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Onshore Oil and Gas Operations, Federal and Indian Oil and Gas Leases
Onshore Oil and Gas Order No. 4, Measurement of Oil

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ONSHORE OIL AND GAS ORDER NO. 4
Federal and Indian Oil and Gas Leases – Measurement of Oil

Effective date: August 23, 1989

I. Introduction

A. Authority

This Order is established pursuant the authority granted to the Secretary of the Interior under various Federal and Indian mineral leasing statutes and the Federal Oil and Gas Royalty Management Act of 1982. This authority has been delegated to the Bureau of Land Management and is implemented by the onshore oil and gas operations regulations, contained in Title 43 CFR Part 3160. Section 3164.1 specifically authorizes the Director, Bureau of Land Management, to issue Onshore Oil and Gas Orders when necessary to implement ***or*** supplement the operating regulations, and provides that all shall such Order shall be binding on the lessees and operators of Federal and restricted Indian oil and gas leases which have been, or may hereafter be, issued.

Specific authority for the provisions contained in this Order is found at §3162.7-1, Disposition of Production; §3162.7-2, *Measurement of Oil*; and Subpart 3163, Noncompliance and Assessment.

B. Purpose

One purpose of this Order is to establish requirements and minimum standards for the measurement of oil, and to provide standard operating practices for lease oil storage and handling facilities, by the methods authorized in 43 CFR 3162.7-2, i.e., measurement by tank gauging, positive displacement metering system, or other methods acceptable to the authorized officer. Proper oil measurement ensures that the Federal Government and Indian mineral owners receive the royalties due, as specified in the governing oil and gas leases.

Another purpose of this Order is to establish abatement periods for corrective action when noncompliance with the minimum standards is detected. This Order also serves also serves as notice to any party cited for noncompliance that it may request from the authorized officer an extension of the abatement period for any violation, provided that the request for extension is applied for and granted prior to the expiration of the abatement period previously allowed.

C. Scope.

This Order is applicable to all Federal and Indian (except Osage) oil and gas leases. In addition, this Order is also applicable to all wells and facilities on State or privately owned mineral lands committed to a unit or communitization agreement that affects Federal or Indian interests, notwithstanding any provision of a unit or communitization agreement to the contrary.

II. Definitions

A. Authorized officer means any employee of the Bureau of Land Management authorized to perform the duties described in Groups 3000 and 3100. (See 43 CFR 3000.0-5.)
B. Barrel (bbl) means 42 standard United States gallons of 231 cubic inches each.
C. Business day means any day Monday through Friday excluding Federal holidays.
D. Cpl. means the correction factor for the effect of pressure on liquid.
E. Cps. means the correction factor for the effect of pressure on steel.
F. Ctl. means the correction factor for the effect of temperature on liquid.
G. Cts. The correction factor for the effect of temperature on steel.
H. INC means incident of noncompliance, which serves as a Notice of Violation under 43 CFR Subpart 3163.
I. Lessee means a person or entity holding record title in a lease issued by the United States. (See 43 CFR 3160.0-5).
J. Major violation means noncompliance which causes or threatens immediate, substantial, and adverse impact on public health and safety, the environment, production accountability, or royalty income (see 43 CFR 3160.0-5).
K. Minor violation means noncompliance which does not rise to the level of a "major violation." (see 43 CFR 3160.0-5).
L. Operating rights owner means a person or entity holding operating rights in a lease issued by the United States. A lessee also may be an operating rights owner if the operating rights in a lease or portion thereof have not been severed from record title. (see 43 CFR 3160.0-5).
M. Operator means any person or entity, including but not limited to the lessee or operating rights owner, who has stated in writing to the authorized officer that it is responsible under the terms and conditions of the lease for the operations conducted on the leased lands or portions thereof. (see 43 CFR 3160.0-5).
N. Oil, for the purposes of this Order, means all liquid hydrocarbons produced from or for the benefit of jurisdictional leases, including condensate and oil from tar sands that is measured as liquid.

N.1. Clean Oil/Pipeline Oil means crude oil or condensate that is of such as a quality that it is acceptable to normal purchasers.
N.2. Slop oil means crude oil that is such quality that it is not acceptable to normal purchasers and which requires special treatment other than that which can economically be provided at the existing or modified facilities or portable equipment and is usually sold to oil reclaimers.
N.3. Waste oil means lease crude oil that has been determined by the authorized officer to be of such quality that it cannot be treated economically and put in a marketable condition with existing or modified lease facilities or portable equipment and cannot be sold to reclaimer and also has been determined by the authorized officer to have no economic value and for which royalty is not due.

