### STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

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Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, New Mexico 87505 FORM C-108 Revised 4-1-98

	APPLICATION FOR AUTHORIZATION TO INJECT
I.	PURPOSE:       Secondary Recovery       X       Pressure Maintenance       Disposal       Storage         Application qualifies for administrative approval?       Yes       X       No
II.	OPERATOR: EOG RESOURCES
	ADDRESS:4000 N. BIG SPRING ST.,SUITE 500, MIDLAND, TX 79705
	CONTACT PARTY: RANDY CATE ; MIKE FRANCIS PHONE: 915-687-4135
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.
IV.	Is this an expansion of an existing project? X Yes No If yes, give the Division order number authorizing the project: R-11389
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.
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.
VII.	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 geologic data on the injection zone including appropriate lithologic detail, geologic 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 sources known to be immediately underlying the injection interval.
IX.	Describe the proposed stimulation program, if any.
*X.	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 sources of drinking water.
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:	RANDALL S. CATE	TITLE:	PROJECT ENGINEER
SIGNATURE: _			DATE: 2/27/2002

\* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: \_\_\_\_\_\_VIII. WAS SUBMITTED MAY 18, 2000 CASE N0. 12399

### 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 the 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, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, 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.

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APPLICATION FOR AUTHORIZATION TO INJECT RED HILLS NORTH UNIT #606H - WATER INJECTION

# VI. TABULATION OF DATA ON WELLS IN AREA OF REVIEW

HOLE DIR	Vertical	Horizontal	Horizontal	Vertical														
RNG	33	33	ŝ	33	33	S	S	33	33	34	34	94 8	34	3	34	84	е 4	34
<b>d</b> MT	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
SEC	-	-	-	12	12	12	12	12	12	9	9	9	9	9	7	~	7	7
E/W DIR	FEL	FEL	FWL	FEL	FWL	FWL	FWL	FWL	FWL	FEL	밀	FWL	FWL	FEL	FEL	ц Ц	FEL	FWL
E/W FTG	660	1830	1650	660	2130	1650	1880	2449	2475	1980	1980	1980	660	660	1980	1980	1780	2310
N/S DIR	FSL	FSL	FSL	FNL	FSL	FNL	FNL	FSL	FNL	FSL	FSL	FSL	FSL	FSL	FNL	FNL	FNL	FNL
N/S FTG	510	1430	1060	1980	1830	1830	660	1250	1750	066	066	510	510	810	660	660	1980	1650
PB DEPTH	12396	12440	12450	12562	12553	12405	12446	16095		12935	15406	12508	12421		15566	12648	12507	12337
6	12500	12550	12500	12600	12600	12540	12550	16229	17296	15700	15675	12600	12600	12516	15623	15623	12600	12550
COMP DATE	19950116	19950403	19950607	19940716	19940909	19950114	19960502	20001128	20010526	19950416	19910123	19941031	19941128	19950128	19921016	19970522	19931212	19940302
SPUD DATE	19941210	19950305	19950512	19940606	19940727	19941210	19950327	20000831	20010312	19950405	19900912	19940928	19941023	19950105	19920718	19961102	19931009	19940116
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ORIGINAL LEASE NAME	HALLWOOD '1' FEDERAL #2	HALLWOOD '1' FEDERAL #3	HALLWOOD '1' FEDERAL #4	HALLWOOD '12' FEDERAL #6	HALLWOOD '12' FEDERAL #7	HALLWOOD '12' FEDERAL #9	HALLWOOD '12' FEDERAL #10	RED HILLS NORTH UNIT #211	RED HILLS NORTH UNIT #212	HALF '6' FEDERAL COM #1	HALF '6' FEDERAL COM #1	HALF `6' FEDERAL #2	HALF '6' FEDERAL #3	HALF '6' FEDERAL #4	DIAMOND '7' FEDERAL COM #1	DIAMOND '7' FEDERAL COM #1	DIAMOND '7' FEDERAL #2	DIAMOND '7' STATE #1
API UNITIZED LEASE NAME	30025327480000 RED HILLS NORTH UNIT #102	30025328860000 RED HILLS NORTH UNIT #103	30025328870000 RED HILLS NORTH UNIT #104	30025325270000 RED HILLS NORTH UNIT #206	30025325840000 RED HILLS NORTH UNIT #207	30025327890000 RED HILLS NORTH UNIT #209	30025328950000 RED HILLS NORTH UNIT #210	30025350770000 RED HILLS NORTH UNIT #211	30025353630000 RED HILLS NORTH UNIT #212	30025309820001 RED HILLS NORTH UNIT #601	30025309820000 RED HILLS NORTH UNIT #601	30025326110000 RED HILLS NORTH UNIT #602	30025326800000 RED HILLS NORTH UNIT #603	30025328110000 RED HILLS NORTH UNIT #604	30025316380000 RED HILLS NORTH UNIT #701	30025316380001 RED HILLS NORTH UNIT #701	30025322460000 RED HILLS NORTH UNIT #702	30025322490000 RED HILLS NORTH UNIT #707

\* See attached wellbore schematics for well construction and completion detail.

