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NATURAL RESOURCES-OIL AND GAS LAW

JASON KELLAHIN (RETIRED 1991)

July 28, 1995

HAND DELIVERED

Mr. Michael E. Stogner
Hearing Examiner
Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 87505

Re: PROPOSED AVALON UNIT STATUTORY UNITIZATION
NMOCD Case 11297
Application of Exxon Corporation for
a Waterflood Project and EOR Qualification
Eddy County, New Mexico

NMOCD Case 11298
Application of Exxon Corporation for
Statutory Unitization
Eddy County, New Mexico

Dear Mr. Stogner:

On behalf of Premier Oil & Gas, Inc., please find enclosed our proposed order for your consideration in this matter which was presented to you at the hearing held on June 29, 1995.

Very truly yours,


W. Thomas Kellahin

cc: James Bruce, Esq.
Attorney for Exxon Corporation
cc: William F. Carr, Esq.
Attorney for Yates Petroleum Corporation
cc: Premier Oil & Gas, Inc.
Attn: Kenneth Jones

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

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

**APPLICATION OF EXXON CORPORATION CASE NO. 11297
FOR A WATERFLOOD PROJECT AND EOR
QUALIFICATION, EDDY COUNTY, NEW MEXICO**

**APPLICATION OF EXXON CORPORATION CASE NO. 11298
FOR STATUTORY UNITIZATION,
EDDY COUNTY, NEW MEXICO**

**PREMIER OIL & GAS, INC.'S PROPOSED
ORDER OF THE DIVISION**

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on June 29, 1995, at Hobbs, New Mexico, before Examiner Michael E. Stogner.

NOW, on this ____ day of July, 1995, 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) Division Case Nos. 11297 and 11298 were consolidated at the time of the hearing for the purpose of testimony.

(3) The applicant, Exxon Corporation ("Exxon"), seeks the statutory unitization, pursuant to the "Statutory Unitization Act", Sections 70-7-1 through 70-7-21, N.M.S.A. (1978), of 2,140.14 acres, more or less, being a portion of the Delaware Mountain Group of the Avalon-Delaware Pool, Eddy County, New Mexico, said portion to be known as the Avalon Delaware Unit; the applicant further seeks approval of the Unit Agreement and the Unit Operating Agreement which were submitted in evidence as applicant's Exhibit Nos. 2 and 3 in this case.

(4) Exxon proposes that the horizontal limits of said unit area would be comprised of the following described Federal, State and Fee lands in Eddy County, New Mexico:

| | |
|------------|---|
| Tract 1: | SW/4 Sec 29, T20S, R28E |
| Tract 2: | Sec 31, T20S, R28E |
| | Lot 4(NW/4NW/4) Sec 4 T21S, R27E |
| | Lots 1&2 (N/2NE/4) Sec 5 T21S, R27E |
| Tract 3-A: | Lot 1 (NW/4NW/4) Sec 30, T20S, R28E |
| Tract 3-B: | Lot 2 (SW/4NW/4) Sec 30, T20S, R28E |
| Tract 3-C: | NE/4NW/4 Sec 30, T20S, R28E |
| Tract 3-D: | SE/4NW/4 Sec 30, T20S, R28E |
| Tract 3-E: | SW/4NE/4 Sec 30, T20S, R28E |
| Tract 4-A: | NW/4SE/4 Sec 30, T20S, R28E |
| Tract 4-B: | NE/4SE/4 Sec 30, T20S, R28E |
| Tract 5-A: | Lot 3 (NW/4SW/4) Sec 30, T20S, R28E |
| Tract 5-B: | Lot 4 (SW/4SW/4) Sec 30, T20S, R28E |
| Tract 5-C: | NE/4SW/4 Sec 30, T20S, R28E |
| Tract 5-D: | SE/4SW/4 Sec 30, T20S, R28E |
| Tract 5-E: | SW/4SE/4 Sec 30, T20S, R28E |
| Tract 5-F: | SE/4SE/4 Sec 30, T20S, R28E |
| Tract 6: | E/2E/2 Sec 25, T20S, R27E |
| Tract 7: | E/2NE/4 Sec 36, T20S, R27E |
| Tract 8: | E/2SE/4 Sec 36, T20S, R27E |
| Tract 9: | Lots 1 & 2 (N/2NE/4) Sec 6, T21S, R27E |
| Tract 10: | W/2W/2, NE/4NW/4, SE/4SW/4 Sec 32, T20S, R28E |
| Tract 11: | SE/4NW/4 & NE/4SW/4 Sec 32, T20S, R28E |
| Tract 12: | E/2SE/4, SW/4NW/4 Sec 32, T20S, R28E |

(5) Exxon proposes that the vertical limits of said unit area would comprise that interval which includes the "Upper Cherry Canyon Reservoir" ("UCC") and the "Lower Cherry Canyon/Upper Brushy Canyon Reservoir" ("LCC-UBC") and extends from an upper limit between 100 feet above the base of the Goat Seep Reef to the top of the Bone Springs formation to a lower limit of the base of the Brushy Canyon formation which are defined at all points under the unit area correlative to a depth of 2,378 feet and 4,880 feet, respectively, as identified on the Compensated Neutron/Litho density/Gamma Ray Log dated September 14, 1990 for the Exxon Yates "C" Federal Well No. 36, located in Unit A of Section 31, T20S, R28E, NMPM, Eddy County, New Mexico.

