U.S. Onshore Resources & Carbon Management

December 2022

Multiphase Flowmeter (MPFM) Update

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Agenda

- Multiphase Meter Background
- Agar Specifics
- Field Trial Data
- Summary and Next Steps

Benefits of Multiphase Flow Meters (MPFMs)

- Reduced Emissions
- Reduced Footprint
  - Smaller skid
  - Potential to reduce flowline lengths by testing on well pads
- Increased Surveillance
- Reduced CAPEX

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Oxy's MPFM Journey

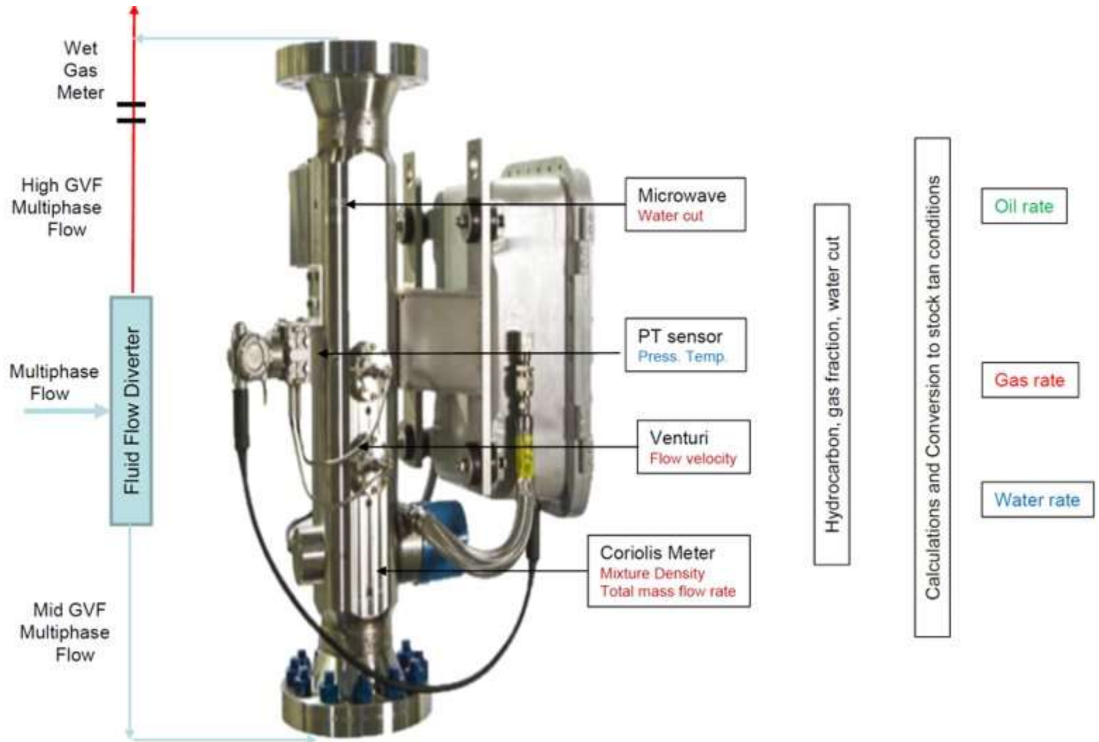
Oxy has been trialing and searching for a suitable MPFMs since 2015. ***The Agar MPFM is the fifth MPFM trialed by Oxy.***