### EOG RESOURCES, INC. 510' FSL & 660' FEL Sec.1-T25S-R33E

### RHNU NO. 102 LEA CO., NEW MEXICO JULY 28, 2000





### EOG RESOURCES, INC. 1060' FSL & 1650' FWL Sec.1-T25S-R33E

### RHNU NO. 104 LEA CO., NEW MEXICO DECEMBER 12, 2000



### EOG RESOURCES, INC. 1980' FNL & 660' FEL Sec.12-T25S-R33E

### RHNU NO. 206 / HALLWOOD "12" FEDERAL NO. 6 LEA CO., NEW MEXICO DECEMBER 11, 2000





### EOG RESOURCES, INC. 1830' FNL & 1650' FWL SEC. 12-T25S-R33E

### RHNU NO. 209 LEA CO., NEW MEXICO MAY 13, 199

### WELLBORE SCHEMATIC



N:\SCHEM\LEA\HALLWOOD '12' FEDERAL NO.9\COMP.DOC

### EOG RESOURCES, INC. 660' FNL & 1880' FWL Sec.12-T25S-R33E

### RHNU NO. 210 / HALLWOOD "12" FEDERAL NO. 10 LEA CO., NEW MEXICO DECEMBER 11, 2000





N:\SCHEMLEA\RHNU NO.211\COMP.DOC

LEA COUNTY, N.M. RHNU NO. 211

EOG RESOURCES, INC.

RHNU NO. 212 LEA COUNTY, NEW MEXICO FEB 27, 2002		0 15.151 0 15.529 0 15.529 0 15.907 0 16.315 0 15.907 0 15.308 17.206 17.208 (MD) 12.273 (MD) 12.273 (MD) 12.273 (MD) 12.273 (MD)
T25S, R33E C 7, T25S,R34E	WELL SCHEMATIC	DETAIL: 0# HC K-553' w/500sx (circ.cmt) 0# HC K-55JJS LTC @ 5.002' w/1325sx (circ.cm t.) P-110 Hydril521/LTC @ 12.365' w/1030sx - TOC of 7'csg @ 4.890'(t.s.) 1.6# P-110 Hydril521 from 11.711'to 17.296' w/370sx 1.6# P-110 Hydril521 from 11.711'to 17.296' w/370sx 4 holes @ 12.587' 8 holes @ 12.587' 9 holes @ 13.624' 9 holes @ 14.413' 11 holes @ 14.413' 11 holes @ 14.413' 11 holes @ 14.413' 11 holes @ 14.762' 11 holes @ 14.762' 11 holes @ 14.762' 11 holes @ 14.762' 10 holes @ 14.762' 10 holes @ 14.762' 10 holes @ 14.762' 11 holes @ 14.762' 10 holes @ 14.762' 11 holes @ 14.762' 10 holes @ 14.762' 10 holes @ 14.762' 11 holes @ 14.762' 11 holes @ 14.762' 11 holes @ 14.762' 12 holes @ 14.762' 13 holes @ 14.762' 14 holes @ 14.762' 14 holes @ 14.762' 15 holes @ 14.762' 10 holes @ 14.762' 11 holes @ 14.762' 10 holes @ 14.762' 10 holes @ 14.762' 11 holes @ 14.762' 10 holes @ 14.762' 11 holes @ 14.762' 12 holes @ 14.762' 13 holes @ 14.762' 14 holes @ 14.762' 14 holes @ 14.762' 15 holes @ 14.762' 16 holes @ 14.762' 17 holes @ 14.762' 17 holes @ 14.762' 18 holes @ 14.762' 19 holes @ 14.762' 10 holes @ 14.762' 1
EOG RESOURCES, INC. S.L.2475' FWL, 1750' FNL, Sec. 12, B.H.L. 2300' FWL & 320' FNL, SE	W elibare	C A S IN G

N:\SCHEM/LEA\RHNU NO.212\RHNU 212 SCHEM.DOC











PBTD: 12,447'



### EOG RESOURCES, INC. 1650' FNL & 2310' FWL Sec.7-T25S-R34E

### RHNU NO. 707 LEA CO., NEW MEXICO AUGUST 01, 2000



### EOG RESOURCES, INC. 810' FSL & 660' FEL Sec.6-T25S-R34E

### HALF '6' FEDERAL NO. 4 LEA CO., NEW MEXICO FEBRUARY 19, 2002

### CURRENT WELLBORE SCHEMATIC



7-7/8" Open Hole from 5,056' to 12,516' TD @ 12,516'

		<b>C A</b> 3 - 3 / 5 / 8 - 5 / 8 - 1 / 2	0 = + 0 = +		н н н н н н н н н н н н н н н н н н н	A II S J d rii d cii d cii t e d	C C 5 5 - 1 0 - 1 0 - 1 0	650 650 7C 0f7 0f4	3SE) (c fro	0 M 5 - 2 - 2 - 2 - 2	C m c m c m d d d d d d d d d d d d d d d	<b>SCH</b> (cir (cir (cir (cir (c) (c) (c) (c) (c) (c) (c) (c) (c) (c)	EMA to to to	m t.	)	- ~							
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EOG RESOURCES, INC.