(6) Exxon, with approximately 61 percent of the unit acreage and Yates Petroleum Corporation ("Yates") with approximately 13-1/2 percent of the unit acreage appeared and presented evidence in support of approval of the unit.

(7) Premier Oil & Gas Inc. ("Premier"), the operator of Tract 6 with 7.6 percent of the unit acreage and 4.16% of the total remaining reserves (by Exxon's calculation--See Exxon Exhibit 10 (G-19) **but credited by Exxon with only 1.0192% of unit production** appeared and presented evidence in opposition to including Tract 6 with the unit.

EXXON PROPOSAL

(8) Exxon proposes to:

(a) institute a Secondary Recovery Project for recovery of oil by waterflooding an interior portion of the unit which will be surrounded by an outer ring of 40-acre tract which will not contain producing wells nor contain or be offset by injection wells. (See Exxon Exhibit 39); and

(b) possibly at an undetermined time in the future to convert the Secondary Recovery Project to a Tertiary Recovery Project by expanding the original waterflood project area by drilling additional injection wells and producing wells and commencing the injection of carbon dioxide ("CO2") at which point the outer ring tracts will contain producing and adjacent injection wells.

(9) Exxon contends that, based upon its Technical Report (Exxon Exhibit 10 G-14), the reserves for the Tracts in the Unit should be allocated as follows (reserve data units is in thousands of barrels of oil):

| TRACT | OPERATOR | REMAINING PRIMARY RESERVES* | SECONDARY WATERFLOOD RESERVES* | TERTIARY CO2 RESERVES* |
|-------|-----------|-----------------------------------|--------------------------------------|------------------------------|
| 1 | YATES | 0.00 | 0.00 | 203.90 |
| 2 | EXXON | 741.80 | 4,368.20 | 18,995.00 |
| 3-A | YATES | 0.00 | 345.10 | 530.60 |
| 3-B | YATES | 43.40 | 403.60 | 1,693.00 |
| 3-C | YATES | 0.00 | 0.80 | 446.70 |
| 3-D | YATES | 33.40 | 373.30 | 1,045.90 |
| 3-E | YATES | 0.00 | 0.00 | 362.50 |
| 4-A | YATES | 0.00 | 0.00 | 852.50 |
| 4-B | YATES | 0.00 | 0.00 | 247.40 |
| 5-A | YATES | 53.40 | 368.10 | 1,425.90 |
| 5-B | YATES | 19.30 | 174.50 | 1,189.70 |
| 5-C | YATES | 33.80 | 741.50 | 2,177.20 |
| 5-D | YATES | 40.30 | 698.40 | 2,009.30 |
| 5-E | YATES | 20.20 | 157.50 | 966.20 |
| 5-F | YATES | 0.00 | 69.30 | 481.00 |
| 6 | PREMIER | 0.00 | 0.00 | 1,626.00 |
| 7 | OXY-YATES | 0.00 | 0.00 | 427.60 |
| 8 | MWJ PROD. | 0.70 | 0.00 | 165.80 |
| 9 | MERIT | 0.00 | 0.00 | 444.30 |
| 10 | EXXON | 202.80 | 499.40 | 3,350.90 |
| 11 | EXXON | 3.10 | 69.70 | 1,050.50 |
| 12 | EXXON | 0.00 | 0.00 | 191.10 |
| TOTAL | | 1,192.20 | 8,269.40 | 39,883.00 |

PREMIER'S OBJECTIONS

(10) Premier contends that its Tract 6 should be **excluded** because:

(a) Exxon proposes to include a column of 40-acre tracts including four 40-acre tracts (Tract 6) operated by Premier within the western boundary the Avalon Unit but does not intend to attempt to recovery from those tracts any remaining primary oil or any secondary oil by waterflooding;

(b) Exxon basis its plan upon a Technical Report dated August, 1992 (Exxon Exhibit 10) which was prepared exclusively by Exxon personnel and submitted to Yates and the other working interest owners on November 25, 1992;

(c) the Secondary Recovery Project ("waterflooding") is the reason for the Unit, while the Tertiary Recovery Project ("CO2") has only some probability of happening/not happening (See Exxon Exhibit 7--letter dated 10/10/94);

(d) on June 17, 1994, the working interests owners met to discuss the Exxon Technical Report and unanimously agreed to **exclude** Premier's Tract 6 from both the Secondary Recovery and Tertiary Recovery project in the Avalon Unit and Exxon has made no change in its Technical Report to now justify including the Premier Tract in the Unit;

(e) under the Exxon analysis the inclusion of the Premier Tract 6 is **not necessary** in order to effectively carry on the Secondary Recovery Project and that it is **premature** to include this Tract 6 for a Tertiary Recovery Project

(f) under the Exxon analysis there is **no increase** in ultimate recovery of secondary oil from the unit by including the Premier Tract 6;

✓ (g) the Exxon analysis of the CO2 potential is speculative and not been the subject of any scientific study to determine its feasibility and therefore any forecasted increase in ultimate recovery of tertiary oil from the unit by including the Premier Tract 6 is speculative;

✓ (h) ~~Exxon operates or owns working interests in all tracts except Tracts 6, 7, and 8,~~ seeks to include the Premier Tract 6 only as a "protection buffer" and assigns no "contributing value" for secondary oil recovery; See Section 70-7-4(J) NMSA 1978;

✓ (i) Because Premier, as owner of all of Section 25, T20S, R27E, is not receiving any "contributing value" for primary or secondary oil, it does not want to divide its property for Exxon's satisfaction.

