (30 Holes). Acidized Perfs 12208-12223' w/175 gal  $7\frac{1}{2}\%$  NEFE HCL Acid. Reperf'd 12208-12223' w/1 JSPF (15 holes). Perf'd Devonian 12172-184' w/2 JSPF (24 holes). IP 2-21-85 Pumping 120 BOPD, no water and gas TSTM.

### VII. Data on Proposed Operation:

- Proposed Average Daily Rate: 800 BWPD Proposed Maximum Daily Rate: 2500 BWPD
- 2) Type of System: Open
- 3) Proposed Average Injection Pressure: 500 psig Proposed Maximum Injection Pressure: 1150 psig
- 4) Injection Water Source: South Knowles Devonian,
  Southeast Knowles Wolfcamp

Compatibility Tests: See attached water analyses.

- 5) Chemical Analysis of Disposal Zone: See attached water analysis.
- VIII. Geological Data on the Injection Zone:

Geological Name: San Andres Dolomite

Lithological Detail: Fine to Very Fine Grain, Dense Crystalline

Dolomite

Thickness: 919'

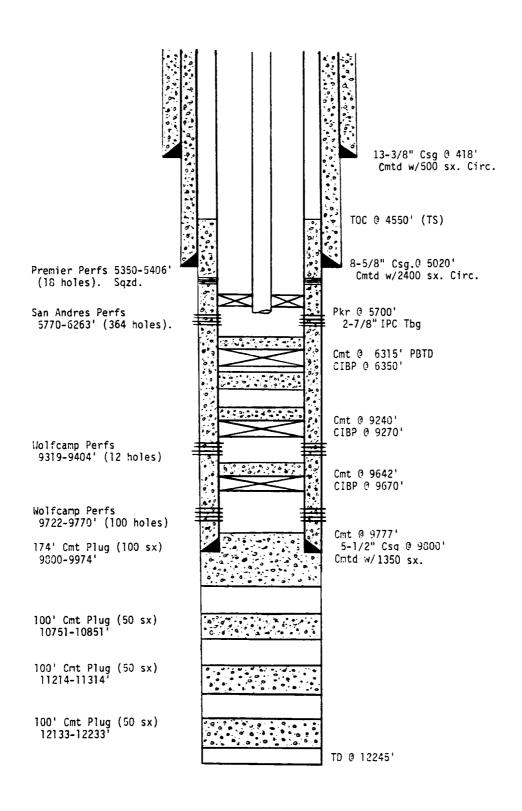
Depth: 5385' to 6304'

Geological Data of Drinking Water Zone:

The underground source of drinking water overlying the zone of disposal is the Ogallala, which occurs near the surface and is approximately 350' thick. There is no known source of drinking water below the zone of disposal.

- IX. Proposed Stimulation Program: Acidize San Andres perforations with 4100 gal 15% NEFE HCL, and if necessary, Acid Frac San Andres with 35000 gal gelled 15% NEFE HCL acid.
- X. Log and Test Data: Test Data attached. Logs enclosed.
- XI. Chemical Analysis of Fresh Water: See attached water analysis sheets dated 2-24-86 for freshwater wells shown on map.
- XII. The available geologic and engineering data have been examined, and there is no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.
- XIII. Proof of Notice: Copy of application sent to surface owner by certified mail. Affidavit of Mailing attached. Proof of Publication to be received from Hobbs Daily News Sun.

ARCO Oil and Gas Company Emma Lawrence No. 1 1980' FSL & 660' FEL Sec. 23-T17S-R38E Lea County, New Mexico



ARCO Oil and Gas Company Emma Lawrence No. 1 1980' FSL & 660' FEL Sec. 23-T17S-R38E Lea County, New Mexico

#### Disposal Well Tabular Data

#### Surface Casing

Size: 13-3/8" set at 418'. Cemented with 500 sx.

TOC at surface determined by circulating.

Hole Size: 17-1/2"

#### Intermediate Casing

Size: 8-5/8" set at 5020'. Cemented with 2400 sx.

TOC at surface determined by circulating.

Hole Size: 11"

#### Long String

Size: 5-1/2" set at 9800'. Cemented with 1350 sx.

TOC at 4550' determined by temperature survey. Hole Size: 7-7/8"

Total Depth: 12249'

Injection Interval: 5770' to 6263' (Perforated)

Tubing: Size 2-7/8" lined with internal plastic coating (PA-521) set in a

Baker Lok-Set packer at 5700 feet.

Name of Injection Formation: San Andres

Is this a new well drilled for injection? No, the well was originally drilled to test the Devonian formation.

