

UNIT AGREEMENT
EAST VACUUM (GRAYBURG-SAN ANDRES) UNIT
COUNTY OF LEA
STATE OF NEW MEXICO

THIS AGREEMENT entered into as of the first day of September, 1978, by and between the parties subscribed, ratifying, or consenting hereto, and herein referred to as the "parties hereto,"

W I T N E S S E T H:

WHEREAS, the parties hereto are the owners of working, royalty or other oil and gas interests in the Unit Area subject to this Agreement; and

WHEREAS, the Commissioner of Public Lands of the State of New Mexico is authorized by law (Volume 2, Chapter 7, Article 11, New Mexico Statutes, 1953 Annotated) to consent to and approve the development or operation of State lands under agreements made by lessees of State land jointly or severally with other leasees where such agreements provide for the unit operation or development of part of or all of any oil or gas pool, field or area; and

WHEREAS, the Commissioner of Public Lands of the State of New Mexico is authorized by an Act of the Legislature (Sec. 1, Chap. 162, Laws of 1951; Chap. 7, Art. 11, Sec. 41, N. M. State, 1953 Annot.) to amend with the approval of lessee, evidenced by the lessee's execution of such agreement or otherwise, any oil and gas lease embracing State lands so that the length of the term of said lease may coincide with the term of such agreements for the unit operation and development of part or all of any oil or gas pool, field or areas; and

WHEREAS, the parties hereto hold sufficient interest in the East Vacuum (Grayburg-San Andres) Unit Area covering land hereinafter described to give reasonably effective control of operations therein; and

WHEREAS, it is the purpose of the parties hereto to enable institution and consummation of additional recovery operations, to conserve natural resources, prevent waste and secure other benefits obtainable through development and operation of the East Vacuum (Grayburg-San Andres) Unit subject to this Agreement under the terms, conditions and limitations herein set forth.

NOW, THEREFORE, in consideration of the premises and the promises herein contained, the parties hereto commit to this Agreement their respective interests in the "Unit Area" and the "Unitized Formation" lying thereunder (as those terms are defined hereinafter) and agree severally among themselves as follows:

1. ENABLING ACT AND REGULATIONS. The oil and gas operating regulations in effect as of the effective date hereto governing drilling and producing operations not inconsistent with the terms hereof or the laws of the State of New Mexico are hereby accepted and made a part of this Agreement.

2. DEFINITIONS. For the purpose of this Agreement, the following terms and expressions as used herein shall mean:

(a) "Division" means the Oil Conservation Division of the Department of Energy and Minerals of the State of New Mexico.

(b) "Commissioner" means the Commissioner of Public Lands of the State of New Mexico.

(c) "Royalty Interest" or "Royalty" means an interest other than a Working Interest in or right to receive a portion of the Unitized Substances or the proceeds thereof and includes the royalty interest reserved by the lessor by an oil and gas lease and any overriding royalty interest, oil payment interest, net profits contracts, or any other payment or burden which does not carry with it the right to search for and produce Unitized Substances.

BEFORE EXAMINER NUTTER
OIL CONSERVATION DIVISION
Phillips EXHIBIT NO. 1
CASE NO. 6366

(d) "Royalty Owner" means the owner of a Royalty Interest.

(e) "Tract" means each parcel of land described as such and given a Tract number in Exhibit B.

(f) "Tract Participation" means the percentage of Unitized Substances allocated to a Tract under this Agreement as shown in Exhibit B.

(g) "Unit Area" means the land shown on Exhibit A, and described by Tracts in Exhibit B, encompassing 7,025.30 acres, more or less.

(h) "Unit Operating Agreement" means any agreement or agreements, whether one or more, entered into either separately or collectively by and between the Unit Operator and the Working Interest Owners, as provided in Section 9, ACCOUNTING PROVISIONS AND UNIT OPERATING AGREEMENT, and shall be styled "Unit Operating Agreement, East Vacuum (Grayburg-San Andres) Unit, Lea County, New Mexico."

(i) "Unit Participation" of a Working Interest Owner is the sum of the percentages obtained by multiplying the Working Interest of such Working Interest Owner in each Tract by the Tract Participation of such Tract.

(j) "Unitized Formation" means the Grayburg-San Andres Formation identified between the depths of 4,050 feet (103 feet sub-sea) and 5,050 feet (1,103 feet sub-sea) on the Lane Wells Acoustic log Run No. 1 dated 4-14-64 in Exxon's New Mexico State "K" No. 19, located in the SE/4 SE/4 of Section 28, T-17-S, R-35-E, Lea County, New Mexico, and is to include all subsurface points throughout the Unit Area correlative to those identified depths in the lands committed hereto.

(k) "Unitized Substances" means all oil, gas, gaseous substances, sulphur contained in gas, condensate, distillate and all associated and constituent liquid or liquefiable hydrocarbons within or produced from the Unitized Formation.

(l) "Working Interest" means the right to search for, produce and acquire Unitized Substances whether held as an incident of ownership of mineral fee simple title, under an oil and gas lease or otherwise.

(m) "Working Interest Owner" means any party hereto owning a Working Interest, including a carried working interest owner, holding an interest in Unitized Substances by virtue of a lease, operating agreement, fee title or otherwise, which interest is chargeable with and obligated to pay or bear, either in cash or out of production, or otherwise, all or a portion of the cost of drilling, developing and producing the Unitized Substances from the Unitized Formation and the operation thereof hereunder. The owner of oil and gas rights which are free of lease or other instrument conveying the Working Interest to another shall be regarded as a Working Interest Owner to the extent of seven-eighths (7/8) of his interest in Unitized Substances, and as a Royalty Owner with respect to his remaining one-eighth (1/8) interest therein.

(n) "Voting Interest" means the percentage authority each Working Interest Owner shall hold in deciding all matters of Unit Operation and shall be identical to its then Unit Participation.

(o) "Oil and Gas Rights" are the rights to explore, develop, and operate lands within the Unit Area for the production of Unitized Substances, or to share in the production so obtained or the proceeds thereof.

(p) "Unit Operations" are all operations conducted pursuant to this Agreement and the Unit Operating Agreement.

(q) "Unit Equipment" is all personal property, lease and well equipment, plants, and other facilities and equipment taken over or otherwise acquired for the joint account for use in Unit Operations.

(r) "Unit Expense" is all cost, expense, or indebtedness incurred by Working Interest Owners or Unit Operator pursuant to this Agreement and the Unit Operating Agreement for or on account of Unit Operations.

3. EXHIBITS. The following exhibits, which are attached hereto, are incorporated herein by reference:

EXHIBIT A; is a map that illustrates the boundary lines of the Unit Area and the Tracts therein.

EXHIBIT B; is a schedule that describes each Tract in the Unit Area and sets forth the Tract Participations for each Tract. Said schedule shall become effective at 7:00 a.m. on the effective date of this Agreement.

It is hereby agreed by all parties to this Agreement that Unit Operator is empowered to correct any mathematical or clerical errors which may exist in the pertinent exhibits to this Agreement; provided, however, that correction of any error other than correction of mathematical or clerical error shall be made by Unit Operator only after first having obtained approval of Working Interest Owners and the Division. The correction of any error shall not include any re-evaluation of engineering or geological interpretations used in determining Tract Participation.

Exhibits A and B shall be revised by Unit Operator whenever changes render such revision necessary, and at least two copies of such revision shall be filed with the Commissioner.

4. EXPANSION OF UNIT AREA. The above described Unit Area may, when practicable, be expanded to include therein any additional tract or tracts regarded as reasonably necessary or advisable for the purposes of this agreement, whenever such expansion is necessary or advisable to conform with the purposes of this Agreement. Tract Participations resulting from such expansion shall be on a negotiated basis and, after agreement between the affected parties has been reached, such expansion shall be effected in the following manner:

(a) Upon concurrence of two or more Working Interest Owners all of whom have at least a combined seventy-five percent (75%) of the then Voting Interest and after preliminary concurrence by the Commissioner and the Division, Unit Operator shall prepare a notice of proposed expansion describing the contemplated changes in the boundaries of the Unit Area, the reasons therefor, and the proposed effective date thereof, preferably the first day of a month subsequent to the date of notice.

(b) Said notice shall be delivered to the Commissioner and the Division, and copies thereof mailed to the last known address of each Working Interest Owner and each Royalty Owner whose interests are affected, advising that 30 days will be allowed for submission to the Unit Operator of any objections.

(c) Upon expiration of the 30-day period provided in the preceding item (b) hereof, Unit Operator shall file with the Commissioner and the Division evidence of mailing of the notice of expansion and a copy of any objections thereto which have been filed with the Unit Operator, together with an application in sufficient number for approval of such expansion and with appropriate joinders.

(d) After due consideration of all pertinent information, the expansion shall, upon approval by the Commissioner and the Division, become effective as of the date prescribed in the notice thereof.

In any approved expansion of the Unit Area, the revised Tract Participations of those Tracts which were committed prior to each such expansion shall remain in the same ratio one to another.

5. UNITIZED LAND AND UNITIZED SUBSTANCES. All oil, gas, gaseous substances, sulphur contained in gas, condensate, distillate and all associated and constituent liquid and liquefiable hydrocarbons in the lands committed to this Agreement are, as to the Grayburg-San Andres Formation, unitized under the terms of this Agreement (and are herein called Unitized Substances) and said lands shall constitute lands referred to herein as "unitized land" or "land subject to this Agreement."

6. UNIT OPERATOR. Phillips Petroleum Company is hereby designated as the Unit Operator and by signature hereto as Unit Operator agrees and consents to accept the duties of Unit Operator for the development and production of Unitized Substances as herein provided. Whenever reference is made herein to the "Unit Operator," such reference means the Unit Operator acting in that capacity and not as an owner of interest in Unitized Substances, and the term

"Working Interest Owner" when used herein shall include or refer to Unit Operator as the owner of a Working Interest when such interest is owned by it.

7. RESIGNATION OR REMOVAL OF UNIT OPERATOR. Unit Operator shall have the right to resign at any time, but such resignation shall not become effective so as to release Unit Operator from the duties and obligation of Unit Operator and terminate Unit Operator's rights as such for a period of six (6) months after notice of intention to resign has been served by Unit Operator on all Working Interest Owners and the Commissioner and the Division, and until all wells then drilled hereunder are placed in satisfactory condition for suspension or abandonment, whichever is required by the Commissioner as to State Lands, unless a new Unit Operator shall have been selected and approved and shall have taken over and assumed the duties and obligations of Unit Operator prior to the expiration of said period.

The resignation of Unit Operator shall not release Unit Operator from any liability or default by it hereunder occurring prior to the effective date of its resignation.

The Unit Operator may be removed at any time by the affirmative vote of Working Interest Owners having ninety percent (90%) or more of the Voting Interest remaining after excluding the Voting Interest of the Unit Operator. Such removal shall be effective upon notice thereof to the Commissioner.

In all such instances of resignation or removal, until a successor Unit Operator is selected and approved, as hereinafter provided, the Working Interest Owners shall be jointly responsible for the performance of the duties of Unit Operator and shall, not later than 30 days before such resignation or removal becomes effective, appoint a common agent to represent them in any action to be taken hereunder.

The resignation or removal of Unit Operator under this Agreement shall not terminate its right, title or interest as the owner of a Working Interest or other interests in Unitized Substances, but upon the resignation or removal of Unit Operator becoming effective, such Unit Operator shall deliver possession of all equipment, materials and appurtenances owned by the Working Interest Owners and used in conducting Unit Operations to the new duly qualified successor Unit Operator, or to the owner thereof if no such new Unit Operator is elected, to be used for the purpose of conducting Unit Operations hereunder. Nothing herein shall be construed as authorizing removal of any material, equipment and appurtenances needed for the preservation of any wells.

8. SUCCESSOR UNIT OPERATOR. Whenever the Unit Operator shall tender his or its resignation as Unit Operator, or shall be removed as hereinabove provided, the Working Interest Owners shall, by affirmative vote of at least sixty-five percent (65%) of the then Voting Interest, select a successor Unit Operator; provided, however, that if the Unit Operator that is removed fails to vote or votes only to succeed itself, the successor Unit Operator may be selected by the affirmative vote of at least fifty-one percent (51%) of the Voting Interest remaining after excluding the Voting Interest of the Unit Operator that resigned or was removed. Such selection shall not become effective until (a) a Unit Operator so selected shall accept in writing the duties and responsibilities of Unit Operator, and (b) the selection shall have been approved by the Commissioner. If no successor Unit Operator is selected and qualified as herein provided, the Commissioner may, at his election, declare this Unit Agreement terminated.

9. ACCOUNTING PROVISIONS AND UNIT OPERATING AGREEMENT. All costs and expenses incurred by Unit Operator in conducting Unit Operations hereunder shall be apportioned among, borne and paid by the Working Interest Owners, all in accordance with this Agreement and the Unit Operating Agreement. The Unit Operating Agreement shall also provide the manner in which the Working Interest Owners shall be entitled to receive their respective proportionate and allocated share of the benefits accruing hereto in conformity with their underlying operating agreements, leases, or other independent contracts and such other rights and obligations as between Unit Operator and the Working Interest Owners as they may agree upon. However, the Unit Operating Agreement shall not be deemed to modify the terms and conditions of this Unit Agreement or to relieve the Unit Operator of any right or obligation established under this Unit Agreement. In case of any inconsistency or conflict between the Unit Agreement and the Unit Operating Agreement, this Agreement shall prevail. One true copy of the Unit Operating Agreement shall be filed with the Commissioner.

10. RIGHTS AND OBLIGATIONS OF UNIT OPERATOR. Except as otherwise specifically provided herein, the exclusive right, privilege and duty of exercising any and all rights of the parties hereto (including surface rights) which are necessary or convenient for the prospecting for, producing, storing, allocating and distributing the Unitized Substances, are hereby granted and delegated to and shall be exercised by the Unit Operator as herein provided. Upon request therefor, acceptable evidence of title to said rights shall be deposited with said Unit Operator and, together with this Agreement, shall constitute and define the rights, privileges and obligations of Unit Operator. Nothing herein, however, shall be construed to transfer title to any land, lease, Royalty Interest, operating agreement or communitization agreement, it being understood that under this Agreement the Unit Operator, in its capacity as Unit Operator, shall exercise the rights of possession and use vested in the parties hereto only for the purposes herein specified.

11. EQUIPMENT AND FACILITIES NOT FIXTURES ATTACHED TO REALTY. Each Working Interest Owner has heretofore placed and used on its Tract or Tracts committed to this Agreement, various well and lease equipment and other property, equipment and facilities. It is also recognized that additional equipment and facilities may hereafter be placed and used upon the Unit Area as now or hereafter constituted. Therefore, for all purposes of this Agreement any and all such equipment shall be considered to be personal property and not fixtures attached to realty. Accordingly, said well and lease equipment and personal property are hereby severed from the mineral estates affected by this Agreement, and it is agreed that any and all such equipment and personal property shall be and remain personal property for all purposes.

12. PLAN OF FURTHER DEVELOPMENT AND OPERATION. It is recognized and agreed by the parties hereto that the object and purpose of this Agreement is to formulate and to put into effect an enhanced recovery project in order to effect the optimum recovery of Unitized Substances, prevent waste and conserve natural resources. The parties hereto agree that the Unit Operator may, subject to the consent and approval of a plan of operation by the Working Interest Owners, the Commissioner and the Division, inject into the Unitized Formation, through any well or wells completed therein, brine, water, air, gas, oil, liquefied petroleum gas, or any other substance or a combination of any of said substances, whether produced from the Unitized Formation or not, and that the location of input wells and the rates of injection therein and the rate of production shall be governed by standards of good geologic and petroleum engineering practices and conservation methods. This Agreement is and shall be subject to the conservation laws of the State of New Mexico, to the valid rules, regulations and order of the Commissioner and the Division and to all other applicable federal, state and municipal laws, rules, regulations and orders. After commencement of enhanced recovery operations, Unit Operator shall furnish the Commissioner monthly injection and production reports for each well in the Unit Area completed in the Unitized Formation. The Working Interest Owners and the Commissioner shall be furnished periodic reports on the progress of the plan of operation and any revisions or changes thereto necessary to meet changed conditions or to protect the interests of all parties to this agreement; provided, however, that any major revisions of the plan of operation involving a basic deviation from the initial plan of operation shall be subject to the consent and approval of the Working Interest Owners, the Commissioner and the Division.

13. PARTICIPATION. The Tract Participations shown on Exhibit B attached hereto shall govern the allocation of Unitized Substances on and after the effective date of this Unit Agreement and until the allocation schedule is revised pursuant to this Agreement and the revised Tract Participations are approved by the Commissioner and the Division.

The Tract Participations of each Tract in the Unit Area have been calculated and determined in accordance with the following formulas using data heretofore approved by the Working Interest Owners:

Initial Participation, the sum of

50% of each Tract's share of total adjusted oil production from the Unit Area for the period July 1, 1976 through December 31, 1976, and

50% of each Tract's share of total future primary oil production from the Unit Area until 12,343,300 barrels of oil have been produced from the Unit Area subsequent to December 31, 1976; thereafter,

Final Participation, the sum of

74% of each Tract's share of total secondary oil estimated for all Tracts in the Unit Area.

25% of each Tract's share of total hydrocarbon pore volume in the Unit Area, and

1% of each Tract's share of total ultimate primary oil estimated for all Tracts in the Unit Area.

14. ALLOCATION OF UNITIZED SUBSTANCES. All Unitized Substances produced and saved (less, save and except any part of such Unitized Substances used in conformity with good operating practices on unitized land for drilling, operating, camp and other production or development purposes and for pressure maintenance) shall be apportioned among and allocated to the committed Tracts in accordance with the respective Tract Participations effective hereunder during the respective periods such Unitized Substances were produced, as set forth in the schedule of participation in Exhibit B. The amount of Unitized Substances so allocated to each committed Tract, and only that amount (regardless of whether it be more or less than the amount of the actual production of Unitized Substances from the well or wells, if any, on such Tract), shall, for all intents, uses and purposes, be deemed to have been produced from such Tract.

The Unitized Substances allocated to each such Tract shall be distributed among, or accounted for to, the parties entitled to share in the production from such Tract in the same manner, in the same proportions, and upon the same conditions, as they would have participated and shared in the production from such Tract, or in the proceeds thereof, had this Agreement not been entered into, and with the same legal effect. It is hereby agreed that production of Unitized Substances from any such committed Tract shall be allocated as provided herein regardless of whether oil or gas is being produced from any particular Tract committed hereto. If the Working Interests or the Royalty Interests in any Tract are divided with respect to separate parcels or portions of such Tract and owned severally by different persons, the Tract Participations of such Tract shall, in the absence of a recordable instrument among all owners fixing the division of ownership, be divided among such parcels or portions in proportion to the number of surface acres in each.

15. BALANCING OF PRODUCTION. Unit Operator shall make a proper and timely gauge of all lease tanks, except treating and separation vessels located on each Tract in order to ascertain the amount of merchantable oil in such tanks, above the pipe line connections, as of 7:00 a.m. on the effective date hereof. All Unitized Substances which are a part of the prior allowable of the well or wells from which the same were produced shall be and remain the property of the Working Interest Owners entitled thereto as if the Unit had not been formed and such Working Interest Owners shall promptly remove same. Any such Unitized Substances not so removed may be sold by the Unit Operator for the account of such Working Interest Owners, subject to the payment of all royalty to Royalty Owners under the terms and provisions of the applicable lease or leases and other contracts. All such Unitized Substances which are in excess of the prior allowable of the well or wells from which the same were produced shall be regarded and treated the same as Unitized Substances produced after the effective date hereof. If, as of the effective date hereof, any Tract is over-produced with respect to the allowable of the well or wells on that Tract and the amount of such over-production has been sold or otherwise disposed of, such over-production shall be regarded and included as a part of the Unitized Substances produced after the effective date hereof and the amount thereof charged to such Tract as having been delivered to the persons entitled to Unitized Substances allocated to such Tract.

16. TAKING UNITIZED SUBSTANCES IN KIND. The Unitized Substances allocated to each Tract shall be delivered in kind to the respective parties entitled thereto by virtue of the ownership of Oil and Gas Rights therein or by purchase from such owners. Such parties shall have the right to construct, maintain and operate within the Unit Area all necessary facilities for that purpose, provided they are so constructed, maintained and operated as not to interfere with Unit Operations. Any extra expenditures incurred by Unit Operator by reason of the delivery in kind of any portion of Unitized Substances shall be borne by the owner of such portion. If a Royalty Owner has the right to take in kind a share of Unitized Substances and fails to do so, the Working Interest Owner whose Working Interest is subject to such Royalty Interest shall be entitled to take in kind such share of Unitized Substances.

17. FAILURE TO TAKE IN KIND. If any party fails to take in kind or separately dispose of such party's share of Unitized Substances, Unit Operator shall have the right, but not the obligation, for the time being and subject to revocation at will by the party owning the share, to purchase or sell to others such share; however, all contracts of sale by Unit Operator of any other party's share of Unitized Substances shall be only for such reasonable periods of time as are consistent with the minimum needs of the industry under the circumstances, but in no event shall any such contracts be for a period in excess of one year. The proceeds of the Unitized Substances so disposed of by Unit Operator shall be paid to the Working Interest Owner of each affected Tract or a party designated by such Working Interest Owner who shall distribute such proceeds to the parties entitled thereto. Notwithstanding the foregoing, Unit Operator shall not make a sale into interstate commerce of any other party's share of gas production without first giving such other party sixty (60) days notice of such intended sale.

18. CERTIFICATION OF UNIT PRODUCTION. It is anticipated, at the effective date of unitization, crude oil produced, saved and sold from the East Vacuum Grayburg-San Andres Unit will be subject to the Energy Policy and Conservation Act (Public Law 94-163) as well as rules and regulations of the Department of Energy, or its successor, herein referred to as "DOE". As of the date of this Agreement, these rules and regulations entitle certain Tracts to regulatory benefits. It is the intent of the parties hereto that until 12,343,300 barrels of oil have been produced from the Unit Area subsequent to December 31, 1976, each Tract shall retain such regulatory benefit as it was entitled to receive under competitive operation and it shall share with all Tracts such additional regulatory benefit as may result from unitized operation by existing or future rules and regulations of DOE. Following production of the said 12,343,300 barrels any regulatory benefit received by any Tract shall be shared with all Tracts. In each instance where a regulatory benefit is shared it shall be shared on the basis of Tract Participation.

As of the date of this Agreement, DOE rules and regulations define "imputed stripper well" crude oil and "new crude oil" and provide regulatory benefits for qualifying volumes of each. In addition, "Base Production Control Level" is defined and identifies the oil produced which equals such volume as "old oil".

A. Imputed stripper well crude oil will be allocated among the Tracts as follows:

1. When the Tract's allocated share of Unitized Substances is equal to or less than its contribution to the Unit's imputed stripper well crude oil volume at the effective date of unitization, the entire volume of Unitized Substances allocated to it will be imputed stripper well crude oil.
2. When the Tract's allocated share of Unitized Substances is more than its contribution to the Unit's imputed stripper well crude oil volume at the effective date of unitization (and the latter such volume is not zero) the volume of Unitized Substances allocated to it will be imputed stripper well crude oil and new crude oil, except if insufficient volume of new crude oil remains to be allocated after allocation among the Tracts which contributed to the Unit's imputed new crude oil volume, the deficiency shall be made up with old oil. The volume of stripper well crude oil will consist in part of a first volume equal to its contribution to the Unit's imputed stripper well crude oil volume at the effective date of unitization and in part of the remaining imputed stripper well crude oil (after subtraction of all such first volumes) allocated among all Tracts based on Tract Participation.
3. Imputed stripper well crude oil not allocated above will be allocated among all remaining Tracts based on Tract Participation.

- B. New crude oil will be allocated among the Tracts as follows:
1. When the Tract's allocated share of Unitized Substances is equal to or less than its contribution to the Unit's imputed new crude oil volume at the effective date of unitization, the entire volume of Unitized Substances (less any volume allocated to it under Paragraph A above) will be new crude oil.
 2. When the Tract's allocated share of Unitized Substances is more than its contribution to the Unit's imputed new crude oil volume at the effective date of unitization, the volume of Unitized Substances allocated to it will be all new crude oil (less any volume allocated to it under Paragraph A-2 above) if it did not contribute to the Unit's Base Production Control Level, or new crude oil, imputed stripper well crude oil and old oil if it did contribute to the Unit's Base Production Control Level. In the latter event, the new crude oil will consist in part of a first volume equal to its contribution to the Unit's imputed new crude oil volume at the effective date of unitization and in part of the remaining new crude oil (after subtraction of all such first volumes and after subtraction of all volumes allocated under Paragraph A-2 and B-1 above). Such remaining new crude oil will be allocated among all the Tracts which contributed to the Unit's Base Production Control Level on the basis of Tract Participation. Should the sum of such first and Second parts exceed any Tract's allocated share of Unitized Substances, the excess will be distributed among the remaining Tracts which contributed to the Unit's Base Production Control Level on the basis of Tract Participation.
- C. Old crude oil shall comprise the remainder of the Unitized Substances and shall be distributed among the Tracts so as to make up the difference between each Tract's allocated share of Unitized Substances and that allocated to it above.

This Article 18 shall remain in effect only so long as necessary for the Unit to comply with applicable laws, rules and regulations of appropriate governmental authorities. Should such laws, rules and regulations hereafter change substantially so as to alter the basis for the distribution of Unit Production as set forth above, then in such event an amended method of allocation among the Unit ownership shall be implemented by the Unit Operator which as nearly as possible achieves the stated intention hereof. In any event this Article 18 will automatically terminate in its entirety upon the production of 12,343,300 barrels of oil from the Unit Area subsequent to December 31, 1976. This Article 18 is deemed supplementary to the other provisions of this Agreement and the provisions of the Unit Operating Agreement so that nothing contained herein shall alter the terms of such Agreement (except Article 14 hereof) including but not limited to the portions hereof dealing with Tract Participation, the allocation of Unitized Substances, and the allocation of investment and operating costs.

19. ROYALTY SETTLEMENT. If, under any existing lease, the State of New Mexico is entitled to take in kind a share of the Unitized Substances produced from any committed Tract, the Unit Operator shall make deliveries of such Royalty share taken in kind in conformity with the applicable contracts, laws and regulations. Settlement for Royalty interest not taken in kind shall be made by Working Interest Owners responsible therefor under existing contracts, laws and regulations, on or before the last day of each month for Unitized Substances produced during the preceding calendar month; provided, however, that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for the payment of any Royalties due under their leases except that said Royalties shall be computed in accordance with the terms of this Agreement.

