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March 12, 1991

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OIL CONSERVATION DIVISION

6580

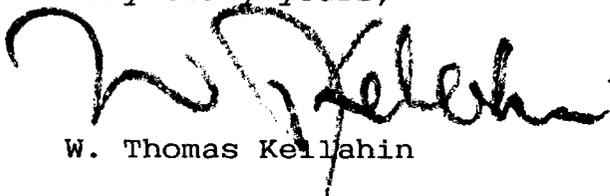
Mr. William J. LeMay
Oil Conservation Division
Post Office Box 2088
Santa Fe, New Mexico 87504

Re: Application of Conoco Inc. for
Amendment of Division Order R-6157,
Maljamar Carbon Dioxide Injection
Project, Lea County, New Mexico

Dear Mr. LeMay:

On behalf of Conoco, Inc., please find enclosed our application to Reopen Case No. 6580 and clarify Order R-6157 concerning its previously approved Carbon Dioxide Injection Pilot Project, Grayburg-San Andres formation, Maljamar Pool which we request be set for hearing on the Examiner's docket now scheduled for April 18, 1991.

Very truly yours,



W. Thomas Kellahin

WTK/tic
Enclosure

cc: Judith Finkle, Esq.
Conoco Inc.
Post Office Box 2197
Houston, Texas 77252

Mr. William J. LeMay
March 12, 1991
Page 2

cc: Jerry Hoover
Conoco Inc.
10 Desta Drive West
Midland, Texas 79705

142/appt304.110

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES
OIL CONSERVATION DIVISION

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OIL CONSERVATION DIVISION

APPLICATION OF CONOCO INC. FOR
AMENDMENT OF DIVISION ORDER NO.
R-6157, MALJAMAR CARBON DIOXIDE
INJECTION PROJECT, LEA COUNTY,
NEW MEXICO

CASE NO. 6580
(REOPENED)

A P P L I C A T I O N

COMES NOW CONOCO, INC., by and through its attorneys, KELLAHIN, KELLAHIN & AUBREY, and requests that the New Mexico Oil Conservation Division reopen Division Case No. 6580 concerning its previously approved Carbon Dioxide Injection Pilot Project in the Grayburg-San Andres formation, Maljamar Pool, and to amend Order R-6157 to authorize, retroactively, the injection of recycled produced hydrocarbon gases, CO₂ and water in order to continue the effective and efficient operation of the MCA Unit Co₂ Injection Project and the economic recovery of oil production from the reservoir.

In support thereof the applicant states:

(1) Prior to unitization of the MCA unit, as shown in Exhibit "A," for enhanced recovery, pressure

maintenance through cooperative gas injection by the various operators in the area was established by approval of the Maljamar Cooperative Repressuring Agreement on November 11, 1942 (Order 485). In the ensuing 20 years the original cooperative area was expanded to gas injection and eventually pilot waterflooding was performed.

(2) On December 1, 1959, the New Mexico Oil Conservation Commission entered Order R-2403 consolidating prior Division orders for this cooperative project and changing its name to the Maljamar Cooperative Agreement (MCA). On September 24, 1962, the MCA project area was unitized for waterflooding with Conoco named as operator and Order R-2403 (December 31, 1962) adopted a Plan of Operations for the waterflood project.

(3) On October 30, 1979, the New Mexico Oil Conservation Division entered Order R-6157 (attached as Exhibit "B") which approved a portion of the Maljamar Cooperative Agreement area for the installation of a pilot carbon dioxide injection project for tertiary recovery purposes.

(4) By Administrative Order PMX-153 entered January 13, 1989, the Division approved the expansion

of the Carbon Dioxide Injection Pilot Project into 3920 acres of the 8040 acre MCA Unit.

(5) The Conoco Plan of Operations for the CO₂ project was approved by the BLM on November 2, 1987, by the Commissioner of Public Lands on November 6, 1987 and by the NMOCD-Hobbs Supervisor on November 20, 1987.

(6) The approved plan of operations called for the reinjection of produced hydrocarbon gas along with recycled CO₂.

(7) Conoco's CO₂ injection into the Grayburg-San Andres formation commenced in May, 1983, in the initial pilot project. Stages 1 and 2 of full scale CO₂ injection operations were subsequently commenced on January 26, 1989 and January 27, 1990, respectively.

