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EXHIBIT

PAN AMERICAN PETROLEUM CORPORATION

LEASE AUTOMATIC CUSTODY TRANSFER INSTALLATION  
STORAGE SYSTEM II - EMPIRE ABO POOL  
EDDY COUNTY, NEW MEXICO

NEW MEXICO OIL CONSERVATION COMMISSION

EXAMINER HEARING  
SEPTEMBER 30, 1959

*Handwritten notes:*  
15771, 15772, 15773

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BEFORE EXAMINER NUTTER  
OIL CONSERVATION COMMISSION  
*Nutter* EXHIBIT NO. 4  
C 15771, 15772, 15773

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## INTRODUCTION

Pan American Petroleum Corporation respectfully submits this exhibit in support of its request to the Oil Conservation Commission of the State of New Mexico for approval to install and operate lease automatic custody transfer facilities at Storage System II, Empire Abo Pool, Eddy County, New Mexico.

The proposed LACT unit will be located at the site of Storage System II, located in NW/4 SW/4 Section 2, T-18-S, R-27-E, Eddy County, New Mexico. This tank battery stores and the LACT until will handle oil produced from State Leases in NW/4 NW/4 (E-5461) of Section 2, S/2 NW/4 (B-7244-30) and NW/4 SW/4 (B-7244-30) and SE/ SW/4 (B-7244-30) of Section 2, NE/4 SW/4 (B-8814-12) of Section 2, SW/4 SE/4 (E-7833) of Section 2, T-18-S, R-27-E, Eddy County, New Mexico. Attachment No. 1 is a plat of these leases, the tank battery, and the connected wells.

Permission to commingle oil produced from the above described leases was granted by Order No. R-1292 which was entered by the Commission after hearing Case No. 1552.

Prior to commingling, Pan American will separately measure the production from each lease with corrosion-resistant type meters which will be maintained in such a manner as to insure accurate measurement of the produced oil at all times. The meters shall be checked for accuracy in accordance with the instructions of the Commission.

LACT unit operating data collected by Pan American and other companies shows that the installation of facilities to accurately record temperature corrected volumes and automatically transfer lease produced crude oil to pipeline custody will:

1. Conserve natural resources in the form of light hydrocarbons which are now being lost from produced

crude oil to the atmosphere during the gauging operation at which time accumulated light ends escape and others flash from the stored oil to the atmosphere.

2. Substantially reduce residence time of the treated crude in the storage tanks thereby lessening vapor losses by way of normal tank venting or breathing.
3. Conserve manpower and improve lease operation by substantially reducing the current tank battery attendance time which will in turn release lease operating personnel and pipeline personnel for performance of other duties.
4. Release more money for finding and developing additional oil reserves since LACT equipment requires less capital investment than equivalent conventional lease facilities.

#### LACT UNIT

##### Equipment

The positive displacement meter type LACT unit to be installed at Storage System II is basically the same as a number of LACT units already approved by the Oil Conservation Commission. Recently, the Commission granted approval of similar positive displacement meter type LACT units in the Artesia Field, Eddy County (Order No. <sup>R-1346</sup>~~1346~~), the South Vacuum Unit, Lea County (Order No. R-1327), and the Caprock-Queen Pool, Chaves County (Order No. R-1326).

The LACT unit which Pan American proposes to install will consist of a pipeline pump; a BS&W monitor to detect the presence of unmerchantable oil; a valve to divert unmerchantable oil back to the treating facilities; a strainer; an air eliminator; a temperature compensated corrosion resistant positive displacement meter equipped with counter-ticket printer, set-stop counter, and fail-safe safety shutdown switch; a proportional pipeline sampler; a back pressure valve to assure that the line to and from the meter is packed with oil at a pressure in excess of the vapor pressure of the metered fluid; a calibrated meter prover tank; a LACT unit control panel; and other fail-safe safety features.

#### Operation

Operation of the LACT system can be followed by reference to the LACT unit flow diagram, included as Attachment No. 2.

Production from each lease served by Storage System II enters the tank battery and passes through the respective lease separator or treater. The treated crude is then measured by individual lease production meters. From the lease meters the oil is collected and transferred to common storage in the LACT unit surge tank. When the oil level in the surge tank reaches the high level float switch (A), the pipeline pump (C) is automatically started and the crude oil is then pumped through the LACT unit into the pipeline.