Has the well ever been perforated in any other zones? Yes

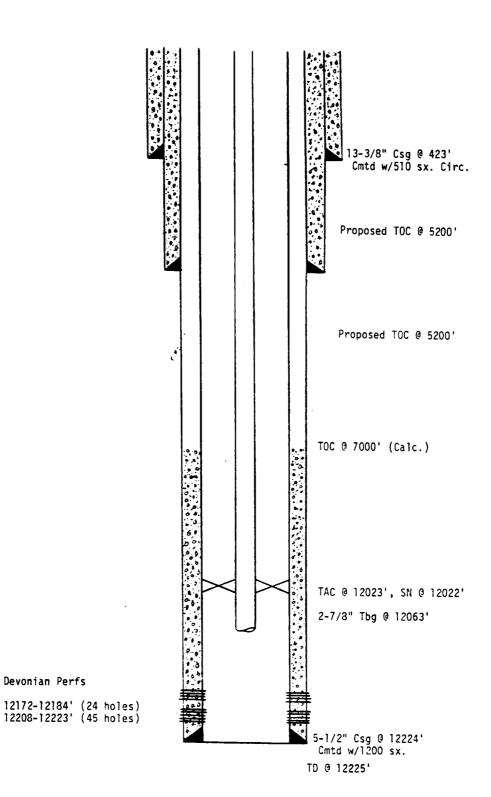
Perforated intervals and plugging detail: Spotted 100' cement plugs (50 sx/plug) at 12133-12233', 11214-11314', 10751-10851'. Spotted 200' cement plug (100 sx/plug) at 9774-9974'. Perforated 9722-9733' and 9744-9770' (100 holes). Set CIBP at 9670'. Spotted cement from 9642-9670'. Perforated 9319, 33, 35, 48, 54, 55, 62, 63, 88, 94, 9401 and 9404' (12 holes). Set CIBP at 9270'. Spotted cement from 9240-9270'. Spotted 210' cement plug (25 sx) at 7490-7700'. Perforated 5839, 90, 5920, 40, 51, 65, 76, 94, 95, 6003, 22, 33, 6105, 34, 35, 40, 57, 6216, 28, 32, 37, 40, 41 and 6242' (24 holes). Set CIBP at 5800'. Spotted cement from 5765-5800'. Perforated 5350-54, 57, 61-63, 76-78, 81, 83, 87-89 and 5406. 83, 87-89 and 5406. Plan to squeeze perforations 5350-5406 with 50 sx of cement and drill out cement and CIBP at 5800'.

AOGC - Emma Lawrence No. 1 Page Two

Depth and Name of overlying and/or underlying oil or gas zones (pools) in this area:

Name	<u>Depth</u>
South Knowles Devonian	12170'
Southeast Knowles Wolfcamp	9644'

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#### P O BOX 1468 MONAHANS TEXAS 79756 PH 943-3234 OR 563-1040

#### RESULT OF WATER ANALYSES

		BORATORY NO	186169	_
Mar James Cur	L A	MPLE RECEIVED -	1-14-86	
o: Mr. Jerry Guy	SA	SULTS REPORTED.	1-17-86	
P.O.Box 1710, Hobbs, NM	RE	SUL IS REPORTED.		
OMPANY ARCO Oil & Gas Company	. = 455	As liste	-d	
	Know1	es. South	<u> </u>	
TELD OR POOL	COUNTY	ST	ATE	
ECTION 18 BLOCK SURVEY T-175 & R-31	PE	3·	A , E	
SOURCE OF SAMPLE AND DATE TAKEN				
NO. 1 Produced water-taken from Beli	co's C. E. B	rooks #1. 1-1	1-8h	
NO. 2 Produced (Devonian) water - to	aken from R.	F. Fort 1-1	3-86	
NO. 3 Produced (Wolfcamp) water-take	en from R. F	. Fort "A". 1	-13-86	
NO. 4				
REMARKS:CHEMICAL AL	ND PHYSICAL F	PROPERTIES		
CHEMOALA	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0302	1.0242	1.0373	
pH When Sampled	1.0302	1 - 2 - 2 - 2	_ <del></del>	
pH When Received	6.97	6.85	6.56	
B.carbonate as HCO3	720	811	988	
Supersaturation as CaCO3	20	35	30	
Undersaruration as CaCO3				
Total Hardness as CaCO3	6,200	5,200	9,700	
Calcium as Ca	2,000	1,480	2,660	
Magnesium as Mg	292	365	741	
Sodium and/or Potassium	12,072	10,001	16,720	
Sulfate as SO4	1,501	1,676	2,095	
Chloride as Cl	21,483	17.400	30.538	
iron as Fe	0.08	0.63	0.59	
Barium as Ba				
Turbidity: Electric		1		
Color as Pt				
Total Solids, Calculated	38.067	31.732	53.742	
Temperature °F.	10.001	1		
Carbon Dioxide, Calculated				
Dissolved Oxigen, Winkler				
Hydrogen Sulfide	275	875	1.750	
Resistivity, ohms/m at 77° F.	0.206	0.247	0.151	
Suspended Oil				
Filtrable Solics as mg/1				
Volume Fritered, ml				
Calcium Carbonate Scaling Tendency	NONE	NONE	NONE	
Calcium Sulfate Scaling Tendency	NONE	NONE	NONE	
Calcium Surface Searing January				
Results F	Reported As Mill gra	ms Per Liter		
Additional Determinations And Remarks				
			· · · · · · · · · · · · · · · · · · ·	
				<del></del>