III. Requirements.

A. Required Recordkeeping.

The operator shall keep all test data, meter reports, charts/recordings, or other similar records for 6 years from the date they were generated, or if involved in an audit or investigation, the records shall be maintained until the record holder is released by the Secretary from the obligation to maintain them. The authorized officer may request these records any time within this period. Records submitted shall include all additional information used to compute volumes so that computations may be verified.

B. General (See 43 CFR 3162.7-2)

1. The regulations at 43 CFR 3162.7-2 authorize oil measurement methods for production from leases, units, and communitization agreements subject to the jurisdiction of the Bureau of Land Management, as such jurisdiction is defined in 43 CFR 3161.1. The authorized oil measurement methods are tank gauging, positive displacement metering systems, and other methods acceptable to the authorized officer. The requirements and minimum standards for each of these methods are set forth below.

2. These requirements and minimum standards are based on the standards and practices recommended by the American Petroleum Institute (API). The API standards and recommended practices are considered by both the Department of the Interior and the oil and gas industry to be appropriate for proper oil measurement. The requirements and minimum standards set out herein are those necessary to promote conservation of natural resources and to ensure that oil production, except for waste oil, is properly measured for sales and allocation purposes, in order that the Federal Government and Indian mineral owners will receive the royalties due under governing oil and gas leases. When an infraction of the minimum standards in this Order is discovered it will be considered noncompliance and an incident of noncompliance (INC) will be issued. Operators who discover noncompliance with these minimum standards and take immediate corrective action will not be issued an INC. If the authorized officer or his representative is present when an operator discovers a malfunction or does not use correct procedures as specified in this Order, an INC will be issued unless immediate corrective action is taken.

A major violation, as defined in this Order, will generally require an immediate shut-in of the metering device. However, where the non-recoupable loss is not significant or where damage to the resource is likely to occur if a shut-in is required, an abatement period of 24 hours may be given.

The intent of these minimum standards is to ensure that when equipment malfunctions that could result in inaccurate measurement occur, that proper corrective actions are taken, the authorized officer is notified, and an amended production report is submitted.

Equipment failure that is discovered by the operator and promptly corrected will not be considered a violation. However, the incidents of noncompliance that may result from equipment failure are considered violations, and a partial list is as follows:

Failure to install equipment properly.

Failure to repair or correct equipment malfunction properly or in a timely manner.

Failure to submit report of alternate method of measurement for sales.

Failure to submit amended production reports in a timely manner.

Failure to adhere to the minimum standard procedures specified in this Order.

The use of improper equipment, when discovered, will be considered a violation, and an INC will be issued.

The use of improper procedures will be considered a violation and, when witnessed by the authorized officer or his representative, immediate corrective action will be required. In the event that proper procedures are then used as required by this Order, and prior to completing the operation, calibration, or proving, the violation will be considered as properly corrected. In this case, although the violation will be documented in the agency files, no formal INC will be issued.

All future sales and allocation facilities and sales or allocation facilities in existence on the effective date of this Order, unless covered by a valid variance, shall meet the minimum standards prescribed in this Order.

Meter installations constructed in accordance with the API standards in effect at that time shall not automatically be required to retrofit to meet revised API standards. The Bureau will review any revised API standards and, when deemed necessary, will amend the Order accordingly through the rulemaking process.

Any variances from these requirements and minimum standards shall be in accordance with Section IV. of this Order.

3. A violation of a minimum standard established by this Order shall be abated within the time period specified.

Where abatement is required "prior to sales or removal," this means that necessary actions shall be taken so that no oil may be removed beyond the measurement point until properly measured.

If any such violation is not abated within required period, action shall be initiated in accordance with 43 CFR Subpart 3163.

C. Oil Measurement by Tank Gauging

Oil measurement by tank gauging shall accurately compute the volume of oil withdrawn from a properly calibrated sales tank by measuring the height of the oil level in the tank before delivery (opening gauge) and then measuring the height of the oil level in the tank after delivery (closing gauge). The opening and closing gauges are then used with the tank calibration charts (tank tables) to compute accurately the volume of oil withdrawn. Gauging may be accomplished by measuring the height of the oil level from the tank bottom or a fixed datum plate upward to the surface of the oil in the tank (innage gauging) or by measuring from a fixed reference point at the top of the tank downward to the surface of the oil in the tank (outage gauging). Samples shall be

taken from the oil before gauging to determine API gravity and sediment and water content. Prior to gauging, the temperature of the oil shall be determined from measurements made in the tank. The measured oil volume shall then be corrected for sediment and water content, and to the standard sales temperature of 60 °F.