In order to assure delivery of merchantable oil to the pipeline at all times, a BS&W probe (E) is mounted downstream of the pump (C). If oil delivered by the LACT unit exceeds 1% BS&W content, the BS&W monitor will cause the diverting valve (F) to close the meter run and direct all bad oil into the recycling tank. When the BS&W content of the

oil returns to a satisfactory range as determined by the BS&W monitor, the diverting valve (F) will close to the recycling tank and again direct the flow of oil to the LACT meter run. Merchantable oil passes through the strainer (G), the gas eliminator (H), and on through the positive displacement meter (I). The P.D. meter will be an A. O. Smith Model S-12 automatic temperature compensated, corrosion resistant meter equipped with fail-safe controls, counter-ticket printer and set-stop counter to allow the pumper to follow daily and monthly lease production. After being metered, the oil is sampled at point (J), passes through the back pressure valve (K), and flows on to the pipeline. The back pressure valve will be set at approximately 5 psi to assure that a positive head is held across the P.D. meter (I) and to prevent flow when the transfer pump (C) is not operating. The meter prover tank (L) is located downstream of the back pressure valve. When sufficient oil has been transferred to the pipeline to lower the fluid level in the surge tank to the low level float switch (B), the pipeline pump is automatically stopped. When lease production again fills the surge tank up to the level of float switch (A) the automatic custody transfer cycle again commences.

Any unmerchantable oil which is collected in the recycling tank will be treated in the tank. After the water is drawn off from the tank bottom, the recycle pump (N) will return the treated oil to the LACT unit surge tank. The volume of unmerchantable oil will be a very small percentage of the total lease produced volume as the wells on the leases served by this tank battery now produce little or no water.

### Sampling

A composite representative sample of all oil delivered to the pipeline will be obtained by the sampler (J). The A. O. Smith P.D. meter

will be equipped with an electric impulse transmitter which will signal the electric pump driven sampler to extract a proportionate sample of each unit volume of oil passing through the meter. Collection of a composite sample will be accomplished in a vapor-proof container. The sample will be tested by the pipeline. Calibration of the BS&W monitor, if required, will be made on the basis of the analysis of the composite sample.

#### Meter Proving

The LACT unit P.D. meter will be proven to the satisfaction of the New Mexico Oil Conservation Commission, the pipeline company, and Pan American Petroleum Corporation. Meter proving tests will be witnessed by representatives of the pipeline and Pan American.

The meter will be proven against a fixed volume tank calibrated to the satisfaction of the pipeline and Pan American. The tank will be built to conform to the standards of API Code 1101. The inside surfaces of the tank will be plastic coated to prevent corrosion and the adherence of crude products to the vessel, thereby reducing to an absolute minimum meter proving errors introduced by such factors. Oil collected in the prover tank during the meter proving tests will flow out of the tank and into the pipeline by gravity.