Form No. 3

# P O BOX 1468 MONAHANS, TEXAS 79756 PM 943-3234 OR 563-1040

## RESULT OF WATER ANALYSES

		ABORATORY NO	186169 (Pag	e 2)
o: Mr. Jerry Guy		SAMPLE RECEIVED	1-14-86	
P.O.Box 1710, Hobbs, NM		RESULTS REPORTED	1-17-86	
P.O.BOX 1710, NODBS, NA	·	RESUL IS REPORTED	J_ <del></del>	
COMPANY ARCO OIL & Gas Company	. = =	As liste	d	
COMPANY ARCO OIT & Gas Company	LEASE	vles South	<u>.u</u>	··
FIELD OR POOL	TOTAL TOTAL	Tea	NM	<del></del>
SECTION BLOCK SURVEY	_ COUNTY	Lea S	TATE	
SOURCE OF SAMPLE AND DATE TAKEN:	lasta C.E. I	2 m = 1 = #1	06	
NO. 1 Produced water-taken from Bel	ICO S C.E.	STOOKS #1. 1-13	5-00	
NO. 2 Produced (Devonian) water- ta				
NO. 3 Produced (Wolfcamp) water-tal	ken from R.	F. Fort "A".	-13-86	
NO. 4				
REMARKS:Samp]	les heated	to 115°F.		
CHEMICAL A	ND PHYSICAL	PROPERTIES		
	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.				
pH When Sampled				
pH When Received				
Bicarbonate as HCO3	1,000	805	720	
Supersaturation as CaCO3	120	80	10	
Undersaturation as CaCO3		_ <b>_</b>		
Total Hardness as CaCO3				
Calcium as Ca				
Magnesium as Mg				
Sodium and/or Potassium				
Sulfate as SO4				
Chloride as CI				
Iron as Fe	<u> </u>			
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated				ļ
Temperature °F.			ļ	ļ
Carbon Dioxide, Calculated				
Dissolved Oxigen, Winkler	ļ			
Hydrogen Sulf de				
Resistivity, ohms/m at 77° F.	ļ	_	<del> </del>	
Suspended Oil				<del> </del>
Filtrable Solids as mg/i	<u> </u>			<del> </del>
Volume Filtered, ml	ļ		<u> </u>	
Calcium Carbonate Scaling Tendency	NONE	NONE	NONE	<del> </del>
	·			
				<del></del>
	Reported As Millig		<del></del>	
Additional Determinations And Remarks A careful				
tion of any potential incompatibil	ity betweer	any combinati	on of the wa	ters repre-
sented herein. We also find no im	plication o	of a compatibil	ity problem	in compining
any of the above waters with San A	ndres. How	ever, this sho	<u>niq pe dhari</u>	fied in that
this is based on a comparison with	<u>San Andres</u>	records in th	<u>e general ar</u>	ea. Inis is
to say that based on the results h	<u>erein, no </u>	roblem should	ne encounter	en as a re-
sult of the combination of these w	arers in ar	<u>iy proportion d</u>	esired. It	snould be
added that the higher temperature	showed no	mplication of	causing any	calclum
carbonate scaling potential				

Form No. 3

Waylan C. Martin, M. A.

COPY RELEASED TO JACK LOWDER, ARCO OIL & GAS @ Midland 2-17-00 (as per Mike Feagan with H. L. Brown Co.)

Martin Water Laboratories, Inc.

P 0, BOX 1468 ONAHANS, TEXAS 79756	RESULT OF WATER A	NALYSES		731 W. INDIAN/ DLAND, TEXAS 7
NE 943-3234 OR 563-1040	LA	BORATORY NO	1079221	PHONE 683-4521
Mr. J. L. McGill	SAA	APLE RECEIVED	10-24-79	
P.O.Box 2239, Hidland, Te	RE.	SULTS REPORTE	10-25-79	
# 1 }=== 1=		Indian Wel		
DMPANY E. L. Brown, Jr.	LEASE	OB THEFT	*******	
ELD OR POOL			Texa	
CTION BLOCK SURVEY		s	TATE	
URCE OF SAMPLE AND DATE TAK	EN:	10 29 7	•	
NO. 1 Produced water - to				
NO. 2 Produced veter - to	then from Indian Wells	Jones #1, 10	-23-79	
NO. 3 Produced water - ta	aken from Indian Wells	Jones #3. 10	-23-79	
NO. 4	<del></del>		<del></del>	<del></del>
EMARKS:				
	CHEMICAL AND PHYSICAL P	<del></del>	T	1124
	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0237	1.0268	1.0224	+
pH When Sampled			<del> </del>	<del> </del>
pH When Received	6.9	7.4	7.3	+
Bicarbonate as HCO3	1.452	1.513	1,525	+
Supersaturation as CaCO3			<del>                                     </del>	. <del> </del>
Undersaturation as CaCO3			<del>                                     </del>	<del></del>
Total Hardness as CaCO3	5,000	5,250	4,900	<del></del>
Calcium as Ca	1,520	1,560	1,440	<del></del>
Magnesium as Mg		328	316	
Sodium and/or Potassium	9,858	10,763	9.919	<del></del>
Sulfate as SO4	3,538	3,725	3,542	<del></del>
Chioride as CI	15,269	16,639	15,269	<del></del>
Iron as Fe	0.78	1.2	0.39	
Barium as Ba			<del> </del>	<del> </del>
Turbidity, Electric				<del></del>
Color as Pt		<b></b>		
Total Solids, Calculated	31,289	34,579	32,011	<del></del>
Temperature °F.			<del> </del>	<del></del>
Carbon Dioxide, Calculated			<del></del>	<del></del>
Dissolved Oxygen, Winkler			<del> </del>	<del>_</del>
Hydrogen Sulfide	1,000	856	1,750	<del></del>
Resistivity, ohms/m at 77° F.	0.240	0.227	3.240	<del>}                                    </del>
Suspended Oil		<del> </del>	+	
Filtrable Solids as mg/1		<del> </del> -	<del></del>	
Volume Filtered, ml		ļ. ——-	<del></del>	
		<del> </del>	<del> </del>	+
		<del> </del>	<del> </del>	
		I	<u>- L</u>	<u> </u>
	Results Reported As Milligram			
Additional Determinations And Remarks	Sample from Jones #2		F i	-
			, ,	ords.
base analyses will be ut	ilised as typical natu	ter see wat	es value inc	~1401
			·	
			·	
		<del> </del>		