The following requirements and minimum standards shall be accomplished in accordance with API Standard 2545 (ANSI/ASTM D-1085), "Method of Gauging Petroleum and Products," 1965, reaffirmed in 1987, and (ANSI/ASTM D-1250), Tables 5A and 6A.
[54 FR 39527, Sept. 27, 1989]

1. *Sales Tank Equipment.* Each oil storage tank to be used for oil sales by tank gauging shall be properly equipped for such gauging, using the "API Recommended Practice for Setting Connecting, Maintenance, and Operation of Lease Tanks, API RP 12 R1," 1986. Tanks shall also be connected, maintained, and operated so as to comply with the Site Security Regulations, 43 CFR 3162.7-5, and Onshore Oil and Gas Order No. 3, and sales tanks shall meet the following requirements:

a. Each sales tank shall be equipped with a pressure-vacuum thief hatch and/or vent-line valve.

Violation: Major.
Corrective Action: Install proper thief hatch and/or vent line valve or drain.
Abatement Period: 30 days.

b. Each sales tank shall be set and maintained level and free of distortion in accordance with the above-referenced API recommended practice.

Violation: Major.
Corrective Action: Level tanks.
Abatement Period: Prior to sales or removal.

c. Pursuant to API Standard 2545 (ANSI/ASTM D-1085), "Method of Gauging Petroleum and Petroleum Products," October 1965 (reaffirmed August 1987), each tank shall be equipped with a gauging reference point, with a the height of the reference point stamped on a fixed bench-mark plate or stenciled on the tank near the gauging hatch.

Violation: Minor.
Corrective Action: Affix a gauging reference point in gauging hatch and stamp on bench-mark plate or stencil on tank near gauging hatch.
Abatement Period: 30 days.

2. *Sales Tank Calibrations.* Each oil storage tank to be used for oil sales by tank gauging shall be accurately calibrated for such gauging, using the API Standard 2550 (ANSI/ASTM D-1220), "Method for Measurement and Calibration of Upright Cylindrical Tanks," 1965, reaffirmed August 1987, and API RP 2556, "Correcting Gauge Tables for Incrustation," August 1968. The following minimum standards shall be satisfied:

a. Sales tank capacities shall be determined by actual tank measurements by the method know as "tank calibration" and in accordance with the above-referenced API Standards.

Violation: Minor.
Corrective Action: Make capacity determination and develop appropriate capacity table.
Abatement Period: 60 days.

b. A sales tank shall be recalibrated if it is relocated or repaired or the capacity is changec through denting, damage, or installation or removal of interior components, or otherwise.

Violation: Minor.
Corrective Action: Recalibrate tank and develop new (revised) capacity table.
Abatement Period: 60 days.

c. Calibration charts (tank tables) shall be submitted to the authorized officer on request.

Violation: Minor.
Corrective Action: Submit tables to authorized officer.
Abatement Period: 30 days.

3. *Oil Sampling.* Sampling of oil to be sold from sales tank is required and shall be conducted in such fashion as to yield a representative sample of the oil for purposes of determining the physical properties of the oil, following the "API Manual of Petroleum Measurement Standards, Chapter 8.1 - Manual Sampling" (ASTM D-4057), October 1981 (Reaffirmed August 1987), or Chapter 8.2 - Automatic Sampling of Petroleum and Petroleum Products, April 1983 (Reaffirmed August 1987), and shall meet the following minimum standard. All samples shall be taken from the contents of the sales tank prior to gauging, after allowing the tank contents to settle for at least 30 minutes following isolation of the tank, in accordance with the procedures specified in the above-referenced API Standard.

Violation: Major.
Corrective Action: Repeat sampling procedure.
Abatement Period: Prior to sales or removal.

4. *Sales Tank Gauging.* Gauging of oil sales tanks is required and shall be accomplished in such fashion as to measure the contents of the tank accurately, following API Standard 2545 (ANSI/ASTM D-1085), "Method of Gauging Petroleum and Petroleum Products" 1965 (Reaffirmed August 1987), and shall meet the following minimum standards.

a. Gauging shall be accomplished using gauging tapes made of steel or corrosion-resistant material with graduation clearly legible, not kinked or spliced, and traceable to the standards of the National Bureau of Standards and certified as accurate by eithe the manufacturer or an independent testing facility. Working tapes, when checked

against a tape certified to NBS standards, will be allowed as NBS traceable.

Violation: Major.
Corrective Action: Replace tape.
Abatement Period: Prior to sales or removal.

b. Acceptable gauging requires 2 identical gauges to the nearest ¼-inch for tanks with a capacity of less than 1,000 barrels, and 2 identical gauges the nearest ⅛-inch for tanks with a capacity of 1,000 barrels or more.