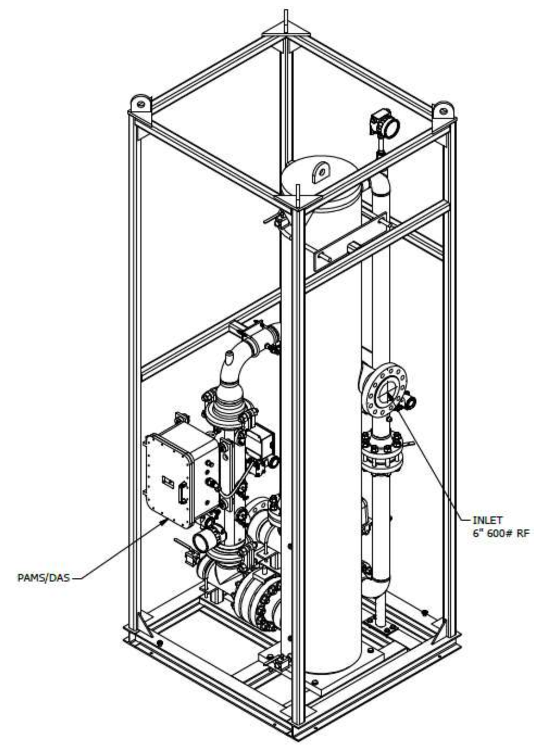
Agar specifics:

- Not a generally licensed nuclear device
- Lowest nameplate liquid and gas uncertainty among competition*
- Features a partial separation device, which greatly reduces impact of GVF and GOR on measurement accuracy.
- Made in USA

*Per Southwest Research Institute Paper

How the Agar MPFM Works





How Agar MPFM Compares to Traditional Test Vessel

Reduced Emissions and Upsets

- No PSV
- Minimal blowdown during maintenance
- Reduction in facility upsets due to elimination of level control and ANSI 600 pressure rating

Reduced Footprint

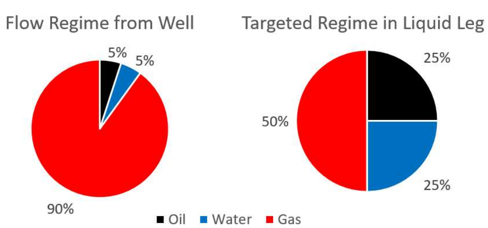
- ~80% smaller footprint (See right)
- Well site testing with manifold at recent development in Texas eliminated 21,000' of test lines.

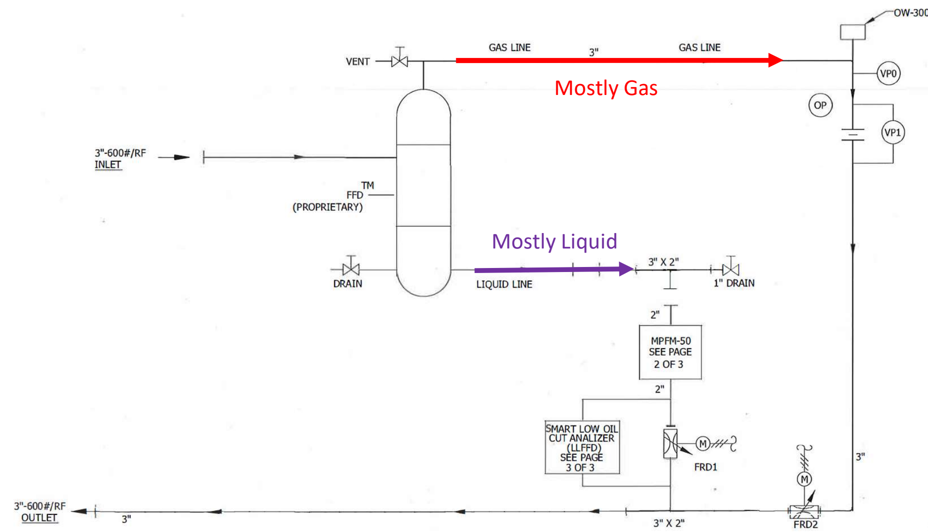
Increased Surveillance

- No purge time
- Continuous and instantaneous data vs. single data point at end of test
- Increased data accessibility on Graphworx, LOWIS, and OSI PI

API Industry Standard

- Recognized by API MPMS 20.5 as a well test and allocation method
- Inlet fluid flow diverter makes the Agar MPFM a partial separation device per API
  - **Gas Leg** – A portion of the gas is separated and sent through the gas leg, which uses an orifice for measurement
  - **Liquid Leg** – Receives a stream with reduced gas and measures properties with venturi, Coriolis, and microwave meter.