If gas obtained from lands not subject to this Agreement is introduced into the Unitized Formation for use in pressure maintenance, stimulation of production, or increasing ultimate recovery, which shall be in conformity with a plan first approved by the Commissioner and the Division, a like amount of gas, less appropriate deductions for loss from any cause, may be withdrawn from the Unitized Formation Royalty free as to dry gas, but not as to the products extracted therefrom; provided that such withdrawal shall be pursuant to such conditions and formulas as may be prescribed or approved by the Commissioner; provided further, that such right of withdrawal shall terminate on the termination of this Agreement. If liquefied petroleum gases obtained from lands or formations not subject to this Agreement be injected into the Unitized Formation for the purpose of increasing ultimate recovery, which shall be in conformance with a plan first approved by the Commissioner, part or all of such liquefied petroleum gases may be withdrawn Royalty free pursuant to such conditions and formulas as may be prescribed or approved by the Commissioner.

Royalty due on account of State lands shall be computed and paid on the basis of all Unitized Substances allocated to such lands.

20. RENTAL SETTLEMENT: Rentals on State of New Mexico lands subject to this Agreement shall be paid at the rate specified in the respective leases, or may be reduced or suspended under order of the Commissioner pursuant to applicable laws and regulations.

21. CONSERVATION. Operations hereunder and production of Unitized Substances shall be conducted so as to provide for the most economical and efficient recovery of such substances to prevent waste as defined by State laws or regulations.

22. DRAINAGE. Unit Operator shall take appropriate and adequate measures to prevent drainage of Unitized Substances from the Committed Tracts by wells on land not subject to this Agreement, or with consent of the Commissioner and pursuant to applicable regulations, pay a fair and reasonable compensatory royalty.

23. LEASES AND CONTRACTS CONFORMED AND EXTENDED. The terms, conditions and provisions of all leases, subleases and other contracts relating to exploration, drilling, development or operation for oil, gas, gaseous substances, sulphur contained in gas, condensate, distillate and all associated and constituent liquid and/or liquefiable hydrocarbons in and under lands committed to this Agreement are hereby expressly modified and amended to the extent necessary to make the same conform to the provisions hereof, but otherwise to remain in full force and effect; and the parties hereto hereby consent that the Commissioner as to the State leases, by his approval hereof, or by the approval hereof by his duly authorized representative, does hereby establish, alter, change or revoke the drilling, producing, rental, minimum royalty and royalty requirements of State leases committed hereto and the regulations in respect thereto to conform said requirements to the provisions of this Agreement, and without limiting the generality of the foregoing, Unit Operations conducted on any part of the Unit Area shall be considered with respect to leases or term mineral or Royalty interest as follows:

(a) The development and operation of lands subject to this Agreement under the terms hereof shall be deemed full performance of all obligations for development and operation with respect to each and every part or separately owned Tract committed to this Agreement, regardless of whether there is any development of any particular Tract, or part thereof, of unitized land, notwithstanding anything to the contrary in any lease, operating agreement or other contract by and between the parties hereto, or their respective predecessors in interest, or any of them.

(b) Production from any part of the Unitized Formation, except for the purpose of determining payments to Royalty Owners, or other Unit Operations, shall be considered as production from or operations upon each Tract; and such production or operations shall continue in effect each lease or term mineral or royalty interest as to all lands and formations covered thereby just as if such operations were conducted on and as if a well were producing from each Tract.

(c) Suspension of drilling or producing operations on all unitized lands pursuant to direction or consent of the Commissioner shall be deemed to constitute such suspension pursuant to such direction or consent as to each and every Tract of unitized land.

(d) Any lease embracing lands of the State of New Mexico which is made subject to this Agreement shall continue in force beyond the term provided therein as to the lands committed hereto until the termination hereof.

(e) Any lease embracing lands of the State of New Mexico having only a portion of its land committed hereto shall be segregated as to that portion committed and that not committed, and the terms of such lease shall apply separately as to such segregated portions commencing as of the effective date hereof. Provided, however, that, notwithstanding any of the provisions of this Agreement to the contrary, such lease shall continue in full force and effect beyond the term provided therein as to all lands embraced in such lease if oil or gas is or has heretofore been discovered in paying quantities on some part of the lands embraced in such lease committed to this Agreement or so long as a portion of the Unitized Substances produced from the Unit Area is, under the terms of this Agreement, allocated to the portion of the lands covered by such lease committed to this Agreement or, at any time during the term hereof, as to any lease that is valid and subsisting and upon which the lessee or the Unit Operator is then engaged in bona fide drilling, reworking or enhanced recovery operations on any part of the lands embraced in such lease, then the same as to all lands embraced therein should remain in full force and effect so long as such operations are diligently prosecuted; and if they result in the production of oil or gas, said lease shall continue in full force and effect as to all lands embraced therein, so long thereafter as oil or gas in paying quantities is being produced from any portion of said lands.

24. COVENANTS RUN WITH LAND. The covenants herein shall be construed to be covenants running with the land with respect to the interest of the parties hereto and their successors in interest until this Agreement terminates, and any grant, transfer or conveyance of interest in land or leases subject hereto shall be and hereby is conditioned upon the assumption of all privileges and obligations hereunder by the grantee, transferee or other successor in interest.

25. EFFECTIVE DATE. This Agreement shall become binding upon each party as of the date such party executes or ratifies the instrument by which it becomes a party hereto. This Agreement shall become effective as of 7:00 o'clock a.m. of the first day of the calendar month next following approval by the Commissioner and the Working Interest Owners. Subsequent to approval of this Agreement by the Division, the Working Interest Owners shall have the sole and exclusive right to determine whether this Agreement shall become effective by a vote favoring unitization by Working Interest Owners owning seventy-five percent (75%) or more of the combined Unit Participation. Notwithstanding the accomplishment of the other requirements of this section, this Agreement shall terminate on the termination date or extended termination date provided for in Article 26 unless prior to that date Working Interest Owners by the vote herein provided have determined that this Agreement should become effective and have established an effective time and date.

There must be filed at least one counterpart of this Agreement for record in the office of the County Clerk of Lea County, New Mexico, by the Unit Operator.

Unit Operator shall, within thirty (30) days after the effective date of this Agreement, file for record in the office where a counterpart of this Agreement is recorded, a certificate to the effect that this Agreement became effective according to its terms and stating further the effective date.

26. IPSO FACTO TERMINATION. If the requirements of Article 25 are not accomplished on or before January 1, 1980, this Agreement shall ipso facto terminate on that date (hereinafter called "termination date") and thereafter be of no further effect, unless prior thereto Working Interest Owners owning a combined Unit Participation of at least seventy-five percent (75%) have become parties to this Agreement and Working Interest Owners owning seventy-five percent (75%) or more of that percent have decided to extend the termination date for a period not to exceed one year. If the termination date is so extended and the requirements of Article 25 are not accomplished on or before the extended termination date, this Agreement shall ipso facto terminate on the extended termination date and thereafter be of no further effect. For the purpose of this Article, Unit Participation shall be as calculated on the basis of Tract Participation shown on the original Exhibit B.

27. TERM. The term of this Agreement shall be for and during the time that Unitized Substances are produced in paying quantities from the Unit Area and so long thereafter as drilling, reworking or other operations (including enhanced recovery operations) are prosecuted thereon without cessation of more than ninety (90) consecutive days, unless sooner terminated by Working Interest Owners in the manner hereinafter provided.

This Agreement may be terminated with the approval of the Commissioner and two or more Working Interest Owners owning seventy-five percent (75%) of the then Unit Participation whenever such Working Interest Owners determine that Unit Operations are no longer profitable, feasible or in the interest of conservation. Notice of any such termination shall be given by Unit Operator to all parties hereto.

Upon termination of this Agreement, the further development and operation of the Unit Area as a Unit shall be abandoned, Unit Operations shall cease, and thereafter the parties hereto shall be governed by the terms and provisions of the leases and contracts affecting the separate Tracts.

If not otherwise covered by the leases unitized under this Agreement each Royalty Owner hereby grants Working Interest Owners a period of six months after termination of this Agreement in which to salvage, sell, distribute or otherwise dispose of the personal property and facilities used in connection with Unit Operations.

Upon termination of this Agreement, Unit Operator shall file for record in the office of the County Clerk of Lea County, New Mexico, a certificate to the effect that this Agreement has terminated and declare therein the termination date.

28. NOTICES. All notices, demands, objections or statements required hereunder to be given or rendered to the parties hereto shall be deemed fully given if made in writing and personally delivered to, or delivered by certified mail, to the party or parties at their respective addresses set forth in connection with the signatures hereto or to the ratification or consent hereof or to such other address as any such party may have furnished in writing to the party sending the notice, demand or statement.

29. NO WAIVER OF CERTAIN RIGHTS. Nothing contained in this Agreement shall be construed as a waiver by a party hereto of the right to assert any legal or constitutional right or defense as to the validity or invalidity of any law of the State of New Mexico, or regulations issued thereunder in any way affecting such party, or as a waiver by any such party of any right beyond his or its authority to waive.

30. UNAVOIDABLE DELAY. All obligations under this Agreement requiring the Unit Operator to commence or continue drilling or to operate on or to produce Unitized Substances from any of the lands subject to this Agreement shall be suspended while, but only so long as, the Unit Operator, despite the exercise of due care and diligence, is prevented from complying with such obligations, in whole or in part, by strikes, acts of God, Federal, State or municipal law agencies, unavoidable accidents, uncontrollable delays in transportation, inability to obtain necessary materials in open market, or other matters beyond the reasonable control of the Unit Operator whether similar to matters herein enumerated or not.

31. TITLE. Each party who, by acceptance of produced Unitized Substances or the proceeds thereof, may claim to own a Working Interest or Royalty Interest in and to any Tract or in the Unitized Substances allocated thereto, shall be deemed to have warranted its title to such interest, and, upon receipt of the Unitized Substances or the proceeds thereof to the credit of such interest, shall indemnify and hold harmless all other parties in interest from any loss due to failure, in whole or in part, of its title to any such interest.

If the title or right of any party claiming the right to receive in kind all or any portion of the Unitized Substances allocated to a Tract is in dispute, Unit Operator at the direction of Working Interest Owners shall either:

(a) require that the party to whom such Unitized Substances are delivered or to whom the proceeds thereof are paid furnish security for the proper accounting therefor to the rightful owner if the title or right of such party fails in whole or in part, or

(b) withhold and market the portion of Unitized Substances with respect to which title or right is in dispute, and impound the proceeds thereof until such time as the title or right thereto is established by a final judgment of a court of competent jurisdiction or otherwise to the satisfaction of Working Interest Owners, whereupon the proceeds so impounded shall be paid to the party rightfully entitled thereto, provided, that as to State land or leases, no payments of funds due the State of New Mexico shall be withheld, such funds of the State shall be deposited as directed by the Commissioner, all to be held as unearned money pending final settlement of the title dispute and then applied as earned or returned in accordance with such final settlement.

Unit Operator, as such, is relieved from any responsibility for any dispute of title hereunder.

Any conveyance of all or any part of any interest owned by a party with respect to any Tract shall be subject to this Agreement. No change of title shall be binding upon Unit Operator, or upon any party other than the party so transferring until 7:00 a.m. on the first day of the calendar month next succeeding the date of receipt by Unit Operator of a photocopy or a certified copy of the recorded instrument evidencing such change in ownership.

32. COUNTERPARTS. This Agreement may be executed in any number of counterparts, no one of which needs to be executed by all parties, or it may be ratified or consented to by separate instrument in writing specifically referring hereto and shall be binding upon all those parties who have executed such a counterpart, ratification, or consent hereto with the same force and effect as if all such parties had signed the same document and regardless of whether or not it is executed by all other parties owning or claiming an interest in the lands within the above described Unit Area.

33. TAXES. Each Working Interest Owner shall render and pay for its account and the account of its Royalty Owners all valid taxes on or measured by the Unitized Substances in and under or that may be produced, gathered and sold from its land subject to this Agreement after the effective date of this Agreement, or upon the proceeds or net proceeds derived therefrom. Each Working Interest Owner in each Tract may charge the proper proportion of said taxes to the Royalty Owners having interests in said Tract, and may currently retain and deduct sufficient of the Unitized Substances or derivative products, or net proceeds thereof, from the allocated share of each Royalty Owner to secure reimbursement for the taxes so paid. No such taxes shall be charged to the State of New Mexico or to any lessor who has a contract with his lessee which requires the lessee to pay such taxes.

In order to avoid title failures which might incidentally cause the title to a Working Interest or Royalty Interest to fail, the owners of (1) the surface rights to each committed Tract, (2) severed mineral or Royalty Interest in said Tracts and improvements located on said Tracts not used for Unit Operations shall individually be responsible for the rendition and assessment, for ad valorem tax purposes, of all such property, and for the payment of such taxes, except as otherwise provided in any contract or agreement between such owners and a Working Interest Owner or Owners. If any ad valorem taxes are not paid by such owner responsible therefor when due, Unit Operator may, at any time prior to tax sale, pay the same, redeem such property and discharge such tax liens as may arise through nonpayment. In the event Unit Operator makes any such payment or redeems any such property from the tax sale, Unit Operator shall be reimbursed therefor by the Working Interest Owners in proportion to their respective Unit Participation then in effect, and Unit Operator shall withhold from any proceeds derived from the sale of Unitized Substances otherwise due to said delinquent taxpayer or taxpayers an amount sufficient to defray the costs of such payment or redemption, such withholding to be distributed among the Working Interest Owners in proportion to their respective contributions toward such payment or redemption. Such withholding shall be without prejudice to any other remedy, either at law or in equity, which may be available for exercise by the Unit Operator or by the Working Interest Owners.

34. CONFLICT OF SUPERVISION. Neither the Unit Operator nor the Working Interest Owners or any of them shall be subject to any forfeiture, termination, or expiration of any rights hereunder or under any leases or contracts subject hereto, or to any penalty or liability on account of delay or failure in whole or in part to comply with any applicable provisions thereof to the extent that the said Unit Operator, Working Interest Owners, or any of them are hindered, delayed or prevented from complying therewith by reason of the failure of the Unit Operator to obtain, in the exercise of due diligence, the concurrence of proper representatives of the State of New Mexico in and about any matters or things concerning which it is required herein that such concurrence be obtained. The parties hereto, including the Commissioner, agree that all powers and authority vested in the Commissioner in and by any provisions of this contract are vested in the Commissioner and shall be exercised by him pursuant to the provisions of the laws of the State of New Mexico and subject, in any case, to appeal or judicial review as may now or hereafter be provided by the laws of the State of New Mexico.

35. NO PARTNERSHIP. It is expressly agreed that the relation of the parties hereto is that of independent contractors and nothing in this Agreement contained, express or implied, or any operations conducted hereunder, shall create or be deemed to have created a partnership or association between the parties hereto or any of them.

36. NO SHARING OF MARKET. This Agreement is not intended to provide, and shall not be construed to provide, directly or indirectly, for any cooperative refining, joint sale, or marketing of Unitized Substances.

37. BORDER AGREEMENT. Subject to the approval of the Commissioner, the Unit Operator with Working Interest Owners approval in accordance with the voting procedure in Section 4.3.2 of the Unit Operating Agreement, may enter into a border-protection agreement or agreements with the owners of land adjacent to the committed Tracts with respect to the operations in the border area for the maximum ultimate recovery, conservation purposes and property protection of the parties and interest.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as of the date first written and have set opposite their respective names the date of execution and the address of each of the respective executing parties.

PHILLIPS PETROLEUM COMPANY
UNIT OPERATOR AND WORKING INTEREST OWNER

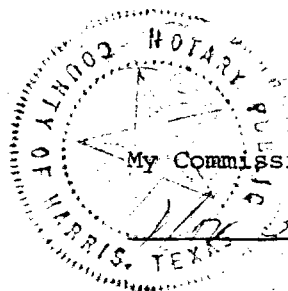
P. O. Box 1967
Houston, Texas 77001

By: *A. J. Willis*
A. J. WILLIS, Attorney in Fact

DATE: September 8, 1978

THE STATE OF TEXAS X
COUNTY OF HARRIS X

The foregoing instrument was acknowledged before me this 9th day of September, 1978, by A. J. WILLIS, Attorney-in-Fact for PHILLIPS PETROLEUM COMPANY, a Delaware Corporation, on behalf of said corporation.



F. W. Ladd
Notary Public in and for Harris County, Texas

F. W. LADD
Notary Public in and for Harris County, Texas
My Commission Expires November 30, 1978
Bonded by Alexander Lovett - Lawyers Surety Corp.

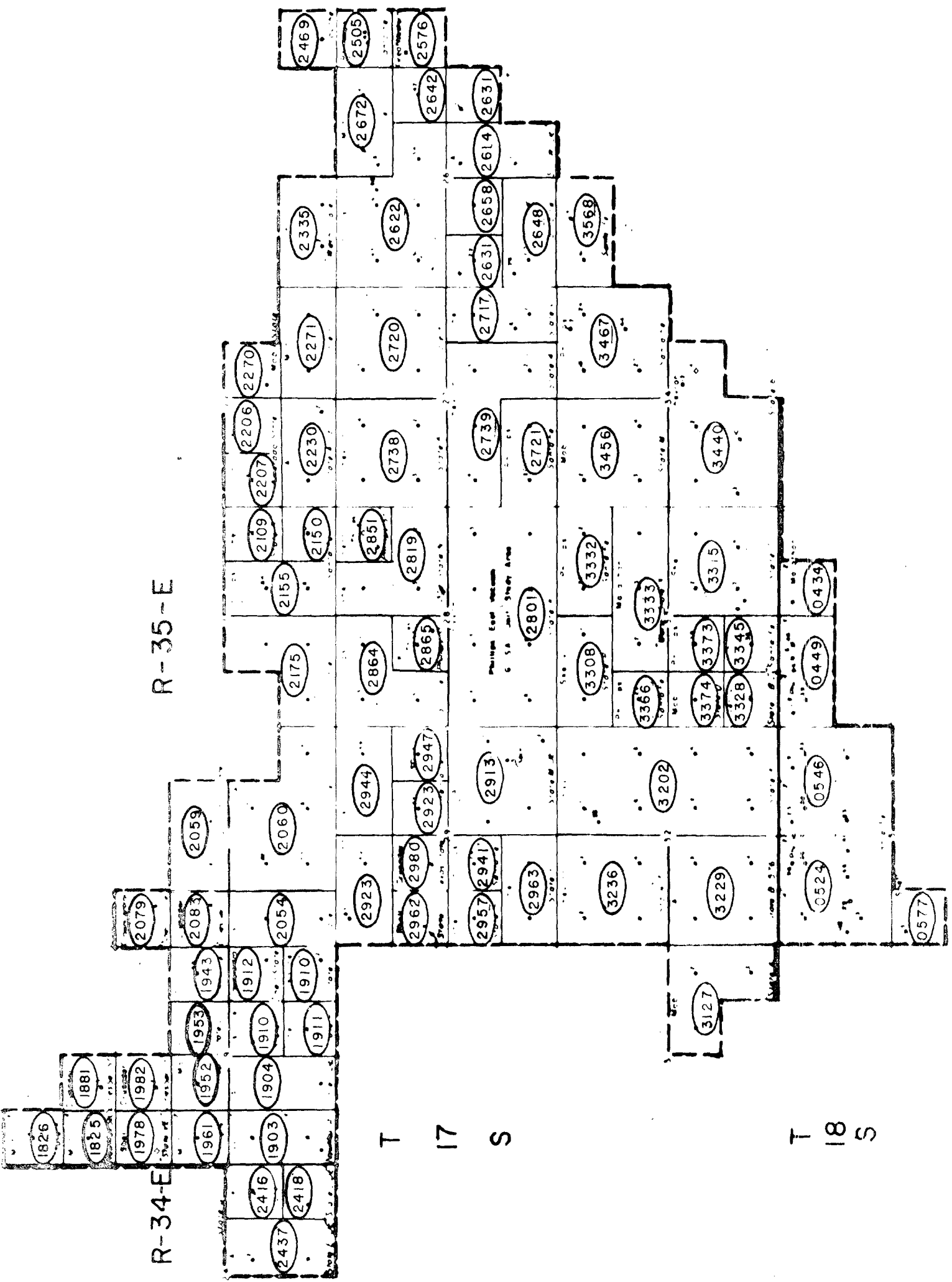


EXHIBIT "A"
 TO UNIT AGREEMENT
 EAST VACUUM GRAYBURG SAN ANDRES UNIT
 LEA COUNTY, NEW MEXICO



EXHIBIT "B"
EAST VACUUM GRAYBURG-SAN ANDRES UNIT
LEA COUNTY, NEW MEXICO

TRACT NO.	LEASE NAME AND LAND DESCRIPTION	NO. OF ACRES	NEW MEXICO STATE LSE. NO.	BASIC ROYALTY	LESSEE OF RECORD	OVERRIDING ROYALTY OWNER AND AMOUNT	WORKING INT. OWNER	% W. I. IN TRACT	% TRACT PARTICIPATION	
									INITIAL	FINAL
2801	New Mexico State K S $\frac{1}{2}$ Sec. 28, T-17-S, R-35-E	320.00	A-1320	.125	Exxon Co.	None	Exxon Co.	100.00	3.36943	5.34834
3202	New Mexico State K E $\frac{1}{2}$ Sec. 32 T-17-S, R-35-E	320.00	A-1320	.125	Exxon Co.	None	Exxon Co.	100.00	9.53857	10.46326
1903	New Mexico State J (Lots 3 & 4) W $\frac{1}{2}$ SW $\frac{1}{4}$ Sec. 19, T-17-S, R-35-E	75.38	B-936	.125	Exxon Co.	None	Exxon Co.	100.00	-	.62367
1904	State J DE E $\frac{1}{2}$ SW $\frac{1}{4}$ Sec. 19 T-17-S, R-35-E	80.00	B-936-18	.125	Atlantic Richfield Company	Exxon Co. .0625	Atlantic Richfield Company	100.00	.06411	.58090
2505	Santa Fe NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 25, T-17-S, R-35-E	40.00	B-960	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	.29267	.22031
2206	Amerada State NE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 22, T-17-S, R-35-E	40.00	B-1040-7	.125	Amerada-Hess Corp.	None	Amerada Hess Corp.	100.00	-	.08543
2207	Amerada State NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 22, T-17-S, R-35-E	40.00	B-1040-8	.125	Polaris Production Corporation	Amerada Hess .075	Kokomo Oil Co. T. W. Little D. E. Radtke Davis Payne	6.25 31.25 31.25 31.25	.08775	.03779
3308	N $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 33, T-17-S, R-35-E	80.00	B-1334	.125	Getty Oil Co.	None	Getty Oil Co.	100.00	2.05778	1.28872
2109	State S NE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 21, T-17-S, R-35-E	40.00	B-1398-5	.125	Shell Oil Co.	None	Shell Oil Co.	100.00	-	.05420

TRACT NO.	LEASE NAME AND LAND DESCRIPTION	NO. OF ACRES	NEW MEXICO		BASIC ROYALTY	LESSEE OF RECORD	OVERRIDING ROYALTY OWNER AND AMOUNT	WORKING INT. OWNER	% W.I. IN TRACT	% TRACT PARTICIPATION	
			STATE USE NO.	NO.						INITIAL	FINAL
1910	State C NW $\frac{1}{4}$ SE $\frac{1}{4}$ & SE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 19, T-17-S, R-35-E	80.00	B-1398-14		.125	Joe B. Singer	Shell Oil Co. .125	H.M. Bettis, Inc. W.F. Boyle & Co. Norman D. Stovall, Jr.	18.00 18.00 18.00	.13168	.36099
1911	State K SW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 19, T-17-S, R-35-E	40.00	B-1398-21		.125	Shell Oil Co.	None	Shell Oil Co.	100.00	-	.25707
1912	Shell, State NE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 19, T-17-S, R-35-E	40.00	B-1398-24		.125	Crown Central Petroleum Corp.	Harold E. Jones .01 Shell Oil Co. .0625 When production is below 16 B/D and .125 otherwise	Crown Central Petroleum Corp.	100.00	.01092	.13261
2913	State M DE SE $\frac{1}{4}$ Sec. 29, T-17-S, R-35-E	160.00	B-1399-10		.125	Atlantic Rich- field Co.	Shell Oil Co. .125	Atlantic Rich- field Co.	100.00	1.75146	2.00209
2614	State W DE W $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 26, T-17-S, R-35-E	80.00	B-1399-10		.125	Shell Oil Co.	Shell Oil Co. .125	Atlantic Rich- field Co.	100.00	.51529	.42296
3315	State T SE $\frac{1}{4}$ Sec. 33, T-17-S, R-35-E	160.00	B-1400-3		.125	Shell Oil Co.	None	Shell Oil Co.	100.00	4.72528	4.13554
2416	State C NE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 24, T-17-S, R-35-E	40.00	B-1404-2		.125	Shell Oil Co.	None	Shell Oil Co.	100.00	-	.18642
2717	State V E $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 27, T-17-S, R-35-E	80.00	B-1404-2		.125	Shell Oil Co.	None	Shell Oil Co.	100.00	1.59428	1.41489
2418	State C DE SE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 24, T-17-S, R-34-E	40.00	B-1404-3		.125	Atlantic Rich- field Co.	Shell Oil Co. .125	Atlantic Rich- field Co.	100.00	.13176	.30137
2819	State N W $\frac{1}{4}$ NE $\frac{1}{4}$ & SE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 28, T-17-S, R-35-E	120.00	B-1423-1		.125	Shell Oil Co.	None	Shell Oil Co.	100.00	.91257	.92386
2720	State K NE $\frac{1}{4}$ Sec. 27	160.00	B-1482-3		.125	Cities Service Co.	None	Cities Service Company	100.00	3.95617	1.01965

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									INITIAL	FINAL
2721	Santa Fe S $\frac{1}{2}$ SW $\frac{1}{4}$ Sec. 27, T-17-S, R-35-E	80.00	B-1497	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	2.85287	2.44676
2622	Santa Fe NW $\frac{1}{4}$ and SW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 26, T-17-S, R-35-E	200.00	B-1497	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	3.96585	1.47884
2923	Santa Fe SW $\frac{1}{4}$ NE $\frac{1}{4}$ & NE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 29, T-17-S, R-35-E	80.00	B-1501	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	.08595	.40873
0524	Santa Fe NW $\frac{1}{4}$ Sec. 29, T-17-S, R-35-E	40.00	B-1501-2	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00		
	Santa Fe NW $\frac{1}{4}$ Sec. 5, T-18-S, R-35-E	159.95	B-1502	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	5.88423	4.14654
1825	New Mexico "O" (Lot 4) SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 18-T17-S, R-35-E	37.66	B-1518	.125	Mobil Oil Corp.	None	Mobil Oil Corp.	100.00	.12327	.07567
1826	State K-6 (Lot 3) NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 18, T-17-S, R-35-E	37.64	B-1527	.125	Mobil Oil Corp.	None	Mobil Oil Corp.	100.00	.24714	.08909
3127	State K N $\frac{1}{4}$ SE $\frac{1}{4}$ & SE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 31, T-17-S, R-35-E	120.00	B-1527	.125	Mobil Oil Corp.	None	Mobil Oil Corp.	100.00	4.43564	4.57057
3328	State BC SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 33, T-17-S, R-35-E	40.00	B-1565-2	.125	Getty Oil Co.	None	Getty Oil Co.	100.00	1.51919	1.77571
3229	State B SW $\frac{1}{4}$ Sec. 32, T-17-S, R-35-E	160.00	B-1576-3	.125	Atlantic Richfield Company	None	Atlantic Richfield Company	100.00	5.74378	7.01489
2230	State A DE S $\frac{1}{2}$ SW $\frac{1}{4}$ Sec. 22, T-17-S, R-35-E	80.00	B-1585-5	.125	Atlantic Richfield Company	None	Atlantic Richfield Company	100.00	.34300	.30083