OPERATOR: EOG RE	SOURCES, INC.			
WELL NAME & NUMBER	RHNU NO. 606H-WI			
WELL LOCATION: S.	L.530'FSL & 1650' FEL SEC.6,T258,R34E	; B.H.L. 1400' FNL & 2	150' FWL SEC. 12, T25S, R33	
Ξ.	OUTAGE LUCATION	UNII LEI IEK	SECTION	IOWNSHIP KANGE
WELLBORE	<u>SCHEMATIC</u>		<u>WELL C</u> Surface C	<u>ONSTRUCTION DATA</u> asing
		Hole Size:	/2"	Casing Size: 13 3/8"
		Cemented with: _	475 SX.	<i>or</i> ft <sup>3</sup>
		Top of Cement: _	SURFACE	Method Determined: CIRC
			Intermediate	c Casing
		Hole Size:	(2 1/4"	Casing Size: 9 5/8"
		Cemented with: _	1350 sx.	<i>or</i> ft³
		Top of Cement: _	SURFACE	Method Determined: CIRC
			Production	Casing
		Hole Size:	8 3/4"; 6 1/8"	Casing Size: 7"; 4 ½" LINER
		Cemented with:	800; 520 sx.	or
		Top of Cement: _	5000'; 11,500'	Method Determined: TEMP.SURV,CBL
		Total Depth:	12,700'; 19727'	
			<u>Injection I</u>	nterval
		2	2,700' TMD feet	to 19,727' TMD
			(Perforated or Open H	ole; indicate which)

INJECTION WELL DATA SHEET

Side 1

		INJECTION	WELL DATA SHEET
Tub	ing Size:	2 7/8";2 3/8"	Lining Material: INTERNAL PLASTIC COAT
Typ	e of Packer:	4 ½" BAKER AD-1 ; IP	Ç
Pac	ker Setting Depth:	11,600°	
Oth	er Type of Tubing	/Casing Seal (if applicab	le):
		Ā	Iditional Data
<u> </u>	Is this a new well	drilled for injection?	XX Yes ** No
	If no, for what pu TO CLEAN UP F	Irpose was the well orig RACTURE TREATMENT	inally drilled? ** WELL WILL INITIALLY BE PRODUCED
4	Name of the Injec	ction Formation: T	HIRD BONE SPRING SAND
Э.	Name of Field or	Pool (if applicable):	RED HILLS
4.	Has the well ever intervals and give	been perforated in any plugging detail, i.e. sac	other zone(s)? List all such perforated ks of cement or plug(s) used. <u>NO</u>
5.	Give the name an injection zone in	id depths of any oil or g this area:	as zones underlying or overlying the proposed
	Ω	ELAWARE - 5200'-9300'	
	М	VOLFCAMP - 12,300'-13,8	,00,
		MORROW - 14,800'-15,5	00,

### APPLICATION FOR AUTHORIZATION TO INJECT RHNU NO. 606H-WI

- VII. 1.) PROPOSED AVG. INJECTION RATE --- 2500 BWPD PROPOSED MAX. INJECTION RATE --- 3000 BWPD
  - 2.) CLOSED SYSTEM
  - 3.) PROPOSED AVG. INJECTION PRESSURE --- 3000 psig PROPOSED MAX. INJECTION PRESSURE --- 3250 psig FROM RHNU 302 STEP RATE TEST
  - 4) SOURCES OF INJECTED WATER----PRODUCED BONE SPRING WATER FROM RED HILLS PRODUCED MORROW WATER FROM PITCHFORK RANCH FRESH WATER FROM SANTA ROSA WELLS IN AREA DELAWARE & BONE SPRING FROM TRISTE DRAW AREA WHEN FULLSCALE FLOOD IMPLEMENTED --ANALYSIS INCLUDED---
- VIII. UNDERGROUND SOURCE OF FRESH WATER SANTA ROSA FOUND AT APPROX. 300'.; ANALYSIS INCLUDED
- IX. STIMULATION WILL CONSIST OF 2 STAGE ---400,000 GAL. & 500,000 # SAND FRACTURE TREATMENT

## Injection Pressure vs. Injection Rate



Martin Water Laboratories, Inc.

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

	1	LABORATORY NO.	20	2-123
TO: <u>Mr. Randy Cate</u>		SAMPLE RECEIVED	2/	14/02
P.O. Box 2267, Midland, Texas	79702	RESULTS REPORTED.	2/	20/02
FOC Bosources Inc				
COMPANY LOG RESources, Inc.	Lt	ASE		
FIELD OR POOL				
SECTION BLOCK SURVEY	COUNTY	STAT	ТЕ	
SOURCE OF SAMPLE AND DATE TAKEN:	_			
NO.1 <u>Raw water - taken from fr</u>	resh water sta	ation.		2/13/02
NO.2 Produced water - taken fr	om Red Hills	North Unit #30	02 SWD.	2/13/02
NO.3 Produced water - taken fr	om Triste Dra	aw SWD.		2/13/02
NO.4 Produced water - taken fr	om Vaca #30 S	SWD.		2/13/02
REMARKS:				
СНЕМ	CAL AND PHYSICA	L PROPERTIES	·;=;	
	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60* F.	1 0022	1.0660	1 1786	1 0116
pH When Sampled		1.0000		
pH When Received	7 64	6 / 7	4 84	3.64
Bicarbonate as HCO.	283	854	68	
Supersaturation as CaCO.		0.14	00	<u>u</u> _
Undersaturation as CaCO.	f			
Total Hardness as CaCO.	420	15,800	74 000	3 700
Calcium as Ca	104	4 240	23 200	840
Magnesium as Mg	39	1,264	3 888	389
Sodium and/or Potassium	222	34 154	76 620	6 317
Suitate as SQ.	318	217	174	586
	241	63 207	170 446	11 031
	2.41	1 112	7/ 1	6/2
Barium as Ba		19112		072
			<u>v</u>	
Color as Pt				[
Total Solids, Calculated	1 208	103 035	27/ 396	20.063
			<u>2/4,J/U</u>	20.001
Carbon Dioxide, Calculated	12	564	1 768	0
	<u> </u>			V
Hydrogen Sulfide	0.0	0.0	0.0	0.0
Besistivity obms/m at 77° F	5 68	0.0	0.0/8	0 300
Suspended Oil		0.071	01040	
Filtrable Solids as mo/t				
Volume Filtered, ml			~	
Calcium Sulfate Scaling Tencency	None	None	None	None
Re	sults Reported As Milligra	ms Per Liter		
Additional Determinations And Remarks The objective he	erein is to evalu	ate compatibility	between these f	our_waters
Our greatest concern is that the Red hills	North Unit SWD	water had black p	recipitation, an	d we assume
this was due to iron sulfide although ther	e was no residua	1 hydrogen sulfid	<u>e present. This</u>	would be the
only concern because if the Red Hills Nort	h Unit SWD does	have hydrogen sul	fide, it would h	e incompatible
with the water from the other SWD wells si	nce they both ha	ve soluble iron.	However, it sho	uld be noted
that a previous record of composite produc	ed water from th	e Red Hills North	Unit battery (1	aboratory
#1201-119 reported 12/18/01) did not indic	ate the presence	of hydrogen sulf	ide. Also, we w	ould be con-
cerned about the possibility of oxygen in	the fresh water.	If there was oxy	vgen in the fres	h water, it
would have to be removed chemically or phy	sically before b	eing mixed with an	ny of these wate	rs.