#### Fail-Safe Features

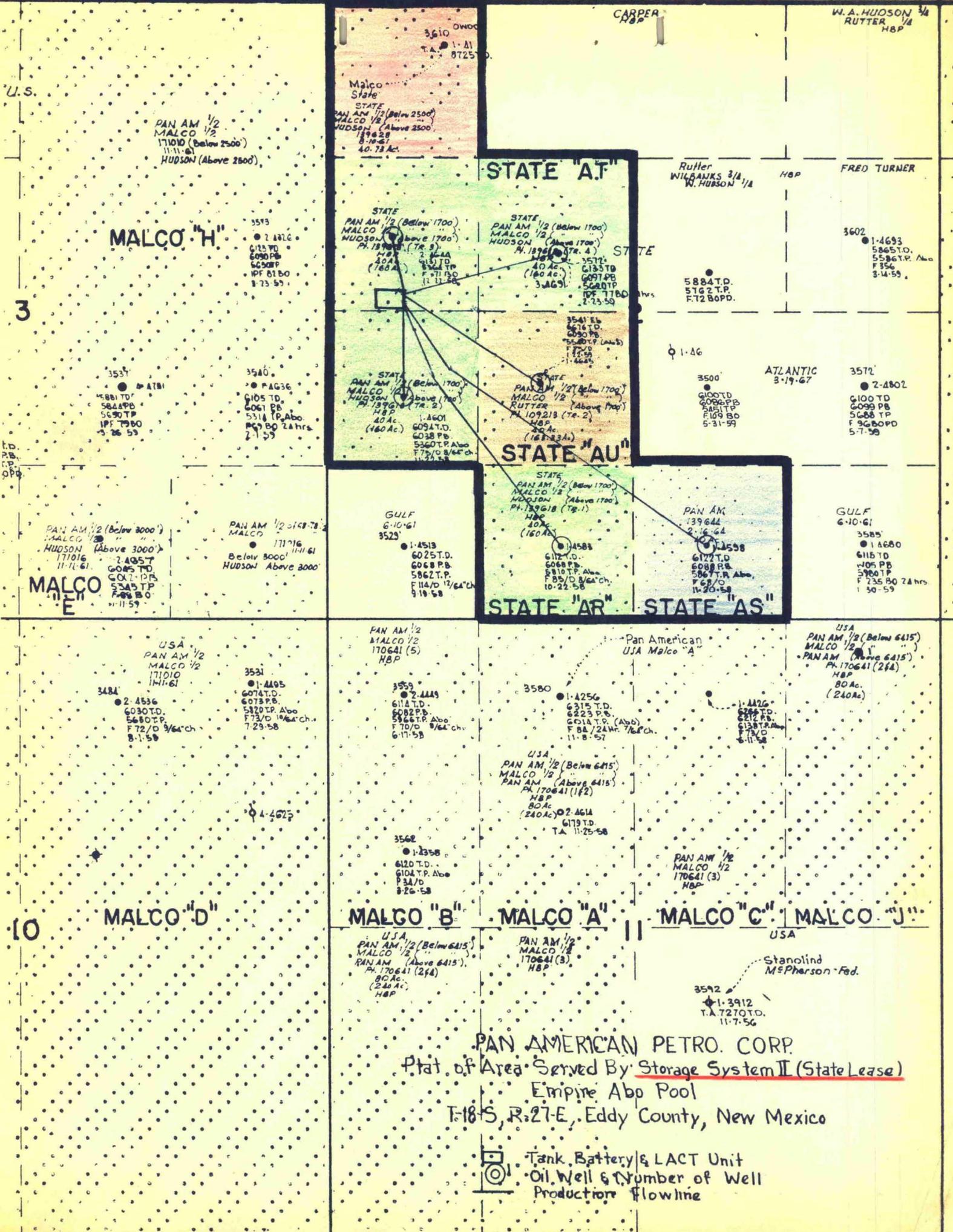
The LACT unit will be checked daily by a pumper. All operations are designed to be fail-safe for unattended operation as follows:

1. No oil can be run from the battery without passing through the LACT unit P.D. meter.

2. The P.D. meter will be equipped with a safety switch which will automatically de-energize the pipeline pump if the meter counter fails to operate or if the oil flow rate through the meter falls below a preset value.
3. In the event of failure of the low level float switch (B), a low pressure safety shutdown switch (D) will de-energize the pipeline pump, thereby preventing the lowering of the fluid level in the surge tank to the point that air or vapors would be drawn into the meter run.
4. In the event of failure of the high level float switch (A) the surge tank can overflow via an equalizing line into the recycle tank. If the recycle tank fills up to the level of float switch (M) all leases served by the battery will be automatically shutin. Combined storage will contain a minimum of one day's production. The battery and LACT unit will be checked daily by a pumper.
5. The P.D. meter will be equipped with set-stop controls to prevent over production.
6. The BS&W monitor performance will be automatically checked by the manual determination of sample BS&W content at the end of each month or during intervening periods as desired.
7. On electric power failure, transfer of oil to the pipeline will stop.

Tamper Proof Design

The P.D. meter cumulative barrels counter is non-resettable. The BS&W monitor controller and the LACT unit control panel will be locked to prevent tampering. The prover tank plug valves will be sealed at all times except during proving runs by authorized personnel.