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									INITIAL	FINAL
2631	Santa Fe NW $\frac{1}{4}$ SW $\frac{1}{4}$ & NE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 26, T-17-S, R-35-E	80.00	B-1608	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	.58700	.57020
3332	N $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 33, T-17-S, R-35-E	80.00	B-1608	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	2.91244	3.46424
3333	Warn State A/C 3 SE $\frac{1}{4}$ NW $\frac{1}{4}$ & S $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 33, T-17-S, R-35-E	120.00	B-1713-1	.125	Marathon Oil Company	None	Marathon Oil Company	100.00	2.90007	4.14916
0434	Warn State A/C 5 NW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 4, T-18-S, R-35-E	39.78	B-1713-1	.125	Marathon Oil Company	None	Marathon Oil Company	100.00	.06395	.05966
2335	Warn State S $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 23, T-17-S, R-35-E	80.00	B-1713-5	.125	Sohio Petroleum Co.	Marathon Oil Co. .0625	Sohio Petroleum Co. Donaldson Brown Trust A/C 1 Donaldson Brown Trust A/C 2 Ft. Worth Nat'l. Bank Trustee #1979	33.3333	.20139	.24994
3236	State 3-32 NW $\frac{1}{4}$ Sec. 32 T-17-S, R-35-E	160.00	B-1838-1	.125	Chevron USA Inc.	None	Chevron USA Inc.	100.00	4.81994	3.56440
2437	State E DE W $\frac{1}{2}$ SE $\frac{1}{4}$ Sec. 24, T-17-S, R-34-E	80.00	B-1838-3	.125	Atlantic Richfield Co.	None	Atlantic Richfield Co.	100.00	.87720	.16590
2738	State 5-27 NW $\frac{1}{4}$ Sec. 27 T-17-S, R-35-E	160.00	B-1839-1	.125	Chevron USA Inc.	None	Chevron USA Inc.	100.00	.85895	1.49111
2739	State 4-27 N $\frac{1}{2}$ SW $\frac{1}{4}$ & W $\frac{1}{2}$ SE $\frac{1}{4}$ Sec. 27, T-17-S, R-35-E	160.00	B-1840-1	.125	Chevron USA Inc.	None	Chevron USA Inc.	100.00	3.57513	2.99166
3440	State 6-34 SW $\frac{1}{4}$ & NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 34, T-17-S, R-35-E	200.00	B-1845-1	.125	Chevron USA Inc.	None	Chevron USA Inc.	100.00	4.17424	3.06316
2941	Santa Fe NE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 29, T-17-S, R-35-E	40.00	B-1861	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	.04540	.36837

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									INITIAL	FINAL
2642	Santa Fe SE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 26 T-17-S, R-35-E	40.00	B-1861	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	.15483	.09621
1943	Santa Fe SE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 19, T-17-S, R-35-E	40.00	B-2073	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	.03964	.15124
2944	Santa Fe N $\frac{1}{2}$ NE $\frac{1}{4}$ Sec. 29, T-17-S, R-35-E	80.00	B-2073	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	.00902	.28466
3345	Santa Fe SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 33, T-17-S, R-35-E	40.00	B-2073	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	1.46480	1.31282
0546	Santa Fe NE $\frac{1}{4}$ Sec. 5 T-18-S, R-35-E	159.85	B-2073	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	4.91331	4.84507
2947	Santa Fe SE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 29, T-17-S, R-35-E	40.00	B-2131	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	-	.37286
2648	Santa Fe S $\frac{1}{2}$ SW $\frac{1}{4}$ Sec. 26, T-17-S, R-35-E	80.00	B-2131	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	.44568	.54475
0449	Santa Fe N $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 4, T-18-S, R-35-E	79.70	B-2131	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	1.82837	1.61531
2150	Santa Fe SE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 21 T-17-S, R-35-E	40.00	B-2224	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	.02695	.13931
2851	Phillips State NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 28, T-17-S, R-35-E	40.00	B-2224	.125	Phillips Petroleum Company	Phillips Petroleum Company .05468750	Pennzoil Co. Jack D. Hensley Boyd Laughlin Hamilton McRae Wainoco, Inc.	81.2500 3.1250 1.5625 1.5625 12.5000	.05809	.31133
1952	Staplin State A/C 2 SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 19, T-17-S, R-35-E	40.00	B-2245	.125	Marathon Oil Co.	None	Marathon Oil Co.	100.00	-	.14278

TRACT NO.	LEASE NAME AND LAND DESCRIPTION	NO. OF ACRES	NEW MEXICO STATE LSE. NO.	BASIC ROYALTY	LESSEE OF RECORD	OVERRIDING ROYALTY OWNER AND AMOUNT	WORKING INT. OWNER	% W.I. IN TRACT	% TRACT PARTICIPATION	
									INITIAL	FINAL
1953	Staplin State A/C 2 SW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 19, T-17-S, R-35-E	40.00	B-2245	.125	Marathon Oil Co. & Shell Oil Co.	None	Marathon Oil Co. Shell Oil Co.	50.00 50.00	-	.18428
2054	State F W $\frac{1}{2}$ SW $\frac{1}{4}$ Sec. 20, T-17-S, R-35-E	80.00	B-2245-6	.125	Joe B. Singer	Marathon Oil Co. .03125	H.M.Bettis, Inc. W.F.Boyle & Co. Norman D. Stovall, Jr. Turnco, Inc. S. B. Street & Co. Larry O. Hulsey	18.00 18.00 18.00 18.00 10.00	.01465	.11637
2155	Santa Fe SW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 21, T-17-S, R-35-E	40.00	B-2264-1	.125	Phillips Petro-leum Company	None	Phillips Petro-leum Company	100.00	.09904	.16750
3456	State M NW $\frac{1}{4}$ Sec. 34, T-17-S, R-35-E	160.00	B-2273-2	.125	Mobil Oil Corp.	None	Mobil Oil Corp.	100.00	5.93605	5.46508
2957	State H NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 29, T-17-S, R-35-E	40.00	B-2284-2	.125	Shell Oil Co.	Fredrick H.Burg-land Est. .0625	Shell Oil Co.	100.00	.20489	.46592
2658	Santa Fe NE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 26, T-17-S, R-35-E	40.00	B-2360-1	.125	Phillips Petro-leum Company	None	Phillips Petro-leum Company	100.00	.24243	.33494
2059	Carthay State SE $\frac{1}{4}$ NW $\frac{1}{4}$ and SW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 20, T-17-S, R-35-E	80.00	B-2388	.125	Phillips Petro-leum Company	Phillips Petro-leum Company .05468750	Millard Deck John R. Bryant L. O. Box	62.50 12.50 25.00	.14130	.01631
2060	Santa Fe SE $\frac{1}{4}$ SE $\frac{1}{4}$; SE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 20, T-17-S, R-35-E and NE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 20,	120.00	B-2388	.125	Phillips Petro-leum Company	None	Phillips Petro-leum Company	100.00	.43773	.37941
1961	T-17-S, R-35-E State N (Lot 2) SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 19, T-17-S, R-35-E	37.68	B-2423-4	.125	Mobil Oil Corp.	None	Mobil Oil Corp.	100.00	.08302	.08458

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			STATE LSE. NO.	NO.						INITIAL	FINAL
2962	State I SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 29 T-17-S, R-35-E	40.00	B-2423-12		.125	Shell Oil Co.	None	Shell Oil Co.	100.00	-	.27131
2963	State F S $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 29, T-17-S, R-35-E	80.00	B-2423-12		.125	Shell Oil Co.	None	Shell Oil Co.	100.00	.91042	.66249
2864	Santa Fe W $\frac{1}{2}$ NW $\frac{1}{4}$ & NE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 28, T-17-S, R-35-E	120.00	B-2498		.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	.08098	.37561
2865	Phillips State SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 28, T-17-S, R-35-E	40.00	B-2498		.125	Phillips Petroleum Company	Phillips Petroleum Company .05468750	Pennzoil Co. Jack D. Hensley Boyd Laughlin Hamilton McRae Wainoco, Inc.	81.2500 3.1250 1.5625 1.5625 12.5000	.07695	.10078
3366	SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 33, T-17-S, R-35-E	40.00	B-2517		.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	1.48641	1.44414
3467	Santa Fe NE $\frac{1}{4}$ Sec. 34 T-17-S, R-35-E	160.00	B-2519		.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	1.65754	2.38560
3568	Santa Fe N $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 35, T-17-S, R-35-E	80.00	B-2519		.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	-	.12795
2469	Southern State SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 24, T-17-S, R-35-E	40.00	B-2531-7		.125	Nevill G. Penrose Est. and William Fleming	None	Nevill G. Penrose Est. Donaldson Brown Tr, A/C 1 Donaldson Brown Tr. A/C 2 Mrs. Mary D. Walsh	33.3333 15.8334 0.8333 50.0000	.00169	.09977
2270	Mobil State NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 22, T-17-S, R-35-E	40.00	B-2735		.125	Mobil Oil Corp.	Mobil Oil Corp. .125	Petro Search, Inc. C. W. Seely Kokomo Oil Co. Kenneth Midkiff Arapaho Petroleum T. W. Little D. E. Radtke Davis Payne	43.7500 6.2500 6.2500 5.0000 6.2500 10.8333 10.8333 10.8334	.03727	.07150

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									INITIAL	FINAL
2271	State P S $\frac{1}{2}$ SE $\frac{1}{4}$ Sec. 22, T-17-S, R-35-E	80.00	B-2735	.125	Mobil Oil Corp.	None	Mobil Oil Corp.	100.00	.13155	.17975
2672	State P N $\frac{1}{2}$ NE $\frac{1}{4}$ Sec. 26, T-17-S, R-35-E	80.00	B-2735	.125	Mobil Oil Corp.	None	Mobil Oil Corp.	100.00	.20862	.63057
3373	Santa Fe NE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 33, T-17-S, R-35-E	40.00	B-2862-3	.125	Phillips Petroleum Company	None	Phillips Petroleum Company	100.00	1.48621	1.61649
3374	State O NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 33 T-17-S, R-35-E	40.00	B-2863-1	.125	Mobil Oil Corp.	None	Mobil Oil Corp.	100.00	1.52442	1.54153
2175	State L NE $\frac{1}{4}$ SW $\frac{1}{4}$ & S $\frac{1}{2}$ SW $\frac{1}{4}$ Sec. 21, T-17-S, R-35-E	120.00	B-2956	.125	Mobil Oil Corp.	None	Mobil Oil Corp.	100.00	.25813	.23742
2576	State E SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 25, T-17-S, R-35-E	40.00	B-7428-2	.125	Great Western Drilling Company	None	Great Western Drilling Co. Davoil, Inc. Amoco Production Company	32.2380 17.7620 50.0000	.07094	.09084
0577	State V AA NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 5, T-18-S, R-35-E	40.00	E-6504	.125	Shell Oil Co.	None	Shell Oil Co.	100.00	.60190	.22541
1978	State VF (Lot 1) NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 19, T-17-S, R-35-E	37.66	E-7259	.125	Shell Oil Co.	None	Shell Oil Co.	100.00	-	.10264
2079	Shell State NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 20 T-17-S, R-35-E	40.00	E-7259-4	.125	Crown Central Petroleum Corp.	Harold E. Jones .01 Shell Oil Co. .0625 when production is below 16 B/D and .125 otherwise	Crown Central Petroleum Corp.	100.00	.01082	.07001

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			STATE LSE. NO.	NO.						INITIAL	FINAL
2980	Crusader Texas State SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 29 T-17-S, R-35-E	40.00	E-7585		.125	Texaco, Inc.	Texaco, Inc.	100.00	-	-	.15587
1881	Cities Service State 2 SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 18, T-17-S, R-35-E	40.00	K-6023-1		.125	Elk Oil Co.	John M. Kelly Est. .075 Elk Oil Co. Joseph J.Kelly John M.Kelly Est.	45.00 5.00 50.00	-	-	.09265
1982	Cities Service State 2 NE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 19, T-17-S, R-35-E	40.00	K-6023-1		.125	Elk Oil Co.	John M. Kelly Est. .075 Elk Oil Co. Joseph J.Kelly John M.Kelly Est.	45.00 5.00 50.00	-	-	.13018
2083	Cities Service State 1 SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 20, T-17-S, R-35-E	40.00	K-6023-1		.125	Elk Oil Co.	John M. Kelly Est. .075 Elk Oil Co. Joseph J.Kelly John M.Kelly Est.	45.00 5.00 50.00	-	-	.05126

UNIT OPERATING AGREEMENT
EAST VACUUM (GRAYBURG-SAN ANDRES) UNIT
COUNTY OF LEA
STATE OF NEW MEXICO

THIS AGREEMENT, entered into as of the first day of September, 1978, by the parties who have signed the original of this instrument, a counterpart thereof, or other instrument agreeing to be bound by the provisions hereof:

W I T N E S S E T H:

WHEREAS, the parties hereto as Working Interest Owners have executed as of the date hereof, an agreement entitled "Unit Agreement, East Vacuum (Grayburg-San Andres) Unit, County of Lea, State of New Mexico," herein referred to as "Unit Agreement," which, among other things, provides for a separate agreement to be entered into by Working Interest Owners to provide for the development and operation of the Unit Area as therein defined:

NOW, THEREFORE, in consideration of the mutual agreements herein set forth, it is agreed as follows:

ARTICLE 1

CONFIRMATION OF UNIT AGREEMENT

1.1 Confirmation of Unit Agreement. The Unit Agreement is hereby confirmed and by reference made a part of this Agreement. The definitions in the Unit Agreement are adopted for all purposes of this Agreement. If there is any conflict between the Unit Agreement and this Agreement, the Unit Agreement shall govern.

1.2 Additional Definition. "Composite Unit Participation" of a Working Interest Owner is the sum of his initial Unit Participation multiplied by the ratio of initial phase reserves to total reserves and his final Unit Participation multiplied by the ratio of estimated final phase reserves to total reserves. Initial phase reserves shall be 12,343,300 barrels less actual production between 12/31/76 and the effective date of the Unit. For the purposes of this Agreement final phase reserves are estimated to be 40,794,740 barrels.

ARTICLE 2

EXHIBITS

2.1 Exhibits. The following exhibits are incorporated herein by reference:

2.1.1 Exhibits A and B of the Unit Agreement.

2.1.2 Exhibit C, attached hereto, which is a schedule showing the Working Interest of each Working Interest Owner in each Tract, the percentage of Unit Participation attributable to each such interest and the Unit Participation of each Working Interest Owner. Exhibit C or a revision thereof, shall not be conclusive as to the information therein, except it may be used as showing the Unit Participation of the Working Interest Owners for purposes of this Agreement until shown to be in error or is revised as herein authorized. The Composite Participation percentages as shown on Exhibit C are tentative and will be recalculated following the effective date of the Unit in accordance with Article 1.2 of this Agreement.

2.1.3 Exhibit D, attached hereto, which is the Accounting Procedure applicable to Unit Operations. If there is any conflict between this Agreement and Exhibit D, this Agreement shall govern.

2.1.4 Exhibit E, attached hereto, which contains insurance provisions applicable to Unit Operations.

BEFORE EXAMINER NUTTER
OIL CONSERVATION DIVISION
Phillips EXHIBIT NO. <u>1314</u>
CASE NO. <u>6366</u>

2.2 Revision of Exhibits. Whenever Exhibits A and B are revised, Exhibit C shall be revised accordingly and be effective as of the same date. Unit Operator shall also revise Exhibit C from time to time as required to conform to changes in ownership of which Unit Operator has been notified as provided in the Unit Agreement.

ARTICLE 3

SUPERVISION OF OPERATIONS BY WORKING INTEREST OWNERS

3.1 Overall Supervision. Working Interest Owners shall exercise overall supervision and control of all matters pertaining to Unit Operations pursuant to this Agreement and the Unit Agreement. In the exercise of such authority, each Working Interest Owner shall act solely in its own behalf in the capacity of an individual owner and not on behalf of the owners as an entirety.

3.2 Specific Authorities and Duties. The matters with respect to which the Working Interest Owners shall decide and take action shall include, but not be limited to, the following:

3.2.1 Method of Operation. The method of operation, including any type of pressure maintenance, enhanced recovery, or other recovery program to be employed.

3.2.2 Drilling of Wells. The drilling of any well whether for production of Unitized Substances, for use as an injection well, or for other purposes.

3.2.3 Well Change of Status. The abandonment, or change of status of any well in the Unit Area, or the use of any well for injection or other purposes.

3.2.4 Expenditures. The making of any single expenditure in excess of Twenty-Five Thousand Dollars (\$25,000.00); provided that approval by Working Interest Owners of the drilling, reworking, deepening or plugging back of any well shall include approval of all necessary expenditures required therefor, and for completing, testing, and equipping the same, including necessary flow lines, separators, and lease tankage.

3.2.5 Appearance Before a Court or Regulatory Agency. The designating of a representative to appear before any court or regulatory agency in matters pertaining to Unit Operations, provided that such designation shall not prevent any Working Interest Owner from appearing in person or from designating another representative in its own behalf.

3.2.6 Audits. The auditing of the accounts of Unit Operator pertaining to Unit Operations hereunder; provided that the audits shall:

- (a) not be conducted more than once each year except upon the resignation or removal of Unit Operator, and
- (b) be made upon the approval of the owner or owners of a majority of Working Interest other than that of Unit Operator, at the expense of all Working Interest Owners other than Unit Operator, or
- (c) be made at the expense of those Working Interest Owners requesting such audit, if owners of less than a majority of Working Interest, other than that of Unit Operator, request such an audit, and
- (d) be made upon not less than thirty (30) days' written notice to Unit Operator.

(e) A Working Interest Owner, upon notice in writing to Unit Operator and other Working Interest Owners, shall have the right to audit Unit Operator's accounts and records relating to the Joint Account for any calendar year within the twenty-four (24) month period following the end of such calendar year; provided, however, the making of an audit shall not extend the time for the taking of written exception to and the adjustments of accounts as provided for in Paragraph 4 of Section I of Exhibit D.

3.2.7 Inventories. The taking of periodic inventories under the terms of Exhibit D.

3.2.8 Technical Services. The authorization of charges to the joint account for services by consultants or Unit Operator's technical personnel not covered by the overhead charges provided by Exhibit D.

3.2.9 Assignments to Committees. The appointment of committees to study any problems in connection with Unit Operations.

3.2.10 The removal of Unit Operator and the selection of a successor.

3.2.11 The enlargement of the Unit Area.

3.2.12 The adjustment and readjustment of investments.

3.2.13 The termination of the Unit Agreement.

ARTICLE 4

MANNER OF EXERCISING SUPERVISION

4.1 Designation of Representatives. Each Working Interest Owner shall in writing inform Unit Operator of the names and addresses of the representative and alternate who are authorized to represent and bind such Working Interest Owner with respect to Unit Operations. The representative or alternate may be changed from time to time by written notice to Unit Operator.

4.2 Meetings. All meetings of Working Interest Owners shall be called by Unit Operator upon its own motion or at the request of one or more Working Interest Owners having a total Unit Participation of not less than five percent (5%). No meeting shall be called on less than fourteen (14) days' advance written notice with agenda for the meeting attached. Working Interest Owners who attend the meeting may amend items included in the agenda and may act upon an amended item or other items presented at the meeting. The representative of the Unit Operator shall be chairman of each meeting.

4.3 Voting Procedure. Working Interest Owners shall decide all matters coming before them as follows:

4.3.1 Voting Interest. Each Working Interest Owner shall have a Voting Interest equal to its Unit Participation then in effect.

4.3.2 Vote Required. Unless otherwise provided herein or in the Unit Agreement, Working Interest Owners shall determine all matters by the affirmative vote of two or more Working Interest Owners having a combined Voting Interest of at least sixty-five percent (65%); however, should any one Working Interest Owner have more than thirty-five percent (35%) Voting Interest, its negative vote or failure to vote shall not defeat a motion, and such motion shall pass if approved by Working Interest Owners having a majority Voting Interest, unless one or more Working Interest Owners having a combined Voting Interest of at least five percent (5%) likewise vote against the motion or fail to vote.

4.3.3 Vote at Meeting by Nonattending Working Interest Owner. Any Working Interest Owner who is not represented at a meeting may vote by letter or telegram addressed to the representative of the Unit Operator if its vote is received

prior to the vote on the item.

4.3.4 Poll Votes. Working Interest Owners may vote on and decide, by letter or telegram, any matter submitted in writing to Working Interest Owners if no meeting is requested, as provided in Section 4.2, within seven (7) days after the proposal is sent to Working Interest Owners. Unit Operator will give prompt notice of the results of the voting to all Working Interest Owners.

ARTICLE 5

INDIVIDUAL RIGHTS OF WORKING INTEREST OWNERS

5.1 Reservation of Rights. Working Interest Owners severally reserve to themselves all their rights except as otherwise provided in this Agreement and Unit Agreement.

5.2 Specific Rights. Each Working Interest Owner shall have, among others, the following specific rights:

5.2.1 Access to Unit Area. Access to the Unit Area at all times to inspect Unit Operations, all wells, and the records and data pertaining thereto and to operate non-unitized formations pursuant to Article 13.

5.2.2 Reports. The right to receive from Unit Operator, upon written request, copies of all reports to any governmental agency, reports of crude oil runs and stocks, inventory reports, and all other information pertaining to Unit Operations. The cost of gathering and furnishing information not ordinarily furnished by Unit Operator to all Working Interest Owners shall be charged to the Working Interest Owner who requests the information.

ARTICLE 6

UNIT OPERATOR

6.1 Initial Unit Operator. PHILLIPS PETROLEUM COMPANY is hereby designated as initial Unit Operator.

6.2 Resignation or Removal - Selection of Successor. The resignation or removal of Unit Operator, and the selection of a successor shall be governed by the provisions of the Unit Agreement.

ARTICLE 7

AUTHORITIES AND DUTIES OF UNIT OPERATOR

7.1 Exclusive Right to Operate Unit. Subject to the provisions of this Agreement and to instructions from Working Interest Owners, Unit Operator shall have the exclusive right and be obligated to conduct Unit Operations.

7.2 Workmanlike Conduct. Unit Operator shall conduct Unit Operations in a good and workmanlike manner as would a prudent operator under the same or similar circumstances. Unit Operator shall freely consult with Working Interest Owners and keep them informed of all matters which Unit Operator, in the exercise of its best judgment, considers important. Unit Operator shall not be liable to Working Interest Owners for damages unless such damages result from its gross negligence or willful misconduct.

7.3 Liens and Encumbrances. Unit Operator shall endeavor to keep the Lands, Leases and Unit Equipment in the Unit Area free from all liens and encumbrances occasioned by Unit Operations except the lien of Unit Operator granted hereunder.

7.4 Employees. The number of employees used by Unit Operator in conducting Unit Operations, their selection, hours of labor, and compensation shall be determined by Unit Operator. Such employees shall be the employees of Unit Operator.

7.5 Records. Unit Operator shall keep correct books, accounts and records of Unit Operations.

7.6 Reports to Working Interest Owners. Unit Operator shall furnish to Working Interest Owners periodic reports of Unit Operations as prescribed by Working Interest Owners.

7.7 Reports to Governmental Authorities. Unit Operator shall make all reports to governmental authorities that it has the duty to make as Unit Operator.

7.8 Engineering and Geological Information. Unit Operator shall furnish to a Working Interest Owner, upon written request, a copy of the log and other engineering and geological data pertaining to wells drilled for Unit Operations.

7.9 Expenditures. Unit Operator is authorized to make single expenditures not in excess of Twenty-Five Thousand Dollars (\$25,000.00) without prior approval of Working Interest Owners. Information copies of AFEs in excess of \$5,000.00 will be furnished upon request. If an emergency occurs, Unit Operator may immediately make or incur such expenditures as in its opinion are required to deal with the emergency. Unit Operator shall report to Working Interest Owners as promptly as possible the nature of the emergency and the action taken.

7.10 Wells Drilled by Unit Operator. All wells drilled by Unit Operator shall be at the usual rates prevailing in the area. Unit Operator may employ its own tools and equipment under terms and conditions approved by Working Interest Owners.

7.11 Border Agreements. Unit Operator may, after approval by Working Interest Owners, enter into border agreements with respect to land adjacent to the Unit Area for the purpose of coordinating operations.

ARTICLE 8

TAXES

8.1 Ad Valorem Taxes. Beginning with the first calendar year after the effective date hereof, Unit Operator shall make and file all necessary ad valorem tax renditions and returns with the proper taxing authorities covering all real and personal property of each Working Interest Owner used or held by Unit Operator in Unit Operations. Unit Operator shall settle assessments arising therefrom. All such ad valorem taxes shall be paid by Unit Operator and charged to the joint account, provided that if the interest of a Working Interest Owner is subject to a separately assessed overriding royalty interest, production payment, or other interest in excess of a one-eighth (1/8) royalty, such Working Interest Owner shall be given credit for the reduction in taxes paid resulting therefrom.

If the ad valorem taxes are based in whole or in part upon separate valuations of each party's working interest, then notwithstanding anything to the contrary herein, charges to the joint account shall be made and paid by the parties hereto in accordance with the tax value generated by each party's working interest.

8.2 Other Taxes. Each Working Interest Owner shall pay, or cause to be paid, all production severance, gathering, and other taxes imposed upon or in respect to the production or handling of its share of Unitized Substances.

ARTICLE 9

INSURANCE

9.1 Insurance. Unit Operator, with respect to Unit Operations, shall do the following:

9.1.1 Carry Workmen's Compensation Insurance in compliance with the Workmen's Compensation Law of the State of New Mexico.

9.1.2 Carry Employer's Liability and other insurance as required by the laws of the State of New Mexico.

9.1.3 Carry other insurance as set forth in Exhibit E.

ARTICLE 10

ADJUSTMENT OF INVESTMENTS

10.1 Personal Property Taken Over. Upon the effective date hereof, Working Interest Owners shall deliver to Unit Operator the following:

10.1.1 Wells. All wells completed in the Unitized Formation or which were completed in the Unitized Formation and which contributed to oil production during the last half of 1976.

10.1.2 Well and Lease Equipment. The casing and tubing in each such well, the wellhead connections thereon, and all other lease and operating equipment that is used in the operation of such wells which

10.1.2.1 Working Interest Owners determine is necessary or desirable for conducting Unit Operations, or

10.1.2.2 Unit Operator deems necessary for the temporary convenience of the Unit. This equipment shall be retained on a loan basis for a period of time not to exceed twelve (12) months. If the equipment is not returned within the period provided the Unit will purchase it at the same evaluation as the original inventory.