Form No. 3

By \_\_\_\_\_\_

Martin Water Laboratories, Inc.

Iron as Fe

Barium as Ba Turbidity, Electric 709 W. INDIANA MIDLAND, TEXAS 79701 PHONE 683-4521

RESULT	OF	WATER	ANAL	YS.	ES
--------	----	-------	------	-----	----

			50094	
TO Mr. Randy Cate			5-16-00	
P.O. Box 2267, Midland, TX	79702		5-16-00	
		REQUEIS REFUNITO		
COMPANYEOG Resources, Inc.	t	EASE Vaca 13	Federal	
SECTION 13 BLOCK SURVEY T-25	S&R-33E COUNTY Le	eaSTAT	F NM	
SOURCE OF SAMPLE AND DATE TAKEN:				
NO 1 Raw water - taken fro	m fresh water we <sup>.</sup>	11 located in N	W/4 of Sectio	on 13.
NO 9				
NU. 2	-,			
NO. 3	<del> </del>			· · · · · · · · · · · · · · · · · · ·
NO. 4				
NO. 4 REMARKS:				
NO. 4	CHEMICAL AND PHYSIC	AL PROPERTIES		
NO. 4	CHEMICAL AND PHYSIC NO. 1	AL PROPERTIES NO. 2	NO. 3	NO. 4
NO. 4	CHEMICAL AND PHYSIC NO. 1 1.0062	AL PROPERTIES NO. 2	NO. 3	NO. 4
NO. 4REMARKS: Specific Gravity at 60° F. pH When Sampled	CHEMICAL AND PHYSIC NO. 1 1.0062	AL PROPERTIES NO. 2	NO. 3	NO. 4
NO. 4REMARKS: Specific Gravity at 60* F. pH When Sampled pH When Received	CHEMICAL AND PHYSIC NO. 1 1.0062 6.54	AL PROPERTIES NO. 2	NO. 3	NO. 4
NO. 4REMARKS:	CHEMICAL AND PHYSIC NO. 1 1.0062 6.54 88	AL PROPERTIES NO. 2	NO. 3	NO. 4
NO. 4	CHEMICAL AND PHYSIC NO. 1 1.0062 6.54 88	AL PROPERTIES NO. 2	NO. 3	NO. 4
NO. 4	CHEMICAL AND PHYSIC NO. 1 1.0062 6.54 88	AL PROPERTIES NO. 2	NO. 3	NO. 4
NO. 4	CHEMICAL AND PHYSIC NO. 1 1.0062 6.54 88 4,300	AL PROPERTIES NO. 2	NO. 3	NO. 4
NO. 4	CHEMICAL AND PHYSIC NO. 1 1.0062 6.54 88 4,300 980	AL PROPERTIES NO. 2	NO. 3	NO. 4
NO. 4	CHEMICAL AND PHYSIC NO. 1 1.0062 6.54 88 4,300 980 450	AL PROPERTIES NO. 2	NO. 3	NO. 4
NO. 4	CHEMICAL AND PHYSIC NO. 1 1.0062 6.54 88 4,300 980 450 485	AL PROPERTIES NO. 2	NO. 3	NO. 4
NO. 4	CHEMICAL AND PHYSIC NO. 1 1.0062 6.54 88 4,300 980 450 485 458	AL PROPERTIES NO. 2	NO. 3	NO. 4

11.2

Color as Pt				
Total Solids, Calculated	5,869			
Temperature *F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen,				
Hydrogen Sulfide	0.0			
Resistivity, ohms/m at 77* F.	0.920			
Suspended Oil	· · · · · · · · · · · · · · · · · · ·			
Filtrable Solids as mg/l				
Volume Filtered, ml				
Nitrate, as N	1.0			
	- No D	reme Des Liter		
He	sults Reported As Millig	rains Per Liter		
Additional Determinations And Remarks The linder	signed certi	fies the at	ove to be true	and correct
Additional Determinations And Remarks The under to the best of his knowledge and	signed certi belief.	fies the at	oove to be true :	and correct
Additional Determinations And Remarks The under to the best of his knowledge and	signed certi belief.	fies the at	oove to be true :	and correct
Additional Determinations And Remarks The under to the best of his knowledge and	signed certi belief.	fies the at	oove to be true :	and correct
Additional Determinations And Remarks The under to the best of his knowledge and	signed certi belief.	fies the at	oove to be true :	and correct
Additional Determinations And Remarks The under to the best of his knowledge and	signed certi belief.	fies the at	oove to be true :	and correct
Additional Determinations And Remarks The under to the best of his knowledge and	signed certi belief.	fies the at	Dove to be true	and correct
Additional Determinations And Remarks The under to the best of his knowledge and	signed certi belief.	fies the at	Dove to be true :	and correct
Additional Determinations And Remarks The under to the best of his knowledge and	signed certi belief.	fies the at	Ye The true	and correct
Additional Determinations And Remarks The under to the best of his knowledge and	signed certi belief.	fies the at	Dove to be true	and correct
Additional Determinations And Remarks The under to the best of his knowledge and	signed certi belief.	By	pove to be true	and correct

