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

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

CASE NO. 10342
ORDER NO. R-9555

APPLICATION OF MARATHON OIL COMPANY FOR A PRESSURE MAINTENANCE PROJECT, EDDY COUNTY, NEW MEXICO

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on June 27, 1991, at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 31st day of July, 1991 the Division Director, having considered the testimony, the record and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

(1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) At the time of the hearing, this case was consolidated with Division Case No. 10341 for the purpose of testimony.

(3) The applicant, Marathon Oil Company, seeks authority to institute a pressure maintenance project in its proposed Tamano (BSSC) Unit Area, which was the subject of Case No. 10341, comprising the S/2 NE/4 and SE/4 of Section 10 and all of Section 11, Township 18 South, Range 31 East, NMPM, by the injection of water into the Tamano-Bone Spring Pool through the following five wells to be converted from producing oil wells to injection wells:

Well Name and Number	Footage Location	Unit Letter	Section	Perforated Injection Interval (feet)
Stetco "10" Federal Well No. 3	1980' FSL - 1650' FEL	J	10	8030' - 8090'
Johnson "B" Federal A/C-1 Well No. 10	990' FNL - 450' FWL	D	11	8017' - 8080'
Marathon-Shugart "B" Well No. 1	470' FSL - 660' FWL	M	11	8072' - 8228'
Harvey E. Yates Company Hudson "11" Federal Well No. 4	2310' FN & EL	G	11	8057' - 8148'
Harvey E. Yates Company A.J. "11" Federal Well No. 1	560' FSL - 990' FEL	P	11	8005' - 8197'

(4) Geologic testimony indicates that the Bone Spring formation in this general area is a basin and slope deposit consisting of shelf derived turbidite sandstone, slump and debris flow carbonates and basinal shales. The reservoir for the proposed pressure maintenance project is the Second Carbonate of the Bone Spring formation which is a vuggy, naturally fractured dolomitized toe-of-slope carbonate debris flow deposit confined by dense dolomites having no matrix or secondary porosity dipping to the south-southeast.

(5) Further geologic and engineering evidence indicates that hydrocarbon trapping in this reservoir is stratigraphic in nature averaging 135 feet in thickness with log porosity ranging from 3 percent to 6 percent. Production performance in the Tamano-Bone Spring Pool is indicative of a solution gas drive reservoir. There is existence in this reservoir of bottom water; however, pressure history indicates that the aquifer is not lending pressure support to the reservoir.

(6) The secondary recovery operations proposed by the applicant should result in the additional recovery of approximately 2.261 million barrels of oil, which represents a 50 percent increase over the estimated recovery of primary reserves within the same area, thereby preventing waste.

(7) Current production levels from the nineteen producing wells within the proposed unitized area are not in an advanced state of depletion and cannot be classified as "stripper wells".

(8) Pursuant to General Rule 701E, the proposed project should be classified as a pressure maintenance project and governed accordingly.

(9) By Division Order No. R-9354 issued in Case No. 10115, dated November 7, 1990, a special depth bracket allowable of 460 barrels of oil per day was established for the Tamano-Bone Spring Pool.

(10) The project allowable should be equal to top unit allowable for the Tamano-Bone Spring Pool (authorized by said Order No. R-9354) times the number of developed (production or injection) proration units within the subject project area.

(11) Further, the transfer of allowables between wells within the project should be permitted.

(12) The applicant submitted data on the proposed injection wells, water wells in the area, and all other wells (including plugged wells) which penetrate the zone of interest within 1/2 mile of each of the proposed injection wells. This data shows that wells in the area are cased and plugged so as to protect fresh water and prevent fluid migration from the injection zone, and includes testimony indicating no evidence of open faults or any other hydrologic connection between the injection zone and the fresh water resources in the area.

(13) The operator should take all steps to ensure that the injected water enters only the proposed injection interval and is not permitted to escape into other formations or onto the surface from injection, production or plugged and abandoned wells.

(14) It is the applicant's intention to confine the injected fluids from the five proposed wells to the Second Carbonate of the Bone Spring formation; however, the applicant seeks a surface limitation pressure in excess of the Division's guidelines of 0.2 psi per foot of depth, but not in excess of 2300 psi surface pressure.

(15) Actual step-rate tests on the Johnson "B" Federal Well No. 10 and Shugart "B" Well No. 1 (both proposed injection wells) indicate that the Second Carbonate of the Bone-Spring formation fractures between 1928 pounds and 2147 pounds.

(16) The increase in surface injection pressure as requested by the applicant will afford it an opportunity to inject water at a faster rate without damage to the reservoir thus substantially reducing the time it will take to achieve fill up.