Violation: Major.
Corrective Action: Repeat gauging until 2 identical readings are obtained.
Abatement Period: Prior to sales or removal.

c. The proper bob for innage gauging or outage gauging shall be used in accordance with the above-reference API standard.

Violation: Major.
Corrective Active: Repeat gauging using proper bob.
Abatement Period: Prior to sales or removal.

5. *Oil Gravity.* Tests for oil gravity are required, following the "API Manual of Petroleum Measurement Standards Chapter 9 - Density Determination" (ASTM D-1298-80) 1981, and (ASTM D-287-82) "Standard Test Method for API Gravity of Crude Petroleum and Petroleum Products" (Hydrometer Method), and shall be performed on a representative sales tank oil sample obtained following "API Manual of Petroleum Measurement Standards, Chapter 8.1, "Manual Sampling of Petroleum and Petroleum Products" (ASTM D-4057) October 1981 (Reaffirmed 1987). Gravity tests shall meet the following minimum standards.

a. All gravity determinations shall be completed before oil sales are made.

Violation: Major.
Corrective Action: Obtain sample from sales tank and determine oil gravity.
Abatement Period: Prior to sales or removal.

b. Accuracy of all instruments used to determine oil gravity for oil sales purposes shall be traceable to the standards of the National Bureau of Standards and certified as accurate by either the manufacturer or independent testing facility.

Violation: Major.
Corrective Action: Replace instruments.
Abatement Period: Prior to sales or removal.

c. The instrument used to obtain the oil gravity shall be clean, with no loose shot weights or detached gravity scale.

Violation: Major.
Corrective Action: Clean and/or replace hydrometer.

Abatement Period: Prior to sales or removal.

d. The instrument used to obtain the oil gravity shall be calibrated for a gravity range that includes the observed gravity of the oil sample being tested.

Violation: Major.
Corrective Action: Repeat gravity tests using hydrometer with proper scale.
Abatement Period: Prior to sales or removal.

e. Temperatures shall be measured and recorded to the nearest 1.0 °F.

Violation: Major.
Corrective Action: Repeat test, measuring and recording temperature to nearest 1.0 °F.
Abatement Period: Prior to sales or removal.

f. Liquid density (gravity) will be measured and recorded to the nearest 0.1° API gravity, making any necessary meniscus correction. The observed gravity shall be corrected to 60 °F. using Table 5A, "Table 5A - Generalized Crude Oils" and JP-4, Correction of Observed Gravity to API Gravity at 60 °F.

Violation: Major.
Corrective Action: Repeat test, measuring and recording gravity to nearest 0.1° API gravity after making necessary correction for fluid meniscus.
Abatement Period: Prior to sales or removal.

6. *Tank Temperature.* Determination of the temperature of oil contained in a sales tank is required following the "API Standard 2543, Method of Measuring the Temperature of Petroleum and Petroleum Products" (ANSI/ASTM D - 1086) October 1965 (Reaffirmed August 1987), and shall meet the following minimum standards:

a. Accuracy of all thermometers used for oil sales purposes shall be traceable to the standards of the National Bureau of Standards and certified as accurate by either the manufacturer or independent testing facility. Working thermometers shall be checked against a thermometer certified accurate to NBS standards and their use shall be permitted.

Violation: Major.
Corrective Action: Replace thermometer.
Abatement Period: Prior to sales or removal.

b. Thermometers shall be kept clean and free of mercury separation. The temperature measurements shall be take by immersing the thermometer to the approximate vertical center of the fluid column, not less than 12 inches from the shell of the tank, for a minimum of 5 minutes and then read and recorded to the nearest 1 °F.

Violation: Major.
Corrective Action: Replace thermometer or repeat measurement as prescribed.

Abatement Period: Prior to sales or removal.

7. *Sediment and Water (S&W).* Determinations of the sediment and water content of oil contained in sales tanks is required following the "API Manual of Petroleum Measurement Standards, Chapter 10 - Sediment and Water and Section 4 - Determination of Sediment and Water in Crude Oils by the Centrifuge Method (Field Procedure), Second Edition, May 1988 (ASTM 96-88), and shall meet the following minimum standards:

a. A thoroughly mixed oil sample-solvent combination, prepared in accordance with the procedure described in the above-referenced API Manual, shall be heated to at least 140 °F. prior to centrifuging.

Violation: Major.
Corrective Action: Repeat procedures using the defined standards.
Abatement Period: Prior to sales or removal.

b. The heated sample shall be whirled in the centrifuge for not less than 5 minutes, and at the conclusion of centrifuging, the temperature shall be a minimum of 115 °F. without water- saturated diluent, and 125 °F. with water-saturated diluent.