For (Au	rm 3160-3 Igust 1999)			FORM APPROVED OMB No. 1004-0136 Expires November 30, 2000		
	UNITED STATES			5. Lease Serial No.	······	
	DEPARTMENT OF THE IN	NMNM 30400				
	BUREAU OF LAND MANO	GEMENT		6. If Indian, Allottee or	Tribe Name	
<u> </u>	APPLICATION FOR PERMIT TO D	RILL OR REENTER				
1a.	Type of Work: X DRILL	ENTER		7. If Unit or CA Agreement, Name and No.		
	<u>- अस</u> गण तलाई 			Red Hills Noth Unit NM NM 104037 X		
				8. Lease Name and We	ll No.	
1b.	Type of Well: Oil Well Gas Well X Other	Single Zone Multi	ple Zone	Red Hills North Unit 606H	l	
2.	Name of Operator			9. API Well No.		
	EOG Resources, Inc.	T		/ 	<u> </u>	
3a.	Address	3b. Phone No. (include area	code)	10. Field and Pool, or E	xploratory	
	P.O. Box 2267, Midland, TX 79702	(915)686-3714		Red Hills Bone Spring		
4.	Location of well (Heport location clearly and in accordan	nce with any State requiremen	ts.*)	11. Sec., T., R., M., or Bi	k. And Survey or Area	
	At surface 530' FS		Sec 6 T-25-S: R-34-E	(S/L)		
	At proposed prod. Zone 1400'FN	IL & 2150'FWL)		Sec 12 T-25-S; R-33-E	(BHL)	
14.	Distance in miles and direction from nearest town or pos	st office*		12. County or Parish	13. State	
	19 Miles west from Jal, NM		Lea	NM		
15.	Distance from proposed*	om proposed* 16. No. of Acres in lease 17. Spacir				
	location to nearest	Can Fuhihit F				
	(Also to pearest drig. Unit line, if any) 530			320		
18,	Distance from proposed location*	19. Proposed Depth TVD 12,700	20. BLM/BI/	IA Bond No. on file		
	applied for, on this lease, ft. 900	TMD 19,727		NM2308		
21.	Elevations (Show whether DF, KDB, RT, GL, etc)	22. Approximate date work wi	Il start*	23. Estimated duration		
	3433	4/1/2002		60 days		
		24. Attachments				
The	following completed in accordance with the requirements of O	nshore Oil an Gas Order No. 1,	shall be attach	ed to this form:		
1. W	/ell plat certified by a registered surveyor.	4. Bond to cover	the operations	unless covered by an exis	sting bond on file (see	
2. A	Drilling Plan.	Item 20 above	)			
3. A	Surface Use Plan (if the location is on National Forest Sytem	Lands, the 5. Operator certi	fication.			
SU	JPO shall be filed with the appropriate Forest Service Office)					
25.	Signature	Name (Printed/Typed)		Date		
	Make Chance	Mike Francis		2/26/2002		
Title Ag	gent					
Аррг	roved by (Signature)	Name (Printe 6. Such other site authorized offi	e specific infor	mation and/c Date	·····	
Title		Office	<u> </u>	—		
Applic operat Condi	ation approval does not warrant or certify the applicant holds legal or e tions theron. tions of approval, if any, are attached	quitable title to those rightes in the su	ibject lease whic	h would entitle the applicant to	conduct	
Title 1	8 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crir	ne for any person knowingly and willfing motion within the second s	ully to make to a	ny department or agency of the	e United	
States (Instr	any talse, fictutious or fraudulent statements or representations as to a uctions on reverse)	iny matter within its jurisidiction.				

DISTRICT I P. O. Box 1980

.

Hobbs, NM 88241-1980

• <u>DISTRICT II</u> P. O. Drawer DD

Artesia, NM 88211-0719

DISTRICT III 1000 Rio Brazos Rd. Aztec, NM 87410

DISTRICT IV P. O. Box 2088 Santa Fe, NM 87507-2088 State of New Mexico Energy, Minerals, and Natural Resources Department

**OIL CONSERVATION DIVISION** 

P. O. Box 2088 Santa Fe, New Mexico 87504-2088 Form C-102 Revised 02-10-94

Instructions on back

Submit to the Appropriate District Office State Lease — 4 copies Fee Lease — 3 copies