10.1.3 Records. A copy of all production and well records for such wells.

10.2 Inventory and Evaluation of Personal Property. Working Interest Owners shall at Unit Expense inventory and evaluate, as determined by Working Interest Owners, the personal property taken over. Such inventory shall include and be limited to those items of equipment considered controllable under Exhibit D except, upon determination of Working Interest Owners, items considered noncontrollable may be included in the inventory in order to insure a more equitable adjustment of investment. Casing shall be included in the inventory for record purposes, but shall be excluded from evaluation and investment adjustment.

10.3 Investment Adjustments. Upon approval by Working Interest Owners of the inventory and evaluation, investments shall be adjusted as follows:

10.3.1 Each Working Interest Owner shall be credited with the value, as determined in accordance with Section 10.2 above, of its interest in all personal property taken over by Unit Operator under Section 10.1.2.1, and charged with an amount equal to that obtained by multiplying the total value of all such personal property taken over by Unit Operator under Section 10.1.2.1, by such Working Interest Owner's Composite Unit Participation. If the charge against any such Working Interest Owner is greater than the amount credited to such Working Interest Owner, the resulting net charge shall be paid and in all other respects be treated as any other item of Unit Expense chargeable against such Working Interest Owner. If the credit to any Working Interest Owner is greater than the amount charged against such Working Interest Owner, the resulting net credit shall be paid to such Working Interest Owner by Unit Operator out of funds received by it in settlement of the net charges described above.

10.4 General Facilities. The acquisition of warehouses, warehouse stocks, lease houses, camps, facility systems, and office buildings necessary for Unit Operations shall be by negotiation by the owners thereof and Unit Operator, subject to the approval of Working Interest Owners. There shall be no adjustment for lease roads or appurtenances thereto.

10.5 Ownership of Personal Property and Facilities. Each Working Interest Owner, individually, shall by virtue hereof own an undivided interest equal to its Final Unit Participation in all personal property and facilities taken over or otherwise acquired by Unit Operator pursuant to this Agreement.

ARTICLE 11

WELL BORES

11.1 Condition of Wells. All wells delivered to the Unit Operator shall be completed in the Unitized Formation and be in a reasonably good physical condition to produce Unitized Substances or capable of being used for Unit Operations on the effective date hereof. If within 180 days after the effective date any such well is determined by the Working Interest Owners not to have been in a reasonably good physical condition when taken over, including but not limited to defective casing or junk in the well, the Working Interest Owner who contributed such well shall be liable to the other Working Interest Owners for liquidated damages in an amount, measured by the cost to Working Interest Owners of repairing such unit well, not to exceed Fifty Thousand Dollars (\$50,000.00); provided that any amount in excess of Fifty Thousand Dollars (\$50,000.00) shall be treated as any other item of Unit Expense and charged to the joint account.

ARTICLE 12

UNIT EXPENDITURES

12.1 Basis of Charge to Working Interest Owners. Unit Operator initially shall pay all Unit Expenditures. Each Working Interest Owner shall reimburse Unit Operator for its share of Unit Expenditures in accordance with the following:

12.1.1 Operating Expense. Each Working Interest Owner's share of operating expense shall be the same as its Unit Participation in effect at the time the expenditure was made.

12.1.2 Investment Expenditures. Each Working Interest Owner's share of the first 15 million dollars of total unit investment in excess of the initial unit inventory will be the same as its Composite Unit Participation. Each Working Interest Owner's share of all additional investment will be the same as its final Unit Participation. This investment will include well deepening costs, costs to convert wells to injection service, tank battery consolidation costs, and all other costs normally considered as investment costs in oil field accounting practices.

12.2 Budgets. Before or as soon as practical after the effective date hereof, Unit Operator shall prepare a budget of estimated Unit Expenditure for the remainder of the calendar year, and on or before the first day of each June thereafter shall prepare such a budget for the ensuing calendar year. A budget shall set forth the estimated Unit Expenditures by quarterly periods. Budgets shall be estimates only and shall be adjusted or corrected by Working Interest Owners and Unit Operator whenever an adjustment or correction is proper. A copy of each budget and adjusted budget shall promptly be furnished to each Working Interest Owner.

12.3 Advance Billings. Unit Operator shall have the right, without prejudice to other rights or remedies, to require Working Interest Owners to advance their respective shares of estimated Unit Expenditures by submitting to Working Interest Owners, on or before the 15th day of any month, an itemized estimate thereof for the succeeding month with a request for payment in advance. Within fifteen (15) days after receipt thereof, each Working Interest Owner shall pay to Unit Operator its share of such estimate. Adjustments between estimated and actual Unit Expenditures shall be made by Unit Operator at the close of each calendar month and the accounts of Working Interest Owners shall be adjusted accordingly.

12.4 Commingling of Funds. Funds received by Unit Operator under this Agreement need not be segregated or maintained by it as a separate fund, but may be commingled with its own funds.

12.5 Lien and Security Interest of Unit Operator. Each Working Interest Owner grants to Unit Operator a lien upon its Oil and Gas Rights in each Tract, and a security interest in its share of Unitized Substances when extracted and its interest in all Unit Equipment, to secure payment of its share of Unit Expenditures, together with interest thereon at the rate of twelve percent (12%) per annum. To the extent that Unit Operator has a security interest under the Uniform Commercial Code of the State, Unit Operator shall be entitled to exercise the rights and remedies of a secured party under the Code. The bringing of a suit and the obtaining of judgment by Unit Operator for the secured indebtedness shall not be deemed an election of remedies or otherwise affect the lien rights or security interest as security for the payment thereof. In addition, upon default by any Working Interest Owner in the payment of its share of Unit Expenditures, Unit Operator shall have the right, without prejudice to other rights or remedies, to collect from the purchaser the proceeds from the sale of such Working Interest Owner's share of Unitized Substances until the amount owed by such Working Interest Owner, plus interest, has been paid. Each purchaser shall be entitled to rely upon Unit Operator's written statement concerning the amount of any default. Unit Operator hereby grants a like lien to Working Interest Owner.

12.6 Unpaid Unit Expenditures. If any Working Interest Owner fails to pay its share of Unit Expenditure within sixty (60) days after rendition of a statement therefor by Unit Operator, each Working Interest Owner agrees, upon request of Unit Operator, to pay its proportionate part of the unpaid share of Unit Expenditures of a defaulting Working Interest Owner. The Working Interest Owners that pay the share of Unit Expenditures of a defaulting Working Interest Owner shall be reimbursed by the Unit Operator for the amount so paid, plus any interest collected thereon, upon receipt by Unit Operator of any past due amount collected from or credited to the account of the defaulting Working Interest Owner. Any Working Interest Owner so paying a defaulting Working Interest Owner's share of Unit Expenditures shall, to obtain reimbursement thereof, be subrogated to the lien and other rights herein granted Unit Operator.

12.7 Carved-out Interest. If any Working Interest Owner shall, after executing this Agreement, create an overriding royalty, production payment, net proceeds interest, carried interest, or any other interest out of its Working Interest, such carved-out interest shall be subject to the terms and provisions of this Agreement, specifically including, but without limitation, Section 12.5 hereof entitled "Lien and Security Interest of Unit Operator." If the Working Interest Owner creating such carved-out interest (a) fails to pay any Unit Expenditures chargeable to such Working Interest Owner under this Agreement, and the production of Unitized Substances accruing to the credit of such Working Interest Owner is insufficient for that purpose, or (b) withdraws from this Agreement under the terms and provisions of Article 19 hereof, the carved-out interest shall be chargeable with a pro rata portion of all Unit Expenditures incurred hereunder, the same as though such carved-out interest were a Working Interest, and Unit Operator shall have the right to enforce against such carved-out interest the lien and all other rights granted in Section 12.5 for the purpose of collecting the Unit Expenditures chargeable to the carved-out interest.

ARTICLE 13

NONUNITIZED FORMATION

13.1 Right to Operate. Any Working Interest Owner that now has or hereinafter acquires the right to drill for and produce oil, gas or other minerals, from a formation underlying the Unit Area other than the Unitized Formation, shall have the right to do so notwithstanding this Agreement or the Unit Agreement. In exercising the right, however, such Working Interest Owner shall exercise care to prevent unreasonable interference with Unit Operations. No Working Interest Owner other than Unit Operator shall produce Unitized Substances through any well drilled or operated by it. If any Working Interest Owner drills any well into or through the Unitized Formation, the Unitized Formation shall be protected in a manner satisfactory to Working Interest Owners so that the production of Unitized Substances will not be affected adversely.

13.2 Multiple Completions. No well now or hereafter completed in the Unitized Formation within the Unit Area or any enlargement thereof shall ever be completed as a multiple completion with the Unitized Formation and any other formation unless such multiple completion and the subsequent handling of the multiple completion is approved by Working Interest Owners in accordance with the voting procedures as set out in Section 4.3.2 of this Agreement.

ARTICLE 14

TITLES

14.1 Representation and Indemnity. Each Working Interest Owner represents that it is the owner of the respective Working Interest set forth opposite its name in Exhibit C, and agrees to indemnify and hold harmless the other Working Interest Owners from any loss due to failure, in whole or in part, of its title to any such interest, except failure of title arising because of Unit Operations; however, such indemnity and any liability arising therefrom shall be limited to an amount equal to the net value that has been received from the sale or receipt of Unitized Substances attributed to the interest as to which title failed. Each failure of title will be deemed to be effective insofar as this Agreement is concerned, as of 7:00 a.m. on the first day of the calendar month in which such failure is finally determined, and there shall be no retroactive adjustment of Unit Expenditures, or retroactive allocation of Unitized Substances of the proceeds therefrom, as a result of title failure.

14.2 Failure Because of Unit Operations. The failure of title to any Working Interest in any Tract because of Unit Operations, including non-production from such Tract, shall not change the Unit Participation of the Working Interest Owner whose title failed in relation to the Unit Participation of the other Working Interest Owners at the time of the title failure.

ARTICLE 15

LIABILITY, CLAIMS AND SUITS

15.1 Individual Liability. The duties, obligations, and liabilities of Working Interest Owners shall be several and not joint or collective, and nothing herein contained shall ever be construed as creating a partnership of any kind, joint venture, association or trust among Working Interest Owners.

15.2 Settlements. Unit Operator may settle any single damage claim or suit involving Unit Operations but not involving an expenditure in excess of Five Thousand Dollars (\$5,000.00) provided the payment is in complete settlement of such claim or suit. If the amount required for settlement exceeds the above specified amount, Working Interest Owners shall assume and take over the further handling of the claim or suit unless such authority is expressly delegated to Unit Operator. All costs and expense of handling, settling, or otherwise discharging such claim or suit shall be an item of Unit Expense if approved in accordance with provisions of Exhibit D. If a claim is made against any Working Interest Owner or if any Working Interest Owner is sued on account of any matter arising from Unit Operations and over which such Working Interest Owner individually has no control because of the rights given Working Interest Owners and Unit Operator by this Agreement and the Unit Agreement, the Working Interest Owner shall immediately notify the Unit Operator and the claim or suit shall be treated as any other claim or suit involving Unit Operations.

ARTICLE 16

INTERNAL REVENUE PROVISION

16.1 Internal Revenue Provisions. Notwithstanding any provisions herein that the rights and liabilities of the parties hereunder are several and not joint or collective or that this Agreement and the operations hereunder shall not constitute a partnership, if for Federal income tax purposes this Agreement and the operations hereunder are regarded as a partnership, then each of the parties hereto hereby elects to be excluded from the application of all of the provisions of Subchapter K, Chapter 1, Subtitle A of the Internal Revenue Code of 1954 as permitted and authorized by Section 761 of said Code and the regulation promulgated thereunder. Operator is hereby authorized and directed to execute on behalf of each of the parties hereto such evidence of this election as may be required by the Secretary of the Treasury of the United States or the Federal Internal Revenue Service including specifically, but not by way of limitation, all of the returns, statements, and the data required by Federal Regulations 1.761-1 (a). Should there be any requirement that each party hereto further evidence this election, each party hereto agrees to execute such documents and furnish such other evidence as may be required by the Federal Internal Revenue

Service or as may be necessary to evidence this election. Each party hereto further agrees not to give any notice or take any other action inconsistent with the election made hereby. If any present or future income tax laws of the state or states in which the property covered by this Agreement is located, or any future income tax law of the United States, contain, or shall hereafter contain, provisions similar to those contained in Subchapter K, Chapter 1, Subtitle A of the Internal Revenue Code of 1954, under which an election similar to that provided by Section 761 of said Subchapter K is permitted, each of the parties hereto hereby makes such election or agrees to make such election as may be permitted by such laws. In making this election, each of the parties hereto hereby states that the income derived by him from the operations under this Agreement can be adequately determined without the computation of partnership taxable income.

ARTICLE 17

NONDISCRIMINATION

17.1 Nondiscrimination. Unit Operator, in connection with the performance of work under this Agreement, agrees to comply with the clauses set forth in Exhibit "F" attached hereto and made a part hereof.

ARTICLE 18

NOTICES

18.1 Notices. All notices required hereunder shall be in writing and shall be deemed to have been properly served when sent by mail or telegram to the address of the representative of each Working Interest Owner as furnished to Unit Operator in accordance with Article 4.

ARTICLE 19

WITHDRAWAL OF WORKING INTEREST OWNER

19.1 Withdrawal. A Working Interest Owner may withdraw from this Agreement by transferring, without warranty of title either express or implied, to the Working Interest Owners who do not desire to withdraw all its Oil and Gas Rights, exclusive of Royalty Interest, together with its interest in all Unit Equipment and in all wells used in Unit Operations, provided that such Transfer shall not relieve such Working Interest Owner from any obligation or liability incurred prior to the first day of the month following receipt by Unit Operator of such transfers. The delivery of the transfer shall be made to Unit Operator for the transferees. The transferred interest shall be owned by the transferees in proportion to their respective Unit Participations. The transferees, in proportion to the respective interests so acquired, shall pay transferor for its interest in Unit Equipment, the salvage value thereof less its share of the estimated cost of salvaging same and of plugging and abandoning all wells then being used or held for Unit Operations, as determined by Working Interest Owners. In the event such withdrawing owner's interest in the aforesaid salvage value is less than such owner's share of such estimated costs, the withdrawing owner, as a condition precedent to withdrawal, shall pay the Unit Operator, for the benefit of Working Interest Owners succeeding to its interest, a sum equal to the deficiency. Within sixty (60) days after receiving delivery of the transfer, Unit Operator shall render a final statement to the withdrawing owner for its share of Unit Expense, including any deficiency in salvage value, as determined by Working Interest Owners, incurred as of the first day of the month following the date of receipt of the transfer. Provided all Unit Expense, including any deficiency hereunder, due from the withdrawing owner has been paid in full within thirty (30) days after the rendering of such final statement by the Unit Operator, the transfer shall be effective the first day of the month following its receipt by Unit Operator and, as of such effective date, withdrawing owner shall be relieved from all further obligations and liabilities hereunder and under the Unit Agreement, and the rights of the withdrawing Working Interest Owner hereunder and under the Unit Agreement shall cease insofar as they existed by virtue of the interest transferred.

19.2 Limitation on Withdrawal. Notwithstanding anything set forth in Section 19.1, Working Interest Owners may refuse to permit the withdrawal of a Working Interest Owner if its Working Interest is burdened by any royalties, overriding royalties, production payments, net proceeds interest, carried interest, or any other interest created out of the Working Interest in excess of one-eighth (1/8) lessor's royalty, unless the other Working Interest Owners willing to accept the assignment agree to accept the Working Interest subject to such burdens.

ARTICLE 20

ABANDONMENT OF WELLS

20.1 Rights of Former Owners. If Working Interest Owners decide to permanently abandon any well within the Unit Area prior to termination of the Unit Agreement, Unit Operator shall give written notice thereof to the Working Interest Owners of the Tract in which the well is located and they shall have the option for a period of ninety (90) days after the receipt of such notice to notify Unit Operator in writing of their election to take over and own the well. Within ten (10) days after the Working Interest Owners of the Tract have notified Unit Operator of their election to take over the well, they shall pay Unit Operator, for credit to the joint account, the amount estimated by Unit Operator and approved by Working Interest Owners as the salvage value, less estimated plugging cost, of the casing and other equipment in and on the well up to and including the well head, except the casing therein if contributed by the Working Interest Owner as provided in Article 10.1. If the salvage value of the well is less than zero, the Working Interest Owners will accept the well without payment from the Unit. The Working Interest Owners of the Tract, by taking over the well, agree to seal off effectively and protect the Unitized Formation and upon abandonment to plug the well in compliance with applicable laws and regulations.

20.2 Plugging. If the Working Interest Owners of a Tract do not elect to take over a well located thereon which is proposed for abandonment, Unit Operator shall plug and abandon the well in compliance with applicable laws and regulations.

ARTICLE 21

EFFECTIVE DATE AND TERM

21.1 Effective Date. This Agreement shall become effective on the date and at the time that the Unit Agreement becomes effective.

21.2 Term. This Agreement shall continue in effect so long as the Unit Agreement remains in effect and thereafter until (a) all unit wells have been abandoned and plugged or turned over to Working Interest Owners in accordance with Article 20, (b) all Unit Equipment and real property acquired for the joint account have been disposed of by Unit Operator in accordance with instructions of Working Interest Owners, and (c) there has been a final accounting.

ARTICLE 22

ABANDONMENT OF OPERATIONS

22.1 Termination. Upon termination of the Unit Agreement the following will occur:

22.1.1 Oil and Gas Rights. Oil and Gas Rights in and to each separate Tract shall no longer be affected by this Agreement and thereafter the parties shall be governed by the terms and provisions of the leases, contracts, and other instruments affecting the separate tracts.

22.1.2 Right to Operate. Working Interest Owners of any Tract that desire to take over and continue to operate wells located thereon may do so by agreeing to plug each well in compliance with applicable laws and regulations at such time as it

is abandoned and by paying to Unit Operator, for credit to the joint account, the salvage value, less estimated plugging costs of the casing and other equipment up to and including the well head in and on any wells taken over, as estimated by Unit Operator and approved by Working Interest Owners. Casing contributed by the Working Interest Owners as provided in Article 10.1 will be excluded.

22.1.3 Salvaging Wells. Unit Operator shall salvage as much of the casing and equipment in or on wells not taken over by Working Interest Owners of separate Tracts as can economically and reasonably be salvaged, and shall cause the wells to be plugged and abandoned in compliance with applicable laws and regulations.

22.1.4 Cost of Salvaging. Working Interest Owners shall share the cost of salvaging, liquidation, or other distribution of assets and properties used in Unit Operation in proportion to their respective Unit Participations.

22.1.5 Distribution of Assets. Working Interest Owners shall share in the distribution of Unit Equipment, or the proceeds thereof, in proportion to their Unit Participation.

ARTICLE 23

EXECUTION

23.1 Original, Counterpart or Other Instrument. A party may become a party to this Agreement by signing the original of this instrument, a counterpart thereof, or other instrument agreeing to be bound by the provisions hereof. The signing of any such instrument shall have the same effect as if all the parties had signed the same instrument.

ARTICLE 24

SUCCESSORS AND ASSIGNS

24.1 Successors and Assigns. The provisions hereof shall be covenants running with the lands, leases and interests covered hereby, and shall be binding upon and inure to the benefit of the respective heirs, devisees, legal representatives, successors and assigns of the parties hereto.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the dates opposite their respective signatures.

PHILLIPS PETROLEUM COMPANY
UNIT OPERATOR AND WORKING INTEREST OWNER

By: *A. J. Willis*
A. J. WILLIS, Attorney-in-Fact

THE STATE OF TEXAS X

COUNTY OF HARRIS X

The foregoing instrument was acknowledged before me this 8th day of September, 1978, by A. J. WILLIS, Attorney-in-Fact for PHILLIPS PETROLEUM COMPANY, a Delaware Corporation, on behalf of said corporation.

F. W. Ladd
Notary Public in and for Harris County, Texas
F. W. LADD
Notary Public in and for Harris County, Texas
My Commission Expires November 30, 1978
Bonded by Alexander Leight, Leight's Surety Co.

My Commission Expires:
12/30/1978

EXHIBIT "C"
 TO UNIT OPERATING AGREEMENT
 EAST VACUUM GRAYBURG-SAN ANDRES UNIT
 LEA COUNTY, NEW MEXICO

PART A

TRACT NO.	WORKING INTEREST OWNER	WORKING INTEREST IN TRACT - %	UNIT PARTICIPATION - %		
			INITIAL	FINAL	COMPOSITE* (TENTATIVE)
0434	Marathon Oil Co.	100.00	.06395	.05966	.06043
0449	Phillips Petroleum Co.	100.00	1.82837	1.61531	1.65347
0546	Phillips Petroleum Co.	100.00	4.91331	4.84507	4.85730
0524	Phillips Petroleum Co.	100.00	5.88423	4.14654	4.45775
0577	Shell Oil Co.	100.00	.60190	.22541	.29284
1826	Mobil Oil Corp.	100.00	.24714	.03909	.11740
1825	Mobil Oil Corp.	100.00	.12327	.07567	.08419
1881	Elk Oil Co.	45.00	-	.04169	.03422
	Joseph J. Kelly	5.00	-	.00463	.00380
	John M. Kelly Est.	50.00	-	.04633	.03803
1982	Elk Oil Co.	45.00	-	.05858	.04809
	Joseph J. Kelly	5.00	-	.00651	.00534
	John M. Kelly Est.	50.00	-	.06509	.05343
1978	Shell Oil Co.	100.00	-	.10264	.08426
1961	Mobil Oil Corp.	100.00	.08302	.08458	.08430
1952	Marathon Oil Co.	100.00	-	.14278	.11721
1943	Phillips Petroleum Co.	100.00	.03964	.15124	.13125
1912	Crown Central Petroleum Corp.	100.00	.01092	.13261	.11082
1910	H. M. Bettis, Inc.	18.00	.02370	.06498	.05759
	W. T. Boyle & Co.	18.00	.02370	.06498	.05759
	Norman D. Stovall, Jr.	18.00	.02370	.06498	.05759
	Turnco, Inc.	18.00	.02370	.06498	.05759
	S. B. Street & Co.	18.00	.02370	.06498	.05759
	Larry O. Hulsey	10.00	.01318	.03609	.03199
1904	Atlantic Richfield Co.	100.00	.06411	.58090	.48835
1903	Exxon Co.	100.00	-	.62367	.51197
1911	Shell Oil Co.	100.00	-	.25707	.21103
1953	Marathon Oil Co.	50.00	-	.09214	.07564
	Shell Oil Co.	50.00	-	.09214	.07564
2079	Crown Central Petroleum Corp.	100.00	.01082	.07001	.05941
2083	Elk Oil Co.	45.00	-	.02307	.01894
	Joseph J. Kelly	5.00	-	.00256	.00210
	John M. Kelly Est.	50.00	-	.02563	.02104
2059	Millard Deck	62.50	.08831	.01019	.02418
	John R. Bryant	12.50	.01766	.00204	.00484
	L. O. Box	25.00	.03533	.00408	.00968
2060	Phillips Petroleum Co.	100.00	.43773	.37941	.38985
2054	H. M. Bettis, Inc.	18.00	.00263	.02095	.01767
	W. T. Boyle & Co.	18.00	.00264	.02095	.01767
	Norman D. Stovall, Jr.	18.00	.00264	.02095	.01767
	Turnco, Inc.	18.00	.00264	.02094	.01766
	S. B. Street & Co.	18.00	.00264	.02094	.01766
	Larry O. Hulsey	10.00	.00146	.01164	.00981
2109	Shell Oil Co.	100.00	-	.05420	.04449
2155	Phillips Petroleum Co.	100.00	.09904	.16750	.15524
2175	Mobil Oil Corp.	100.00	.25813	.23742	.24113
2150	Phillips Petroleum Co.	100.00	.02695	.13931	.11919
2270	Petro Search, Inc.	43.7500	.01630	.03128	.02860
	C. W. Seely	6.2500	.00233	.00447	.00409
	Kokomo Oil Co.	6.2500	.00233	.00447	.00409
	Kenneth Midkiff	5.0000	.00186	.00358	.00327
	Arapaho Petroleum	6.2500	.00233	.00447	.00409
	T. W. Little	10.8333	.00404	.00774	.00708
	D. E. Radtke	10.8333	.00404	.00774	.00708
	Davis Payne	10.8334	.00404	.00775	.00708