(j) that Premier's Tract 6 can be excluded in accordance with the New Mexico Statutory Unitization Act.

(11) In the alternative, Premier contends that if Tract 6 is to be included in the unit, then and in that event, the application for unitization must be **denied** because:

(a) the horizontal and vertical limits of said unit have **not** been reasonably defined by development;

(b) Exxon's Technical Report is flawed because it incorrectly correlates the top of the Upper Cherry Canyon-Downlap Unit and the base of the Upper Cherry Canyon Reservoir in Premier's FV #3 Well located as (Unit Well 1709) within Premier's Tract 6. This results in Exxon mistakenly only attributing 55 feet of net thickness to the UCC reservoir which in turn affects the contouring of the various geologic maps, including the "TOTAL NET RESERVOIR HYDROCARBON THICKNESS AT RESV COND MAP" from which Exxon concludes that Premier's Tract 6 acreage has no remaining primary oil potential;

(c) Premier's FV #3 Well when correctly correlated indicates a net porosity thickness in the Upper Cherry Canyon Reservoir of 137 feet which is some 82 feet more than attributed by Exxon; (See Premier Exhibit 2)

(d) Exxon has determined that 131 feet of net pay thickness is the average for wells in the UCC reservoir but only credits Premier's FV #3 Well with 55 feet; (See Exxon Exhibit 10 B-1)

(e) Premier's hydrocarbon pore volume map shows that there is substantial recoverable oil remaining under Premier's Tract 6.

(f) Exxon's Technical Report in assigning "relative value" to each tract, determined that based upon logged derived water saturations ($S_w=0.46$) there are 2,320,00 barrels of waterflood target oil to be recovered from the Premier Tract 6 (See Premier's Exhibit 8) but then arbitrarily eliminated all of that incremental oil by increasing the water saturation ($S_w=0.60$) based upon water production volumes reported by Gulf when it operated the Premier FV-3 Well; (See Exxon Exhibit 10 G-19)

(g) Premier has determined that SW should be derived from log analysis and not actual water production because the actual water production from the FV-3 Well is attributed to water encroachment from above the Upper Cherry Canyon Reservoir;

(h) Exxon over credits Yates' EP #6 Well (1113) with net pay thickness;

(i) Exxon gives workover reserves in the UCC reservoir to Yates' Tracts 1111, 1311, 1313, 1511 but excludes workover reserves for Premier's Tract 6 which has the same reservoir parameters with identical S_w values (See Exxon Exhibit 10 Map 19);

(j) Exxon is biased in distributing waterflood reserves;

(k) Exxon has incorrectly mapped the UBC reservoir's gross thickness on Premier's acreage;

BACKGROUND-UNITIZATION NEGOTIATIONS

(12) On May 21, 1991, Exxon commenced unitization plans for the Avalon Area and announced its schedule to commence waterflood operations by June, 1992.

(13) In November, 1991 Exxon issued its first Technical Report, but progress towards unitization was delayed until August, 1992 when Exxon issued its Second Technical Report (Exxon Exhibit 10) and circulated that report to the working interest owners.

(14) The Exxon technical Report was undertaken exclusively by Exxon without requesting participation or involvement by Premier.

(15) On November 25, 1992, David Boneau on behalf of Yates advised Exxon that:

(a) Yates considered the engineering work in the August-1992 Technical Report to have "cut a few corners" and expressed concern that the modeling work required that permeability be increased by a factor of two or more and "cast doubt on the shaly-sand analysis of the logs which reduced log porosity and indirectly log permeability. Maybe a different log analysis would have given permeabilities that fit the computer model without modification. Probably you all believe there is no change that the basic geologic picture can be wrong." See Yates Exhibit 6 (2-A).

(b) Yates expressed concern that the areas outside the wells where primary production has been established in the UCC-LBC may not be developed economically by CO₂.

(c) Yates questioned Exxon's workover reserve credited to Yates' Tracts 111, 1311, 1313, 1511 and 1513 **but** states "Since the assumed workover reserves benefit Yates, we are willing to believe the Exxon explanation and leave the workover reserves in the Engineering Report (ie, Exxon Exhibit 10 part 2).

(16) On December 22, 1992, Exxon advises Yates that Exxon has increased the primary reserves credited to Yates Wells EP-5 (Unit E-Sec 30), Well EP-8 (Unit F-Sec 30) and C-36 (Unit A-Sec 31).

(17) By January 7, 1993 Yates has withdrawn its concerns about the Exxon Technical Report, but continues to express concerns over Exxon's AFEs, Exxon's participation formula and states "Exxon's voting procedures stinks."