(17) The applicant presented results of "Frachite Logs", post fracture fluid survey data and fluid injectivity profiles to determine the fracture gradient of the Second Carbonate interval within the Unit Area. Said evidence indicates that a surface pressure of 3000 pounds would be required to propagate a fracture above of below the Bone Spring Second Carbonate or to frac-out-of-zone.

(18) The acceleration of response time for the pressure maintenance project which can be attained with the approval of an increased surface injection pressure limitation will not cause harm to the proposed injection zone.

(19) Injection into each well should be accomplished through plastic-lined tubing installed in a packer set at approximately 100 feet above the uppermost perforation; the casing-tubing annulus in each well should be filled with an inert fluid; and a pressure gauge or approved leak-detection device should be attached to the annulus in order to determine leaks in the casing, tubing or packer.

(20) The injection wells or pressurization system for each well should be so equipped as to limit injection pressure at the wellhead to no more then 2300 psi. Any additional increase in pressure on any of said wells should be permitted only after notice and hearing. Further, should it become necessary, the supervisor of the Artesia District Office of the Division or the Director may order a decrease of the injection pressure on any of the above injection wells.

(21) Prior to commencing injection operations, the casing in each of the subject wells should be pressure tested throughout the interval, from the surface down to the proposed packer-setting depth, to assure integrity of such casing.

(22) The operator should give advance notice to the supervisor of the Artesia District Office of the Division of the date and time of the installation of injection equipment and of the mechanical integrity pressure-test in order that the same may be witnessed.

(23) Approval of the subject application is in the best interest of conservation and will not violate correlative rights, further the project should be governed by the provisions of Rules 701 through 708 of the Division Rules and Regulations.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, Marathon Oil Company, is hereby authorized to institute a pressure maintenance project on its proposed Tamano (BSSC) Unit Area (Division Case No. 10341), by the injection of water into the Second Carbonate of the Bone Spring formation through the following five wells, which will be converted from producing oil wells to injection wells, all located in Township 18 South, Range 31 East, NMPM, Tamano-Bone Spring Pool, Eddy County, New Mexico:

Well Name and Number	Footage Location	Unit Letter	Section	Perforated Injection Interval (feet)
Stetco "10" Federal Well No. 3	1980' FSL - 1650' FEL	J	10	8030' - 8090'
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Harvey E. Yates Company A.J. "11" Federal Well No. 1	560' FSL - 990' FEL	P	11	8005' - 8197'

(2) The pressure maintenance project, hereby designated the Tamano (BSSC) Unit Pressure Maintenance Project, shall be comprised of the following described area in Eddy County, New Mexico:

TOWNSHIP 18 SOUTH, RANGE 31 EAST, NMPM
Section 10: S/2 NE/4 and SE/4
Section 11: All

(3) The allowable for the project area shall be any amount up to and including a volume equal to the top unit allowable for the Tamano-Bone Spring Pool, as prescribed by Division Order No. R-9354, times the number of proration units (producing or injection) within the project area.

FURTHER: The allowable assigned to the project area may be produced from any well or wells within the project area in any proportion.

(4) Injection into each well shall be accomplished through plastic-lined tubing installed in a packer set at approximately 100 feet above the uppermost perforation.

(5) The casing-tubing annulus in each injection well shall be filled with an inert fluid; and a pressure gauge shall be attached to the annulus or the annulus shall be equipped with an approved leak-detection device in order to determine leakage in the casing, tubing or packer.

(6) Prior to commencing injection operations, the casing in each of the subject wells shall be pressure tested to assure the integrity of such casing in a manner that is satisfactory to the supervisor of the Division's Artesia District Office.

(7) Each injection well or pressurization system for each well shall be equipped with a pressure-limiting switch or other acceptable device which will limit the wellhead pressure on the injection well to no more than 2300 psi.

(8) Any increase in the injection pressure on any of the said wells shall be permitted only after notice and hearing.

(9) The operator shall notify the supervisor of the Artesia District Office of the Division in advance of the date and time of the installation of injection equipment and of the mechanical integrity pressure-test in order that the same may be witnessed.

(10) The operator shall immediately notify the supervisor of the Division's Artesia District Office of the failure of the tubing, casing or packer, in either of said injection wells or the leakage of water or oil from any plugged and abandoned well within the project area and shall take such timely steps as may be necessary or required to correct such failure or leakage.

(11) Should it become necessary, the supervisor of the Artesia District Office of the Division or the Director may at any time order a decrease of the injection pressure on any of the subject injection wells.

(12) Said pressure maintenance project shall be governed by the applicable provisions of Rules 701 through 708 of the Division Rules and Regulations.

(13) Monthly progress reports shall be submitted to the Division in accordance with Rules 706 and 1115.

(14) 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 hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY
Director

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