Form No. 3

P O BOX 1468 MONAHANS TEXAS 79756 PH 943-3234 OR 563-1040

709 W INDIANA MIDLAND TEXAS 79701 PHONE 683-4521

#### RESULT OF WATER ANALYSES

Mr. Jarry Guy	LAB	ORATORY NO	286364 2-24-86	
Mr. Jerry Guy Ben 1710, Hobbs, NM	MAZ	DI E DECEIVED	7-74-00	<del></del>
, be 1/10, nobbs, are	RES	ULTS REPORTED.	2-20-00	
ARCO OII & Gas Compan	Y LEASE	Emma Lawren	C#	
OR POOL	- COUNTY LO	BA ST	ATE Nm	<del></del>
E OF SAMPLE AND DATE TAKEN:	17S	SI	A   E	
		1 2077 V.maha	4 E 1	
Raw water - taken from w				
2 Raw water-taken @ ranch	house - front far	icet 3920 nor	th of Erma La	WEYENCE
3 Raw water - teken from w	indmill located	4.2241 SSE of	Roma Laweren	ce. 2-24
4				
RKS:				
	AL AND PHYSICAL PR	OPERTIES		
CALINIO	NO. 1		NO 3	110 4
fic Gravity at 60° F.	<del></del>	NO. 2	NO. 3	NO. 4
pen Sampled	1.0014	1.0015	1.0014	
	9.06	7 00	0.03	
en Received	8.06	7.89	8.01	
onate as HCO3	229	220	229	
ersaturation as CaCO3				
saturation as CaCO3				
ardness as CaCO3	216	252	224	
as Ca	67	74	66	
um as Mg	12	17	15	
and/or Potassium	49	36	45	
as \$04	71	74	71	
as CI	43	50	43	<del></del>
e	0.21	0.80	0.84	
as Ba				<del> </del>
y, Electric				
s Pt				
lids, Calculated	470	468	468	
iture °F.				
Dioxide, Calculated				
d Oxigen, Winkler				
n Suif-de	e.o	0.0	0.0	
ity, ohms/m at 77° F.	12.42	7.50	17 40	
d Oil	17.00	7.50	17.00	
Solids as mg/:				
e Filtered, ml				
	ults Reported As Milligrams	Per Liter		
Res	arts reported his mingrams			and oar
		Iffae the sho	we to be true	ALLU CITT
Determinations And Remarks   The	undersigned certi	lfies the sho	ve to be true	And Co.
Determinations And Remarks	undersigned certi	lfies the abo	ve to be true	And Cor
	undersigned certi	lfies the abo	ve to be true	And Cor
I Determinations And Remarks The	undersigned certi	lfies the abo	ve to be true	and cor
I Determinations And Remarks The	undersigned certi	liles the abo	ve to be true	And Cur
I Determinations And Remarks The	undersigned certi	liles the abo	ve to be true	And EU

cc: As per attached list.