AMENDED REPORT

/-2088	WELL	LOCATION	AND	ACREAGE	DEDICATION	PLAT	

<sup>1</sup> APl Number	<sup>2</sup> Pool Code	3 Po	<sup>3</sup> Pool Name						
	51820		Red Hil						
<sup>4</sup> Property Code <sup>5</sup> Property	Name				i	• Well Numb	er		
	REI	HILLS	S NORTH L	JNIT		60	6 н		
OGRID No. • Operator	Name					* Elevation			
							3.		
	* SU	RFACE	LOCATION						
UL ar lot no. Section Township	Range	Lot. Ida	Feet from the	North/South	line Feet from	a the East/West line	County		
0 6 25 SOUTE	1 34 EAST, N.M.P.M.	T, N.M.P.M. 530' SOUTH 1650'					LEA		
"BOTT	OM HOLE LOCAT	ION IF	DIFFEREN	NT FROM	SURFACE				
UL ar lot no. Section Township	Range	Lot Ida	Feet from the	North/South	line Feet from	h the East/West line	County		
12 Deducted Armen 13 Joint on Infill	14 Consolidation Code	18 Order		L	<u> </u>		1		
			NO.						
	TTI DE ACCIONER T		COMDIENTON		INTEDECT				
CONSOLIDATE	DE ASSIGNED I	ARD UNI	T HAS REEN	APPROVE	) BY THE D	INISION			
19									
			1		OPERA	ATOR CERTIFIC	CATION		
	1		1		I hereby	certify that the in	formation		
	1		ł		to the be	i nerein is true and est of my knowledge	ond belief.		
					Signature	1			
	ι Ι		1		Me	he taxan			
	1		l l		Printed N	ame			
					Mike	Francis	rancis		
	1		1		Agent	-			
			l l		Date				
	}		1	5/02	2				
			ł			· · · · · · · · · · · · · · · · · · ·			
	1		1		SURVE	YOR CERTIFIC	ATION		
	1		1		I hereb	y certify that t	he well		
					location	shown on this p	olat was		
			1		plotted f	trom tiela notes d made by me o	r under		
	 		-   -		my sup	pervision, and ti	hat the		
	EOG RESO	URCES, INC.			same is	true and correct	t to the		
	RED HILLS NO	RTH UNIT <b>#60</b> 0 = 3433	5		2001	my Dener.			
	$\mathbf{X} = \mathbf{Y}$	756246			Date of St	urvey			
		32.15364			FE	BRUARY 22, 200	)2		
			J ¦		Signature	and Seal of hits	(SA)		
	7,7	7	— +		I II.		<u>}</u>		
	1		1		6	THE CONN &	214		
	]		l			Autoria	*		
	l I	\	- 7		1 At	China Mod	5 <b>1</b>		
<u></u>	73"38'47" W			0'	1 1 15	in 1	Ser.		
	1942'	ORE 57	,		Certificate	NG AL	<u> </u>		
1		• +	1		V. L. B	SINER' R.P.S.	#7920		

DISTRICT 1

• DISTRICT II P. O. Drawer DD

DISTRICT III

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

Artesia, NM 88211-0719

State of New Mexico Energy, Minerals, and Natural Resources Department

**OIL CONSERVATION DIVISION** 

Form C-102 Revised 02-10-94

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P. O. Box 2088 Santa Fe, New Mexico 87504-2088

AMENDED REPORT

1

1000 Rio Brozos Rd. Aztec, NM 87410 DISTRICT IV

<u>DISTRICT IV</u> P. O. Box 2088 Santa Fe, NM 87507-2088

<sup>DB8</sup> WELL LOCATION AND ACREAGE DEDICATION PLAT

'API Number         'Pool Code         'Pool Name           51820         Pool Hills Bone Spring												
* Property Code										• Well Number	h H	
'OGRID No.	<sup>e</sup> Operator N	ame	ED	G RES		CES. 1		<u>,</u>			• Elevation 3433	
1311			" SUI	RFACE		CATION	··· <u>·</u> ·			[		
UL or lot no. Section	Township	Rang		Lot Ida	Peet	from the	North/South	line	Feet from	the E	ast/West line	County
	"BOTT	OM HOLE	LOCAT	ION IF	DI	FFERE	NT FROM	SI	JRFACE			L
UL or lot no. Section	Township	Range	5	Lot Ida	Feet.	from the	North/South	line	Feet from t	ihe E	ast/Vest line	County
<sup>12</sup> Dedicated Acres <sup>13</sup> Join 320	at or Infill	<sup>14</sup> Consolidatio	n Code	<sup>18</sup> Order	No.		I		L			
NO ALLA CON	OWABLE WI	ELL BE ASSI	GNED TO	O THIS	COM T HA	PLETION S BEEN	UNTIL AL	L IN D By	TERESTS	HAVE	E BEEN	<u></u>
BORE"		SECTION 7							OPERAT / hereby c contained / to the best Bignature Printed Nam Mike Fr Title Agent Date 2/26 SURVEY / hereby location s plotted from surveys for my super same is to best of nor ARE	OR ertify berein of m, of m, anc anc / 02 OR cert hown fill hown fill hown fill of rvisic rvis rvisic rvisic rvisic rvisic rvisic rvis	CERTIFICA that the ind is true and y knowledge a y knowledge a CERTIFICA tify that the on this pu- by me or on, and the and correct tife 22/200	ATION formation complete nd belief.
						 	<u> </u>		Cartifice of V. L. BEZ	NER	AL OF TOT NIN NIN NIN NIN NIN NIN NIN NI	#7920

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

State of New Mexico Energy, Minerals, and Natural Resources Department Form C-102 Revised 02-10-94

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<u>DISTRICT III</u> 1000 Rio Brazos Rd. Aztec, NM 87410