Violation: Major.
Corrective Action: Repeat test as prescribed.
Abatement Period: Prior to sales or removal.

c. The combined volume of water and sediment at the bottom of the 100 ml. centrifuge tube shall be read:
(1) To the nearest 0.05 ml. in the range from 0.1 to 1 ml.
(2) To the nearest 0.1 ml. if above the 1 ml. graduation.
(3) Estimated to the nearest 0.025 ml. if the volume is less than 0.1 ml.

The water and sediment volume in the centrifuge tube thus determined shall be multiplied by the appropriate factor for the centrifuge tube size and oil sample-solvent ratio, as specified in the above-referenced API Manual, and the product recorded as the percentage of water and sediment.

Violation: Major.
Corrective Action: Repeat test as specified or repeat procedures using specified factors.
Abatement Period: Prior to sales or removal.

D. Oil Measurement by Positive Displacement Metering System

Oil measurement by a positive displacement metering system, for purposes of oil sales, shall be accomplished by a Lease Automatic Custody Transfer (LACT) unit designed to provide for the unattended transfer of liquid hydrocarbons from a production facility to the transporting carrier

while providing proper and accurate means for the determination of net standard volume and quality, while also providing for fail-safe and tamper proof operations in accordance with the regulations at 43 CFR 3162.7-5 and Onshore Oil and Gas Order No. 3.
[54 FR 39527, Sept.27, 1989]

A positive displacement meter is one which registers the volume passing through said meter by a system which constantly and mechanically isolates the flowing liquid into segments of known volume.

LACT unit design shall follow API Spec. 11N "API Specifications for Lease Automatic Custody Transfer (LACT) Equipment," 1979, and API Manual of Petroleum Measurement Standards, Chapter 6 -Metering Assemblies, Section 1, LACT Systems, February 1981 (Reaffirmed August 1987). LACT units shall be constructed and operated so as to satisfy the following requirements and minimum standards:

1. *LACT Unit Components and General Operating Requirements.*
   a. Each LACT unit shall include all of the following listed components as a minimum:
      (1) Charging pump and motor.
      (2) Sampler, composite sample container and mixing system.
      (3) Stainer.
      (4) Positive displacement meter.
      (5) Meter proving connections.
      (6) Meter backpressure valve and check valve.
      (7) Air eliminator.
      (8) Diverter valve or shut-off valve.
      (9) Sediment and Water Monitor.
      (10) Automatic Temperature/Gravity Compensator.

Violation: Major: a.1.,2.,4., 5., 6., and 10.
Corrective Action: Install component.
Abatement Period: Prior to sales or removal.

Violation: Minor: a.3., 7., 8., and 9.
Corrective Action: Install component.
Abatement Period: 30 days.

   b. All components of LACT unit shall be accessible for reasonable inspection by the authorized officer.

Violation: Minor.
Corrective Action: Provide authorized officer with means of access to LACT.
Abatement Period: 30 days.

   c. The authorized officer shall be notified of any LACT unit failure, such as electrical, meter, or other failure that results in use of an alternate method of measurement.

Violation: Minor.

Corrective Action: Notify authorized officer of alternate method used.
Abatement Period. By 5th business day following use of alternate method.

d. Any and all tests conducted on oil samples extracted from LACT samplers for determination of oil gravity and S & W content shall meet the same requirements and minimum standards specified in this Order with respect to oil measurement by tank gauging for all measurements taken of temperature, gravity, and S&W content (Section III.C.5., 6., and 7.)

Violation: Major.
Corrective Action: Report tests for gravity, temperature, and/or S & W content per Section III.C.5., 6., and 7. minimum standards.
Abatement Period: Prior to sales or removal.

2. *Operating Requirements for LACT Unit Components.* All required LACT unit components shall be operated to satisfy the following minimum standards:

a. *Charging pump and motor.* The LACT unit shall include an electrically driven pump rated for a discharge pressure and rate that are compatible with the rating for the meter used and sized to assure turbulent flow in the LACT main stream piping.

Violation: Major.
Corrective Action: Install properly designed pump and motor.
Abatement Period: Prior to sales or removal.

b. *Sampler.* The sampler probe shall extend into the center one-third of the flow piping in a vertical run, at least 3 pipe diameters downstream of any pipe fitting. The probe shall always be in a horizontal position.