(8) Gradually, following the initiation of full scale CO₂ injection in Stages 1 and 2 (see Exhibit "A"), production wells in these areas began to produce various levels of carbon dioxide in conjunction with other hydrocarbon gasses.

(9) The Maljamar gas plant, which processed all MCA casinghead gas was unable to handle MCA produced gas when the processed volume of CO₂ reached levels in excess of 200 MSCFD and Conoco was unable to market

such gas. Plant design would not allow removal of CO₂ volumes at a rate greater than 200 MSCFD.

(10) At this point, Conoco began its produced gas recycling operations on March 7, 1990. The produced gas stream from the CO₂ responding areas was dehydrated, compressed, and reinjected into the reservoir. This recycled produced gas stream now contains 60% CO₂.

(11) This method of operation has proved to be economic and has not resulted in waste.

(12) As of March 1, 1991, approximately .6 BSCF of hydrocarbon and carbon dioxide gas has been reinjected into the subject reservoir.

(13) Conoco is currently evaluating the economic viability of constructing a recovery plant whereby the associated natural gas liquids contained within the produced gas stream may be recovered and marketed.

(14) Reinjection of the hydrocarbon/carbon dioxide gas stream will not reduce the effectiveness of the project and will not reduce ultimate oil recovery from the subject reservoir.

(15) The applicant's current method of disposition of the hydrocarbon/carbon dioxide gas is in the best

interest of conservation, protection of correlative rights, and prevention of waste.

(16) The application should be approved by amending Division Order R-6157.

(17) Accordingly, Conoco now seeks to reopen Case No. 6580 and to clarify Order R-6157 to provide for retroactive reinjection of proposed hydrocarbon gasses carbon dioxide, and water for the MCA Unit CO₂ Injection Project.

WHEREFORE, applicant, after notice and hearing, requests that this application be granted.