EXHIBIT "C" PART A - CONTINUED

TRACT NO.	WORKING INTEREST OWNER	WORKING INTEREST	UNIT PARTICIPATION - %		
		IN TRACT - %	INITIAL	FINAL	COMPOSITE (TENTATIVE)*
2206	Amerada Hess Corp.	100.00	-	.08543	.07013
2207	Kokomo Oil Co.	6.25	.00549	.00236	.00292
	T. W. Little	31.25	.02742	.01181	.01461
	D. E. Radtke	31.25	.02742	.01181	.01461
	Davis Payne	31.25	.02742	.01181	.01461
2230	Atlantic Richfield Co.	100.00	.34300	.30083	.30838
2271	Mobil Oil Corp.	100.00	.13155	.17975	.17112
2335	Sohio Petroleum Co.	33.3333	.06713	.08332	.08042
	Donaldson Brown Tr. A/C 1	15.8334	.03189	.03957	.03819
	Donaldson Brown Tr. A/C 2	.8333	.00168	.00208	.00201
	Ft. Worth National Bank Trustee No. 1979	50.0000	.10069	.12497	.12062
2416	Shell Oil Co.	100.00	-	.18642	.15303
2437	Atlantic Richfield Co.	100.00	.87720	.16590	.29329
2418	Atlantic Richfield Co.	100.00	.13176	.30137	.27099
2469	Neville G. Penrose Est.	33.3333	.00056	.03326	.02740
	Donaldson Brown Tr. A/C 1	15.8334	.00027	.01580	.01302
	Donaldson Brown Tr. A/C 2	.8333	.00001	.00083	.00068
	Mrs. Mary D. Walsh	50.0000	.00085	.04988	.04110
2505	Phillips Petroleum Co.	100.00	.29267	.22031	.23327
2576	Great Western Drilling Co.	32.2380	.02287	.02929	.02814
	Davoil, Inc.	17.7620	.01260	.01613	.01550
	Amoco Production Co.	50.0000	.03547	.04542	.04364
2672	Mobil Oil Corp.	100.00	.20862	.63057	.55500
2622	Phillips Petroleum Co.	100.00	3.96585	1.47884	1.92425
2642	Phillips Petroleum Co.	100.00	.15483	.09621	.10671
2631	Phillips Petroleum Co.	100.00	.58700	.57020	.57321
2658	Phillips Petroleum Co.	100.00	.24243	.33494	.31837
2614	Atlantic Richfield Co.	100.00	.51529	.42296	.43950
2648	Phillips Petroleum Co.	100.00	.44568	.54475	.52701
2720	Cities Service Co.	100.00	3.95617	1.01965	1.54556
2738	Chevron U.S.A. Inc.	100.00	.85895	1.49111	1.37789
2717	Shell Oil Co.	100.00	1.59428	1.41489	1.44702
2739	Chevron U.S.A. Inc.	100.00	3.57513	2.99166	3.09615
2721	Phillips Petroleum Co.	100.00	2.85287	2.44676	2.51949
2851	Pennzoil Co.	81.2500	.04720	.25296	.21611
	Jack D. Hensley	3.1250	.00181	.00973	.00831
	Boyd Laughlin	1.5625	.00091	.00486	.00415
	Hamilton McRae	1.5625	.00091	.00486	.00415
	Wainoco, Inc.	12.5000	.00726	.03892	.03325
2819	Shell Oil Co.	100.00	.91257	.92386	.92184
2864	Phillips Petroleum Co.	100.00	.08098	.37561	.32284
2865	Pennzoil Co.	81.2500	.06252	.08188	.07841
	Jack D. Hensley	3.1250	.00241	.00315	.00302
	Boyd Laughlin	1.5625	.00120	.00158	.00151
	Hamilton McRae	1.5625	.00120	.00158	.00151
	Wainoco, Inc.	12.5000	.00962	.01259	.01206
2801	Exxon Co.	100.00	3.36943	5.34834	4.99393
2944	Phillips Petroleum Co.	100.00	.00902	.28466	.23529
2923	Phillips Petroleum Co.	100.00	.08595	.40873	.35092
2962	Shell Oil Co.	100.00	-	.27131	.22272
2980	Texaco, Inc.	100.00	-	.15587	.12795
2947	Phillips Petroleum Co.	100.00	-	.37286	.30608
2913	Atlantic Richfield Co.	100.00	1.75146	2.00209	1.95720
2941	Phillips Petroleum Co.	100.00	.04540	.36837	.31053
2957	Shell Oil Co.	100.00	.20489	.46592	.41917
2963	Shell Oil Co.	100.00	.91042	.66249	.70689
3127	Mobil Oil Corp.	100.00	4.43564	4.57057	4.54640
3202	Exxon Co.	100.00	9.53857	10.46326	10.29765
3236	Chevron U.S.A. Inc.	100.00	4.81994	3.56440	3.78926
3229	Atlantic Richfield Co.	100.00	5.74378	7.01489	6.78724
3332	Phillips Petroleum Co.	100.00	2.91244	3.46424	3.36542
3308	Getty Oil Co.	100.00	2.05778	1.28872	1.42645
3366	Phillips Petroleum Co.	100.00	1.48641	1.44414	1.45171
3333	Marathon Oil Co.	100.00	2.90007	4.14916	3.92546

EXHIBIT "C" PART A - CONTINUED

<u>TRACT NO.</u>	<u>WORKING INTEREST OWNER</u>	<u>WORKING INTEREST IN TRACT - %</u>	<u>UNIT PARTICIPATION - %</u>		
			<u>INITIAL</u>	<u>FINAL</u>	<u>COMPOSITE*</u> <u>(TENTATIVE)</u>
3315	Shell Oil Co.	100.00	4.72528	4.13554	4.24116
3373	Phillips Petroleum Co.	100.00	1.48621	1.61649	1.59316
3374	Mobil Oil Corp.	100.00	1.52442	1.54153	1.53847
3328	Getty Oil Co.	100.00	1.51919	1.77571	1.72977
3345	Phillips Petroleum Co.	100.00	1.46480	1.31282	1.34004
3467	Phillips Petroleum Co.	100.00	1.65754	2.38560	2.25521
3456	Mobil Oil Corp.	100.00	5.93605	5.46508	5.54943
3440	Chevron U.S.A. Inc.	100.00	4.17424	3.06316	3.26215
3568	Phillips Petroleum Co.	100.00	-	.12795	.10503
			<hr/>	<hr/>	<hr/>
			100.00000	100.00000	100.00000

PART B

<u>WORKING INTEREST OWNER</u>	<u>TRACT</u>	<u>UNIT PARTICIPATION - %</u>		
		<u>INITIAL</u>	<u>FINAL</u>	<u>COMPOSITE*</u> <u>(TENTATIVE)</u>
Amerada Hess Corp.	2206	-	.08543	.07013
Amoco Production Co.	2576	.03547	.04542	.04364
Arapaho Petroleum	2270	.00233	.00447	.00409
Atlantic Richfield Co.	1904	.06411	.58090	.48835
	2230	.34300	.30083	.30838
	2437	.87720	.16590	.29329
	2418	.13176	.30137	.27099
	2614	.51529	.42296	.43950
	2913	1.75146	2.00209	1.95720
	3229	5.74378	7.01489	6.78724
	OWNER TOTAL	9.42660	10.78894	10.54495
H. M. Bettis, Inc.	1910	.02370	.06498	.05759
	2054	.00263	.02095	.01767
	OWNER TOTAL	.02633	.08593	.07526
L. O. Box	2059	.03533	.00408	.00968
W. T. Boyle & Co.	1910	.02370	.06498	.05759
	2054	.00264	.02095	.01767
	OWNER TOTAL	.02634	.08593	.07526
Donaldson Brown A/C 1	2335	.03189	.03957	.03819
	2469	.00027	.01580	.01302
	OWNER TOTAL	.03216	.05537	.05121
Donaldson Brown A/C 2	2335	.00168	.00208	.00201
	2469	.00001	.00083	.00068
	OWNER TOTAL	.00169	.00291	.00269
John R. Bryant	2059	.01766	.00204	.00484
Chevron U.S.A. Inc.	2738	.85895	1.49111	1.37789
	2739	3.57513	2.99166	3.09615
	3236	4.81994	3.56440	3.78926
	3440	4.17424	3.06316	3.26215
	OWNER TOTAL	13.42826	11.11033	11.52545
Cities Service Co.	2720	3.95617	1.01965	1.54556
Crown Central Petroleum Co.	1912	.01092	.13261	.11082
	2079	.01082	.07001	.05941
	OWNER TOTAL	.02174	.20262	.17023
Davoil, Inc.	2576	.01260	.01613	.01550
Millard Deck	2059	.08831	.01019	.02418
Elk Oil Co.	1881	-	.04169	.03422
	1982	-	.05858	.04809
	2083	-	.02307	.01894
	OWNER TOTAL	-	.12334	.10125
Exxon Co.	1903	-	.62367	.51197
	2801	3.36943	5.34834	4.99393
	3202	9.53857	10.46326	10.29765
	OWNER TOTAL	12.90800	16.43527	15.80355
Ft. Worth National Bank Trustee #1979	2335	.10069	.12497	.12062
Getty Oil Co.	3308	2.05778	1.28872	1.42645
	3328	1.51919	1.77571	1.72977
	OWNER TOTAL	3.57697	3.06443	3.15622
Great Western Drilling Co.	2576	.02287	.02929	.02814
Jack D. Hensley	2851	.00181	.00973	.00831
	2865	.00241	.00315	.00302
	OWNER TOTAL	.00422	.01288	.01133
Larry O. Hulsey	1910	.01318	.03609	.03199
	2054	.00146	.01164	.00981
	OWNER TOTAL	.01464	.04773	.04180
John M. Kelly Est.	1881	-	.04633	.03803
	1982	-	.06509	.05343
	2083	-	.02563	.02104
	OWNER TOTAL	-	.13705	.11250

PART B - CONTINUED

WORKING INTEREST OWNER	TRACT	UNIT PARTICIPATION - %		
		INITIAL	FINAL	COMPOSITE* (TENTATIVE)
Joseph J. Kelly	1881	-	.00463	.00380
	1982	-	.00651	.00534
	2083	-	.00256	.00210
OWNER TOTAL		-	.01370	.01124
Kokomo Oil Co.	2270	.00233	.00447	.00409
	2207	.00549	.00236	.00292
OWNER TOTAL		.00782	.00683	.00701
Boyd Laughlin	2851	.00091	.00486	.00415
	2865	.00120	.00158	.00151
OWNER TOTAL		.00211	.00644	.00566
T. W. Little	2270	.00404	.00774	.00708
	2207	.02742	.01181	.01461
OWNER TOTAL		.03146	.01955	.02169
Hamilton McRae	2851	.00091	.00486	.00415
	2865	.00120	.00158	.00151
OWNER TOTAL		.00211	.00644	.00566
Marathon Oil Co.	0434	.06395	.05966	.06043
	1952	-	.14278	.11721
	1953	-	.09214	.07564
	3333	2.90007	4.14916	3.92546
OWNER TOTAL		2.96402	4.44374	4.17874
Kenneth Midkiff Mobil Oil Corp.	2270	.00186	.00358	.00327
	1826	.24714	.08909	.11740
	1825	.12327	.07567	.08419
	1961	.08302	.08458	.08430
	2175	.25813	.23742	.24113
	2271	.13155	.17975	.17112
	2672	.20862	.63057	.55500
	3127	4.43564	4.57057	4.54640
	3374	1.52442	1.54153	1.53847
	3456	5.93605	5.46508	5.54943
	OWNER TOTAL		12.94784	12.87426
Davis Payne	2270	.00404	.00775	.00708
	2207	.02742	.01181	.01461
OWNER TOTAL		.03146	.01956	.02169
Pennzoil Co.	2851	.04720	.25296	.21611
	2865	.06252	.08188	.07841
OWNER TOTAL		.10972	.33484	.29452
Neville G. Penrose Est.	2469	.00056	.03326	.02740
Petro Search, Inc.	2270	.01630	.03128	.02860
Phillips Petroleum Company	0149	1.82837	1.61531	1.65347
	0546	4.91331	4.84507	4.85730
	0524	5.88423	4.14654	4.45775
	1943	.03964	.15124	.13125
	2060	.43773	.37941	.38985
	2155	.09904	.16750	.15524
	2150	.02695	.13931	.11919
	2505	.29267	.22031	.23327
	2622	3.96585	1.47884	1.92425
	2642	.15483	.09621	.10671
	2631	.58700	.57020	.57321
	2658	.24243	.33494	.31837
	2648	.44568	.54475	.52701
	2721	2.85287	2.44676	2.51949
	2864	.08098	.37561	.32284
	2944	.00902	.28466	.23529
	2923	.08595	.40873	.35092
	2947	-	.37286	.30608
	2941	.04540	.36837	.31053
	3332	2.91244	3.46424	3.36542
3366	1.48641	1.44414	1.45171	
3373	1.48621	1.61649	1.59316	
3345	1.46480	1.31282	1.34004	
3467	1.65754	2.38560	2.25521	
3568	-	.12795	.10503	
OWNER TOTAL		30.99935	29.29786	29.60259

PART B - CONTINUED

WORKING INTEREST OWNER	TRACT	UNIT PARTICIPATION - %		
		INITIAL	FINAL	COMPOSITE* (TENTATIVE)
D. E. Radtke	2270	.00404	.00774	.00708
	2207	.02742	.01181	.01461
OWNER TOTAL		.03146	.01955	.02169
C. W. Seely	2270	.00233	.00447	.00409
Shell Oil Co.	0577	.60190	.22541	.29284
	1978	-	.10264	.08426
	1911	-	.25707	.21103
	1953	-	.09214	.07564
	2109	-	.05420	.04449
	2416	-	.18642	.15303
	2717	1.59428	1.41489	1.44702
	2819	.91257	.92386	.92184
	2962	-	.27131	.22272
	2957	.20489	.46592	.41917
	2963	.91042	.66249	.70689
OWNER TOTAL	3315	4.72528	4.13554	4.24116
Sohio Petroleum Co.	2335	.06713	.08332	.08042
Norman D. Stovall, Jr.	1910	.02370	.06498	.05759
	2054	.00264	.02095	.01767
OWNER TOTAL		.02634	.08593	.07526
S. B. Street & Co.	1910	.02370	.06498	.05759
	2054	.00264	.02094	.01766
OWNER TOTAL		.02634	.08592	.07525
Texaco, Inc.	2980	-	.15587	.12795
Turnco, Inc.	1910	.02370	.06498	.05759
	2054	.00264	.02094	.01766
OWNER TOTAL		.02634	.08592	.07525
Wainoco, Inc.	2851	.00726	.03892	.03325
	2865	.00962	.01259	.01206
OWNER TOTAL		.01688	.05151	.04531
Mrs. Mary D. Walsh	2469	.00085	.04988	.04110
		100.00000	100.00000	100.00000

*Estimated values only. Actual Composite Unit Percentages will be calculated effective simultaneously with the unit becoming effective.

EXHIBIT " D "

Attached to and made a part of Unit Operating Agreement
 East Vacuum (Grayburg San Andres) Unit
 Lea County, New Mexico

**ACCOUNTING PROCEDURE
 JOINT OPERATIONS**

I. GENERAL PROVISIONS

1. Definitions

"Joint Property" shall mean the real and personal property subject to the agreement to which this Accounting Procedure is attached.

"Joint Operations" shall mean all operations necessary or proper for the development, operation, protection and maintenance of the Joint Property.

"Joint Account" shall mean the account showing the charges paid and credits received in the conduct of the Joint Operations and which are to be shared by the Parties.

"Operator" shall mean the party designated to conduct the Joint Operations.

"Non-Operators" shall mean the parties to this agreement other than the Operator.

"Parties" shall mean Operator and Non-Operators.

"First Level Supervisors" shall mean those employees whose primary function in Joint Operations is the direct supervision of other employees and/or contract labor directly employed on the Joint Property in a field operating capacity.

"Technical Employees" shall mean those employees having special and specific engineering, geological or other professional skills, and whose primary function in Joint Operations is the handling of specific operating conditions and problems for the benefit of the Joint Property.

"Personal Expenses" shall mean travel and other reasonable reimbursable expenses of Operator's employees.

"Material" shall mean personal property, equipment or supplies acquired or held for use on the Joint Property.

"Controllable Material" shall mean Material which at the time is so classified in the Material Classification Manual as most recently recommended by the Council of Petroleum Accountants Societies of North America.

2. Statement and Billings

Operator shall bill Non-Operators on or before the last day of each month for their proportionate share of the Joint Account for the preceding month. Such bills will be accompanied by statements which identify the authority for expenditure, lease or facility, and all charges and credits, summarized by appropriate classifications of investment and expense except that items of Controllable Material and unusual charges and credits shall be separately identified and fully described in detail.

3. Advances and Payments by Non-Operators

Unless otherwise provided for in the agreement, the Operator may require the Non-Operators to advance their share of estimated cash outlay for the succeeding month's operation. Operator shall adjust each monthly billing to reflect advances received from the Non-Operators.

Each Non-Operator shall pay its proportion of all bills within fifteen (15) days after receipt. If payment is not made within such time, the unpaid balance shall bear interest monthly at the rate of twelve percent (12%) per annum or the maximum contract rate permitted by the applicable usury laws in the state in which the Joint Property is located, whichever is the lesser, plus attorney's fees, court costs, and other costs in connection with the collection of unpaid amounts.

4. Adjustments

Payment of any such bills shall not prejudice the right of any Non-Operator to protest or question the correctness thereof; provided, however, all bills and statements rendered to Non-Operators by Operator during any calendar year shall conclusively be presumed to be true and correct after twenty-four (24) months following the end of any such calendar year, unless within the said twenty-four (24) month period a Non-Operator takes written exception thereto and makes claim on Operator for adjustment. No adjustment favorable to Operator shall be made unless it is made within the same prescribed period. The provisions of this paragraph shall not prevent adjustments resulting from a physical inventory of Controllable Material as provided for in Section V.

5. Audits

A. Non-Operator, upon notice in writing to Operator and all other Non-Operators, shall have the right to audit Operator's accounts and records relating to the Joint Account for any calendar year within the twenty-four (24) month period following the end of such calendar year; provided, however, the making of an audit shall not extend the time for the taking of written exception to and the adjustments of accounts as provided for in Paragraph 4 of this Section I. Where there are two or more Non-Operators, the Non-Operators shall make every reasonable effort to conduct joint or simultaneous audits in a manner which will result in a minimum of inconvenience to the Operator. Operator shall bear no portion of the Non-Operators' audit cost incurred under this paragraph unless agreed to by the Operator.

6. Approval by Non-Operators

Where an approval or other agreement of the Parties or Non-Operators is expressly required under other sections of this Accounting Procedure and if the agreement to which this Accounting Procedure is attached contains no contrary provisions in regard thereto, Operator shall notify all Non-Operators of the Operator's proposal, and the agreement or approval of a majority in interest of the Non-Operators shall be controlling on all Non-Operators.

II. DIRECT CHARGES

Operator shall charge the Joint Account with the following items:

1. Rentals and Royalties

Lease rentals and royalties paid by Operator for the Joint Operations.

2. Labor

- A. (1) Salaries and wages of Operator's field employees directly employed on the Joint Property in the conduct of Joint Operations.
- (2) Salaries of First Level Supervisors in the field.
- (3) Salaries and wages of Technical Employees directly employed on the Joint Property if such charges are excluded from the Overhead rates.
- B. Operator's cost of holiday, vacation, sickness and disability benefits and other customary allowances paid to employees whose salaries and wages are chargeable to the Joint Account under Paragraph 2A of this Section II. Such costs under this Paragraph 2B may be charged on a "when and as paid basis" or by "percentage assessment" on the amount of salaries and wages chargeable to the Joint Account under Paragraph 2A of this Section II. If percentage assessment is used, the rate shall be based on the Operator's cost experience.
- C. Expenditures or contributions made pursuant to assessments imposed by governmental authority which are applicable to Operator's costs chargeable to the Joint Account under Paragraphs 2A and 2B of this Section II.
- D. Personal Expenses of those employees whose salaries and wages are chargeable to the Joint Account under Paragraph 2A of this Section II.

3. Employee Benefits

Operator's current costs of established plans for employees' group life insurance, hospitalization, pension, retirement, stock purchase, thrift, bonus, and other benefit plans of a like nature, applicable to Operator's labor cost chargeable to the Joint Account under Paragraphs 2A and 2B of this Section II shall be Operator's actual cost not to exceed twenty per cent (20%).

4. Material

Material purchased or furnished by Operator for use on the Joint Property as provided under Section IV. Only such Material shall be purchased for or transferred to the Joint Property as may be required for immediate use and is reasonably practical and consistent with efficient and economical operations. The accumulation of surplus stocks shall be avoided.

5. Transportation

Transportation of employees and Material necessary for the Joint Operations but subject to the following limitations:

- A. If Material is moved to the Joint Property from the Operator's warehouse or other properties, no charge shall be made to the Joint Account for a distance greater than the distance from the nearest reliable supply store, recognized barge terminal, or railway receiving point where like material is normally available, unless agreed to by the Parties.
- B. If surplus Material is moved to Operator's warehouse or other storage point, no charge shall be made to the Joint Account for a distance greater than the distance to the nearest reliable supply store, recognized barge terminal, or railway receiving point unless agreed to by the Parties. No charge shall be made to the Joint Account for moving Material to other properties belonging to Operator, unless agreed to by the Parties.
- C. In the application of Subparagraphs A and B above, there shall be no equalization of actual gross trucking cost of \$200 or less excluding accessorial charges.

6. Services

The cost of contract services, equipment and utilities provided by outside sources, except services excluded by Paragraph 9 of Section II and Paragraph 1. ii of Section III. The cost of professional consultant services and contract services of technical personnel directly engaged on the Joint Property if such charges are excluded from the Overhead rates. The cost of professional consultant services or contract services of technical personnel not directly engaged on the Joint Property shall not be charged to the Joint Account unless previously agreed to by the Parties.

7. Equipment and Facilities Furnished by Operator

- A. Operator shall charge the Joint Account for use of Operator owned equipment and facilities at rates commensurate with costs of ownership and operation. Such rates shall include costs of maintenance, repairs, other operating expense, insurance, taxes, depreciation, and interest on investment not to exceed eight per cent (8%) per annum. Such rates shall not exceed average commercial rates currently prevailing in the immediate area of the Joint Property.
- B. In lieu of charges in Paragraph 7A above, Operator may elect to use average commercial rates prevailing in the immediate area of the Joint Property less 20%. For automotive equipment, Operator may elect to use rates published by the Petroleum Motor Transport Association.

8. Damages and Losses to Joint Property

All costs or expenses necessary for the repair or replacement of Joint Property made necessary because of damages or losses incurred by fire, flood, storm, theft, accident, or other cause, except those resulting from Operator's gross negligence or willful misconduct. Operator shall furnish Non-Operator written notice of damages or losses incurred as soon as practicable after a report thereof has been received by Operator.

9. Legal Expense

Expense of handling, investigating and settling litigation or claims, discharging of liens, payment of judgments and amounts paid for settlement of claims incurred in or resulting from operations under the agreement or necessary to protect or recover the Joint Property, except that no charge for services of Operator's legal staff or fees or expense of outside attorneys shall be made unless previously agreed to by the Parties. All other legal expense is considered to be covered by the overhead provisions of Section III unless otherwise agreed to by the Parties, except as provided in Section I, Paragraph 3.

10. Taxes

All taxes of every kind and nature assessed or levied upon or in connection with the Joint Property, the operation thereof, or the production therefrom, and which taxes have been paid by the Operator for the benefit of the Parties. ****SEE ADDENDUM PAGE 5****

11. Insurance

Net premiums paid for insurance required to be carried for the Joint Operations for the protection of the Parties. In the event Joint Operations are conducted in a state in which Operator may act as self-insurer for Workmen's Compensation and/or Employers Liability under the respective state's laws, Operator may, at its election, include the risk under its self-insurance program and in that event, Operator shall include a charge at Operator's cost not to exceed manual rates.

12. Other Expenditures

Any other expenditure not covered or dealt with in the foregoing provisions of this Section II, or in Section III, and which is incurred by the Operator in the necessary and proper conduct of the Joint Operations.

III. OVERHEAD**1. Overhead - Drilling and Producing Operations**

i. As compensation for administrative, supervision, office services and warehousing costs, Operator shall charge drilling and producing operations on either:

- () Fixed Rate Basis, Paragraph 1A, or
 () Percentage Basis, Paragraph 1B.

Unless otherwise agreed to by the Parties, such charge shall be in lieu of costs and expenses of all offices and salaries or wages plus applicable burdens and expenses of all personnel, except those directly chargeable under Paragraph 2A, Section II. The cost and expense of services from outside sources in connection with matters of taxation, traffic, accounting or matters before or involving governmental agencies shall be considered as included in the Overhead rates provided for in the above selected Paragraph of this Section III unless such cost and expense are agreed to by the Parties as a direct charge to the Joint Account.

ii. The salaries, wages and Personal Expenses of Technical Employees and/or the cost of professional consultant services and contract services of technical personnel directly employed on the Joint Property shall () shall not () be covered by the Overhead rates.

A. Overhead - Fixed Rate Basis

(1) Operator shall charge the Joint Account at the following rates per well per month:

Drilling Well Rate \$ 1,580
 Producing Well Rate \$ 182

(2) Application of Overhead - Fixed Rate Basis shall be as follows:

(a) Drilling Well Rate

- [1] Charges for onshore drilling wells shall begin on the date the well is spudded and terminate on the date the drilling or completion rig is released, whichever is later, except that no charge shall be made during suspension of drilling operations for fifteen (15) or more consecutive days.
- [2] Charges for offshore drilling wells shall begin on the date when drilling or completion equipment arrives on location and terminate on the date the drilling or completion equipment moves off location or rig is released, whichever occurs first, except that no charge shall be made during suspension of drilling operations for fifteen (15) or more consecutive days.
- [3] Charges for wells undergoing any type of workover or recompletion for a period of five (5) consecutive days or more shall be made at the drilling well rate. Such charges shall be applied for the period from date workover operations, with rig, commence through date of rig release, except that no charge shall be made during suspension of operations for fifteen (15) or more consecutive days.

(b) Producing Well Rates

- [1] An active well either produced or injected into for any portion of the month shall be considered as a one-well charge for the entire month.
- [2] Each active completion in a multi-completed well in which production is not commingled down hole shall be considered as a one-well charge providing each completion is considered a separate well by the governing regulatory authority.
- [3] An inactive gas well shut in because of overproduction or failure of purchaser to take the production shall be considered as a one-well charge providing the gas well is directly connected to a permanent sales outlet.
- [4] A one-well charge may be made for the month in which plugging and abandonment operations are completed on any well.
- [5] All other inactive wells (including but not limited to inactive wells covered by unit allowable, lease allowable, transferred allowable, etc.) shall not qualify for an overhead charge.

(3) The well rates shall be adjusted as of the first day of April each year following the effective date of the agreement to which this Accounting Procedure is attached. The adjustment shall be computed by multiplying the rate currently in use by the percentage increase or decrease in the average weekly earnings of Crude Petroleum and Gas Production Workers for the last calendar year compared to the calendar year preceding as shown by the index of average weekly earnings of Crude Petroleum and Gas Fields Production Workers as published by the United States Department of Labor, Bureau of Labor Statistics, or the equivalent Canadian index as published by Statistics Canada, as applicable. The adjusted rates shall be the rates currently in use, plus or minus the computed adjustment.

B. Overhead - Percentage Basis

(1) Operator shall charge the Joint Account at the following rates:

(a) Development

_____ Percent (%) of the cost of Development of the Joint Property exclusive of costs provided under Paragraph 9 of Section II and all salvage credits.

(b) Operating

_____ Percent (%) of the cost of Operating the Joint Property exclusive of costs provided under Paragraphs 1 and 9 of Section II, all salvage credits, the value of injected substances purchased for secondary recovery and all taxes and assessments which are levied, assessed and paid upon the mineral interest in and to the Joint Property.

(2) Application of Overhead - Percentage Basis shall be as follows:

For the purpose of determining charges on a percentage basis under Paragraph 1B of this Section III, development shall include all costs in connection with drilling, redrilling, deepening or any remedial operations on any or all wells involving the use of drilling crew and equipment; also, preliminary expenditures necessary in preparation for drilling and expenditures incurred in abandoning when the well is not completed as a producer, and original cost of construction or installation of fixed assets, the expansion of fixed assets and any other project clearly discernible as a fixed asset, except Major Construction as defined in Paragraph 2 of this Section III. All other costs shall be considered as Operating.

2. Overhead - Major Construction

To compensate Operator for overhead costs incurred in the construction and installation of fixed assets, the expansion of fixed assets, and any other project clearly discernible as a fixed asset required for the development and operation of the Joint Property, Operator shall either negotiate a rate prior to the beginning of construction, or shall charge the Joint Account for Overhead based on the following rates for any Major Construction project in excess of \$ 25,000.00 _____:

A. _____ % of total costs if such costs are more than \$25,000 _____ but less than \$100,000 _____; plus

B. _____ % of total costs in excess of \$100,000 _____ but less than \$1,000,000; plus

C. _____ % of total costs in excess of \$1,000,000.

Total cost shall mean the gross cost of any one project. For the purpose of this paragraph, the component parts of a single project shall not be treated separately and the cost of drilling and workover wells shall be excluded.