Form No. 3

	The Same Lines, in the Control of th	Surk Ass I	property and	A BIEL BAR	Anna you to make the		179617 "************************************	Sr. & Jr., M Volotto R	100 (S) (M)	John House	150.00
- <del>1</del>	Superior		THE T			Apea ( Mare 1)	MANAGE AND AND	Hurbaiz 10-1-66	HUT BOLL	AND HANDS IT	
1	Corpresso C 19 00	***********	انس ۱		Disc. Opening se	1	Hurbetz 1-11 85	- T		Jerry Chargesty	j
•	Kirby Eapl. M.I. Jon. T. Norrin, S	J. D. Gree		a weisen	Anis (see	<u> </u>	23 86 Amerodo 1-21-86		337.00	31454 U.S.M.	]
	Amereda   3   Seprior	te 12 67 B Eb 61	Waterson Inc. N - 10 - 51	Olse. Open	Apport Fined No.	İ	Superior 4-11-03 MA	i	Hrubetz 7 28-85	147.34.75 0 10 10	]
1.00	Corporado 3 de 18	_	1755	Amereda, elet	C.S.Aivee.atm,M.	Rose Leve	Superior	P. Carry, St. 6		Vertex of Eng. 19	]
	Nutri Bonthall 1 4 1 1 1 1 1 Pages	J.L. Sonds Grief & Hand bad	Metie Gerrett L. Consc	E.G. Lourence	Vaetta Fingado E Roy C. Eoves Amerada	Rey C. Em	oo, (3 2 17 37	Valetti	Fingade (S)	Yelette Fingada	]
	Superior 8-1-8	PL Road, M	Hiterspoon inc.  a 19 67 it 6 67 it 6 67		5 - 7 - 86	Beica 2-18-84 N.3	Superior 5: 24:69 6:10:81		!	Belco Mari	)
	Tonoco, M.I. Tonoco M.I.	Amerode 14:86			C.S. Alves, et al		4-11-67 Raigh Mis, atail Charlette An-	W.V.Law	e e e e e e e e e e e e e e e e e e e	* 24. 94	
3/1	The second secon	J M Keelh(S)	Q	Marrie Garrett Erame & Lawrence Amarada	C S Alves, etal Joe B Carrendy.	1	Gulf	Rey C. E	J L Heman	Seth Aletonates	
	i & Shirmanat Ma Nama Shink Sur	F E Wilson Est MA	Clark	5 7 . 4	<del> </del>		JOA AR 76537		Gulf NBP , uperior	Jerry Chambers Man 1 66 31666	
ni, Ma.	at in the second	III   Lange Game	1 24 06 Sm	C.S. Aires etal	Monto Garren	Gulf A	1115 M 1 M 1 2 120	-Affante Come	R.K.Cone	U.S. M.I. WAR	60
<del>~</del>	9. France		10	Norman Jr	I was read a	(J L Hamen 5 Gulf)	M.E. Cono, etc/	I.R. Cana, oto	Beka	Rey C. Eeves Jerry Chambers and	¥
1	19 Union	KNOW 38		是法		v F Pet.		1	A/OB//	31658 US 4/	ن ل
17	Gulf 10119 H.S.F. 1000 17	38	டம்	1000	A N. Normanur.	Judeen G.Coa	Pies will		Artical 12	ARCO MANAGE AND SOLVES MAI	רא
<u>-</u>	Anarota Gotty		s (132)	1864	I Gulf	GH ,	AACO VIO	Jan.	PART SHOW	MEQ	<b>ac</b>
**	V-346 H.S.F.		•	41-0		-	Tempo II	, it	J.V. Granisi	0 1 01	32°50-
of all	, ,,,,	O.G.Hardin, Mi W.V. Lay	Amozo rence, S	McCall, and M W.V. Lawrence	C Lowrence	from Laure	01 1739 1 W.V. Lemmas		7	W. V. Lawrence C. R. C. Eaves	T
Trak Sek	\$10 pt 8 11 04	H.E. yales	T) Soah	ARCO NM.4161A G.21.87	1000 17 X 6		Adoba 3 H M	JL. Hamon, etal Bull Blass ( )	K	Harvagenir	17
r (8)		Reminister Ant Onle	الواتية المالية المالي المالية المالية المالي	G 21 87 Hardinatel M. Blans	Co. stains.	Chief Same	America Herdin	964 1474 7.M (MO-181 14 M - 46 21 - AM	Mm Teke		.EM Tergusen
(S	520-66 American 5 1 0 14 06 720-66 10-11 7 8 sundan	Theren, and WV	Co atol	W.Y. L.	Phon, M Transa, S L3	22 \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \	Gulf /	NM 4746 X	, T	J. Ale through 1 Goo. H Echole W. 1 20 - + 44	55552
Đ.	Clemental Anguera	Claments Ener		PALES A	RCO 1/2 Int	79 m, 46 U 4 T	Ameroda Z	41/16 145	Super III		
	Surface Divided in Million of Services	Li Gennie Weeds et el	H.E. Yefe4 5:40 96 5:8 90		45 im lat. 6-61		R.F. For F M.I.	Corfer R.F.Fort etal Jones Robinso		1m. Car. ear.	
97	W.V.Lourence Cont.Cortin	Terry Maries mads	Thmmeleurence		Lourence	177/77		Co.etal	25 10 14	a, Searcon (5)	
77	L.E. Combolity & Minning, one	2	Dello Drio	Bris AS'S US		17+1,1		E 5/	S HAR HARA BETZA B IS Int	-	<u>l</u> i
M. gen	Clements (ner. 18 19-86	74 cm		916 84 1991-4838	10 4)	186448724 \$ EM	matigation of the second		400	Garmaia Erral	ħ
320	10 10 04	LJ. Calterray (S) _	Mer B. Breckin	amesia /8 14	26 NM - 4600	THE C	gl.Zu.		Alainemeani.	29	<u> </u>
: #1	Aminha dent 2   5   5   5   5   5   5   5   5   5	Clark,	H.C. Does M. I NE ! N/2 SE	1 1 10	1-94-00 1-01-97	110 11 M	MM 4596 A.	3 m	14		h
-	101 17194 071940 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Jan F. R O.	Guy Manage	Chiefes	Lucille Ingerselletei il A.Stilors	-	A Company	MI	dividue Lapronee	CL BuserMoutes	1
-214	Claments			A COMPTHE CITY	Bin Sun Johnn	ARCO DILEGI			Cabana Oil Carter Esh	Renigem as	1
-	SELUSI SOMES CON (2 " " TO SE			11 19 Rob's.	Teens, S	1 51 1613			E[ 1631	201	
2	Callana A	2200	Man Routh	BETTYN, MI.	3000	6 26 39	46.3 24 97	H.J. Rosser etal(S) Rons	My Parker	7 77 45 How note	
	more Ar Dalla		party LO	cio, i≌	Cilles Self	Name of the last	Phillip H.B.P	4 90.0		<b>-,</b> -, -,	4
24	Share S. H. Sc. St. Market M.	NVW .	** 00000011(5)   110000 25 84 9 X 631 Co.     110000			Paulities !	10.217	O E IN	inca Orig Mardin of TO \$407	1 Am 20 100 1	4
i şr	(9) (9) (9) (9) (9)	LIN LIN	Reague Uniter	Same Constant	Ractel Oil	0-2517	Samo	Ronal	less Off MJ. *I Id Porker, (5)	Carter By Bangid Parker(S)	<u> </u>
10.00		Marie Years	Ectif Work	Cassana Property	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	TOTAL TOTAL	il o et traite	Hatchell I	<b>3</b>	De ag dakter	<u>41</u>
	Englade N. C.	Exign unagera McQuien	U.D. Stement	N. A. Charles		†	- W 1/Chin	4. <del>15.</del> 2.	+ 1325 -		┪
Co :	Les anno Lucion Louis legges Su	M.O.Seey	Small Tracts	3 Perce	Clipstine, etal	ummina .	<b>Φ</b>	ocatio	o of		П
•	The second secon	Promises Small Try.	24004	Klipshire Manua 3 Nov. Cattle Ca	WO. Works	Ja. 20. m	8) F	resh u	intec		h
73	Accordance Care Squares	Figures (4	Server Page	Ches. S. Whin	TO 4440 (340)	Treas Cr Treasment Treasment Treasment	**	resh u	anal	uzed	Ц
	Total Transcal	370UF 40MES INC	Menriette Menning	Tr., etel, Norman Books	AN AMM	AL HAME					4
17		A Common		3 MM Se	1	Continue in	Quench 7 196 - 81,6 cm, see - 81,6 cm, see	Meel A. Breck	768 132	S.P. Johnson etal	944
:		0 782	أرائظت منعد	Apcor Francis	HOW	P. Throneson [				Coder Red (1997)	A A
-	2 D. Williamson C.	Canana to the state		Charter Sayar	W. S. Sagrana de	() Count Asylan ()	12 x - Part cont Sa	1			
364 2	1 Austra Carrier	celmo			1000	Wester, et al.	Quanan 9	, <b>r</b>	ALLEN CONTROL	Mins.	J K
مي	Tray State States	Prince I was built			A 6 Years - W	Sunray-Toylar	10 29 65 W.H. Tamlina	South Gay	H. 1997	A	1 "
		can be the same by the	y a constant with the same		100						