Respectfully submitted,

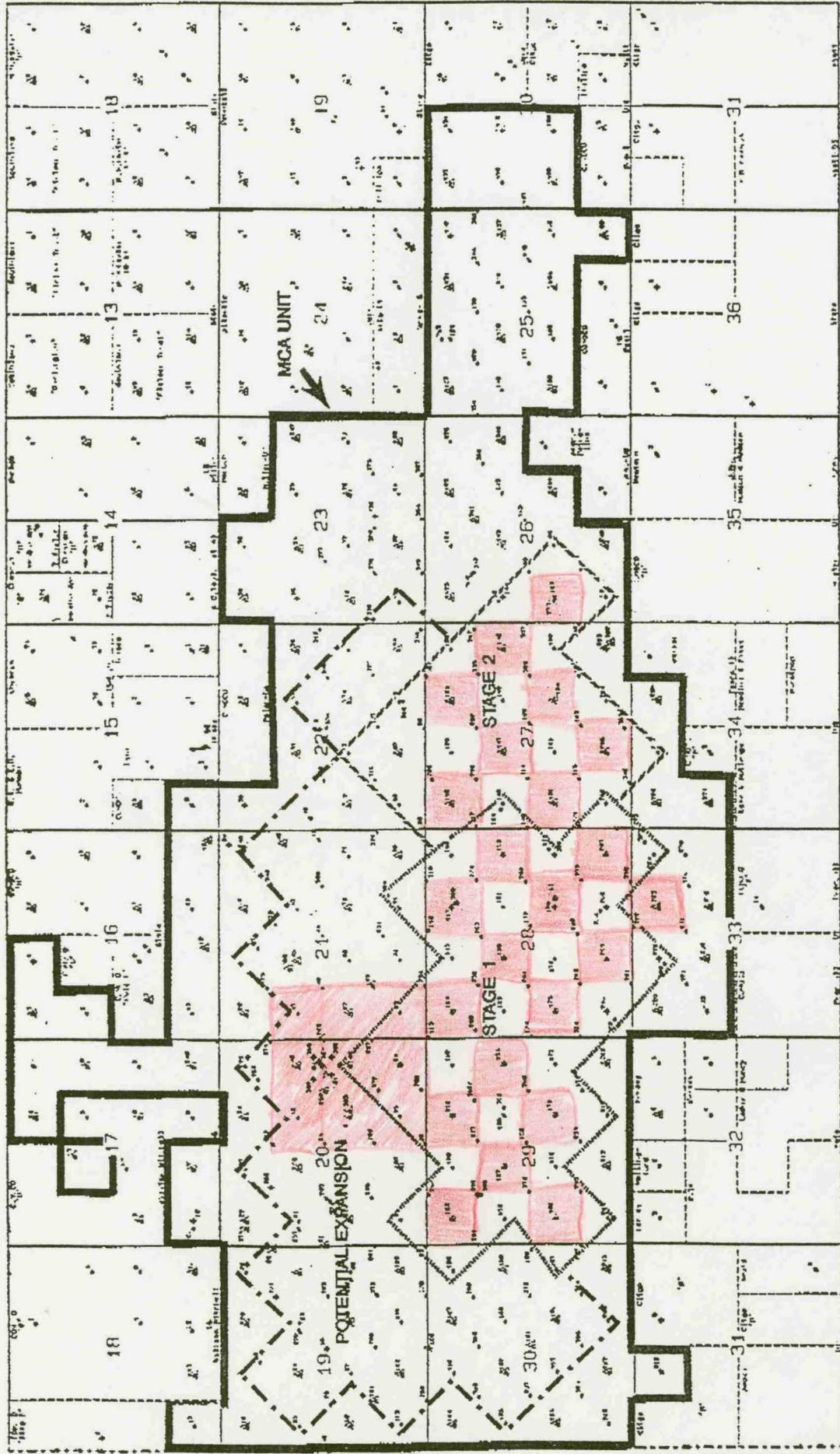
KELLAHIN, KELLAHIN & AUBREY

By: 

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Post Office Box 2265
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R-33-E

R-32-E



CONOCO

MCA UNIT
MALJAMAR FIELD
LEA COUNTY, NIM

EXHIBIT A

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

CASE NO. 6580
Order No. R-6157

APPLICATION OF CONTINENTAL OIL
COMPANY FOR A CARBON DIOXIDE
INJECTION PROJECT, LEA COUNTY,
NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on September 19, 1979, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 20th day of October, 1979, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

- (1) That due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.
- (2) That the applicant, Continental Oil Company, seeks authority to initiate a pilot carbon dioxide injection project in the Grayburg-San Andres formation in Units H and I of Section 20, Township 17 South, Range 32 East, NMPM, Maljamar Pool, Lea County, New Mexico, for tertiary recovery purposes.
- (3) That said pilot project is in an area wherein primary recovery and secondary recovery operations have been conducted.
- (4) That the proposed pilot project is of an experimental nature to evaluate the effectiveness of carbon dioxide injection into the subject reservoir, and as such, will require the drilling of a number of wells at close proximity to each other for purposes of injection and production, and to provide a study of zone isolation, vertical heterogeneity, reservoir directional variation, and the carbon dioxide displacement process.

(5) That in the event the pilot project is successful and indicates the desirability and economic feasibility of the process, the pilot project would be expanded to include additional lands and wells, and would result in the production of otherwise unrecoverable oil, thereby preventing waste.

(6) That the pilot project is to be conducted well within the boundaries of the Maljamar Cooperative Area, a unitized area, and will therefore not impair correlative rights.

(7) That the proposed pilot project should be approved, as well as certain non-standard locations and provisions for additional injection, production, and observation wells at orthodox and unorthodox locations, and expansion of the pilot.

IT IS THEREFORE ORDERED:

(1) That the applicant, Continental Oil Company, is hereby authorized to initiate and conduct a pilot carbon dioxide/water injection project in the Maljamar Cooperative Area Unit, Maljamar Grayburg-San Andres Pool, Lea County, New Mexico.

(2) That the applicant is hereby authorized to continue to inject water in its MCA Unit Well No. 48, located 1980 feet from the North line and 660 feet from the East line of Section 20, Township 17 South, Range 32 East, NMPM, and to convert to water injection its MCA Unit Well No. 256, located 2590 feet from the South line and 1310 feet from the East line of said Section 20, Well No. 66, located 1980 feet from the South line and 660 feet from the East line of said Section 20, and Well No. 262 located 2615 feet from the North line and 25 feet from the West line of Section 21, Township 17 South, Range 32 East, NMPM.

(3) That the applicant is hereby authorized to drill its MCA Unit Well No. 358 at a point 2600 feet from the North line and 660 feet from the East line of the aforesaid Section 20, and to place said well on temporary production.