PAN AMERICAN PETRO. CORP.  
 Plat. of Area Served By Storage System II (State Lease)  
 Empire Abp Pool  
 T-18 S, R-27-E, Eddy County, New Mexico

Tank Battery & LACT Unit  
 Oil Well & Number of Well  
 Production Flowline

U.S.  
 3  
 10

W.A. HUDSON RUTTER 1/4 HBP  
 FRED TURNER  
 ATLANTIC 3-19-67  
 GULF 6-10-61  
 USA  
 PAN AM 1/2 (Below 6415)  
 MALCO 1/2 (Above 6415)  
 PAN AM (Above 6415)  
 PH. 170641 (294)  
 HBP  
 80 Ac.  
 (240 Ac.)  
 Stanolind  
 M. S. Pherson - Fed.  
 3592  
 1-3912  
 T.A. 7270 T.D.  
 11-7-56

MALCO "H"

STATE "AT"

STATE "AU"

STATE "AR" STATE "AS"

MALCO "E"

MALCO "D"

MALCO "B"

MALCO "A"

MALCO "C"

MALCO "J"

PAN AM 1/2  
 MALCO 1/2  
 171010 (Below 2500)  
 11-11-61  
 HUDSON (Above 2500)

Malco State  
 STATE  
 PAN AM 1/2 (Below 2500)  
 MALCO 1/2 (Above 2500)  
 HUDSON 19-6-58  
 8-10-61  
 40.78 Ac.

STATE  
 PAN AM 1/2 (Below 1700)  
 MALCO 1/2 (Above 1700)  
 HUDSON PH. 139618 (Tr. 5)  
 HBP  
 40 Ac.  
 (160 Ac.)

STATE  
 PAN AM 1/2 (Below 1700)  
 MALCO 1/2 (Above 1700)  
 HUDSON H. 139618 (Tr. 4)  
 HBP  
 40 Ac.  
 (160 Ac.)  
 3-16-61

STATE  
 PAN AM 1/2 (Below 1700)  
 MALCO 1/2 (Above 1700)  
 HUDSON PH. 139618 (Tr. 2)  
 HBP  
 40 Ac.  
 (160 Ac.)

STATE  
 PAN AM 1/2 (Below 1700)  
 MALCO 1/2 (Above 1700)  
 HUDSON PH. 109213 (Tr. 2)  
 HBP  
 40 Ac.  
 (160 Ac.)

STATE  
 PAN AM 1/2 (Below 1700)  
 MALCO 1/2 (Above 1700)  
 HUDSON PH. 139618 (Tr. 1)  
 HBP  
 40 Ac.  
 (160 Ac.)

PAN AM  
 139644  
 2-16-64  
 6122 T.D.  
 6088 P.B.  
 5867 T.P. Abn.  
 F 68/D 3/64 ch.  
 10-22-58

GULF  
 6-10-61  
 3585  
 1-1680  
 6115 T.D.  
 405 P.B.  
 5900 T.P.  
 F 235 80 24 hrs  
 1-30-59

GULF  
 6-10-61  
 3523  
 1-4513  
 6025 T.D.  
 6068 P.B.  
 5862 T.P. Abn.  
 F 114/D 12/64 ch.  
 9-19-58

PAN AM 1/2 (Below 3000)  
 MALCO 1/2 (Above 3000)  
 HUDSON 171016  
 11-11-61  
 2-1057  
 6045 T.D.  
 6011 P.B.  
 5345 T.P.  
 F 88 80  
 11-11-59

3534  
 1-881 T.D.  
 5844 P.B.  
 5690 T.P.  
 F 70 80  
 5-26-59

3540  
 2-1816  
 6125 T.D.  
 6090 P.B.  
 6050 T.P.  
 F 61 80  
 1-23-59

3500  
 6100 T.D.  
 6099 P.B.  
 5688 T.P.  
 F 96 BOPD  
 5-7-59

3572  
 2-2802  
 6100 T.D.  
 6099 P.B.  
 5688 T.P.  
 F 96 BOPD  
 5-7-59

USA  
 PAN AM 1/2  
 MALCO 1/2  
 171010  
 11-11-61  
 3484  
 2-4536  
 6030 T.D.  
 6045 T.P.  
 F 72/D 3/64 ch.  
 8-1-58