3. Amendment of Rates

The Overhead rates provided for in this Section III may be amended from time to time only by mutual agreement between the Parties hereto if, in practice, the rates are found to be insufficient or excessive.

IV. PRICING OF JOINT ACCOUNT MATERIAL PURCHASES, TRANSFERS AND DISPOSITIONS

Operator is responsible for Joint Account Material and shall make proper and timely charges and credits for all material movements affecting the Joint Property. Operator shall provide all Material for use on the Joint Property; however, at Operator's option, such Material may be supplied by the Non-Operator. Operator shall make timely disposition of idle and/or surplus Material, such disposal being made either through sale to Operator or Non-Operator, division in kind, or sale to outsiders. Operator may purchase, but shall be under no obligation to purchase, interest of Non-Operators in surplus condition A or B Material. The disposal of surplus Controllable Material not purchased by the Operator shall be agreed to by the Parties.

1. Purchases

Material purchased shall be charged at the price paid by Operator after deduction of all discounts received. In case of Material found to be defective or returned to vendor for any other reason, credit shall be passed to the Joint Account when adjustment has been received by the Operator.

2. Transfers and Dispositions

Material furnished to the Joint Property and Material transferred from the Joint Property or disposed of by the Operator, unless otherwise agreed to by the Parties, shall be priced on the following bases exclusive of cash discounts:

A. New Material (Condition A)

(1) Tubular goods, except line pipe, shall be priced at the current new price in effect on date of movement on a maximum carload or barge load weight basis, regardless of quantity transferred, equalized to the lowest published price f.o.b. railway receiving point or recognized barge terminal nearest the Joint Property where such Material is normally available.

(2) Line Pipe

(a) Movement of less than 30,000 pounds shall be priced at the current new price, in effect at date of movement, as listed by a reliable supply store nearest the Joint Property where such Material is normally available.

(b) Movement of 30,000 pounds or more shall be priced under provisions of tubular goods pricing in Paragraph 2A (1) of this Section IV.

(3) Other Material shall be priced at the current new price, in effect at date of movement, as listed by a reliable supply store or f.o.b. railway receiving point nearest the Joint Property where such Material is normally available.

B. Good Used Material (Condition B)

Material in sound and serviceable condition and suitable for reuse without reconditioning:

(1) Material moved to the Joint Property

(a) At seventy-five percent (75%) of current new price, as determined by Paragraph 2A of this Section IV.

(2) Material moved from the Joint Property

(a) At seventy-five percent (75%) of current new price, as determined by Paragraph 2A of this Section IV, if Material was originally charged to the Joint Account as new Material, or

(b) at sixty-five percent (65%) of current new price, as determined by Paragraph 2A of this Section IV, if Material was originally charged to the Joint Account as good used Material at seventy-five percent (75%) of current new price.

The cost of reconditioning, if any, shall be absorbed by the transferring property.

C. Other Used Material (Condition C and D)

(1) Condition C

Material which is not in sound and serviceable condition and not suitable for its original function until after reconditioning shall be priced at fifty percent (50%) of current new price as determined by Paragraph 2A of this Section IV. The cost of reconditioning shall be charged to the receiving property, provided Condition C value plus cost of reconditioning does not exceed Condition B value.

(2) Condition D

All other Material, including junk, shall be priced at a value commensurate with its use or at prevailing prices. Material no longer suitable for its original purpose but usable for some other purpose, shall be priced on a basis comparable with that of items normally used for such other purpose. Operator may dispose of Condition D Material under procedures normally utilized by the Operator without prior approval of Non-Operators.

D. Obsolete Material

Material which is serviceable and usable for its original function but condition and/or value of such Material is not equivalent to that which would justify a price as provided above may be specially priced as agreed to by the Parties. Such price should result in the Joint Account being charged with the value of the service rendered by such Material.

E. Pricing Conditions

(1) Loading and unloading costs may be charged to the Joint Account at the rate of fifteen cents (15¢) per hundred weight on all tubular goods movements, in lieu of loading and unloading costs sustained, when actual hauling cost of such tubular goods are equalized under provisions of Paragraph 5 of Section II.

(2) Material involving erection costs shall be charged at applicable percentage of the current knocked-down price of new Material.

3. Premium Prices

Whenever Material is not readily obtainable at published or listed prices because of national emergencies, strikes or other unusual causes over which the Operator has no control, the Operator may charge the Joint Account for the required Material at the Operator's actual cost incurred in providing such Material, in making it suitable for use, and in moving it to the Joint Property; provided notice in writing is furnished to Non-Operators of the proposed charge prior to billing Non-Operators for such Material. Each Non-Operator shall have the right, by so electing and notifying Operator within ten days after receiving notice from Operator, to furnish in kind all or part of his share of such Material suitable for use and acceptable to Operator.

4. Warranty of Material Furnished by Operator

Operator does not warrant the Material furnished. In case of defective Material, credit shall not be passed to the Joint Account until adjustment has been received by Operator from the manufacturers or their agents.

V. INVENTORIES

The Operator shall maintain detailed records of Controllable Material.

1. Periodic Inventories, Notice and Representation

At reasonable intervals, Inventories shall be taken by Operator of the Joint Account Controllable Material. Written notice of intention to take inventory shall be given by Operator at least thirty (30) days before any inventory is to begin so that Non-Operators may be represented when any inventory is taken. Failure of Non-Operators to be represented at an inventory shall bind Non-Operators to accept the inventory taken by Operator.

2. Reconciliation and Adjustment of Inventories

Reconciliation of a physical inventory with the Joint Account shall be made, and a list of overages and shortages shall be furnished to the Non-Operators within six months following the taking of the inventory. Inventory adjustments shall be made by Operator with the Joint Account for overages and shortages, but Operator shall be held accountable only for shortages due to lack of reasonable diligence.

3. Special Inventories

Special Inventories may be taken whenever there is any sale or change of interest in the Joint Property. It shall be the duty of the party selling to notify all other Parties as quickly as possible after the transfer of interest takes place. In such cases, both the seller and the purchaser shall be governed by such inventory.

4. Expense of Conducting Periodic Inventories

The expense of conducting periodic Inventories shall not be charged to the Joint Account unless agreed to by the Parties.

ADDENDUM PAGE NO. 3

II - 10 Taxes

If the ad valorem taxes are based in whole or in part upon separate valuations of each party's working interest, then notwithstanding anything to the contrary herein, charges to the joint account shall be made and paid by the parties hereto in accordance with the tax value generated by each party's working interest.

EXHIBIT "E"

ATTACHED TO AND MADE A PART OF

UNIT OPERATING AGREEMENT

EAST VACUUM UNIT

LEA COUNTY, NEW MEXICO

DATED: SEPTEMBER 1, 1978

INSURANCE

Operator, at all times while conducting operations hereunder, shall purchase or provide for the protection and benefit of the parties hereto protection comparable to that afforded under standard form policies of insurance for:

- (a) Workmen's compensation insurance to comply with the applicable federal and state workmen's compensation laws.
- (b) General public liability insurance with bodily injury limits of \$300,000 any one accident and property damage limit of \$100,000 any one accident.
- (c) Automobile public liability insurance with bodily injury limits of \$100,000 any one person, \$300,000 any one accident and property damage limit of \$100,000 any one accident.

Operator shall charge to the joint account an amount equal to the premium applicable to the protection provided.

All losses not covered by standard form policies of insurance for the hazards set out above shall be borne by the parties hereto as their interests appear at the time of any loss.

JKB:ls

EXHIBIT "F"
TO UNIT OPERATING AGREEMENT
EAST VACUUM GRAYBURG-SAN ANDRES UNIT
LEA COUNTY, NEW MEXICO

I. EQUAL EMPLOYMENT OPPORTUNITY PROVISION

During the performance of this agreement, Operator agrees as follows:

- (1) Operator will not discriminate against any employee or applicant for employment because of race, color, religion, national origin or sex. Operator will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard of their race, color, religion, national origin or sex. Such action shall include, but not be limited to the following. Employment, upgrading, demotion, or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Operator agrees to post in conspicuous places, available to employees and applicants for employment notices to be provided for the contracting officer setting forth the provision of this non-discrimination clause.
- (2) Operator will, in all solicitations or advertisements for employees placed in or on behalf of the Operator, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin or sex.
- (3) Operator will send to each labor unit or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided by the agency contracting officer, advising the labor union or workers' representative of Operator's commitments under Section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (4) Operator will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (5) Operator will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (6) In the event of Operator's non-compliance with the non-discrimination clauses of this agreement or with any of such rules, regulations, or orders, Operator, or its subcontractor, may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulations, or order of the Secretary of Labor, or as otherwise provided by law.
- (7) Operator will include the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of the Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. Operator will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions including sanctions for non-compliance; provided

however, that in the event Operator becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, Operator may request the United States to enter into such litigation to protect the interests of the United States.

Operator acknowledges that it may be required to file Standard Form 100 (EEO-1) promulgated jointly by the Office of Federal Contract Compliance, the Equal Employment Opportunity Commission and Plans for Progress with Joint Reporting Committee, Federal Depot, Jeffersonville, Indiana, within thirty (30) days of the date of contract award if such report has not been filed for the current year and otherwise comply with or file such other compliance reports as may be required under Executive Order 11246, as amended and Rules and Regulations adopted thereunder.

Operator further acknowledges that it may be required to develop a written affirmative action compliance program as required by the Rules and Regulations approved by the Secretary of Labor under authority of Executive Order 11246 and supply Non-Operators with a copy of such program if they so request.

II. CERTIFICATION OF NON-SEGREGATED FACILITIES

- (1) Operator assures Non-Operators that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. For this purpose, it is understood that the phrase "segregated facilities" includes facilities which are in fact segregated on a basis of race, color, religion or national origin, because of habit, local custom or otherwise. It is further understood and agreed that maintaining or providing segregated facilities for its employees or permitting its employees to perform their services at any location under its control where segregated facilities are maintained is a violation of the equal opportunity clause required by Executive Order 11246 of September 24, 1955.
- (2) Operator further understands and agrees that a breach of the assurance herein contained subjects it to the provisions of the Order at 41 CFR Chapter 60 of the Secretary of Labor dated May 21, 1968, and the provisions of the equal opportunity clause enumerated in contracts between the United States of America and Non-Operators.
- (3) Whoever knowingly and willfully makes any false, fictitious or fraudulent representation may be liable to criminal prosecution under 18 U.S.C. 1001.

III. OCCUPATIONAL SAFETY AND HEALTH ACT

Operator will observe and comply with all safety and health standards promulgated by the Secretary of Labor under Section 107 of the Contract Work Hours and Standards Act, published in 29 CFR Part 1518 and adopted by the Secretary of Labor as occupational safety and health standards under the Williams-Steiger Occupational Safety and Health Act of 1970. Such safety and health standards shall apply to all subcontractors and their employees as well as to the prime contractor and its employees.

IV. VETERAN'S PREFERENCE

Operator agrees to comply with the following insofar as contracts it lets for an amount of \$10,000 or more or which will generate 400 or more man-days of employment (each man-day consisting of any day in which an employee performs more than one hour of work) and further agrees to include the following provision in contracts with Contractors and Subcontractors.

"CONTRACTOR AND SUBCONTRACTOR LISTING REQUIREMENT

- (1) As provided by 41 CFR 50-250, the contractor agrees that all employment openings of the contractor which exist at the time of the execution of this contract and those which occur during the performance of this contract, including those not generated by the contract and including those occurring at an establishment of the contractor other than the one wherein the contract is being performed but excluding those of independently operated corporate affiliates, shall, to the maximum extent feasible, be offered for listing at an appropriate local office of the State employment service system wherein the opening occurs and to provide such periodic reports to such local office regarding employment openings and hires as may be required. Provided, that this provision shall not apply to openings which the contractor fills from within the contractor's organization or are filled pursuant to a customary and traditional employer-union hiring arrangement and that the listing of employment openings shall involve only the normal obligations which attach to the placing of job orders.
- (2) The contractor agrees to place the above provision in any subcontract directly under this contract."

V, HANDICAPPED WORKERS

The regulations issued under the Rehabilitation Act of 1973 in Title 41, Chapter 60, Part 60-741 of the Code of Federal Regulations are incorporated herein by reference unless this Agreement is exempted by Federal law, rules, regulations or orders of the Secretary of Labor issued pursuant to said Rehabilitation Act of 1973.

VI. CERTIFICATION OF COMPLIANCE WITH ENVIRONMENTAL LAWS

Operator agrees to comply with the Clean Air Act (42 U.S.C. 1857) and the Federal Water Pollution Control Act (33 U.S.C. 1251) when conducting operations involving nonexempt contracts. In all nonexempt contracts with subcontractors, Operator shall require:

- (1) No facility to be utilized by Subcontractor in the performance of this contract with Operator is listed on the Environmental Protection Agency (EPA) list of Violating Facilities. See Executive Order No. 11738 of September 12, 1973, and 40 CFR 15.20.
- (2) Prompt written notification shall be given by Subcontractor to Operator of any communication indicating that any such facility is under consideration to be included on the EPA List of Violating Facilities.
- (3) Subcontractor shall comply with all requirements of Section 114 of the Clean Air Act (42 U.S.C. 1857) and Section 308 of the Federal Water Pollution Control Act (33 U.S.C. 1251), relating to inspection, monitoring, entry, reports, and information, as well as all other requirements specified in these Sections, and all regulations and guidelines issued thereunder.
- (4) The foregoing criteria and requirements shall be included in all of Subcontractor's nonexempt subcontracts, and Subcontractor shall take such action as the Government may direct as a means of enforcing such provisions. See 40 CFR 15.4 & 5.

EXHIBIT _____
EAST VACUUM GRAYBURG-SAN ANDRES UNIT
LEA COUNTY, NEW MEXICO
PROPOSED EXHIBIT "G" FOR UNIT OPERATING AGREEMENT

BUSINESS ETHICS POLICY COMPLIANCE:

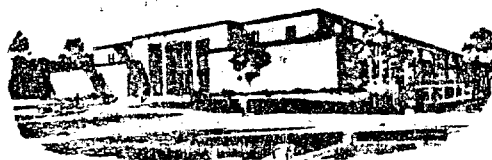
1. Operator agrees to comply with all laws and lawful regulations applicable to any activities carried out in the name of or on behalf of Non-operators under the provisions of this agreement and/or any amendments to it.
2. Operator agrees that all financial settlements, billings and reports rendered to Non-operators as provided for in this agreement and/or any amendments to it, will, to the best of its knowledge and belief, reflect properly the facts about all activities and transactions handled for the account of Non-operators, which data may be relied upon as being complete and accurate in any further recording and reporting made by Non-operators for whatever purpose.
3. Operator agrees to notify Non-operators promptly upon discovery of any instance where the Operator fails to comply with provision (1) above or where Operator has reason to believe data covered by (2) above is no longer accurate and complete.

*addendum to
unit operating agreement*

BEFORE WILLIAM R. POTTER
OIL CONSERVATION DIVISION
<i>Phillips</i> EXHIBIT NO. <u>13</u>
CASE NO: <u>6366</u>

AUG 4 1978

State of New Mexico



Commissioner of Public Lands

July 31, 1978

PHIL R. LUCERO
COMMISSIONER

P. O. BOX 1148
SANTA FE, NEW MEXICO 87501

Phillips Petroleum Company
P. O. Box 1967
Houston, Texas 77001

Re: Proposed-East Vacuum Grayburg-San
Andres Unit
Lea County, New Mexico

ATTENTION: Mr. J. E. Chrisman

Gentlemen:

We have reviewed the unexecuted copy of unit agreement, Exhibits "A" and "B", for the proposed East Vacuum Grayburg-San Andres Unit, Lea County, New Mexico. The form of agreement meets the requirements of the Commissioner of Public Lands, therefore, your agreement has been approved as to form and content.

As agreed by our telephone conversation of this date, Exhibit "B" should reflect all tracts in numerical order and your leases listed in chronological order. All corrections on Exhibit "B" are outlined in red in the enclosed xerox copy of Exhibit "B".

When submitting your agreement for final approval, the following are required by this office.

1. Application for final approval stating Tracts committed and Tracts not committed.
2. Two executed copies of Unit Agreement-One must contain original signatures, together with two copies of Exhibits "A" and "B".
3. One executed copy of Operating Agreement.
4. Two sets of all ratifications from Lessees of Record and Working Interest owners.
5. Order of the New Mexico Oil Conservation Commission.

EXHIBIT 15


Phillips Petroleum Company
P. O. Box 1967
Houston, Texas 77001
July 31, 1978
Page 2.

6. Filing fee in the amount of Two Hundred (\$200.00) Dollars.
7. Re-designation of well names and numbers.
8. Initial Plan of Operation

If we may be of further help please do not hesitate to call on us.

Very truly yours,

PHIL R. LUCERO
COMMISSIONER OF PUBLIC LANDS

BY: 
RAY D. GRAHAM, Director
Oil and Gas Division

PRL/RDG/s
encl.

September 26, 1978

Re: Proposed East Vacuum Grayburg-
San Andres Unit
Lea County, New Mexico

Mr. Ray D. Graham, Director Oil & Gas Div.
Commission of Public Lands
State of New Mexico
P. O. Box 1148
Santa Fe, N. M. 87501

Dear Mr. Graham:

Mr. Kellahin has been asked to prepare our application to the Division of Conservation for creation of the East Vacuum Grayburg San Andres Unit. We hope to have the hearing on October 25. The Agreements will be identical with the copies furnished you except for a revised acreage total of 7,025.30 on p. 2 of the Unit Agreement, revised Exhibits A, B, and C and revised Article 18 of the Unit Agreement. Copies of these revisions are enclosed. Article 18 was revised to get rid of any confusion which may have resulted among the Working Interest Owners from the DOE's recent stripper regulation revision.

I very much appreciate the courtesy extended me when I was in your office on July 24 and your helpfulness in getting all the data included in Exhibit "B" correctly stated. I believe the order now agrees with your preference, and retaining the section number as the first two digits of the Tract number will be helpful in locating the Tracts.

Unless you feel that acknowledgment of the enclosed revisions is necessary, your July 31 letter will serve our purposes.

Yours very truly,

PHILLIPS PETROLEUM COMPANY
ORIGINAL SIGNED BY
J. E. CHRISMAN

J. E. Chrisman

JEC:mb
Encl.

cc: Mr. Jason Kellahin

EXHIBIT 7

EAST VACUUM GRAYBURG-SAN ANDRES UNIT
 DETERMINATION OF UNIT PARTICIPATION
 OWNED BY OVERRIDING ROYALTY INTEREST OWNERS

TRACT NO.	ORRI & OWNER	TRACT PART. %		UNIT PART. - %	
		INITIAL	FINAL	INITIAL	FINAL
1904	.0625 Exxon	.06411	.58090	.00401	.03631
2207	.075 Amerada Hess	.08775	.03779	.00658	.00283
1910	.125 Shell	.13168	.36099	.01646	.04512
1912	.01 Harold E. Jones	.01092	.13261	.00011	.00133
	.0625B Shell			.00068	.00829
2913	.125 Shell	1.75146	2.00209	.21893	.25026
2614	.125 Shell	.51529	.42296	.06441	.05287
2418	.125 Shell	.13176	.30137	.01647	.03767
2335	.0625 Marathon	.20139	.24994	.01259	.01562
2851	.0546875 Phillips	.05809	.31133	.00318	.01703
2054	.03125 Marathon	.01465	.11637	.00046	.00364
2957	.0625 Fredrick H. Burgland Est.	.20489	.46592	.01281	.02912
2059	.0546875 Phillips	.14130	.01631	.00773	.00089
2865	.0546875 Phillips	.07695	.10078	.00421	.00551
2270	.125 Mobil	.03727	.07150	.00466	.00894
2079	.01 Harold E. Jones	.01082	.07001	.00011	.00070
	.0625B Shell			.00068	.00438
1881	.075 John M.Kelly Est.	-	.09265	-	.00695
1982	.075 John M.Kelly Est.	-	.13018	-	.00976
2083	.075 John M.Kelly Est.	-	.05126	-	.00384
				<u>.37408</u>	<u>.54106</u>
	Plus Basic Royalty			<u>12.5</u>	<u>12.5</u>
	Total Royalty			12.87408	13.04106
	W. I. Ownership			87.12592	86.95894
	% of Total Royalty Owned by State			97.09432	95.85110

Handwritten marks:
 S.
 25.

Unit Participation - %

PART B

WORKING INTEREST OWNER	TRACT	UNIT PARTICIPATION - %		
		INITIAL	FINAL	COMPOSITE* (TENTATIVE)
Amerada Hess Corp.	2206	-	.08543	.07013
Amoco Production Co.	2576	.03547	.04542	.04364
Arapaho Petroleum	2270	.00233	.00447	.00409
Atlantic Richfield Co.	1904	.06411	.58090	.48835
	2230	.34300	.30083	.30838
	2437	.87720	.16590	.29329
	2418	.13176	.30137	.27099
	2614	.51529	.42296	.43950
	2913	1.75146	2.00209	1.95720
	3229	5.74378	7.01489	6.78724
OWNER TOTAL		9.42660	10.78894	10.54495
H. M. Bettis, Inc.	1910	.02370	.06498	.05759
	2054	.00263	.02095	.01767
OWNER TOTAL		.02633	.08593	.07526
L. O. Box	2059	.03533	.00408	.00963
W. T. Boyle & Co.	1910	.02370	.06498	.05759
	2054	.00264	.02095	.01767
OWNER TOTAL		.02634	.08593	.07526
Donaldson Brown A/C 1	2335	.03189	.03957	.03819
	2469	.00027	.01580	.01302
OWNER TOTAL		.03216	.05537	.05121
Donaldson Brown A/C 2	2335	.00168	.00208	.00201
	2469	.00001	.00083	.00068
OWNER TOTAL		.00169	.00291	.00269
John R. Bryant	2059	.01766	.00204	.00484
Chevron U.S.A. Inc.	2738	.85895	1.49111	1.37789
	2739	3.57513	2.99166	3.09515
	3236	4.81994	3.56440	3.78926
	3440	4.17424	3.06316	3.26215
OWNER TOTAL		13.42826	11.11033	11.52545
Cities Service Co.	2720	3.95617	1.01965	1.54556
Crown Central Petroleum Co.	1912	.01092	.13261	.11082
	2079	.01082	.07001	.05941
OWNER TOTAL		.02174	.20262	.17023
Davoil, Inc.	2576	.01260	.01613	.01550
Millard Deck	2059	.08831	.01019	.02418
Elk Oil Co.	1881	-	.04169	.03422
	1982	-	.05858	.04809
	2033	-	.02307	.01894
OWNER TOTAL		-	.12334	.10125
Exxon Co.	1903	-	.62367	.51197
	2801	3.36943	5.34834	4.99393
	3202	9.53857	10.46326	10.29765
OWNER TOTAL		12.90800	16.43527	15.80355
Ft. Worth National Bank Trustee #1979	2335	.10069	.12497	.12062
Getty Oil Co.	3308	2.05778	1.28872	1.42645
	3328	1.51919	1.77571	1.72977
OWNER TOTAL		3.57697	3.06443	3.15622
Great Western Drilling Co.	2576	.02287	.02929	.02814
Jack D. Hensley	2851	.00181	.00973	.00831
	2865	.00241	.00315	.00302
OWNER TOTAL		.00422	.01288	.01133
Larry O. Hulsey	1910	.01318	.03609	.03199
	2054	.00146	.01164	.00981
OWNER TOTAL		.01464	.04773	.04180
John M. Kelly Est.	1881	-	.04633	.03803
	1982	-	.06509	.05343
	2083	-	.02563	.02104
OWNER TOTAL		-	.13705	.11250

EAST VACUUM GRAYBURG-SAN ANDRES UNIT

WORKING INTEREST APPROVAL

AS OF 10-24-78

EXHIBIT

PART B - CONTINUED

WORKING INTEREST OWNER	TRACT	UNIT PARTICIPATION - %		
		INITIAL	FINAL	COMPOSITE* (TENTATIVE)
Joseph J. Kelly	1881	-	.00463	.00380
	1982	-	.00651	.00534
	2083	-	.00256	.00210
OWNER TOTAL		-	.01370	.01124
Kokomo Oil Co.	2270	.00233	.00447	.00409
	2207	.00549	.00236	.00292
OWNER TOTAL		.00782	.00683	.00701
Boyd Laughlin	2851	.00091	.00486	.00415
	2865	.00120	.00158	.00151
OWNER TOTAL		.00211	.00644	.00566
T. W. Little	2270	.00404	.00774	.00708
	2207	.02742	.01181	.01461
OWNER TOTAL		.03146	.01955	.02169
Hamilton McRae	2851	.00091	.00486	.00415
	2865	.00120	.00158	.00151
OWNER TOTAL		.00211	.00644	.00566
Marathon Oil Co.	0434	.06395	.05966	.06043
	1952	-	.14278	.11721
	1953	-	.09214	.07564
	3333	2.90007	4.14916	3.92546
	OWNER TOTAL	2.96402	4.44374	4.17874
Kenneth Midkiff	2270	.00186	.00358	.00327
Mobil Oil Corp.	1826	.24714	.08909	.11740
	1825	.12327	.07567	.08419
	1961	.08302	.08458	.08430
	2175	.25813	.23742	.24113
	2271	.13155	.17975	.17112
	2672	.20862	.63057	.55500
	3127	4.43564	4.57057	4.54640
	3374	1.52442	1.54153	1.53847
	3456	5.93605	5.46508	5.54943
	OWNER TOTAL	12.94784	12.87426	12.88744
Davis Payne	2270	.00404	.00775	.00708
	2207	.02742	.01181	.01461
OWNER TOTAL		.03146	.01956	.02169
Pennzoil Co.	2851	.04720	.25296	.21611
	2865	.06252	.08188	.07841
OWNER TOTAL		.10972	.33484	.29452
Neville G. Penrose Est.	2469	.00056	.03326	.02740
Petro Search, Inc.	2270	.01630	.03128	.02860
Phillips Petroleum Company	0149	1.82837	1.61531	1.65347
	0546	4.91331	4.84507	4.85730
	0524	5.88423	4.14654	4.45775
	1943	.03964	.15124	.13125
	2060	.43773	.37941	.33985
	2155	.09904	.16750	.15524
	2150	.02695	.13931	.11919
	2505	.29267	.22031	.23327
	2622	3.96585	1.47884	1.92425
	2642	.15483	.09621	.10671
	2631	.58700	.57020	.57321
	2658	.24243	.33494	.31837
	2648	.44568	.54475	.52701
	2721	2.85287	2.44676	2.51949
	2864	.08098	.37561	.32284
	2944	.00902	.28466	.23529
	2923	.08595	.40873	.35092
	2947	-	.37286	.30608
	2941	.04540	.36837	.31053
	3332	2.91244	3.46424	3.36542
	3366	1.48641	1.44414	1.45171
	3373	1.48621	1.61649	1.59316
	3345	1.46480	1.31282	1.34004
3467	1.65754	2.38560	2.25521	
3568	-	.12795	.10503	
OWNER TOTAL	30.99935	29.29786	29.60259	

PART B - CONTINUED

WORKING INTEREST OWNER	TRACT	UNIT PARTICIPATION - %		
		INITIAL	FINAL	COMPOSITE* (TENTATIVE)
D. E. Radtke	2270	.00404	.00774	.00708
	2207	.02742	.01181	.01461
OWNER TOTAL		.03146	.01955	.02169
C. W. Seely	2270	.00233	.00447	.00409
Shell Oil Co.	0577	.60190	.22541	.29234
	1978	-	.10264	.08426
	1911	-	.25707	.21103
	1953	-	.09214	.07564
	2109	-	.05420	.04449
	2416	-	.18642	.15303
	2717	1.59428	1.41489	1.44702
	2819	.91257	.92386	.92184
	2962	-	.27131	.22272
	2957	.20489	.46592	.41917
	2963	.91042	.66249	.70639
OWNER TOTAL	3315	4.72528	4.13554	4.24116
Sohio Petroleum Co.	2335	.06713	.08332	.08042
Norman D. Stovall, Jr.	1910	.02370	.06498	.05759
	2054	.00264	.02095	.01767
OWNER TOTAL		.02634	.08593	.07526
S. B. Street & Co.	1910	.02370	.06498	.05759
	2054	.00264	.02094	.01766
OWNER TOTAL		.02634	.08592	.07525
Texaco, Inc.	2980	-	.15587	.12795
Turnco, Inc.	1910	.02370	.06498	.05759
	2054	.00264	.02094	.01766
OWNER TOTAL		.02634	.08592	.07525
Wainoco, Inc.	2851	.00726	.03892	.03325
	2865	.00962	.01259	.01206
OWNER TOTAL		.01688	.05151	.04531
Mrs. Mary D. Walsh	2469	.00085	.04988	.04110
		100.00000	100.00000	100.00000

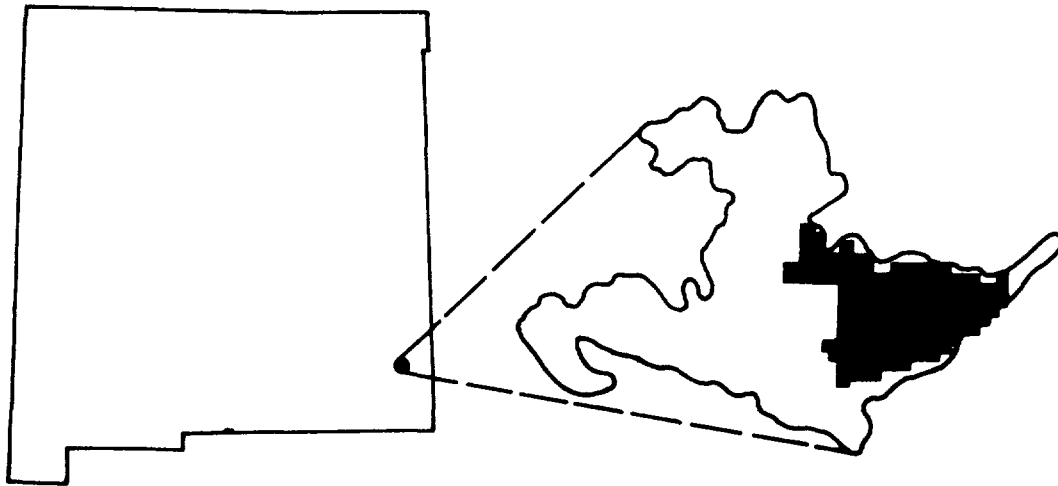
10-24-78 TOTAL W.I.O. SIGN UP 4/25/78 42,452.7

*Estimated values only. Actual Composite Unit Percentages will be calculated effective simultaneously with the unit becoming effective.