Violation: Major.
Corrective Action: Install component properly.
Abatement Period: Prior to sales or removal.

c. *Composite Sample Container.* The composite sample container shall be capable of holding sample under pressure and shall be equipped with a vapor proof top closure and operated to prevent the unnecessary escape of vapor, and the container shall be emptied upon completion of sample withdrawal.

Violation: Major.
Corrective Action: Install component properly, and empty after each sample withdrawal.
Abatement Period: Prior to sales or removal.

d. *Mixing System.* The mixing system shall completely blend the sample into a homogeneous mixture before and during the withdrawal of a portion of sample for testing.

Violation: Major.

Corrective Action: Repair mixing system.
Abatement Period: Prior to sales or removal.

e. *Strainer*. The strainer shall be constructed so that it may be depressurized, opened, and cleaned, be located upstream of the meter, and be made of corrosion resistant material of a mesh size no larger than ¼-inch.

Violation: Minor.
Corrective Action: Replace with properly designed strainer, and install properly.
Abatement Period: 30 days.

f. *Positive Displacement Meter*. The meter shall register volumes of oil passing through said meter determined by a system which constantly and mechanically isolates the flowing oil into segments of known volume, and be equipped with a non-resettable totalizer.

Violation: Major.
Corrective Action: Replace or repair meter or the non-resettable totalizer.
Abatement Period: Prior to sales or removal.

g. *Meter Proving Connections.* All meter proving connections shall be installed downstream from the LACT meter, with the line valve(s) between the inlet and outlet of the prover loop having a double block and bleed design feature to provide for leak testing during proving operations.

Violation: Major.
Corrective Action: Relocate prover loops downstream from LACT meter, and install block and bleed valve as specified.
Abatement Period: Prior to proving LACT.

h. Back Pressure and Check Valves. The back pressure valve and check valve shall be installed downstream from the LACT meter.

Violation: Major.
Corrective Action: Install back pressure valve and check valve downstream from LACT meter.
Abatement Period: Prior to sales or removal.

i. *Air Eliminator*. The air eliminator shall be installed and prevent air/gas from entering the meter.

Violation: Minor.
Corrective Action: Install air eliminator.
Abatement Period: 30 days.

j. *Diverter Valve/Shut-off Valve.* The diverter valve/shut-off valve shall be activated by

the Sediment and Water Monitor so that the valve moves to divert flow to the clean oil discharge only when it receives a positive signal, or provide a shut-off valve configured to shut off oil delivery upon failure to receive a positive signal from the Sediment and Water Monitor.

Violation: Minor.
Corrective Action: Install diverter valve/shut-off valve.
Abatement Period: 30 days.

k. *Sediment and Water (S and W) Monitor.* The Sediment and Water Monitor shall be an internally plastic coated capacitance probe, no smaller in diameter than the skid piping, and shall be mounted in a vertical pipe located upstream from the diverter valve/shut-off valve and the meter.

Violation: Minor.
Corrective Action: Install S and W Monitor.
Abatement Period: 30 days.

l. *Automatic Temperature/Gravity Compensator.* The automatic temperature/gravity compensator shall be sized according to the fluid characteristics being measured.

Violation: Major.
Corrective Action: Install automatic temperature/gravity compensator.
Abatement Period: Prior to sales or removal.

3. *Sales Meter Proving Requirements.* LACT positive displacement meters shall be proved periodically. Meter provings shall follow "API Manual of Petroleum Measurement Standards, Chapter 4 - Proving Systems," 1978, and shall meet the following minimum standards.

a. The types of meter provers to be used, and the calibration requirements are as follows:

(1) The acceptable types of meter provers are pipe provers, tank provers, master meters, or other API recognized meter provers.

Violation: Minor.
Corrective Action: Prove again with acceptable meter prover.
Abatement Period: 30 days.

(2) The prover shall have available at the site for review by the authorized officer, evidence that the prover has been calibrated, with the certified calibration date identified by some unique number, i.e., serial number assigned to and inscribed on the prover. The calibration evidence for a pipe or tank prover shall show the certified volume as determined by the water draw method.

If a master meter is used, the most recent calibration report for said master meter shall be available. Said calibration report shall show that the master meter has been calibrated in accordance with API requirements, has an operating factor within the range from 0.9900 to 1.0100, and that 5 consecutive runs have been

matched within a tolerance of 0.0002.

Violation: Minor.
Corrective Action: Provide calibration certification.
Abatement Period: Prior to proving.

b. Minimum Proving Frequency. For all sales and allocation meters, the accuracy of the measuring equipment at the point of delivery or allocation shall be tested following initial meter installation or following repair, and if proven adequate, at least quarterly thereafter unless a longer period is approved in writing by the authorized officer.