3531  
 1-4495  
 6074 T.D.  
 6073 P.B.  
 5320 T.P. Abn.  
 F 73/D 10/64 ch.  
 7-29-58

PAN AM 1/2  
 MALCO 1/2  
 170641 (5)  
 HBP  
 3559  
 2-4449  
 6118 T.D.  
 6082 P.B.  
 5862 T.P. Abn.  
 F 70/D 9/64 ch.  
 6-17-58

3580  
 1-4256  
 6315 T.D.  
 6223 P.B.  
 6014 T.P. (Abn.)  
 F 84/24 W. 7/64 ch.  
 11-8-57

1-1126  
 6266 T.D.  
 6212 P.B.  
 6138 T.P. Abn.  
 F 78/D  
 6-11-58

USA  
 PAN AM 1/2 (Below 6415)  
 MALCO 1/2 (Above 6415)  
 PAN AM PH. 170641 (1F2)  
 HBP  
 80 Ac.  
 (240 Ac.)  
 2-1614  
 6179 T.D.  
 T.A. 11-25-58

PAN AM 1/2  
 MALCO 1/2  
 170641 (3)  
 HBP

4-4625

3562  
 1-2358  
 6120 T.D.  
 6104 T.P. Abn.  
 F 34/D  
 8-26-58

USA  
 PAN AM 1/2 (Below 6415)  
 MALCO 1/2 (Above 6415)  
 PAN AM PH. 170641 (294)  
 HBP  
 80 Ac.  
 (240 Ac.)

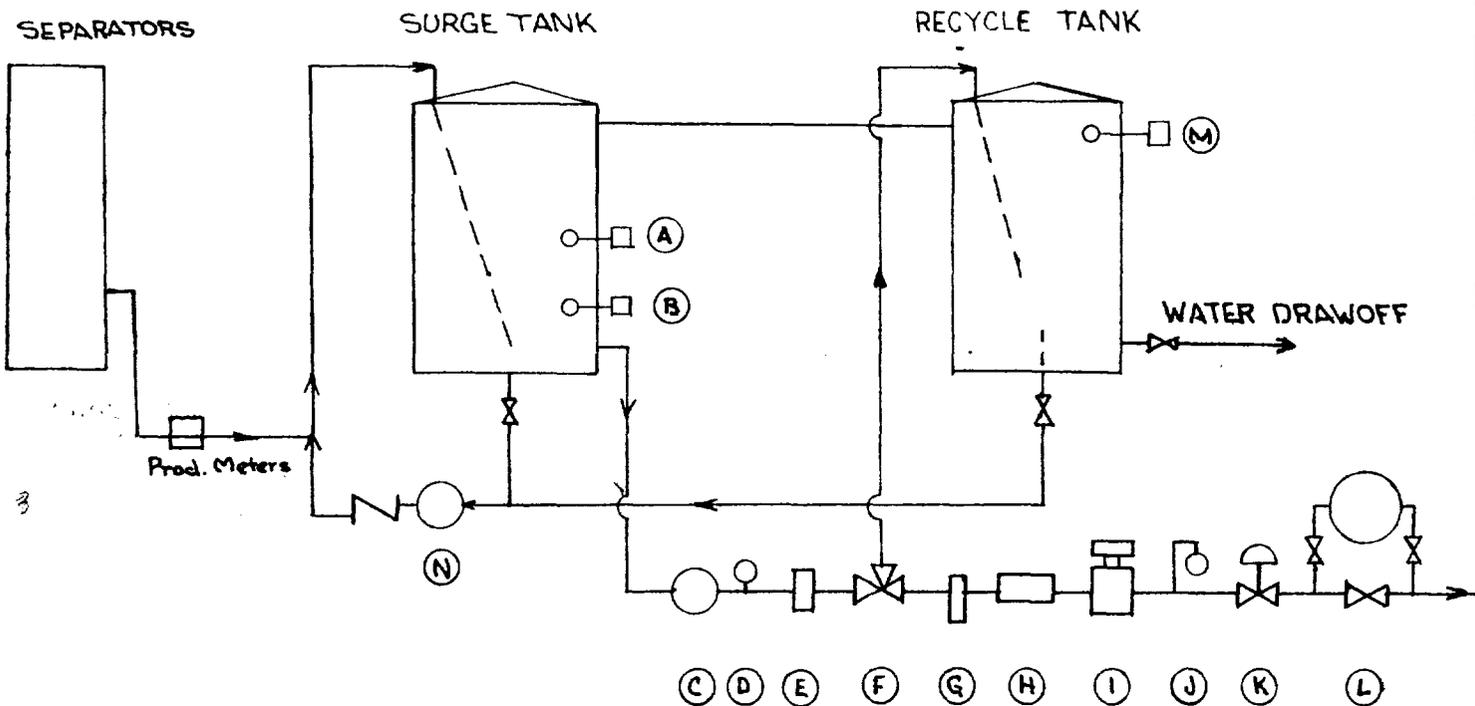
PAN AM 1/2  
 MALCO 1/2  
 170641 (3)  
 HBP