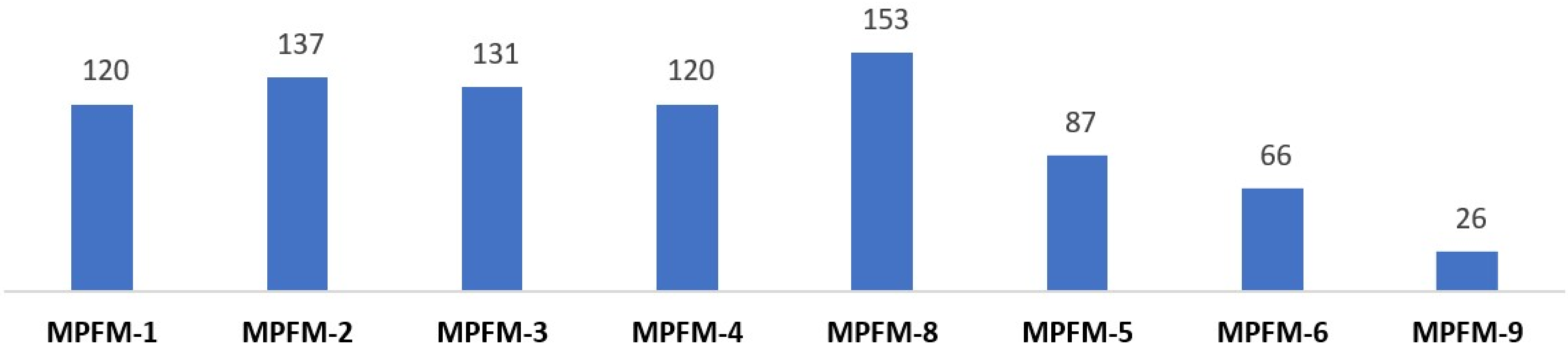




- Previous MPFMs tested within Oxy **were not partial separation devices**

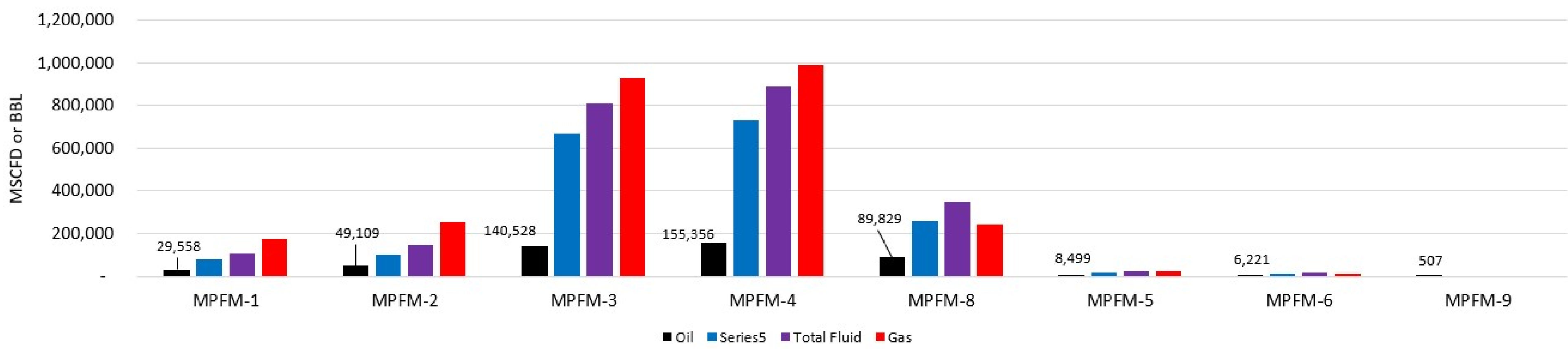
Locations and Well Test Count

840 well tests across 24 wells



Cumulative Measured Production of Accepted Tests

Oil	488,000 BBL → **1.8%**
Water	1,855,000 BBL → **-.6%**
Fluid	2,344,000 BBL → **-.1%**
Gas	2.6 BCF →**.2%**