Artesia, NM 88211-0719

P. O. Drawer DD

DISTRICT IV P. O. Box 2088 Santa Fe, NM 87507-2088

### OIL CONSERVATION DIVISION P. O. Box 2088 Santa Fe, New Mexico 87504-2088

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

' AFI Number			<sup>2</sup> Pool Code	Pool Code 3 Pool Name								
			5182	20		F	Red H	ills Bor	le	Spring		
* Property Co	de	<sup>5</sup> Property N	<b>A3316</b>	RED	HILLS	S ND	IRTH L	JNIT			• Vell Number 606	Н
<b>'OGRID No.</b> 7377		<sup>s</sup> Operator N	ame	ΕŪ	G RES	DUR	CES, 1	NC.			* Elevation 3433	) <sup>*</sup>
		J	······	* SU	RFACE	LOC	ATION	· · · · · · · · · · · · · · · · · · ·			1	
UL or lot no.	Section	Township	Township Range Lo				from the	North/South	line	Feet from the	East/West line	County
"BOTTOM HOLE LOC					ION IF	DIF	FERE	NT FROM	SU	JRFACE	I	
VL or lot no. F	Section 12	Township 25 SOUTH	Rang 33 EAST,	• N.M.P.M.	Lot. Ida	Feet 1	from the 400'	North/South NORTH	line	Feet from the 2150'	East/West line WEST	County LEA
<sup>12</sup> Dedicated A	cres <sup>13</sup> Jo	int or Infill	<sup>14</sup> Consolidati	on Code	<sup>15</sup> Order	No.		L <sub>=</sub> ,,		<u></u>		
	NO ALI	LOWABLE WE	LL BE ASS	IGNED TO	O THIS	COMP T HA	LETION S BEEN	UNTIL ALI	L IN D BY	TERESTS HA	VE BEEN	· ·
		EOG RESOL BOTTOM HOL RED HILLS NOR Y = 40 LAT: N 3 LONG: W 1	1400 1400 RCES, NC. E LOCATION TH UNIT #806 80800 215384 03.50535	SECTION	12			/1		OPERATOR / hereby certi- contained here to the best of Signature Printed Name Mike From Nike From 2/26/00 SURVEYOR / hereby ce location sho plate of Survey my supervis same is true best of my Date of Survey Front density and Protectional Survey Certuited from V. 2. BEZNE	R CERTIFICA	TION ormation complete nd belief. TION fe well a twos actual under ot the to the to the to the

### 1. GEOLOGIC NAME OF SURFACE FORMATION: Permian

### 2. ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:

Rustler	1100'
Delaware Mt. Group	5150'
Bone Spring Lime	9275'
3 <sup>rd</sup> Bone Spring Sand	12225'
TVD	12700'
TMD	19727'

### 3. ESTIMATED DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS:

Upper Permian Sands	100'	Fresh Water
3 <sup>rd</sup> Bone Spring Sand	12400'	Oil

### 4. CASING PROGRAM

•

<u>Hole Size</u>	<u>Interval</u>	<u>OD Casing</u>	Weight Grade Jt. Cond. Type
171/2"	0-650'	13 3/8"	48# H-40 ST&C
12 1/4"	0-5200"	9 5/8"	40# N-80 LT&C
8 3/4"	0-12700;	7"	26#/P110 LTC
6 1/8"	11,500-TD	4 1/2"	11.6#P-110 Hydrill

### Cementing Program:

17 <sup>1</sup> / <sub>2</sub> "" Surface Casing:	Cement to surface with 325 sx Prem Plus, 3% Econolite, 2%Calcium Chloride, 0.25#/sx Flocele, 150 sx Prem Plus, 2% Calcium Chloride
9 5/8" Intermediate:	Cement to surface with 1100sx Interfill C, .25#/sx flocele, 250 sx Premium Plus, 2% Calcium Chloride
7" 2 <sup>nd</sup> Intermediate	Cement w/800sx Premium, 3% Econolite, 5#/sx Salt (3%), +.25lb/sk Flocele; 250 sx Prem 50/50 Poz mix 'A', 2% Halliburton-Gel First, 0.5% Halad-322. +2%HR-5
4 <sup>1</sup> /2" Liner	520 sx Premium Plus +.3% Halad-344+.3%Super CBL+.3%SCR-100. This cement slurry is designed to bring TOC to 11500'.

### 5. MINIMUM SPECIFICATIONS FOR PRESSURE CONTROL: (SEE EXHIBIT #1)

The blowout preventer equipment (BOP) shown in Exhibit #1 will consist of a double ram-type (5000 psi WP) preventer and an annular preventer (5000-psi WP). Units will be hydraulically operated and the ram-type will be equipped with blind rams on top and drill pipe rams on bottom. All BOP's and accessory equipment will be tested in accordance with Onshore Oil & Gas order No. 2. EOG request authorization to use a 2M system, providing for an annular preventer to be used prior to drilling the surface casing shoe and prior to drilling out of first intermediate. Before drilling out of 1st intermediate casing, the ram-type BOP and accessory equipment will be tested to 5000/1000 psi and the annular to 3500/5000-psig pressure.

Pipe rams will be operationally checked each 24-hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.

### 6. TYPES AND CHARACTERISTICS OF THE PROPOSED MUD SYSTEM:

The well will be drilled to TD with a combination of brine, cut brine, and polymer/KCL mud system. The applicable depths and properties of this system are as follows:

		Wt Viscosit	y Water	loss
Depth	Type	<u>(PPG)</u>	(sec)	<u>(cc)</u>
0-650'	Fresh Water (Spud Mud)	8.5	40-45	N.C.
650''-5200'	Brine Water	10.0	30	N.C.
5200'- TD	Cut Brine + Polymer/KCL	. 8.8 - 9.2 32	32	10

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept at the wellsite at all times.