Violation: Minor.
Corrective Action: Notify authorized officer of scheduled proving and prove meter.
Abatement Period: 10 business days.

(1) In the event that the total throughput exceeds 100,000 bbls per month, then proving shall be accomplished monthly.

Violation: Minor.
Corrective Action: Notify authorized officer of scheduled proving.
Abatement Period: By the 10th business day after discovery of the violation.

c. In Establishing the Operating Meter Factor:

(1) At least 6 runs shall be made. Of these 6 runs, 5 consecutive runs shall match within a tolerance of 0.0005 (0.05 percent) between the highest and the lowest reading.

Violation: Major.
Corrective Action: Notify authorized officer and reprove meter.
Abatement Period: 10 business days.

(2) The arithmetic average of these 5 consecutive runs shall be used for computation of the meter factor.

Violation: Minor.
Corrective Action: Compute meter factor using arithmetic average of the 5 consecutive runs.
Abatement Period: Prior to completion of proving.

(3) Meter factor computations shall also include the correction for the effect of pressure on steel (Cps) for provers; and the correction for the effect of temperature on steel (Cts) for provers; and the correction for the effect of temperature on liquid (Ctl), and the correction for the effect of pressure on liquid (Cpl). The Cps and Cts correction factors shall be determined using the "API Manual of Petroleum Measurement Standards, Chapter 12, Section 2," 1981, or latest revised standard, and the Ctl correction factor shall be obtained from the "API Standard 2540, Chapter 11.1, Volume I (ASTM D-1250-80), Table 6A,"

1980, or latest revised standard, and the Cpl correction factor still be obtained from the "API Manual of Petroleum Measurement Standards, Chapter 11.2.1."

Violation: Minor.
Corrective Action: Include proper correction factors.
Abatement Period: Prior to completion of meter proving.

(4) The initial meter factor for a new or repaired meter shall be within the range from 0.9950 to 1.0050, unless the deviation can be justified to the satisfaction of the authorized officer.

Violation: Minor.
Corrective Action: Replace/repair/reprove meter or justify deviation from the brackets 0.9950 to 1.0050 to the authorized officer.
Abatement Period: Prior to completion of proving.

4. *Excessive Meter Factor Deviation.* Excessive meter factor deviation may be evidence of meter malfunction, and corrective action shall be taken upon discovery of meter malfunction. However, if the operator determines that the meter did not, in fact, malfunction, the lessee/operator shall submit, for approval by the authorized officer, a report as to the findings and reasons for the excessive meter factor deviation and the determination of no meter malfunction. In the event a malfunction occurred, the meter shall be immediately removed from service, checked for damage or wear, adjusted and/or repaired, and reproven prior to return to service. The arithmetic average of the malfunction factor and the previous factor shall be applied to the production measured through the meter between the date of the previous factor and the date of the malfunction factor. Malfunction meter factors shall be clearly indicated on the proving report, which shall also contain all appropriate remarks regarding subsequent repairs and/or adjustments.

The minimum standards for evidence meter malfunction, and corrective action required, are as follows:

Meter Factor Deviation.

(1) Deviation in a meter factor not exceed ±0.0025 since the last proving of the meter unless explained by changing conditions, i.e., temperature or gravity or flow-rate.

Violation: Minor.
Corrective Action: Repair or replace meter, or submit report to authorized officer for approval of the findings and reasons for the determination that there is no meter malfunction.
Abatement Period: Prior to of completion of meter proving.

(2) A meter factor shall not exceed 1 percent above or below unity, i.e., outside of the range from 0.9900 to 1.0100.

Violation: Minor.
Corrective Action: Same as (1) above.

Abatement Period: Prior to completion of meter proving.

5. *Meter Reporting Require Requirements.* All meter provings, meter failures, and volume adjustments following meter malfunction shall be reported to the authorized officer, as follows:

Meter Proving Reports. The meter proving report shall be filed on one of the forms set out in "API Manual of Petroleum Measurement Standards, Chapter 12-Calculation of Petroleum Quantities, Section 2-Calculation of Liquid Petroleum Quantities Measured by Turbine or Displacement Meter," 1981 (Reaffirmed August 1987). Any similar format is acceptable provided all required data are included and proper calculation sequence is maintained.

Each meter proving report shall be identified by lease number, communitization agreement number, or unit participating area name, and the location of the facility.

Each meter proving report shall be filed with the authorized officer no later than 10 business days following the meter proving.

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Violation: Minor.
Corrective Action: Submit proper proving report to authorized officer.
Abatement Period: File the report with authorized officer no later than 10th business day following the proving.