(4) That the applicant is hereby authorized to drill four production wells, to be known as the P-1, P-2, P-3, and P-4, said wells to be located approximately 330 feet Northeast, 330 feet Northwest, 330 feet Southwest, and 330 feet Southeast, respectively, of the above described MCA Unit Well No. 358, and to drill two logging, testing, and observation wells, to be known as the L-1 and L-2, said wells to be located approximately midway between the aforesaid MCA Unit Well No. 358 and P-1, and 358 and P-4, respectively.

(5) That upon completion of testing and evaluation of the wells and the reservoir in the pilot area, applicant is authorized to convert the aforesaid MCA Unit Well No. 358 to selective water/carbon dioxide injection into the Grayburg Sixth Zone and the San Andres Ninth Massive Zone.

(6) That the above-described P-1, P-2, P-3, and P-4 producing wells shall be equipped with surface casing set at approximately 700 feet with cement circulated to the surface, and with a long string set at approximately 4150 feet with cement circulated to the surface by means of a DV tool; that said wells shall be dually completed in the Grayburg Sixth Zone and the San Andres Ninth Massive Zone with parallel strings of tubing and separation of the zones by means of a packer.

(7) That the above-described MCA Unit Well No. 358 shall be cased and cemented in like manner to the aforesaid P-1, P-2, P-3, and P-4 wells, and for injection purposes, shall be dually completed equipped with parallel strings of plastic-lined tubing for water/carbon dioxide injection into the Grayburg Sixth Zone and the San Andres Ninth Massive Zone with separation of the zones achieved by means of a packer; further that another packer shall be installed above the uppermost Grayburg perforations and the casing-tubing annulus loaded with an inert fluid; that a pressure gauge shall be attached to the annulus or the annulus shall be equipped with an approved leak detection device to facilitate detection of leakage in the casing, tubing, or packer.

(8) That the injection wells or injection system shall be equipped with a pressure regulator or other acceptable device which will limit the wellhead pressure on the injection wells to no more than 2150 psi.

(9) That the operator shall notify the Supervisor of the Hobbs district office of the Division when the injection system installation has been completed so that an inspection of the same may be made prior to its operation.

(10) That the operator shall immediately notify the Supervisor of the Hobbs district office of the Division of the failure of the tubing, casing, packer, or cement in any well in the project area, or of the leakage of water or oil from or around any of said wells, and shall take such timely steps as may be necessary to correct such failure or leakage.

(11) That the operator shall have the flexibility to drill its production, injection, and observation wells at locations other than those described above, dependent upon analysis of reservoir and fluid characteristics, provided however, that it

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Case No. 6580
Order No. R-6157

shall notify the Santa Fe office of the Division of any such location change and provided further that none of the authorized injection/production/observation wells shall be located outside the project area as defined below.

(12) That the subject project shall be known as the Conoco Maljamar CO₂ Injection Project, and the project area shall comprise the following described lands:

TOWNSHIP 17 SOUTH, RANGE 32 EAST, NMPM
Section 20: S/2 NE/4 and SE/4
Section 21: SW/4 NW/4 and W/2 SW/4

(13) That said project area may be expanded and additional wells drilled and placed on production and/or water/carbon dioxide injection at orthodox and unorthodox locations upon filing written request therefor with the Division Director, with copies of such request being furnished to the operator of any directly or diagonally offsetting 40-acre proration unit not committed to and participating in the MCA Unit. The Division Director may approve the request if, after a period of 20 days, no such offset operator has objected thereto.

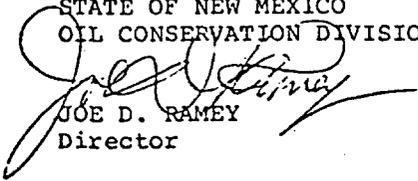
(14) That the Conoco Maljamar CO₂ Injection Project shall be governed by this order and the rules contained herein and by the provisions of Rules 701, 702, and 703 of the Division Rules which are not in conflict herewith.

(15) That monthly project reports of the project herein authorized shall be submitted to the Division in accordance with Rule 704 of the Division Rules, provided however, that a separate supplemental report on Form C-115 shall also be filed each month reporting volumes of water and carbon dioxide injected.

(16) That jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year herein-above designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION


JOE D. RAMEY
Director

S E A L
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