### 7. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT:

(A) A kelly cock will be kept in the drill string at all times.

- (B) A full opening drill pipe-stabbing valve (inside BOP) with proper drill pipe connections will be on the rig floor at all times.
- (C) A mud logging unit complete with H2S detector will be continuously monitoring drilling penetration rate and hydrocarbon shows from 5000' to TD.

### 8. LOGGING, TESTING AND CORING PROGRAM:

Electric logging will consist of GR-Compensated Density-Neutron from12,300' to surface. LWD GR from 12,300' to 13,800'

## 9. ABNORMAL CONDITIONS, PRESSURES, TEMPERATURES AND POTENTIAL HAZARDS:

The estimated bottom hole temperature (BHT) at TD is 175 degrees F with an estimated maximum bottom-hole pressure (BHP) at TD of 5000 psig. No hydrogen sulfide or other hazardous gases or fluids have been encountered, reported or are known to exist at this depth in this area. No major loss circulation zones have been reported in offsetting wells.

### **10. ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS:**

The drilling operation should be finished in approximately one month. If the well is productive, an additional 30-60 days will be required for completion and testing before a decision is made to install permanent facilities.

### SURFACE USE AND OPERATIONS PLAN

### **1. EXISTING ROADS:**

Access to location will be made as shown on Exhibit #2

Routine grading and maintenance of existing roads will be conducted as necessary to maintain their condition as long as any operations continue on this lease.

### 2. PROPOSED ACCESS ROAD:

No new road is required

No turnouts necessary.

No culverts, cattleguards, gates, low-water crossings are necessary.

Surfacing material consists of native caliche to be obtained from the nearest BLM-approved caliche pit. Any additional materials required will be purchased from the dirt contractor.

### **3. LOCATION OF EXISTING WELLS:**

Exhibit #3 shows all existing wells within a one-mile radius of this well.

### 4. LOCATION OF EXISTING AND/OR PROPOSED FACILITIES:

There are no existing production facilities. If production is encountered, a temporary facility will be established on the drill pad, and if warranted, a production facility would be built at a later date in the immediate area of the drill pad location. If the well is productive, the flowline would also be located on the drill-pad site and no additional disturbance will occur.

### 5. LOCATION AND TYPE OF WATER SUPPLY:

Fresh water and brine water for drilling will come from commercial sources and transported to the well site over the roads as shown on Exhibit #2.

### 6. PLANS FOR RESTORATION OF THE SURFACE:

After completion of drilling and/or completion operations, all equipment and other material not needed for operations will be removed. Location will be cleaned of all trash and junk to leave the well in an aesthetically pleasing condition as possible.

Any unguarded pits containing fluid will be fenced until they are dry and back filled.

After abandonment of the well, surface restoration will be in accordance with current federal laws and regulations. Location will be cleaned, and the wellpad removed to promote vegetation and disposal of human waste will be complied with. Trash, waste paper, garbage and junk will be hauled to an approved disposal site in an enclosed trash trailer.

All trash and debris will be removed from the well site within 30 days after finishing drilling and/or completion operations.

### **ANCILLARY FACILITIES:**

No airstrip, campsite, or other facilities will be built.

### WELL SITE LAYOUT:

Exhibit #4 shows the relative location and dimensions of the well pad.

### **OTHER INFORMATION:**

The area around the well site is grassland and the topsoil is duned and sandy. The vegetation is native scrub grasses with abundant oakbrush, sagebrush, yucca, and prickly pear.

### **CERTIFICATION:**

I HEREBY CERTIFY that I, or persons under my direct supervision, have inspected the proposed drill site and access route; that I am familiar with the conditions which presently exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed by EOG Resources, Inc. and its contractors and sub-contractors in conformity with this plan and the terms and conditions under which it is approved.

y me 8 zenasy Drilling Superintendant

Date: 2/26/02

### **ATTACHMENT TO EXHIBIT #1**

- 1. Wear ring to be properly installed in head.
- 2. Blow out preventer and all fittings must be in good condition, 5000 psi W.P. minimum. Exhibit #1.
- 3. All fittings to be flanged
- 4. Safety valve must be available on rig floor at all times with proper connections, valve to be full bore 5000 psi W.P. minimum.
- 5. All choke and fill lines to be securely anchored especially ends of choke lines.
- 6. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.
- 7. Kelly cock on kelly.
- 8. Extension wrenches and hand wheels to be properly installed.
- 9. Blow out preventer control to be located as close to driller's position as feasible.
- 10. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation, and meet all API specifications.

EOG Resources, Inc.

### Red Hills North Unit 606H



Exhibit 1

VICINITY MAP



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Exhibit 4

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### LOCATION & ELEVATION VERIFICATION MAP

![](_page_44_Figure_1.jpeg)

### **Statement Accepting Responsibility For Operations**

Operator Name: EOG Resources, Inc. Street or Box: P.O. Box 2267 City, State: Midland, TX Zip Code: 79702

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The undersigned accepts all applicable terms, conditions, stipulations, and restrictions concerning operations conducted on the leased land or portion thereof, as described below:

Lease No.: NMNM 30400

Legal Description of Land: Section 6, T25S, R34E, NMPM Lea Co., NM (S/2 SE/4)

Formation(s) (if applicable):

Bond Coverage: (State if individually bonded or another's bond) Individually

BLM Bond File No.: NM2308 with endorsement to State of NM

Authorized Signature: Mike Francis

Title: Agent

Date 2/26/02