(18) On April 8, 1994, Exxon with a working interest owner with 73.92 % of the unit area and the proposed unit operator proposed to Yates other major working interest owner with 12.01 % of the unit area, the formation of the subject unit utilizing a Two Phase Tract Participation Formula whereby for Phase I remaining primary oil per tract was weighted by 62.34%; waterflood reserves which included workover potential per tract was weighted by 37.56% and tertiary reserves were weighted by -0- % and then a Phase Two were the weighted percentages were 23.45 %, 20.6375 % and 55.9073 % respectively.

(19) Under the Exxon participation formula Exxon would receive 79.71 % of Phase One oil recovery and 72.529% of Phase Two oil recovery while Yates would receive 9.837% of Phase One oil recovery and 11.55 % of Phase Two oil recovery with Premier receiving -0- % of Phase One oil recovery and 2.279% of Phase Two oil recovery.

(20) On January 18, 1995, Exxon and Yates agreed to a single phase Participation Formula whereby primary oil is weighted by 25 %, secondary oil and workover potential is weighted by 50 % and tertiary oil is weighted by 25 % which results in Exxon receiving 73.92 % of unit production, Yates receiving 12.01 % of unit production and Premier receiving 1.0192 % of unit production.

(21) Exxon/Yates proposed formula is predicated upon the intention to allow each tract to recovery its percentage of remaining primary oil, its percentage of secondary oil and workover oil potential and its percentage of tertiary oil potential by a weighted formula of 25 % primary, 50 % secondary/workover and 25 % tertiary.

THE EXXON-PREMIER DISPUTE

EXXON'S TECHNICAL DATA:

(22) Exxon in support of its contention that neither the Premier FV-3 nor FV-1 is productive of primary oil in the UCC reservoir and that addition west-side injectors are probably not appropriate presented the following geologic/engineer evidence:

(a) that the UCC reservoir reveals that the hydrocarbon distribution is a function of both structure, which controls the downdip, southern and eastern limits of production and stratigraphy which controls the updip pinchout of the reservoir quality sands into tight carbonates on the northern and western sides of the reservoir; (Exxon Exhibit 10-Vol 1)

(b) that there is no apparent updip closure of structural contours in the north and west portions of the proposed unit;

(c) that the "relative value" of Premier tract on the western boundary of the reservoir is Based upon its log analysis of the Premier FV-3 Well, Exxon has determined that there is a total gross thickness of 179 feet based upon picking the top of the Upper Cherry Canyon Downlap at 2589 feet in depth and the base of the Upper Cherry Canyon at 2768 feet in depth;

(d) Based upon a 10 % percent Gamma Ray porosity and a 75 API Gamma Ray unit cutoffs, the Premier FV #3 Well has a total net thickness of 55 feet;

(e) When its interpretation of net thickness for the Premier FV-3 well is integrated into its hydrocarbon pore volume map (Exxon Exhibit 10 map 22) and its volumetric calculations (Exxon Exhibit 10-Vol 1 Exhibit E-4), Premier's FV #3 Well has:

| | |
|-------------------------------|---------------------|
| <i>Original oil in place:</i> | <i>1,580,000 BO</i> |
| <i>Remaining Primary Oil:</i> | <i>-0-</i> |
| <i>Waterflood Target Oil:</i> | <i>580,000 BO</i> |
| <i>Workover Target Oil:</i> | <i>-0-</i> |
| <i>CO2 Target Oil:</i> | <i>1,320,000 BO</i> |

See Exxon Exhibit 10 Vol 1 Exhibit E-6

(f) Exxon concluded that the average Water saturation for the UCC Reservoir by log calculations was 44 % and by watercut was 46 % but for the Premier FV-3 well that Sw factor should be adjusted to 60 % because Gulf reported higher water production in that well than the averages; See Exxon Exhibit 10, Vol 1 Exhibit D-12,D-13, D-14)

(g) By increasing the Sw factor, Exxon calculated the Premier Tract to have only 360,000 barrels of oil in place and that based upon a total cumulative recovery by the FV-3-Well of 5,100 barrels of oil Tract 6 has no remaining primary oil to be recovered;

(h) Based upon its analysis of Premier's FV #3 Well, Exxon further determined that Premier's Tract 6 had no potential for waterflood target oil by applying a weighted factor of 50 % to Tract 6 and further determined it had only 1.626 million barrels of CO2 target oil by applying a weighted factor of 25 %. See Exxon Exhibit 10- Vol. 1 Exhibit E-7 and E-6)

(i) Finally, based upon decline curve analysis (Exxon Exhibit 10 Vol 1 Exhibit G-9), and an 85 % watercut, Exxon concluded that the Premier Tract 6 had no workover Target oil. See Exxon Exhibit 10 Vol 1 Exhibit G-19).

PREMIER'S TECHNICAL DATA:

(23) Premier, the owner/operator in Tract 6, appeared in opposition to the case.

(24) Premier contends that the revised Exxon proposed unit shape, reservoir parameters and participation formula fail to provide "relative value" to Tract 6 as required by Section 70-7-4(J) NMSA (1978), as amended, and unless corrected by the Division will be violated.