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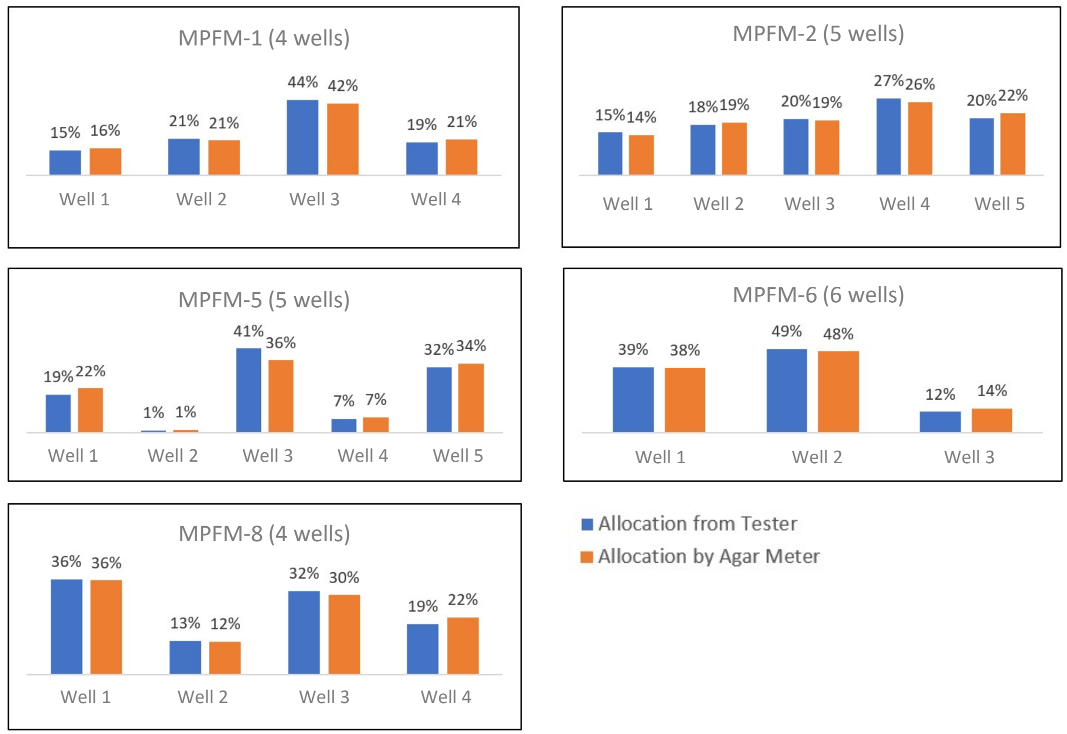
Allocation Based on Cumulative Counts

The 5 Trials with AWT's allocated accurately for 21 wells.

Example Calculation from MPFM-1
- Cum. Oil from Tester @ MPFM-1 site: 29,558 BO
- Well 1 Cum. Oil from Tester: 4,361 BO
- % Production Allocated to Well 1: 15%