EAST VACUUM GRAYBURG

SAN ANDRES UNIT

LEA COUNTY, NEW MEXICO



ENGINEERING - GEOLOGICAL REPORT

NOVEMBER, 1977

EAST VACUUM GRAYBURG-SAN ANDRES UNIT, PROPOSED

LEA COUNTY, NEW MEXICO

ENGINEERING-GEOLOGICAL COMMITTEE REPORT

NOVEMBER, 1977

BEFORE EXAMINER MEETING
OIL COMPLETION PERMITS ON
<i>Phillips</i> ERICT C. 6
CASE NO. <i>6366</i>

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* * * * *

INTRODUCTION

The purpose of this report is to present the findings of the Engineering-Geological Committee concerning the charges to it by the Working Interest Owners of the East Vacuum Grayburg-San Andres Unit, proposed, Lea County, New Mexico. For location, see Figure 1. The charges are listed below:

1. Construct an acceptable base map. (All unit maps in this report use the accepted base map.)
2. Define the vertical interval to be unitized in one or more representative well logs. (The recommended interval to be unitized is that interval of the Grayburg-San Andres correlative to the formations that exist in Exxon's New Mexico State "K" No. 19 from a depth of 4,050 feet to 5,050 feet RKB.)
3. Define the East Vacuum Grayburg-San Andres Unit area in cooperation with the Central Grayburg-San Andres Unit area being expedited by Texaco. (This area is shown on all unit maps in this report.)
4. Tabulate the following parameters by Tract and by Working Interest Owners:
 - A. Number of well bore completions and well bores available for recompletion.
 - B. Cumulative oil production.
 - C. Remaining primary reserves, taking into consideration the effect, if any, of natural water encroachment.
 - D. Ultimate primary reserves.
 - E. Current production for the most representative period.
 - F. Floodable acre-feet by tract and by zone, if possible.
 - G. Net hydrocarbon pore volume by tract and by zone, if possible.
 - H. Secondary reserves by tract and by zone, if possible.

- I. Original oil-in-place by tract and by zone, if possible.
 - J. Any other parameters considered to be appropriate by the Engineering-Geological Committee. The committee added surface acres and net acre-feet to the parameters. (The committee agreed that it is not possible to determine parameters F through I by zone. With this exception, Table I fulfills this charge. Discussions of the method used to determine each of these parameters are presented in the appropriate section of this report.)
5. Investigate the sources and availability of water to be used for flooding. (There is an adequate source of water available for flooding. Details are in the Water Supply Section of this report.)
 6. Develop a detailed plan for secondary recovery operations which will include associated economics containing a differential case between continued primary and waterflooding operations. (The proposed development plan calls for installing the necessary facilities, including drilling 127 water injection wells on a 40-acre, five-spot pattern between unitization date estimated to be October 1, 1978, and the end of 1981. More details are given in the Development Plan Section.)

CONCLUSIONS

From the study of the Grayburg-San Andres zone in the East Vacuum Unit, proposed, area, the Engineering-Geological Committee concludes that:

1. Secondary recovery by waterflooding is feasible in the San Andres reservoir and recovery is estimated to be 29.0 million barrels if conducted on the present 40-acre per well density using a five-spot pattern. The estimated recovery for 20-acre per well density under the same conditions is 40.8 million barrels. Incremental economics above primary and after income tax are:

	<u>40-Acre Less Primary</u>	<u>20-Acre Less Primary</u>
Investment, \$M	11,358	31,742
Net Cash Flow, \$M	75,158	131,156
Average Annual Rate of Return, percent	63	146
Number of Times Investment Returned	7.62	5.13
Payout, years	3.68	2.32
Present Value at 10 Percent, \$M	37,725	83,584

2. Remaining recovery and economics favor the 20-acre per well density and a five-spot pattern. These profit indicators are:

	<u>40-Acre 5-Spot</u>	<u>20-Acre 5-Spot</u>	<u>20-Acre Less 40-Acre</u>
Recovery, MM barrels	38.1	49.8	11.7
Investment, \$M	11,358	31,742	20,384
Net Cash Flow, \$M	93,545	149,543	55,998
Average Annual Rate of Return, percent	151	234	298
Number of Times Investment Returned	9.24	5.71	3.75
Payout, years	2.60	2.04	1.88
Present Value at 10 Percent, \$M	51,583	97,443	45,952

These economics were based on non-escalating costs and a constant lower and upper tier oil price of \$5.25 per barrel and \$12.00 per barrel, respectively.

3. That water injection into the Grayburg formation is not economically feasible.

RECOMMENDATIONS

The following recommendations are based on the foregoing conclusions:

1. Unitize the Grayburg-San Andres zone in the area shown as East Vacuum Grayburg-San Andres Unit, proposed, on the structure map, Figure 2.
2. Develop the waterflood on a 40-acre, five-spot pattern with 20-acre well spacing by drilling 127 water injection wells and installing the necessary surface facilities to operate the flood.
3. Limit water injection to the San Andres formation.

HISTORY

The Vacuum Field was discovered May 5, 1929, by Socony Vacuum Oil Company's Bridges State Well No. 1 located in Section 13, T-17-S, R-34-E, Lea County, New Mexico, as shown in Figure 2. Development began in 1939 and was virtually complete by the end of 1941 with 330 producing wells. There are currently 453 wells producing from the field.

The first waterflood project in the field was Mobil Oil Company's Bridges State lease that began in 1958. The Texaco West Vacuum Unit was formed in 1966. The first flood developed in the better quality reservoir rock was Texaco's Vacuum Grayburg-San Andres Unit in 1973. The latest flood in the field is Atlantic Richfield Company's State Vacuum Unit which was approved in 1977. Texaco's Central Vacuum Unit became effective October 1, 1977.

The proposed East Vacuum Grayburg-San Andres and Vacuum 35 Units are scheduled to begin development in 1978. When these units are developed, over 98 percent of the Vacuum Grayburg-San Andres Field will be under waterflood. Figure 3 is a map showing these units.

In both the Mobil Bridges State waterflood and the Texaco Vacuum and West Vacuum Units, injection into the Grayburg formation has caused premature water breakthrough with subsequent high water-oil ratio production. It is concluded that the reserve contribution of the Grayburg is of less value than the cost of handling the increased water required to flood it.

Behind casing surface water flows that are apparently related to water injection in the existing projects have recently developed over a wide area of the field. This has resulted in the New Mexico Oil Conservation Commission imposing more stringent regulations for waterflood units. These new regulations have been properly considered in the project analysis.

GEOLOGY

The Vacuum Grayburg-San Andres Field is located on the Artesia-Lovington uplift along the northern limit of the Delaware Basin. The San Andres zone is a dolomitized reef with excellent permeability in the fore-reef to the south, pinching out in the poor quality back-reef and lagoonal depositions to the north. This feature is shown in the north-south Cross-Section H-H', Figure 4. Figure 5 is a west-east cross-section for the unit. The only zones shown on these cross-sections are zones that can be correlated over large areas of the unit. They show clearly the zone discontinuity that cause wider well spacing to result in the recovery of less secondary reserves.

The San Andres structure, Figure 2, is an east-west trending anticline showing a closure of more than 400 feet above the original water-oil contact of -700 feet. Lithologically, the Grayburg formation consists of dense gray dolomite with some anhydrite. It contains interbedded dolomitic sand stringers. Log and core data indicate that this formation has a very small reserve. The San Andres formation consists of dense medium crystalline and oolitic dolomite, white to gray in color, with some anhydrite. The pay is a fine to medium crystalline oolitic dolomite with slight fracturing and some solution cavities. The cross-sections in Figures 4 and 5 show the productive intervals to consist of a series of permeable beds separated by impermeable strata. These strata extend over large areas of the field and serve as effective barriers to prevent cross-flow between the permeable beds.

The recommended unitized interval is the vertical interval that appears between a depth of 4,050 feet and 5,050 feet on the Lane Wells acoustic log, Run No. 1, dated April 14, 1964, on Exxon's New Mexico State "K" No. 19. This well is located 330 feet from south line and 330 feet from east line of Section 28, T-17-S, R-35-E, Lea County, New Mexico. The unitized interval is to include all subsurface points throughout the unit area between these identified correlative depths. This interval is shown in Figure 6.

RESERVOIR PERFORMANCE

The East Vacuum Grayburg-San Andres Unit can be divided into three areas of similar performance as shown in Figure 7--the north area of poor quality rock with low production rates, the east area where the production has been greatly influenced by water encroachment, and the south area where most of the proration units are still producing at top allowable rates.

Production and pressure histories are presented graphically for these three areas and the total unit in Figures 8, 9, and 10. Table II presents reservoir reserves and production data for these areas. Of particular interest is the fact that the average reservoir pressure history of the east area, shown in Figure 10, is very nearly the same as that of the south area even though water has displaced 36 percent of the initial hydrocarbon pore volume in the east area.

CORE DATA

Three sets of core data were analyzed to determine the reservoir rock properties. The first set, consisting of 1,283 core samples from 15 wells within the unit area and having a Dykstra-Parsons permeability variation constant of 0.87, was used to determine the porosity cutoff of six percent. This was done statistically by determining the porosity at which the median permeability was 0.1 millidarcy. The pore volume of samples with porosities equal to or greater than six percent having less than 0.1 millidarcy was approximately the same as that of samples with porosities less than six percent having greater than 0.1 millidarcy.

The second set was 196 core samples having porosities equal to or greater than six percent and taken from six continuous permeable zones within the unit area. The permeability variation constant ranged between 0.63 and 0.84 for the individual zones and was 0.78 for all zones. Weighted average permeability and porosity for these samples were 13.7 millidarcies and

10.9 percent respectively. A plot of porosity versus permeability from these samples is shown in Figure 11.

The third set of data was from Phillips' Santa Fe No. 128 in the northwest of northwest of Section 4, T-18-S, R-35-E, Lea County, New Mexico, which was cored to -766 feet in the San Andres. Relative permeability, flood pot, capillary pressure, and wettability analysis were made on these cores and used as a basis for many of the calculations in this report. Figure 12 shows the average oil and water relative permeability curves. The oil curve shows a residual oil saturation of 27 percent. The flood pot test showed a residual oil saturation of 28.7 percent when oil was displaced by formation water and 36.3 percent when oil was displaced by nitrogen gas. Average water saturation at a capillary pressure of 60 psig was 19 percent. Wettability tests showed the reservoir to be neutral.

COMPARISON OF CORE DATA TO SONIC LOG TRAVEL TIMES

Sonic logs were used to determine porosities. They were normalized by preparing histograms for each sonic log over the Grayburg interval and correcting them to correlate with Phillips' Santa Fe No. 128. The normalization correction varied from -5 to +5 microseconds per foot.

Matrix and fluid travel times were calculated by use of the Holgate* method for six wells in the study area on which adequate core data and reliable sonic logs were available. Figures 13 and 14 show the results of the study of the 816 feet of core porosities and sonic travel times from the six wells. This study resulted in the use of a Delta t_m of 46.4 and a Delta t_f of 131.4 to calculate the porosities from all sonic logs. The logs were digitized and a computer used to determine the porosity of each foot of formation.

* Holgate, M. M.: "The Microlog as a Porosity Datum from the Neutron Log in Hills Field, Alberta." The Canadian Mining and Metallurgical Bulletin, July, 1960.

RESERVOIR FLUID DATA

Figure 15 shows the formation volume factor and solution gas-oil ratio as a function of reservoir pressure. These curves were constructed from combined reservoir samples from Phillips' Hale No. 1 and Santa Fe No. 1. The initial reservoir pressure of 1,613 psig was recorded by bottom-hole pressure gauges in 1938. The bubble-point pressure is the average of those determined from 37 wells in the unit by plotting cumulative oil production versus reservoir pressure. The minimum of these 37 bubble-point pressures was 1,150 psig and the maximum 1,290 with an average of 1,233 psig.

ORIGINAL WATER LEVEL DETERMINATION

Completion and production data from the unit indicate the original water level to have been approximately -700 feet. Phillips' Santa Fe No. 17 was completed open hole to -699 feet. Its initial production was water free, but in five months it was producing six barrels of water per day. This was the reason for using -700 feet as the water level. Recent electric log analysis on wells drilled in the 1960's in and around Section 35, T-17-S, R-34-E, confirm the -700 feet water level.

CONNATE WATER SATURATION

The curve shown in Figure 16 was used to determine the connate water saturation. Shell Oil Company prepared it from cores taken from their Denver Unit, Wasson Field, Gaines and Yoakum Counties, Texas. The average porosity by 40-acre proration unit, rather than average porosity in the well bore, was used to calculate the water saturation.

VOLUMETRIC CALCULATIONS

The isopachous map shown in Figure 17 and an isovol map were prepared from which a computer calculated the acre-feet and acre-porosity feet by 40-acre proration unit. Porosity, connate water saturation, and hydrocarbon pore volume were calculated from these data for each 40-acre unit. Original oil-in-place was calculated by multiplying the hydrocarbon pore volume by (7,758 + 1.288).

PRIMARY RESERVES

Turner material balance calculations for a depletion-type reservoir with producing characteristics similar to those of the East Vacuum Grayburg-San Andres Unit indicated a primary recovery factor of approximately 25 percent. Considering the water encroachment from the east, the primary recovery factor was estimated to be 26.3 percent. This resulted in an ultimate primary reserve for the total unit of 78 million barrels. Decline curves were used to determine the primary reserve by tract where possible. Appendix A shows the method used to allocate the rest.

WATER ENCROACHMENT

The pressures from Figure 10 show that water encroachment has not been fast enough to affect reservoir pressure. Water from the east edge of the field has, nonetheless, filled approximately one-eighth of the original hydrocarbon pore volume.

FLOODABLE ACRE-FEET BY TRACT

The floodable acre-feet and secondary reserves, by tract, were based on fractional flow calculations using mid-1972 well tests to determine the

water saturation. This method would not have been viable using well tests after 1972 because most of the operators began plugging back wells to reduce water production at that time. Percent floodable acre-feet were calculated from this saturation and are shown in Figure 18. Floodable acre-feet were calculated by multiplying the average percent remaining floodable acre-feet in each 40-acre proration unit by its acre-feet calculated from the isopachous map shown in Figure 17. Appendix B gives further information concerning the calculations.

SECONDARY RESERVES

A mathematical model study using a residual oil saturation of 35 percent showed that 44 percent of the original oil-in-place could be recovered by primary plus waterflood operations. An estimated recovery of 40 percent was used after a study of other San Andres floods in the Permian Basin showed that none had estimated recoveries as high as 44 percent. The predicted flood performance was obtained by a computer program using the Higgins-Leighton streamline channel flow method.

The San Andres flood with declining production and having reservoir characteristics most similar to the East Vacuum Unit is Shell's Denver Unit in Wasson Field, Gaines and Yoakum Counties, Texas. Table III shows the reservoir data for the two units. Shell's estimated recovery of primary plus secondary is only 35.3 percent for the Denver Unit, but the residual oil saturation for the unit is 40 to 45 percent compared to 35 percent for the East Vacuum Unit.

Shell estimates that reducing well spacing from 40 acres to 20 acres in their Denver Unit will increase the primary and secondary reserves by 3.9 percent of the original oil-in-place. The same increase is estimated for the East Vacuum Unit.

Texaco's Vacuum Grayburg-San Andres Unit began operation in 1973. Even though there is no accurate means of determining the recoverable reserves

at this time, the performance, shown in Figure 19, to date has been impressive. The isopachous map in Figure 20 and the cumulative production map as of January 1, 1973, Figure 21, shows the reservoir to be of similar quality to that of the south portion of the East Vacuum Grayburg-San Andres Unit. Figure 22, cumulative production as of January 1, 1977, shows the effect of increased production from the unit due to unitization.

The secondary reserves were determined for the total unit by subtracting the 78 million barrels of primary oil from 40 percent of the original oil-in-place. This total oil was allocated to each proration unit in proportion to the product of 15 percent of its initial oil-in-place and percent floodable acre-feet (Figure 18).

WATER SUPPLY

A Higgins-Leighton reservoir study showed that the maximum water injection rate will be 95,000 barrels per day. With the four-year development program, the maximum make-up water needed will be 69,000 barrels per day in 1981. Tabulated below are the sources available to supply this need.

<u>Source</u>	<u>Barrels per Day</u>
Phillips Petroleum Company water rights	28,362
Phillips (applied for water rights)	17,977
Rice Engineering (produced water)	10,000
Mobil Oil Corporation (probable)	8,000
Available in Section 36, T-16-S, R-34-E, if needed, from City of Carlsbad:	
4¢/barrel delivered at 50 psi	<u>35,000</u>
Total	99,339
Needed	<u>69,000</u>
Excess	30,339

Phillips will apply for other water rights in the area of the flood as soon as they become available.

DEVELOPMENT PLAN

Facilities

Facilities necessary for waterflood operations in this unit are a consolidated tank battery, water supply wells and lines, water injection and treatment station with injection lines, 76 pumping units, 127 water injection wells, and 10 additional producing wells. Costs for the wells in the south portion include one resistivity and three porosity logs for each well, and coring six wells. Figure 23 shows the location of the major facilities.

Schedule

Figure 24 is a map showing the annual development by area. The wells to be cored are indicated by a semicircle. Time targets for the preunitization work and the installation of facilities are shown in the bar graph below along with the unescalated estimated cost of each project by year in thousands of dollars.

Year	1977	1978	1979	1980	1981
Engineering Committee Work					
Unit Participation Negotiations					
Unit Formed					
Tank Battery Consolidation			2731		
Water Treatment Plant			2877		
Fresh Water Make-up Supply			892		
Lift Equipment Revision			3082		
Drill Injection Wells			8190	6024	4207
Deepen Producing Wells			765	765	656
Drill Producing Wells				466	1087

ECONOMICS

One set of differential economics was run which compared the 40-acre well spacing five-spot at a total primary and secondary recovery of 36.1 percent of the original oil-in-place with continued primary operations. The economics showed a payout of 3.68 years, number of times investment returned 7.62, average annual rate of return 63.3 percent, and a cash flow of 75.2 million dollars for an investment of 11.4 million dollars.

A differential economic analysis was run comparing continued primary operations and 20-acre well spacing five-spot waterflood with primary and secondary recovery of 40 percent of original oil-in-place. For an investment of 31.7 million dollars, the payout was 2.32 years, number of times investment returned 5.13, average annual rate of return 145.5 percent, and cumulative cash flow was 131.2 million dollars. Figure 25 shows cumulative cash flow for future primary plus secondary with infill drilling, future primary plus secondary without infill drilling, and future primary only.

The differential economics after Federal income tax between waterflooding with 20-acre well spacing less waterflooding with 40-acre well spacing are: investment, 20.4 million dollars; payout, 1.88 years; number of times investment returned, 3.75; average annual rate of return, 298 percent; and cash flow, 56 million dollars.

The forecasts from which these analyses were calculated were based on the following premises:

1. The maximum allowable from the unit will be 80 barrels of oil per day times the number of active producing and injection wells in the zone with a maximum number of wells of one per 20 acres (352).
2. The price of lower-tier and upper-tier oil will remain at \$5.25 per barrel and \$12.00 per barrel, respectively. The gas price will remain at 46¢ per Mcf.
3. The unit will be capable of producing the full allowable based on the proposed wells to be drilled.

4. Infill drilling will increase the recovery by 3.9 percent of the original oil-in-place.

Details of cost and production forecasts used for these analyses are shown in four tables presented in Appendix C.

PARTICIPATION PARAMETERS

The sources of participation parameters included in this report are as follows:

<u>Parameter</u>	<u>Source</u>
1. Current Production	New Mexico Oil and Gas Committee Reports.
2. Future Primary Reserves	See Pages 10 and 11 of this report.
3. Cumulative Production	New Mexico Oil and Gas Committee Reports.
4. Ultimate Primary Reserves	Sum of cumulative production and remaining primary reserves.
5. Acre-Feet of Net Pay	See Pages 8 and 10 of this report.
6. Hydrocarbon Pore Volume	See Page 10 of this report.
7. Original Oil-in-Place	See Page 10 of this report.
8. Secondary Oil Reserves	See Pages 10 and 11 of this report.
9. Floodable Acre-Feet	See Page 11 of this report.
10. Usable Well Bores	Working Interest Owners.
11. Surface Area Acres	Working Interest Owners.