(25) Premier provided geologic and petroleum engineer evidence which demonstrates that:

(a) based upon log correlations prepared by Gerrald Harrington, its expert geologic consultant, including log analysis of the Premier FV-3 Well, Premier has determined that the Premier FV-3 Well has a total gross thickness of 308 feet based upon picking the top of the Upper Cherry Canyon Downlap at 2544 feet in depth and the base of the Upper Cherry Canyon at 2852 feet in depth. (See Premier Exhibits 1, 2, and 3)

(b) Mr. Harrington concludes that:

1. the correct correlations will also increase reservoir quality and quantity for Premier location 1509 and that additional UCC reservoir potential exists in Premier's Section 25 (See Premier Exhibit 1)

2. that attributing the correct net thickness to the FV #3 Well changes the contouring of the "UPPER CHERRY CANYON HYDROCARBON THICKNESS MAP" which results in a significantly larger areal extent of the UCC reservoir extending to the north and northwest than that which the Exxon Technical Report attributes to the Premier's Section 25. (See Premier Exhibits 4, 4A, 6, and 6A)

3. that the FV-2 Well log demonstrates potential for UCC reservoir extending westward into other acreage in Section 25 which Exxon excluded from the unit.
 4. additional log correlations demonstrate that Exxon has incorrectly attributed a substantially greater net reservoir thickness and subsequently more hydrocarbon reserves to the Yates "EP" #6 Well (Unit Well 1113) than the Premier analysis and correlations indicate. As a result of this application of incorrect data, Exxon has attributed substantially more recoverable hydrocarbon reserves to Yates' Tract 3-C and its offsetting unit tracts than is warranted.
 5. that the Yates EP #6 Well should have been credited with only 40-42 feet of net pay thickness instead of the 99.5 feet credited by Exxon to this well; (See Premier Exhibit 3)
 6. that Exxon has incorrectly correlated the log of the Premier FV #3 Well and as a result had failed to give the Premier FV #3 Well its correct total net thickness of UCC reservoir and failed to properly value the reservoir quality and quantity for Premier's Tract 6;
- (c) Stuart Hanson, another expert geologic consultant retained by Premier, conducted an independent geologic study which included calibrating and scaling the mudlog for the Premier FV #3 Well and to correlate the Mudlog with the Compensated Neutron Density Gamma Ray Log for that same well and concluded that:
1. the Premier FV #3 Well had an untested portion from 2777 feet to 2791 feet of the UCC reservoir which correlate to a productive portion from 2717 feet to 2730 feet in the offsetting WM

#4 Well (Unit M) Section 30, (See Premier's Exhibit 7) and which, in terms of core analysis and log derived water saturations, showed this interval to be consistent with UCC primary production in the Unit area.

2. that Exxon had incorrectly correlated these wells and in doing so have failed to properly credit the Premier Well with sufficient reservoir thickness.

3. concurred with the conclusions of Mr. Harrington that based upon a 10 % percent porosity and a 75 API unit cutoffs, the Premier FV #3 Well has a total net thickness of 137 feet;

4. when Premier's interpretation of net thickness for the Premier FV-3 well is integrated into its hydrocarbon pore volume map (Premier Exhibit 6) and its volumetric calculations, Premier's VF #3 Well has an estimated 2,910,000 barrels of oil in place, 860,000 barrels of waterflood target oil and 2,380,000 barrels of CO2 target oil.

(d) Premier concludes that the average water saturation ("Sw") for the Premier FV-3 Well should be 39.1 % because it is incorrect to use actual water production which is attributed to a poor cement job acid/frac height and water production from a squeezed zone and therefore Sw should not be increased to 59.9 % as Exxon did.

(e) By using the proper Sw factor, Premier concludes that the Premier's FV #3 Well has 2,910,000 barrels of oil in place and that based upon a total cumulative recovery by Premier's FV #3 Well of 5,100 barrels of oil, Tract 6 still has remaining primary oil to be recovered;

(f) Based upon Exxon's own report, Mr. Paul White, Premier's expert petroleum engineering witness, concluded that:

1. Mr. Hanson and Mr. Harrington had correctly correlated the Premier's FV #3 Well;
2. the Premier Tract 6 has UCC waterflood target oil of 2,320,000 barrels of oil in place, that Yates operated tracts bordering Premier's tracts have 2,680,000 barrels of UCC waterflood target oil (See Premier Exhibit 8) and **therefore** the Exxon Report is biased when it attributed "-0-" waterflood reserves to the Premier Tract 6 (See Exxon Exhibit 10 G-19);
3. that Exxon should have extended the "outer ring-buffer" to include an additional column of 40-acre tracts in Section 25 in order to be consistent with Exxon's inclusion of the Exxon owned tracts in the Southeastern corner of the Unit which contain little or no waterflood target oil;
4. that the waterflood reserves improperly favored both Yates and Exxon as working interest owners in Section 30 to the disadvantage of Premier.
5. that he did not believe the amount of UCC workover target oil Exxon credited to Tracts 1111, 1311, 1313, 1511 and 1513 because the Yates EP #7 Well (1111) had an estimated workover potential of 266,600 barrels (Exxon Exhibit 10 G-19) but the well has only produced 2,000 barrels to date. Therefore these reserves further biased the Exxon report in favor of Exxon and Yates who are both working interest owners in Section 30.