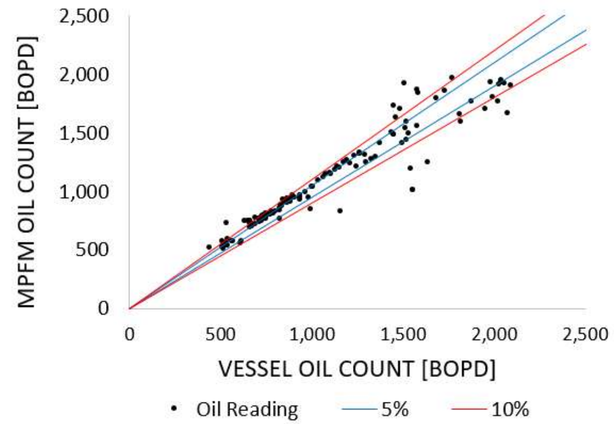
Oil Allocation

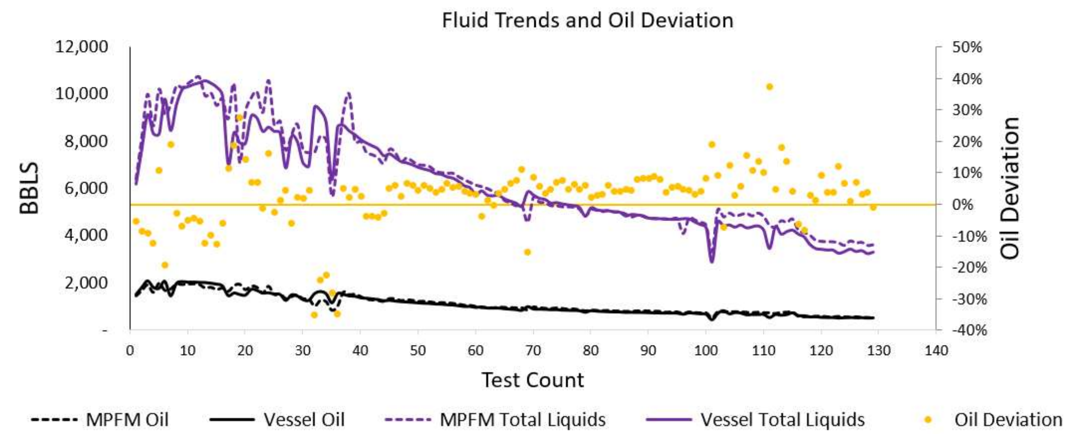


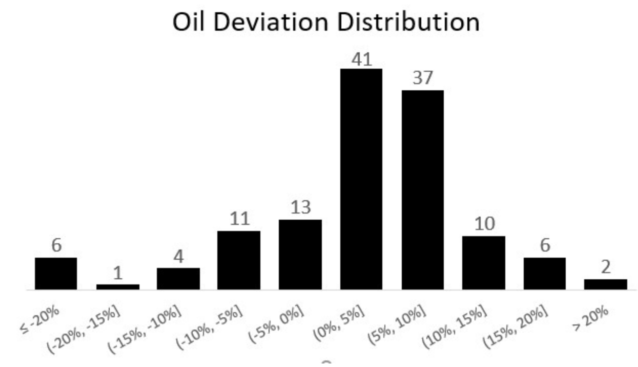
*Single-well trial locations not included.

MPFM-3 – Single Well

- **Setup:** One well, one tester
- **Commissioned:** 3/13/22
- **Last Data Point:** 9/13/22
- **MPFM Used During Flowback:** Yes
- **Lift Type:** Converted from flowing to gas lift on well test #48
- **Tester Meter Type:** Coriolis
- **Quantity of Accepted Tests:** 131
- **Cum. Oil Counted by Agar:** 141,639 BO
- **Cum. Oil Deviation:** .8%