1-3912  
 T.A. 7270 T.D.  
 11-7-56

PAN AM 1/2

USA

STATE



PAN AMERICAN PETROLEUM CORPORATION  
 P. D. METER LACT UNIT  
 STORAGE SYSTEM II (STATE LEASES)  
 EMPIRE ABO POOL  
 EDDY COUNTY, NEW MEXICO

*BAI*  
 -34 072-AT2  
 48 027-AS1  
 58 238-AS1  
 59 866-AU1  
 49 170-AT3  
 54 705-AR1  
 50 869-AT1

- A. High Level Float Switch
- B. Low Level Float Switch
- C. Pipeline Pump
- D. Pressure Safety Shutdown Switch
- E. BS&W Monitor
- F. Bad Oil Diverting Valve
- G. Strainer
- H. Air Eliminator
- I. P.D. Meter
- J. Sampler
- K. Back Pressure Valve
- L. Prover Tank
- M. Lease Shutdown Switch
- N. Recycle Pump

# SERVICE PIPE LINE COMPANY

WEST TEXAS



DIVISION

September 1, 1959

C E WILSON  
DIVISION MANAGER

1628 19TH STREET  
LUBBOCK, TEXAS

Automatic Custody Transfer  
Facilities - Empire Abo  
Field, Eddy County, New  
Mexico

Mr. Neil S. Whitmore  
District Superintendent  
Pan American Petroleum Corporation  
P. O. Box 268  
Lubbock, Texas

Dear Mr. Whitmore,

We have reviewed your plans for lease automatic custody transfer by meters in the Empire - Abo Field, Eddy County, New Mexico.

The facilities shown in these plans are satisfactory with Service Pipe Line Company, and we will accept custody of oil delivered by the proposed LACT units in lieu of conventional manual gauging.

Yours very truly,

SERVICE PIPE LINE COMPANY

A handwritten signature in cursive script, appearing to read 'Charles E. Wilson'.

Charles E. Wilson  
Division Manager

cm

ILLEGIBLE

# PAN AMERICAN PETROLEUM CORPORATION

OIL AND GAS BUILDING

FORT WORTH, TEXAS

ALEX. GLADSTONE, JR.  
DIVISION ENGINEER

August 17, 1959

File: GWK-4486-986.510.1

Subject: LACT Hearing  
Various Leases  
Empire Abo Field  
Eddy County, New Mexico

Mr. A. L. Porter  
New Mexico Oil Conservation Commission  
Capitol Annex Building  
Santa Fe, New Mexico

Dear Sir:

As a result of hearing Case No. 1662 the New Mexico Oil Conservation Commission entered Order No. R-1399 giving Pan American Petroleum Corporation permission to commingle production from seven separate Federal Leases in the Empire Abo Pool, Eddy County, New Mexico. Also as a result of hearing Case No. 1552, the New Mexico Oil Conservation Commission entered Order No. R-1292 giving Pan American Petroleum Corporation permission to commingle the production from four separate State leases. We now desire to install lease automatic custody transfer units to serve each of the commingled batteries. In addition, we desire to install a lease automatic custody transfer unit on our USA Malco Refinery Lease, Empire Abo Pool, Eddy County, New Mexico. Therefore, it is respectfully requested that a hearing date be set on the earliest docket so that we may present our application to obtain approval for operation of these LACT units.

Very truly yours,

*[Handwritten signature]*  
**ILLEGIBLE**