(g) Mr. Kenneth Jones, Premier's owner/operator, testified that he had no confidence in the accuracy of the Exxon Technical Report, because, among other things, Exxon's counting method for the Upper Brushy Canyon was flawed because Exxon gives

Premier's FV #1 Well, 185 feet of gross thickness (Exxon Exhibit 10-Map 4) when in fact it has 215 feet (Exxon Exhibit 10-Appendix C-1) for the proposed new well on tract 1309, which is 330 feet eastward from Premier's FV #1 Well to which Exxon attributes 212 gross feet of UBC reservoir. This results in Exxon incorrectly contouring the lines on Map 4 and will also reduce the volumetric for Tracts 1109 1309 and thereby reduce original oil in place and recoverable oil from these tracts. (note: the correct gross footage should be approximately 238-242 feet)

DIVISION FINDINGS:

(26) The Division finds that:

(a) Section 70-2-33(H) NMSA of the Oil and Gas Act defines Correlative Rights as "...the opportunity afforded, as far as it is practicable to do so, to the owners of each property in a pool to produce without waste his just and equitable share of the oil or gas or both in the pool, being an amount so far as can be practicably determined and so far as can be practicably obtained without waste, substantially in the proportion that the quantity of recoverable oil or gas or both under the property bears to the total recoverable oil or gas or both in the pool and for such purpose, to use his just and equitable share of the reservoir energy;"

(b) Section 70-7-6(B) NMSA of the Statutory Unitization Act states "If the Division determines that the participation formula contained in the unitization agreement does not allocate unitized hydrocarbons on a fair, reasonable and equitable basis, the Division shall determine relative value, from the evidence introduced at the hearing taking into account the separately owned tracts in the unit area, exclusive of physical equipment for development of oil and gas by unit operations, and the production allocated to each tract shall be the proportion that the relative value of each tract so determined bears to the relative value of all tracts in the unit area.

(c) Section 70-7-4 (J) NMSA of the Statutory Unitization Act says "relative value" means the value of each separately owned tract for oil and gas and its contributing value to the unit in relation to like values of other tracts in the unit, taking into account acreage, the quantity of oil and gas recoverable therefrom, location on structure, its probable productivity of oil and gas in the absence of unit operations, the burden of operation to which the tract will or is likely to be subjected, or so many of said factors, or such other pertinent engineering, geological, operating or pricing facts, as may be reasonably susceptible of determination.

(d) Section 70-7-7 NMSA of the Statutory Unitization Act provides that the Division has the authority and obligation to approve or prescribe a plan or unit agreement for unit operation which **shall include**:

"A.area of the pool or part of the pool to be operated as a unit and the vertical limits to be included,..."

"C. an allocation to the separately owned tracts in the unit area of all the oil and gas that is produced from the unit area..."

(27) The Division further FINDS that:

(a) Exxon proposes to include a column of 40-acre tracts including four 40-acre tracts (Tract 6) operated by Premier within the western boundary the Avalon Unit but does not intend to attempt to recovery from those tracts any remaining primary oil or any secondary oil by waterflooding;

○ (b) The Secondary Recovery Project ("waterflooding") is the reason for the Unit, while the Tertiary Recovery Project ("CO2") has only some probability of happening/not happening;

(c) on June 17, 1994, the working interests owners met to discuss the Exxon Technical Report and unanimously agreed to

exclude Premier's Tract 6 from both the Secondary Recovery and Tertiary Recovery project in the Avalon Unit;

(d) Exxon failed to present adequate evidence to demonstrate any substantial change in its Technical Report to now justify including the Premier Tract in the Unit;

(e) under the Exxon analysis the inclusion of the Premier Tract 6 is **not necessary** in order to effectively carry on the Secondary Recovery Project:

(f) Contrary to the testimony of Mr. David Boneau on behalf of Yates that reserves under certain portions of Yates' acreage would remain unrecovered if the Premier acreage were deleted from the unit, the Secondary Recovery Plan as proposed by Exxon provide no means for the recovery of any oil west of the existing Yates' wells.

(g) Since recovery of any such oil is thereby deferred to a tertiary recovery phase for which no commitment has been made, the implication that correlative rights would be impaired and that waste would occur if the Premier acreage were deleted from the proposed unit is groundless.

(h) At such time as firm plans are formulated for a tertiary recovery project, consideration may be given to including the Premier acreage in that CO2 project.

(i) that Exxon's proposed Tertiary Recovery ("CO2") Project is not supported by substantial scientific evidence, is speculative, inadequately studied and is **premature**;

(j) under the Exxon analysis there is **no increase** in ultimate recovery of secondary oil from the unit by including the Premier Tract 6;

(k) the Exxon analysis of the CO2 potential is speculative and not been the subject of any scientific study to determine its feasibility and therefore any forecasted increase in ultimate

recovery of tertiary oil from the unit by including the Premier Tract 6 is speculative;

(l) Exxon seeks to include the Premier Tract 6 only as a "protection buffer" and assigns no "contributing value" for secondary oil recovery; See Section 70-7-4(J) NMSA 1978; and

(m) that Premier's Tract 6 can be excluded in accordance with the New Mexico Statutory Unitization Act.