# STATE OF NEW MEXICO ENERGY MID MINERALS DEPARTMENT

2 12 1 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		_
DISTRIBUTION		
BANTA FE		
FILE	1_	┞
V.8.6.5.	1_	↓
LAND OFFICE	1_	┞-
OPERATOR		i

# OIL CONSERVATION DIVISION

Form C-183 ·

DISTRIBUTION		X 2088	Revised 10-1-78
DANTA PE	SANTA FE, NE'	W'MEXICO 87501	
735			Se. Indicate Type of Lease State Fee X
V.S.O.S.			
LAND OFFICE			5. State Oil & Gas Lease No.
OPERATOR	•		
SUNDR'	Y NOTICES AND REPORTS O	N WELLS	
MO HOT USE THIS FORM FOR PROJUCATI	POSALS TO DRILL OR TO DEEPEN OR PLUI ON FOR PERMIT - " (FORM C-101) FOR S	UCH PROPOSALS.)	7. Unit Agreement Name
1.			
	•THER-		8, Form or Lease Name
2. Name of Operator ARCO U11	and Gas Company		Emma Lawrence
Division of Atlantic Ri	chfield Company		9. Well No.
3. Address of Operator			1
P. O. Box 1710, Hobbs, N	ew Mexico 88240		10, Field and Pool, or Wildon
P. O. Box 1/10, hobbs, N	ew neares source		
4. Location of Well	660 East	LINE AND 1980 PEET	Southeast Knowles Wolfcan
	PEET FROM THE	LINE AND	
	1.70	38E	
South CHE, SEETI	on 23 TOWESHIP 175	NAMES	
	15. Elevation (Show when	har DE RT. GR. etc.)	12. County
HIIIIIIIIII			Lea
	3663.3'		
16. Check	Appropriate Box To Indicat	e Nature of Notice, Report of	Other Data
NOTICE OF L	NTENTION TO:	SUBSEQU	ENT REPORT OF:
NOTICE OF	141211111111111111111111111111111111111		
С	PLUS AND ABANDON	ACMEDIAL WORK	ALTERING CASING
PERFORM REMEDIAL WORK		COMMENCE DRILLING OPES.	PLUS AND ABANDONMENT
TEMPORABILY ABANDON	CHANGE PLANS	CASING TEST AND CEMENT JOB	
PULL OR ALTER CASING	EHANGE PEARS	Added Perfs	& Treated Wolfcamp X
	·		
97HER		<u> </u>	
	Closely state all pertises	details, and give pertinent dates, inc.	luding estimated date of starting any proposed
17. Describe Proposed or Completed ( work) SEE RULE 1988.	Operations (Creary state on personal		·
	1- C NIL BOD POL	w/tho. RIH w/bit to P	BD 9756'. DO FC & cmt 9756' set @ 9601'. Ran Base GR/
MIRU 0/05/85. POH W/ro	ds & pump, NU BOT. TO	2 holes) RIH W/FBRC.	set @ 9601'. Ran Base GR/
9777'. Perf'd Wolfcamp	9744-97/0° W/2 JSPF (1	olug to 500# OF Actdia	ed Wolfcamp 9722-9770' w/ pkr. RIH w/prod equip. Set
Temp Survey 9500-9768'.	Press tested csg/anno	IIUS CO JOOW OK. RETUIE	nkr RTH w/prod equip. Set
TAC @ 9686'. In 19 hrs	, 9/19/85 pmpd 17 BO & :	36 BW. In 24 hrs 9/22/8	) hmbd 0 po c 11: 2::
Final Report.			
		Tal Tal 1	
	<b>からないまだい</b>	/\5\III	
	1//2		
	OCT 17 19	985	
		Tituiane	
	CENTRAL E	II FS Pallas	₹ ·
·	CENTRAL	-ILES Midlan	• <del>••</del>
18 I beech antifu that the informat	tion above is true and complete to the	best of my knowledge and belief.	
18. I Berry Commy	/		
- Withet		Dist Drlg. Supv.	BATE 10/8/85
BIBBO LUTAN, WILL	Canil TITL		
	DV ICHAY CENTAN		OCT 1 0 1985
	BY JERBY SEXTON		OOI T 0 1202
DISTRICT I	SUPERVISOR TITL	·	

#### STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT

DISTRIBUTION		I
BANTA PE		
FILE		
U,1.G.1.		
LAND OFFICE		
OPERATOR	7	П

# L CONSERVATION DIVISIO

Form C-103

SANTA PE	SANTA FE, NEW MEXICO 87501	Revised 10-1-78
FILE	SANTA FE, NEW MEXICO 8/501	Sa. Indicate Type of Lease
U,8.0.8.		State Fee X
LAND OFFICE		5. State Oil 6 Gas Lease No.
OPERATOR	l	
SUNDO	Y NOTICES AND REPORTS ON WELLS	
SUNUR  OF HOT USE THIS FORM FOR PHO  OF "APPLICATION."	T MOTICES AND REFORTS ON TILLS Posals to drill or to ocepen or plug back to a different reservoir. 184 for permit" (form C-101) for such proposals.)	
1.		7. Unit Agreement Name
on	OTHER-	
2. Name of Operator ARCO 011	and Gas Company	8. Farm or Lease Name
Division of Atlantic R:	ichfield Company	Emma Lawrence
3, Address of Operator		9. Well No.
P. O. Box 1710, Hobbs,	New Mexico 88240	1
4. Location of Well		10. Field and Pool, or Wildcat
UNIT LETTER	660 FEET FROM THE East LINE AND 1980	Knowles Wolfcamp
THE South LINE, SECTION	ON 23 TOWNSHIP 17S RANGE 38E	_ umom. (())
	15. Elevation (Show whether DF, RT, GR, esc.)	Lea
	3663.3' GR	
Check .	Appropriate Box To Indicate Nature of Notice, Repor	rt or Other Data
NOTICE OF I	NTENTION TO: SUBS	EQUENT REPORT OF:
PERFORM REMEDIAL WORK	PLUG AND ASANDON REMEDIAL WORK	ALTERING CASING
TEMPORABILY ABANDON	COMMENCE ORILLING OPHS.	PLUE AND ABANDONMENT
PULL OR ALTER CASING	CHANGE PLANS CASING TEST AND CEMENT JOS	X Production Casing Perf, Treat & Complete X
	OTHER DOI, LOG.	Terr, Treat a comprete
OTHER		
17. Describe Proposed or Completed O	perations (Clearly state all pertinent details, and give pertinent dates,	including estimated date of starting any proposed
work) SEE RULE 1903.		
On 4/17/85 ran DST #1	9715-65' Wolfcamp. Opened Tool @ 6:35 AM f	50 mine May press 15# on 19
to strong blow. SI 60	mins. Opened for 120 mins, gas to surf in Rel test tools & POH to 4743', RO, rec 10	bble are cut oil 20 BW 1 bbl
ck. Si for 240 mins.	Rec 39 MCFGD, 15 mins ISIP 3826#, 60 mins IF	EP 264# 120 mins FFP 660#, 240
drig mud in 2% nrs. K	156°F. Fin drlg 7-7/8" hole to 12,249' @ 1	12:00 noon 5/1/85. Ran GR-CDL/
mins rair 3/3/#. But	7/Cal. DST #2 12,228-249' Devonian. TO @ 7	7:22 AM. IFP weak blow, incr to
th after 30 mine ST	1 hr. OT for 1 hr FFP, no fluid to surf.	Closed tool for 2 hrs. Rel too
E POH to 4800' Atten	apted to RO, dropped 3 bars, could not shear	r tool. POH w/tools. Rec 2270
fm wtr in DP RTH w/T	OP OE & spotted 100' cmt plug across Devonia	an 12,233-133' w/50 sx Cl H Neat
cmt. POH to 11.314' 8	s spot 100' cmt plug 11,314-214' w/50 sx C1	H Neat cmt. Spotted 100' cmt
plug 10.851-751', POH	w/DP. RIH $w/2-7/8"$ tbg OE to 9974'. Spot	200' cmt plug 9974-9774' w/100
sx Cl H Neat cmt. Tag	g green cmt @ 9774'. Drld & washed cmt to 9	9795'. Set 45,000# wt on cmt
plug OK, DST #3 Wolf	fcamp, set pkrs @ 9630', OT & pkr failed. ]	Re-set pkrs. OT & lost pkr sea
POH w/test tools. RII	H w/bit. tagged PBD @ 9700'. DO cmt to $9770$	O'. DST #4 9715-9//O' Wolfcamp
OT w/weak blow, slowly	v incr to 2.5# in 2-3/4 hrs. Closed tool.	Opened tool & RIH w/coil tbg t
5000'. Circ N <sub>2</sub> @ 400	SCF/min while GIH w/tbg. Circ N2 @ 9400'	for 1/2 hrs. No fluid to surf.
Slowed pump rate to 2	50 SCF/min, circ 2 hrs. No fluid to surf.	Pmpd total 8 hrs using 368,000
SCF N/2. POH w/coil	tbg. Rel pkrs & POH w/test tools, had gas	& oil w/1850, bibe is note. Dio
bar & RO ½ BO & 28 BW.	. (cont'd on back of page)	
18. I hereby certify that the information	n above is true and complete to the best of my knowledge and belief.	
Cah A & R	Drlg. Engr.	DATE 5/30/85
Steate The Assessment of the Steatest of the S	11148	
ORIGINAL SIGNAL	TO THE DEATOR	JUN 1 1985
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APPROXED SY	71766	