E. Oil Measurement by Other Methods or at Other Locations Acceptable to the Authorized Officer.

Any method of oil measurement, other than tank gauging or positive displacement metering system, requires prior approval, based on applicable API Standards, by the authorized officer. Other measurement methods include, but are not limited to: Turbine metering systems, Measurement by calibrated tank truck, Measurement by weight, and Net oil computer.

The requirements and minimum standards for oil measurement on the lease, unit, unit participating area, or communitized area by an alternate method, or at a location off the lease, unit, unit participating area, or communitized area by either an authorized or an alternate method of measurement, are as follows:

1. *Measurement on the Lease, Unit, Unit Participating Area, Communitized Area.*

An application for approval of an alternate oil measurement method shall be submitted to the authorized officer and written approval obtained before any such alternate oil measurement method is operated. Any operator requesting approval of any alternate oil sales measurement system shall submit performance data, actual field test results, or any other supporting data or evidence acceptable to the authorized officer, that will demonstrate that the proposed alternate oil sales measurement system will meet or exceed the objectives of the applicable minimum standard or does not adversely affect royalty income or production accountability.

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Violation: Major.
Corrective Action: Shut in operations. Submit application for approval of desired method of oil measurement.

Abatement Period: Prior to sales or removal.

2. *Measurement at a Location Off the Lease, Unit, Unit Participating Area, or Communitized Area.*

a. An application for off-lease measurement shall be submitted to the authorized officer and written approval obtained before any such off-lease oil measurement facilities are installed or operated. The application for written approval of off-lease measurement shall justify location of the measurement facilities at the off-lease location desired before approval will be granted, but no additional approval as to the oil measurement method is required, provided measurement is to be accomplished by tank gauging or positive displacement metering system, pursuant to the requirements and minimum standards of this Order.

Violation: Minor.
Corrective Action: Submit application for written approval of off-lease measurement.
Abatement Period: 20 days.

b. If oil measurement is to be accomplished at a location off the lease, unit, unit participating area, or communitized area by any alternate measurement method (any method other than tank gauging or positive displacement metering system), then the application, in addition to justifying the location of the measurement facilities, shall also demonstrate the acceptability of the of the alternate measurement method, pursuant to Section III.E.1.

Violation: Major.
Corrective Action: Submit application for approval of off-lease measurement and approval of desired method of measurement.
Abatement Period: Prior to sales or removal.

F. Determination of Oil Volumes by Methods Other Than Measurement.

Pursuant to 43 CFR 3162.7-2, when production cannot be measured due to spillage or leakage, the amount of production shall be determined in accordance with the methods approved or prescribed by the authorized officer. This category of production includes, but is not limited to, oil which is classified as slop oil or waste oil.

The minimum standards for determining the volume of oil that cannot be measured are as follows:

1. No oil located in an open pit or sump, in a stock tank, in a production vessel or elsewhere, may be classified or disposed of as waste oil unless it can be shown, to the satisfaction of the authorized officer, that it is not economically feasible to put the oil into marketable condition.

Violation: Major.
Corrective Action: Put oil into marketable condition.
Abatement Period: 10 working days.

2. No slop oil may be sold or otherwise disposed of without prior approval from the authorized officer. Following the sale or disposal, the authorized officer shall be notified as to the volume sold or disposed of, and the method used to compute the volume.

Violation: Major.
Corrective Action: Submit complete report of sale or disposal.
Abatement Period: 24 hours.

IV. Variances From Minimum Standards.

An Operator any request that the authorized officer approve a variance from any of the minimum standards prescribed in Section III. All such requests shall be submitted in writing to the appropriate authorized officer and shall provide information as to the circumstances that warrant approval of the variance(s) requested and the proposed alternative means by which the related minimum standard(s) will be satisfied. The authorized officer, after considering all relevant factors, shall approve the requested variance(s) on making a determination that the proposed alternative(s) meet or exceed the objectives of the applicable minimum standard(s), or does not adversely affect royalty income or production accountability. In addition, approval may be given orally by the authorized officer before the operator initiates actions that require a variance from minimum standards. The oral request, if granted, shall be followed by a written request not later than the fifth business day following oral approval, and written approval will then be appropriate.

The authorized officer also may, on his/her motion, issue NTLs that establish modified standards or variances for specific geographic areas of operations.

After notice to the operator, the authorized officer also may require compliance with standards that exceed those contained in this Order whenever such additional requirements are necessary to achieve protection of royalty income or production accountability. The rationale for any such additional requirements shall be documented in writing to the operator.

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Attachment

I. Sections from 43 CFR Subparts 3163 and 3165 (not included with Federal Register publication).