(28) The Division further finds that Exxon's proposal to include the Premier Tract 6:

(a) fails to conform to the statutory requirements set forth in Paragraph 26 above;

(b) fails to appropriately distribute hydrocarbon pore volume with accurate corresponding reservoir parameters and has not established the appropriate relative value to be attributed to each tract including Tract 6; and

(c) fails to submit an appropriate participation formula to allow the owners of Tract 6 to recover their proportionate share of the total remaining recoverable hydrocarbons underlying the unit.

(d) the horizontal and vertical limits of said unit have **not** been reasonably defined by development;

(e) Exxon's Technical Report is flawed because it incorrectly correlates the top and base of the Upper Cherry Canyon Reservoir in Premier's FV #3 Well located as (Unit Well 1709) within Premier's Tract 6 which results in Exxon assigning 55 feet of net thickness to this well which in turn is used to contour the various geologic maps and ultimate the hydrocarbon pore volume map from which Exxon concludes that Premier Tract 6 has no remaining primary oil potential;

(f) Premier's FV #3 Well when correctly correlated has a net porosity thickness in the Upper Cherry Canyon Reservoir of 137 feet which is some 82 feet more than assigned by Exxon;

(g) Premier's hydrocarbon pore volume map establishes that there are substantial additional recoverable oil remaining under Premier's Tract 6.

(h) Exxon's Technical Report in assigning "relative value" to each tract, determined that based upon logged derived water saturations ($S_w=0.46$) there are 2,320,000 barrels of waterflood target oil to be recovered from Premier's Tract 6 **but** then arbitrarily eliminated all of that incremental oil by increasing the water saturation ($S_w=0.60$) based upon water production volumes reported by Gulf when it operated the Premier FV-3 Well;

(i) Premier accurately determined that SW should be derived from log analysis and not actual water production because the actual water production from the FV-3 Well is attributed to water encroachment below the Upper Cherry Canyon Reservoir;

(29) The proposed Secondary Recovery ("waterflood") Project, with the deletion of Premier Tract 6, should result in the additional recovery of approximately 8,269,400 barrels of oil.

(30) The unitized management, operation and further development of the Avalon Unit Area, as modified by this Order, is reasonably necessary to effectively carry on secondary recovery operations and will substantially increase the ultimate recovery of oil and gas from the unitized portion of the pool.

(31) The unitized method of operation as applied to the Avalon Unit Area (with the deletion of the Premier Tract 6) is feasible and will result with reasonable probability in the increased recovery of substantially more oil and gas from the unitized portion of the pool than would otherwise be recovered without unitization.

(32) The estimated additional costs of such operations will not exceed the estimated value of the additional oil so recovered plus a reasonable profit.

(33) Such unitization and adoption of a unitized method of operation will benefit the working interest owners and royalty owners of the oil and gas rights within the Avalon Unit Area.

(34) The granting of the application with the deletion of Tract 6 as proposed by Premier in this case will have no adverse effect upon the Delaware formation.

(35) The deletion of Premier's Tract 6 from the Avalon Unit Agreement and the Avalon Unit Operating Agreement provide for unitization and unit operation of the Avalon Unit Area upon terms and conditions that are fair, reasonable and equitable, and include:

- a) an allocation to the separately owned tracts in the unit area of all oil and gas that is produced from the unit area and which is saved, being the production that is not used in the conduct of unit operations or not unavoidably lost;
- b) a provision for the credits and charges to be made in the adjustment among the owners in the unit area for their respective investments in wells, tanks, pumps, machinery, materials and equipment contributed to the unit operations;
- c) a provision governing how the costs of unit operations, including capital investments, shall be determined and charged to the separately owned tracts and how said costs shall be paid, including a provision providing when, how, and by whom, such costs shall be paid, including a provision providing when, how and by whom such costs shall be charged to each owner or the interest of such owner, and how his interest may be sold and the proceeds applied to the payment of his costs;
- d) a provision for carrying any working interest owner on a limited, carried or net-profits basis, payable out of production,

upon terms and conditions which are just and reasonable, and which allow an appropriate charge for interest for such service payable out of production, upon such terms and conditions determined by the Division to be just and reasonable;

- e) a provision designating the Unit Operator and providing for supervision and conduct of the unit operations, including the selection, removal or substitution of an operator from among the working interest owners to conduct the unit operations;
- f) a provision for a voting procedure for decisions on matters to be decided by the working interest owners in respect to which each working interest owner shall have a voting interest equal to his unit participation; and,
- g) the time when the unit operations shall commence and the manner in which, and the circumstances under which, the operations shall terminate and for the settlement of accounts upon such termination.

(36) Section 70-7-7.F. N.M.S.A. of said "Statutory Unitization Act" provides that any working interest owner who has not agreed in writing to participate in a unit could have relinquished to the Unit Operator all of its operating rights and working interest in and to the unit until his share of the costs has been repaid plus an additional 200 percent thereof as a non-consent penalty.

(37) At the time of the hearing, the applicant requested that no 200 % penalty be assessed these working interest owners in said unit who have not committed their interests.

(38) The statutory unitization of the Avalon Unit Area is in conformity with the above findings, and will prevent waste and protect correlative rights of all interest owners within the proposed unit area, and should be approved.