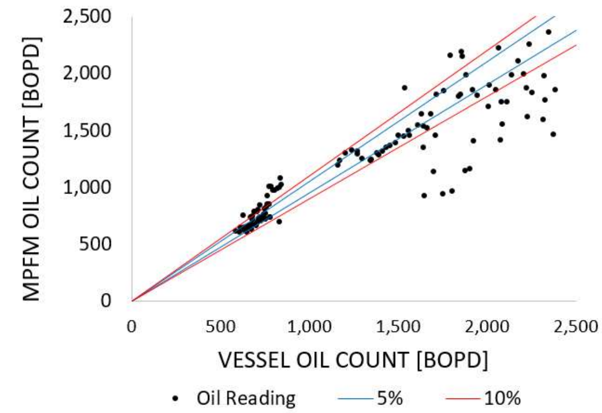


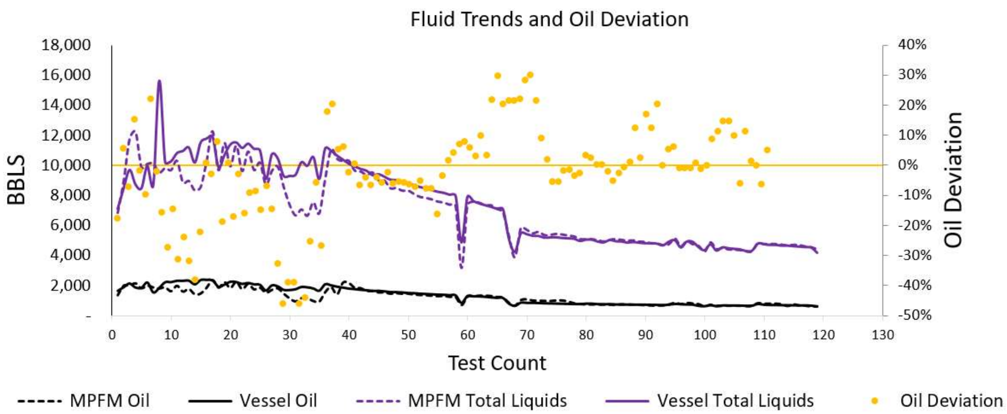


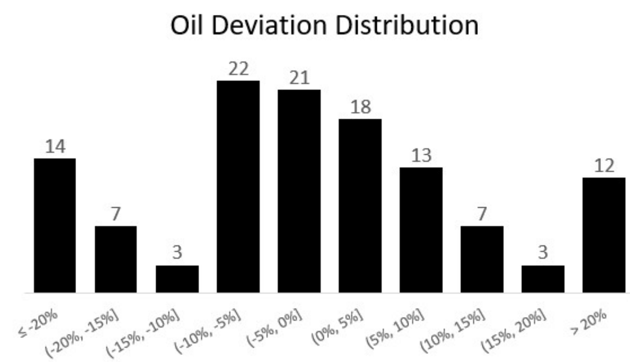


MPFM-4 – Single Well

- **Setup:** One well, one tester
- **Commissioned:** 3/12/22
- **Last Data Point:** 9/13/22
- **MPFM Used During Flowback:** Yes
- **Lift Type:** Converted from flowing to gas lift on well test #48
- **Tester Meter Type:** Coriolis
- **Quantity of Accepted Tests:** 120
- **Cum. Oil Counted by Agar:** 145,658 BO
- **Cum. Oil Deviation:** -6.2%







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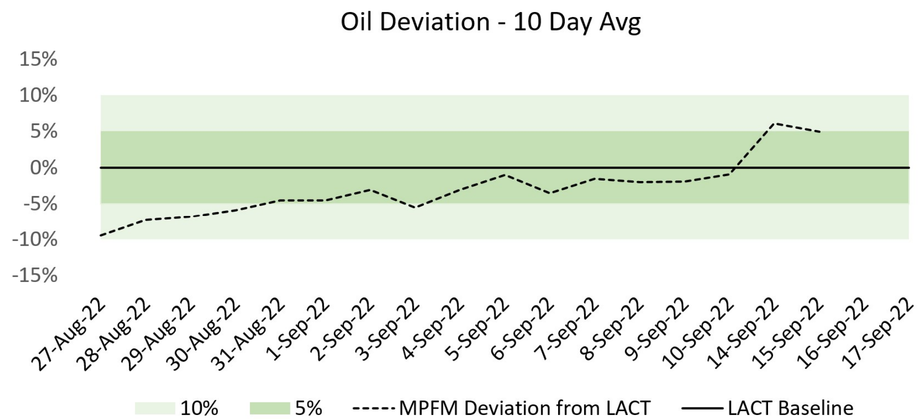
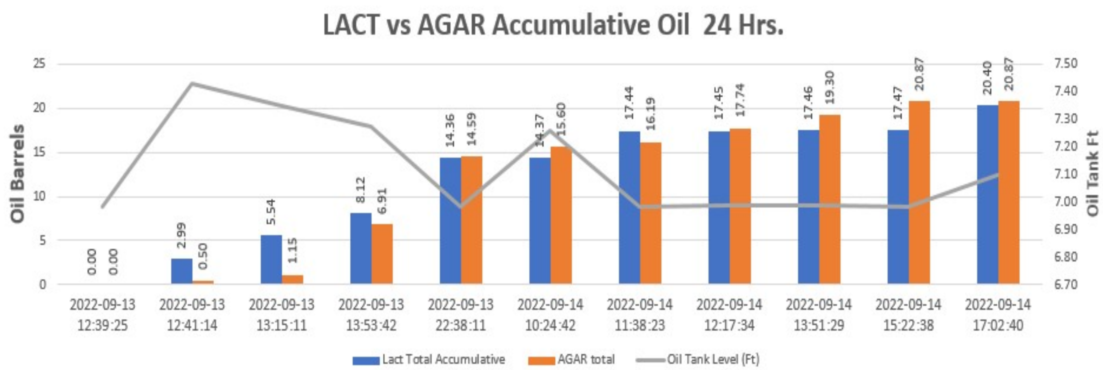
MPFM-9 – Single Well LACT Unit Trial