EAST VACUUM GRAYBURG-SAN ANDRES UNIT, PROPOSED
LEA COUNTY, NEW MEXICO

PARAMETERS, TRACT VALUES

Tract No. (Fig. 26)	Company and Lease	Current Production 7-1-76 to 1-1-77		Future Primary Reserves		Cumulative Production 1-1-77		Ultimate Primary Reserves		Net Pay Ac.-Ft.		Hydrocarbon Pore Volume Ac.-Ft.		Original Oil-In-Place STBO		Secondary Oil STBO		Floodable Well Bores Ac.-Ft.		Surface Area, Acres	
		STBO	STBO	STBO	STBO	STBO	STBO	STBO	STBO	STBO	STBO	STBO	STBO	STBO	STBO	STBO	STBO	STBO	STBO		
<u>Atlantic Richfield Company</u>																					
3203	State B 1576	38,728	760,200	2,568,914	3,329,100	33,919	3,121.7	18,802,910	2,971,068	33,919	4	160.00									
2204	State A DE	3,474	40,900	583,946	624,800	1,540	133.0	801,098	124,254	1,540	2	80.00									
2403	State C DE	2,018	7,100	144,383	151,500	1,490	136.0	819,168	127,056	1,490	1	40.00									
2402	State E DE	6,726	131,800	328,259	460,100	1,904	106.9	643,890	58,326	1,120	2	80.00									
1908	State J DE	526	9,200	100,945	110,100	3,099	263.2	1,585,331	245,892	3,099	1	80.00									
2906	State M DE	12,950	269,200	1,746,219	2,015,400	9,431	897.6	5,406,507	838,573	9,430	4	160.00									
2606	State W DE	7,167	36,900	659,138	696,100	6,488	533.1	3,211,017	79,239	1,060	2	80.00									
	Total	71,589	1,255,300	6,131,804	7,387,100	57,871	5,191.5	31,269,921	4,444,408	51,658	16	680.00									
<u>Chevron U.S.A., Inc.</u>																					
3202	State 3-32	47,719	588,600	2,558,660	3,147,300	19,434	1,692.5	10,194,421	1,469,654	18,027	4	160.00									
2704	State 4-27	37,267	413,000	2,637,031	3,050,100	15,463	1,405.5	8,465,737	1,234,820	14,595	4	160.00									
2702	State 5-27	10,908	74,600	1,908,711	1,983,400	7,064	665.7	4,009,706	621,923	7,064	4	160.00									
3403	State 6-34	43,973	476,400	2,152,498	2,628,800	18,001	1,797.0	10,823,856	1,167,788	12,636	5	200.00									
	Total	139,867	1,552,600	9,256,900	10,809,600	59,962	5,560.7	33,493,720	4,494,185	52,322	17	680.00									
<u>Cities Service Company</u>																					
2701	State K	37,153	508,500	2,087,807	2,596,300	6,157	448.0	2,698,436	418,539	6,157	4	160.00									
<u>Crown Central Petroleum Corp.</u>																					
2001	Shell State E 7259	212	0	16,613	16,600	482	31.7	190,938	29,616	482	1	40.00									
1906	Shell State B 1398	214	0	21,921	21,900	889	60.1	362,000	56,148	889	1	40.00									
	Total	426	0	38,534	38,500	1,371	91.8	552,938	85,764	1,371	2	80.00									
<u>Deck, Millard</u>																					
2003	Carthay State	1,451	16,600	123,357	140,000	88	6.7	40,357	6,132	86	2	80.00									
<u>Elk Oil Company (Old Crusader)</u>																					
2002	Cities Service State 1	0	0	65,834	65,834	469	22.9	137,933	21,394	469	0	40.00									
1803	Cities Service State 2	0	0	6,841	6,841	743	42.7	257,195	39,095	728	0	40.00									
1901	Cities Service State 2	0	0	21,774	21,774	970	59.0	355,374	55,120	970	0	40.00									
	Total	0	0	94,449	94,449	2,182	124.6	750,502	115,609	2,167	0	120.00									

PARAMETERS, TRACT VALUES

Company and Lease	Tract No. (Fig. 26)	Current Production 7-1-76 to 1-1-77	Future Primary Reserves STBO	Cumulative Production 1-1-77 STBO	Ultimate Primary Reserves STBO	Net Pay Ac.-Ft.	Hydrocarbon		Original Oil-In-Place STBO	Secondary Oil STBO	Floodable Well Bores	Surface Area, Acres
							Pore Volume Ac.-Ft.	Pore Volume Ac.-Ft.				
<u>Exxon Company, U.S.A.</u>												
New Mexico State J	1909	0	0	182,968	183,000	3,215	282.2	1,699,773	263,643	3,214	0	75.38
New Mexico State K	2805	33,840	405,400	3,805,400	4,210,800	23,549	2,443.8	14,719,723	2,235,583	23,041	8	320.00
New Mexico State K	3201	94,207	1,167,700	5,111,800	6,279,400	49,517	4,964.2	29,900,825	4,336,220	46,427	8	320.00
Total		128,047	1,573,100	9,100,210	10,673,200	76,281	7,690.2	46,320,321	6,835,446	72,682	16	715.38
<u>Getty Oil Company</u>												
State BC	3308	14,677	190,100	654,313	844,400	6,854	801.6	4,828,271	748,886	6,854	1	40.00
State P	3302	21,221	240,600	1,292,834	1,533,400	5,846	576.4	3,471,826	538,495	5,845	2	80.00
Total		35,898	430,700	1,947,147	2,377,800	12,700	1,378.0	8,300,097	1,287,381	12,699	3	120.00
<u>Great Western Drilling Company</u>												
State E	2502	1,239	1,900	234,119	236,000	1,502	103.8	625,218	19,395	300	1	40.00
<u>Bettis, Boyle and Stovall (Josaline Production Company)</u>												
State C	1907	1,437	14,400	98,945	113,300	2,223	163.3	983,604	152,562	2,223	2	80.00
State F	2005	287	0	164,301	164,300	925	51.9	312,609	48,486	925	2	80.00
Total		1,724	14,400	263,246	277,600	3,148	215.2	1,296,213	201,048	3,148	4	160.00
<u>Marathon Oil Company</u>												
Staplin State A/C 2	1904	0	0	77,305	77,300	2,366	148.1	892,050	138,361	2,366	0	80.00
Warn State A/C 3	3304	26,914	376,800	1,863,901	2,240,700	17,291	1,882.6	11,339,449	1,745,292	17,157	3	120.00
Warn State A/C 5	0401	634	7,800	9,393	17,200	369	41.3	248,762	21,221	203	1	39.86
Total		27,548	384,600	1,950,599	2,335,200	20,026	2,072.0	12,480,261	1,904,874	19,726	4	239.86
<u>Mobil Oil Corporation</u>												
New Mexico "O"	1802	1,312	13,900	23,994	37,900	622	44.4	267,434	29,037	435	1	37.61
State K	3101	41,650	570,200	2,061,367	2,631,600	21,498	2,060.6	12,411,595	1,925,093	21,498	3	120.00
State K-6	1801	2,604	28,200	26,024	54,200	697	52.2	314,416	34,137	488	1	37.67
State L	2103	1,994	38,600	534,773	573,400	1,494	117.7	708,941	93,934	1,287	3	120.00
State M	3402	58,602	727,000	2,702,492	3,429,500	24,962	2,799.5	16,862,207	2,206,037	21,091	4	160.00
State N	1903	817	10,200	112,499	122,700	1,130	37.7	227,078	35,221	1,130	1	37.68
State O	3307	14,827	189,500	676,596	866,100	6,817	700.5	4,219,316	647,890	6,749	1	40.00
State P	2205	895	21,200	260,193	281,400	978	80.0	481,863	74,739	978	2	80.00
State P	2601	2,381	21,500	215,406	236,900	3,874	294.9	1,776,269	263,515	3,705	2	80.00
Total		125,082	1,620,300	6,613,344	8,233,700	62,072	6,187.5	37,269,119	5,309,603	57,361	18	712.96

PARAMETERS, TRACT VALUES

Tract No. (Fig. 26)	Company and Lease	Current Production 7-1-76 to 1-1-77	Future Primary Reserves STBO	Cumulative Production 1-1-77 STBO	Ultimate Primary Reserves STBO	Net Pay Ac.-Ft.	Hydrocarbon Pore Volume Ac.-Ft.	Original Oil-In-Place STBO		Secondary Oil STBO	Floodable Well Ac.-Ft.	Bores	Surface Area, Acres
								In-Place	STBO				
<u>Pennzoil Company</u>													
2801	Phillips State 28	638	6,300	46,248	52,500	1,219	141.1	849,886	131,821	1,219	1	40.00	
2804	Phillips State 28	849	8,300	106,808	115,100	517	45.1	271,650	42,135	517	1	40.00	
	Total	1,487	14,600	153,056	167,600	1,736	186.2	1,121,536	173,956	1,736	2	80.00	
<u>Penrose Production Company</u>													
2404	Southern State	33		19,411	19,400	783	49.8	299,960	40,942	689	1	40.00	
<u>Phillips Petroleum Company</u>													
0402	Santa Fe	19,536	205,200	741,941	947,141	7,403	760.2	4,578,906	671,307	7,056	2	79.70	
0501	Santa Fe	51,699	561,500	1,746,682	2,308,182	19,585	2,306.6	13,893,305	2,009,939	18,272	4	159.85	
0502	Santa Fe	56,300	743,212	2,414,830	3,158,042	18,655	1,909.3	11,500,271	1,729,901	18,152	4	159.95	
1905	Santa Fe	303	5,968	26,897	32,865	958	68.5	412,595	63,995	958	1	40.00	
2004	Santa Fe	3,346	65,900	631,831	697,731	2,439	172.5	1,039,018	156,017	2,370	5	200.00	
2102	Santa Fe	757	14,911	307,732	322,643	783	74.2	446,928	69,320	783	2	80.00	
2104	Santa Fe	206	4,058	283,587	287,645	596	61.6	371,035	57,549	596	1	40.00	
2501	Santa Fe	2,237	44,063	471,789	515,852	1,784	126.2	760,139	82,531	1,249	1	40.00	
2602	Santa Fe	43,052	436,561	2,872,130	3,308,691	10,240	794.2	4,783,717	569,878	7,861	5	200.00	
2603	Santa Fe	2,097	11,800	406,844	418,644	1,513	97.6	587,873	22,795	378	1	40.00	
2604	Santa Fe	7,691	48,000	637,737	685,737	4,849	417.5	2,514,724	192,790	2,230	1	80.00	
2605	Santa Fe	980	47,500	564,991	612,491	3,437	297.3	1,790,725	97,212	1,203	1	40.00	
2607	Santa Fe	2,097	83,600	852,014	935,614	6,702	628.9	3,788,048	117,907	1,313	1	80.00	
2705	Santa Fe	29,124	337,300	1,337,225	1,674,525	11,560	1,328.6	8,002,545	965,648	8,997	2	80.00	
2803	Santa Fe	619	12,192	467,691	479,883	1,941	168.6	1,015,526	156,545	1,929	3	120.00	
2901	Santa Fe	69	1,359	151,537	152,896	1,493	128.4	773,391	119,957	1,493	1	80.00	
2902	Santa Fe	657	12,941	132,022	144,963	2,150	184.8	1,113,104	172,646	2,150	3	120.00	
2905	Santa Fe	0	0	60,224	60,224	1,380	169.0	1,017,936	157,886	1,380	1	40.00	
2907	Santa Fe	347	6,835	304,534	311,369	1,770	165.5	996,855	154,616	1,770	1	40.00	
3301	Santa Fe	28,823	355,800	1,328,059	1,683,859	12,535	1,575.8	9,491,504	1,457,401	12,407	2	80.00	
3303	Santa Fe	14,146	188,700	670,659	859,359	5,808	666.3	4,013,319	603,809	5,634	1	40.00	
3306	Santa Fe	14,142	188,700	675,211	863,911	6,299	746.4	4,495,785	676,397	6,110	1	40.00	
3309	Santa Fe	14,143	183,400	662,053	845,453	5,535	657.1	3,957,905	534,083	4,815	1	40.00	
3401	Santa Fe	17,205	192,400	2,272,651	2,465,051	15,715	1,725.5	10,393,191	815,403	7,741	4	160.00	
3501	Santa Fe	0	0	312,523	312,523	1,992	194.2	1,170,928	14,042	170	1	80.00	
	Total	309,576	3,751,900	20,333,394	24,085,500	147,122	15,425.0	92,909,273	11,669,574	117,017	50	2,159.50	
<u>Polaris Production Corporation</u>													
2202	Amerada State	0	0	0	0	587	38.8	233,704	36,249	587	0	40.00	
2203	Amerada State	997	9,100	259,374	268,474	300	15.6	93,963	14,574	300	1	40.00	
2201	Mobil State	508	2,800	10,062	12,900	530	32.4	195,155	30,269	530	1	40.00	
	Total	1,505	11,900	269,436	281,374	1,417	86.8	522,822	81,092	1,417	2	120.00	

PARAMETERS, TRACT VALUES

Company and Lease	Tract No. (Fig. 26)	Current Production 7-1-76 to 1-1-77	Future Primary Reserves	Cumulative Production 1-1-77	Ultimate Primary Reserves	Net Pay Ac.-Ft.	Hydrocarbon		Original Oil-In-Place STBO	Secondary Oil STBO	Floodable Well Ac.-Ft.	Surface Area, Acres
							Pore Volume Ac.-Ft.	In-Place STBO				
<u>Shell Oil Company</u>												
	2401	0	0	22,137	22,100	1,465	85.2	513,184	78,801	1,450	0	40.00
	2909	4,750	164,900	986,160	1,151,100	4,029	335.8	2,022,622	263,221	3,394	2	80.00
	2908	1,300	34,200	380,373	414,600	2,069	209.2	1,260,073	195,443	2,069	1	40.00
	2903	0	0	4,715	4,700	1,298	123.2	742,070	115,099	1,298	0	40.00
	1910	0	0	78,825	78,800	1,399	116.3	700,509	108,652	1,399	0	40.00
	2802	6,776	139,900	1,356,416	1,496,300	4,444	410.9	2,474,970	383,878	4,444	3	120.00
	2101	0	0	20,145	20,100	312	24.5	147,571	22,889	312	0	40.00
	3305	48,007	561,600	2,510,107	3,071,600	18,870	2,102.1	12,661,561	1,670,558	15,865	4	157.66
	2703	17,275	175,900	1,251,496	1,427,400	7,931	746.0	4,493,376	561,392	6,458	2	80.00
	0503	4,110	96,800	154,879	251,700	1,379	101.7	612,569	94,061	1,365	1	40.00
	1902	0	0	0	0	735	48.1	289,720	43,140	706	0	40.00
	Total	82,218	1,173,300	6,765,253	7,938,400	43,931	4,303.0	25,918,225	3,537,134	38,760	13	717.66
<u>Sohio Petroleum Company</u>												
	2301	1,279	33,600	258,170	291,800	1,710	114.9	692,076	103,607	1,648	2	80.00
<u>Texaco Inc.</u> (Crusader Texas State)												
	2904	0	0	16,538	16,500	806	70.7	425,847	66,051	806	0	40.00
	State CG NCT-2											
	GRAND TOTAL	966,122	12,343,300	65,656,774	78,000,000	500,865	49,306.4	296,986,842	40,794,740	441,750	157	7,025.36

EAST VACUUM GRAYBURG-SAN ANDRES UNIT, PROPOSED
LEA COUNTY, NEW MEXICO

PARAMETERS, TRACT PERCENTAGES

Company and Lease	Tract No. (Fig. 26)	Current Production 7-1-76 to 1-1-77	Future Primary Reserves STBO	Cumulative Production 1-1-77 STBO	Ultimate Primary Reserves STBO	Net Pay Ac.-Ft. STBO	Hydrocarbon Pore Volume (Ac.-Ft.) & Original Oil-In-Place (STBO)	Secondary Oil STBO	Floodable Ac.-Ft.	Well Bores	Surface Area, Acres	
												STBO
<u>Atlantic Richfield Company</u>												
State B 1576	3203	4.009	6.159	3.913	4.268	6.772	6.331	7.283	7.678	2.548	2.277	
State A DE	2204	.360	.331	.889	.801	.307	.270	.305	.349	1.274	1.139	
State C DE	2403	.209	.058	.220	.194	.297	.276	.311	.337	.637	.569	
State E DE	2402	.696	1.068	.500	.590	.380	.217	.143	.254	1.274	1.139	
State J DE	1908	.054	.075	.154	.141	.619	.534	.603	.702	.637	1.139	
State M DE	2906	1.340	2.181	2.660	2.584	1.883	1.820	2.056	2.135	2.548	2.277	
State W DE	2606	.742	.299	1.004	.892	1.295	1.081	.194	.240	1.274	1.139	
Total		7.410	10.171	9.340	9.470	11.553	10.529	10.895	11.695	10.192	9.679	
<u>Chevron U.S.A., Inc.</u>												
State 3-32	3202	4.939	4.769	3.897	4.035	3.880	3.433	3.603	4.081	2.548	2.277	
State 4-27	2704	3.857	3.346	4.016	3.910	3.087	2.851	3.027	3.304	2.548	2.277	
State 5-27	2702	1.129	.604	2.907	2.543	1.410	1.350	1.525	1.599	2.548	2.277	
State 6-34	3403	4.551	3.860	3.278	3.370	3.594	3.645	2.863	2.860	3.185	2.847	
Total		14.476	12.579	14.098	13.858	11.971	11.279	11.018	11.844	10.829	9.678	
<u>Cities Service Company</u>												
State K	2701	3.846	4.120	3.180	3.329	1.229	.909	1.026	1.394	2.548	2.277	
<u>Crown Central Petroleum Corp.</u>												
Shell State E 7259	2001	.022		.025	.021	.096	.064	.073	.109	.637	.569	
Shell State B 1398	1906	.022		.033	.028	.177	.122	.138	.201	.637	.569	
Total		.044		.058	.049	.273	.186	.211	.310	1.274	1.138	
<u>Deck, Millard</u>												
Carthay State	2003	.150	.134	.188	.179	.018	.014	.015	.019	1.274	1.139	
<u>Elk Oil Company (Old Crusader)</u>												
Cities Service State 1	2002			.100	.084	.094	.046	.052	.106		.569	
Cities Service State 2	1803			.010	.009	.148	.087	.096	.165		.569	
Cities Service State 2	1901			.033	.028	.194	.120	.135	.220		.570	
Total				.143	.121	.436	.253	.283	.491		1.708	

EAST VACUUM GRAYBURG-SAN ANDRES UNIT, PROPOSED
LEA COUNTY, NEW MEXICO

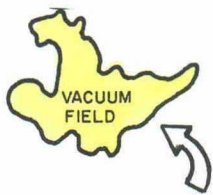
COMPARISON OF PARAMETERS BY AREA

<u>Parameter</u>	<u>North Area</u>	<u>South Area</u>	<u>East Area</u>	<u>Total Area</u>
Average Porosity, percent	10.0	12.4	11.8	11.7
Average Net Thickness, feet	33	127	78	71.3
Average Original Water Saturation, percent	18.6	15.0	15.8	15.9
Original Oil-in-Place, M barrels	59,138	167,341	70,508	296,987
Barrels/Acre	17,393	78,934	46,387	42,273
Cumulative Production 1-1-77, M barrels	18,037	30,717	16,903	65,657
Barrels/Acre	5,305	14,489	11,120	9,346
Remaining Primary 1-1-77, M barrels	2,409	7,971	1,963	12,343
Barrels/Acre	709	3,760	1,291	1,756
Ultimate Primary Recovery, M barrels	20,446	38,688	18,866	78,000
M Barrels/40-Acre Unit	241	730	496	444
Primary Recovery, Percent Original Oil-in-Place	34.6	23.1	26.8	26.3
Total 40-Acre Proration Units	85	53	38	176
Proration Units Producing Top Allowable December, 1976	0	36	7	43
Water Encroachment, Percent Original Hydrocarbon Pore Volume	2.8	4.1	36.0	11.4
Last Half 1976 Production, Barrels/Day/40-Acre Unit	10.6	60.9	29.3	29.8

EAST VACUUM GRAYBURG-SAN ANDRES UNIT, PROPOSED
LEA COUNTY, NEW MEXICO

PROJECT COMPARISON OF EAST VACUUM UNIT TO DENVER UNIT

<u>Project</u>	<u>East Vacuum Grayburg-San Andres Unit, Proposed</u>	<u>Shell Oil Company Denver Grayburg- San Andres Unit</u>
Depth, feet	4,400	5,100
Type Formation	Dolomite	Dolomite
Bottom-Hole Temperature, °F.	101	105
Original Bottom-Hole Pressure, psig	1,613	1,805
Net Pay, feet	71	129
Porosity, percent	11.7	12.0
Permeability, Md.	11.0	3.5
Area, acres	7,025	27,850
Connate Water, percent	15.9	15.0
Original Oil Formation Volume Factor	1.288	1.312
Initial Solution Gas-Oil Ratio, cubic feet/stock tank barrel	465	588
Initial Viscosity of Oil, centipoise	0.80	0.97
Gravity, °API	35	33
Original Oil-in-Place, MM barrels	297	2,166
Ultimate Primary, MM barrels	78	354
Estimated Secondary, MM barrels	41	410
Total, MM barrels	119	764
Recovery to Date, MM barrels	66	595
Flood Pot Residual Oil Saturation, percent	30	40 to 45
Percent of Original Oil Recovered after Waterflood (estimate)	40.0	35.3
Original Gas Cap	No	Yes



□
LOVINGTON



□
HOBBS

□
SEMINOLE

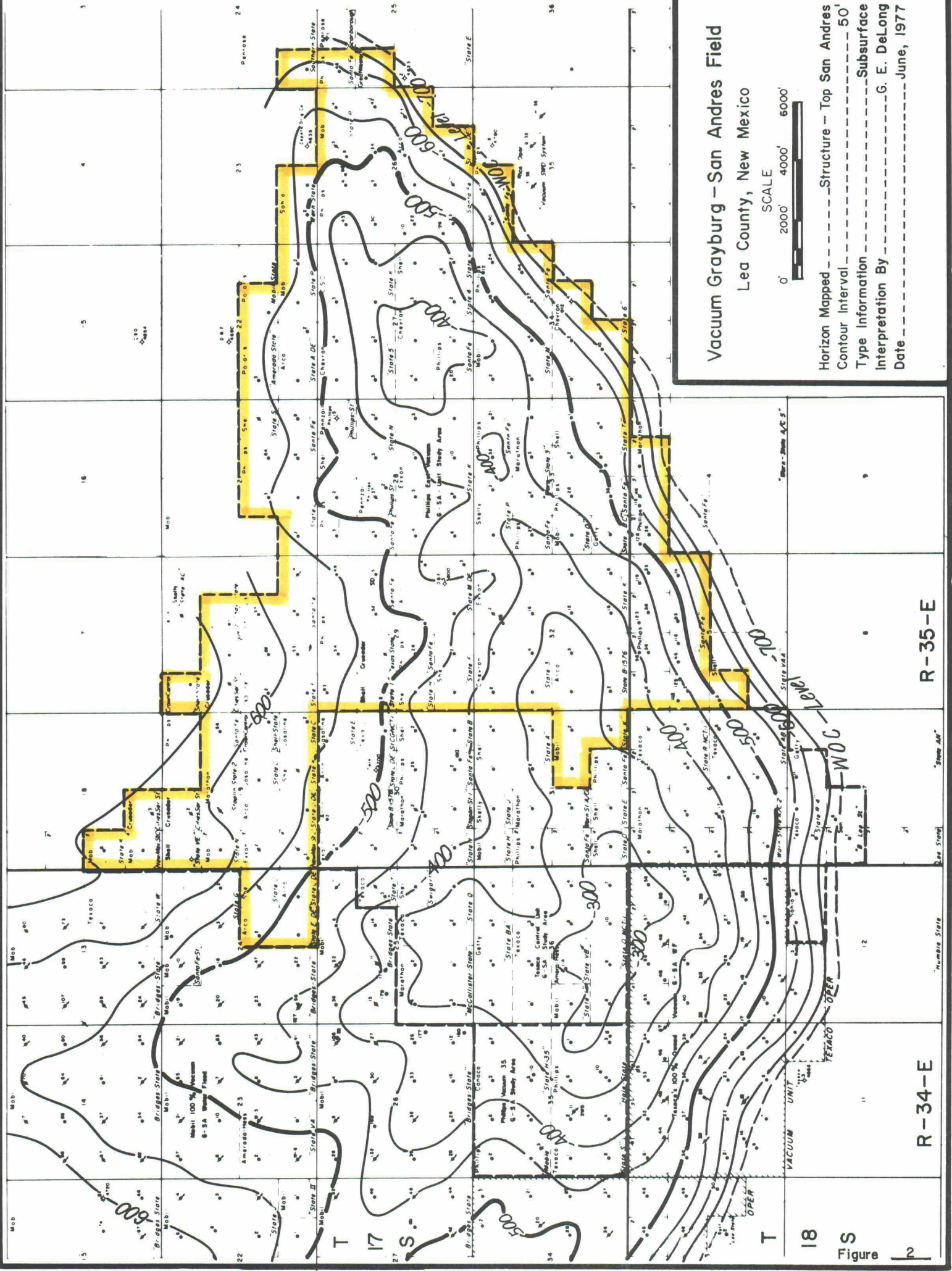
□
ANDREWS

New Mexico

Texas

□
ODESSA

VACUUM FIELD
LEA COUNTY, NEW MEXICO
LOCATION PLAT
SCALE: 1" = 12.12 MILES



Vacuum Grayburg - San Andres Field

Lea County, New Mexico

SCALE
0' 2000' 4000' 6000'

Horizon Mapped ----- Structure - Top San Andres
 Contour Interval ----- 50'
 Type Information ----- Subsurface
 Interpretation By ----- G. E. DeLong
 Date ----- June, 1977

R-35-E

R-34-E

18
Figure

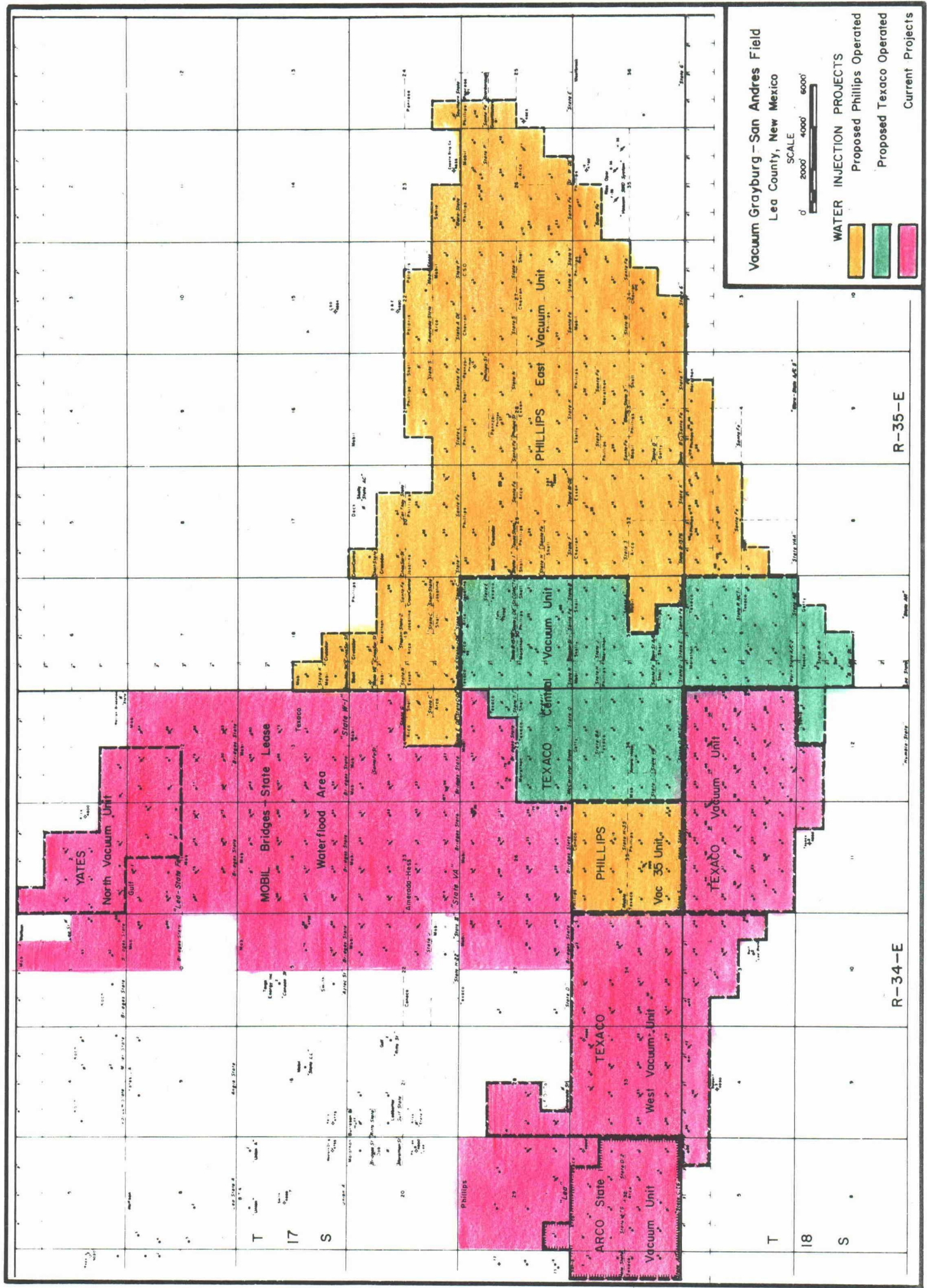


Figure 3