IT IS THEREFORE ORDERED:

(1) The application of Exxon for the Avalon Unit Agreement covering 1971.8 acres, more or less, of Federal, State and Fee lands in the Avalon-Delaware Pool, Eddy County, New Mexico, is hereby approved for statutory unitization pursuant to the "Statutory Unitization Act", Section 70-7-1 through 70-7-21, N.M.S.A. (1978), **SUBJECT** to the following:

That Premier's Tract 6 shall be deleted and the same hereby is deleted from this unit.

(2) The lands covered by said Avalon Unit Agreement shall be designated the Avalon Unit Area and shall comprise the following described acreage in Lea County, New Mexico:

Tract 1: SW/4 Sec 29, T20S, R28E
Tract 2: Sec 31, T20S, R28E
Lot 4(NW/4NW/4) Sec 4 T21S, R27E
Lots 1&2 (N/2NE/4) Sec 5 T21S, R27E
Tract 3-A: Lot 1 (NW/4NW/4) Sec 30, T20S, R28E
Tract 3-B: Lot 2 (SW/4NW/4) Sec 30, T20S, R28E
Tract 3-C: NE/4NW/4 Sec 30, T20S, R28E
Tract 3-D: SE/4NW/4 Sec 30, T20S, R28E
Tract 3-E: SW/4NE/4 Sec 30, T20S, R28E
Tract 4-A: NW/4SE/4 Sec 30, T20S, R28E
Tract 4-B: NE/4SE/4 Sec 30, T20S, R28E
Tract 5-A: Lot 3 (NW/4SW/4) Sec 30, T20S, R28E
Tract 5-B: Lot 4 (SW/4SW/4) Sec 30, T20S, R28E
Tract 5-C: NE/4SW/4 Sec 30, T20S, R28E
Tract 5-D: SE/4SW/4 Sec 30, T20S, R28E
Tract 5-E: SW/4SE/4 Sec 30, T20S, R28E
Tract 5-F: SE/4SE/4 Sec 30, T20S, R28E
Tract 6: **[deleted]**
Tract 7: E/2NE/4 Sec 36, T20S, R27E
Tract 8: E/2SE/4 Sec 36, T20S, R27E
Tract 9: Lots 1 & 2 (N/2NE/4) Sec 6, T21S, R27E
Tract 10: W/2W/2, NE/4NW/4, SE/4SW/4 Sec 32, T20S, R28E
Tract 11: SE/4NW/4 & NE/4SW/4 Sec 32, T20S, R28E
Tract 12: E/2SE/4, SW/4NW/4 Sec 32, T20S, R28E

(3) The vertical limits of said unit area shall comprise that interval which includes the "Upper Cherry Canyon Reservoir" ("UCC") and the "Lower Cherry Canyon/Upper Brushy Canyon Reservoir" ("LCC-UBC") and extends from an upper limit between 100 feet above the base of the Goat Seep Reef to the top of the Bone Springs formation to a lower limit of the base of the Brushy Canyon formation which are defined at all points under the unit area correlative to a depth of 2,378 feet and 4,880 feet, respectively, as identified on the Compensated Neutron/Litho density/Gamma Ray Log dated September 14, 1990 for the Exxon Yates "C" Federal Well No. 36, located in Unit A of Section 31, T20S, R28E, NMPM, Eddy County, New Mexico.

(4) The applicant shall institute a waterflood project for the secondary recovery of oil and associated gas, condensate and all associated liquefiable hydrocarbons within and produced from the unit area, and said waterflood project is the subject of Division Case No. 11194.

(5) The applicant's request for approval of a tertiary recovery ("CO2") project is premature and is hereby **denied**.

(6) The Avalon Unit Agreement and the Avalon Unit Operating Agreement, which were submitted to the Division at the time of the hearing as Exhibit Nos. ___ and ___, respectively, are hereby incorporated by reference into this order.

(7) The Avalon Unit Agreement and the Avalon Unit Operating Agreement provide for unitization and unit operation of a portion of the Delaware formation upon terms and conditions that are fair, reasonable and equitable **PROVIDED** the following amendments are made:

That Premier Tract No 6 shall be deleted

(8) This order shall not become effective unless and until seventy-five percent of the working interest and seventy-five percent of the royalty interest owners in the Unit Area have approved the plan for unit operations as required by Section 70-7-8, N.M.S.A., 1978 Compilation.

(9) If the persons owning the required percentage of interest in the Unit Area as set out in Section 70-7-8, N.M.S.A., 1978 Compilation, do not approve the plan for unit operations within a period of six months from the date of entry of this order, this order shall cease to be of further force and effect and shall be revoked by the Division, unless the Division shall extend the time for ratification for good cause shown.

(10) When the persons owning the required percentage of interest in the Unit Area have approved the plan for unit operations, the interests of all persons in the Unit Area are unitized whether or not such persons have approved the plan or unitization in writing.

(11) Any working interest owner who has not agreed in writing to participate in the unit prior to the effective date of this order shall be deemed to have relinquished to the Unit Operator all of his operating rights and working interest in and to the unit until his share of the costs has been repaid. Such repayment shall not include a non-consent penalty (Section 70-7-7.F N.M.S.A. 1978)

(12) The applicant as Unit Operator shall notify in writing the Division Director of any removal or substitution of said Unit Operator by any other working interest owner within the area.

(13) Jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE in 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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