- **Well Count:** 1
- **Commissioned:** 8/18/22
- **MPFM Used During Flowback:** No – mature well
- **Lift Type:** Gas Lift
- **Baseline Equipment:** LACT
- **Quantity of Tests:** 26 (24-hour period)
- **Cum. Oil Counted by Agar:** 494 BO
- **Cum. Oil Deviation:** -2.9%
- **Comments:**
  - 10-day rolling average used for comparison
  - Well production was below the operating envelope of the Agar meter. Meter operated in batch mode to accumulate liquids





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Summary

- MPFMs have numerous environmental benefits, including reduced emissions and surface footprint
- MPFMs are recognized by API MPMS 20.5 as an acceptable well test and allocation method
- OXY has completed extensive testing (~500,000 BO) of Agar MPFMs in different field applications
- OXY is seeking NMOCD permission to use this technology for well testing and allocation in New Mexico

Agar Corporation
Process Measurement and Control Solutions

Gas Leg Calibration/Verification Procedure for AGAR MPFM-50 with FFD

Table of Revisions

Date	Revision	Version	ER Number	Description of Changes
March 22, 2023	00		ER23-0035	Initial issue created by Wilman Fai, Jairo Suarez, and Vikram Siddavaram

Technical Reviewer	Vikram Siddavaram	March 22, 2023
Reviewer Name	Jairo Suarez	March 22, 2023
Approved for Issue	Wilman Fai	March 22, 2023

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Gas Leg Calibration/Verification Procedure for AGAR MPFM-50 with FFD

1.0 Scope:

The following steps and procedure should be followed to verify the Gas Leg instrumentation both during Startup and Preventive Maintenance activities of an AGAR MPFM-50 when it features the FFD® (Fluidic Flow Diverter) option.

2.0 Objective

Verify that the instruments on the Gas Leg of the AGAR MPFM-50 with FFD are properly calibrated and that their performance meets Agar recommendations to ensure accurate measurement of gas and liquid rates flowing through the gas leg.

3.0 Responsibilities

3.1 Implementation
The MPFM Service Technician will ensure that the procedure is implemented.

3.2 Supervision
The Service Manager will ensure this procedure is followed.

3.3 Verification and Approval
Quality Representative will verify that this procedure is implemented.

3.4 Verification Method
Verification is completed through the Gas Leg Verification Form.

4.0 Procedure

4.1 Required Tools and Equipment

4.1.1 Service Laptop/Desktop

4.1.2 Ethernet cable

4.1.3 Hart Communicator

4.1.4 Handheld Calibration Pump for Gauge and Differential Pressure Transmitters.

4.1.5 Open hex wrenches to open gas leg orifice plate holder flange

5.0 Safety Precautions

5.1 Safety practices shall include, but are not limited to, the following requirements:

5.1.1 Local Safety Regulations and/or Occupational Safety and Health Act of 1970 OSHA 29CFR 1910.269

5.1.2 Local Fire Protection Regulations and/or National Fire Protection Association NFPA 70E

5.1.3 All other applicable state and local safety operating procedures.

5.1.4 Site Acceptance Testing Group shall have available sufficient protective barriers, PPE, and warning signs, where necessary, to conduct specified tests.