Finished POH w/test tools. DO cmt to new PBTD 9800'. RIH w/2993' 5½":0D 17# L-80 csg, 6807' of 5½" OD 17# K-55 csg, set @ 9800'. FC set @ 9856'. Cmtd 5½" OD csg w/550 sx C1 H Neat cmt. BP @ 12:20 PM 5/10/85. Inst wellhead. Temp survey indicated TOC @ 7400'. On 5/14/85 ran GR-CCL log 9755-9100'. Perf'd Wolfcamp w/4 JSPF @ 9722-9733' = 48 - .50" holes. RIH w/pkr & tbg, set pkr @ 9651' & acidized Wolfcamp perfs 9722-9733' w/1500 gals 15% HCL NEFE acid. In 3 hrs swbd 66 BLW & well kicked off flwg. In 16½ hrs rec 39 BNO & 66 BW. POH w/tbg & pkr. RIH w/compl assy, set TAC @ 9595'. RIH w/tbg & rods. On 24 hr potential test 5/30/85 pmpd 33 BO, 108 BW, 8 MCFG on 10 - 120" spm. Final Report.

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RECEIVED

JUN 1 0 1985

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#### AFFIDAVIT OF MAILING

Jack T. Lowder, being duly sworn states that he is an engineer for ARCO Oil and Gas Company, the Applicant herein.

That on the 24th day of November, 1986, in the City of Midland, Midland County, Texas, he mailed in a sealed envelope, postage prepaid, a copy of the application and plat herein attached to the following:

Walter and Emma Lawrence 1026 E. Highland Drive Hobbs, New Mexico 88240

Jack J. Lowder

State of Texas )
County of Midland )

Before me the undersigned, a Notary Public in and for the said County and State, on this 24th day of November, 1986, personally appeared Jack T. Lowder, to me known to be the identical person who executed the within and foregoing instrument and acknowledged to me that he executed the same as his free and voluntary act and deed for the uses and purposes herein set forth.

Given under my hand and seal the day and year last above written.

My commission Expires:

5-28-90

Jane E. Tiel Notary Public Permian District
Post Office Box 1610
Midland, Texas 79702
Telephone 915 684 0100



CERTIFIED

RETURN RECEIPT REQUESTED November 24, 1986

Walter and Emma Lawrence 1026 E. Highland Drive Hobbs, New Mexico 88240

Dear Mr. and Mrs. Lawrence:

Attached is a copy of Form C-108 submitted to the New Mexico Oil Conservation Division requesting permission to dispose of water in the Emma Lawrence No. 1. For your convenience, we have included a plat indicating the location of the well covered by this application.

This letter will serve as formal notice, as required by the NMOCD, of our intention to convert the Emma Lawrence No. 1 to a water disposal well.

We will be happy to provide you with any additional information that you may require at your request. Thank you for your cooperation.

Yours very truly,

Jack J. Lowden

Jack T. Lowder Senior Engineer

JTL: lu Attachments Permian District
Post Office Box 1610
Midland, Texas 79702
Telephone 915 684 0100



November 24, 1986

Hobbs Daily News Sun P.O. Box 860 Hobbs, New Mexico 88240

Dear Sirs:

**CERTIFIED** 

RETURN RECEIPT REQUESTED The New Mexico Oil Conservation Division requires that notice of an application to inject water be published in a newspaper of general circulation in the county in which the well is located. Please print the following notice in the Hobbs Daily News Sun as soon as possible.

"ARCO Oil and Gas Company, P.O. Box 1610, Midland, Texas, 79702, has filed an application with the New Mexico Oil Conservation Division seeking permission to dispose of salt water into a well in Lea County. The water disposal well will be located 1980' FSL, 660' FEL, Sec. 23, Township 17 South, Range 38 East. Water is to be injected into the San Andres formation at an approximate depth of 5700' to 6300'. A maximum injection rate of 2500 BWPD and a maximum injection pressure of 1150 psig is expected. Please refer questions to Jack Lowder at the above address, or call (915) 688-5557. Any requests for hearing or objections to this application must be made to the Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico, 87501, within 15 days."

The notice is to run for one day. The New Mexico Oil Conservation Division also requires that proof of publication be submitted to them before our application is approved. Please send proof of publication, including a copy of the legal advertisement, to Mr. Richard L. Stamets, Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico, 87501. Please send an additional copy of the proof of publication to Mr. D. C. Douglas, ARCO Oil and Gas Company, P.O. Box 1610, Midland, Texas, 79702.

Please send the bill in care of Mr. S. D. Smith, ARCO Oil and Gas Company, P.O. Box 1710, Hobbs, New Mexico, 88240. Thank you for your help and cooperation.

Yours very truly,

Jack J. Lowder

J. T. Lowder Senior Engineer

JTL:lu Attachments

cc: Mr. R. L. Stamets

New Mexico Oil Conservation Division

Mr. S. D. Smith - Hobbs