5.1.5 The Owner's and/or Facility operator's safety procedures shall be reviewed and understood by the Agar Corporation Field Service Engineer.

5.1.6 Roles and Responsibilities shall be defined by the Owner/Operator and understood by the Agar Field Service Engineer.

6.0 Methodology:

6.1 Verify Gas Leg Instrumentation in Empty Pipe condition without flow.

6.1.1 Bypass the MPFM and close the inlet and outlet isolation valves.

6.1.2 Open the purge valves, one at a time, of all the transmitters on the gas leg of the MPFM to bleed any liquid trapped inside the gas leg tubing. A rag or handheld container must be placed in front of each valve before opening it to collect any liquid that might be trapped inside the tubing. Confirm that only gas flows from the purge valve and close it again before proceeding to the next purge valve.

6.1.3 Depressurize the MPFM and confirm that the bottom of the gas leg is empty by opening the drain valve closest to the MPFM outlet located below the lowest pressure sensing tap of the gas leg. If a gas sampling valve is present below the low sensing tap it can be used to verify that the gas leg is empty up to that height.

6.1.4 Open all the purge valves of the transmitters in the gas leg.

6.1.5 Open the enclosure of each pressure transmitter and using a Handheld Hart Communicator and perform preliminary zero trim on all of them.

6.1.6 Use a Handheld Differential & Gauge Pressure Calibration Pump to verify the transmitter zero and the span calibration at the configured URV (Upper Range Value) for each transmitter of the gas leg.

6.1.6.1 Close the block valve of each pressure sensing line of the gas leg transmitters.

6.1.6.2 Verify the configured URV and LRV (Lower Range Value) using a Handheld Hart Communicator. Record the values in the attached verification form.

6.1.6.3 Connect the Handheld Differential & Gauge Pressure Calibration Pump to the HP (High Pressure) calibration tie-in point for each transmitter.

6.1.6.4 Close the transmitter purge valves and using the Calibration Pump pressurize the HP sensor chamber of the transmitter to the URV value and verify that the error between the transmitter reading and the Calibration Pump Display is less than 0.1% of the transmitter's configured range (URV-LRV). Perform sensor Upper Sensor calibration as required. Write down the final values on the attached verification form.

6.1.6.5 Connect a service laptop to the MPFM with an Ethernet cable and establish a web-browser session to access the HTML interface of the MPFM.

6.1.6.6 Go to the PT Check screen from the Diagnostics Menu and confirm that the Difference between the on-screen values and the Calibration Pump value is less than 0.1% of the transmitters configured range (URV-LRV). If the more than this error, perform calibration of the corresponding input channels where the transmitters are mapped to. Record the measured and calculated % Error values in the attached verification form.

6.1.6.7 Depressurize the transmitter and disconnect the Calibration Pump. Open the purge valves and the process block valve to the transmitter.

6.1.6.8 Go to the PT Check screen from the Diagnostics Menu and confirm that the FS error of the Gas Leg Transmitters (VP1, VP2 and VP3) is less than 0.1%. If more than this error, perform calibration of the corresponding input channels where the transmitters are mapped to. Record the final measured and FS % Error values in the attached verification form.

6.1.6.9 Verify that the VP0 reading is within +/- 0.1 psia from atmospheric pressure value (14.68 psia). If more than this error, perform calibration of the corresponding input channel where this transmitter is mapped to. Record the final measured value in the attached verification form.

6.1.7 Check OW300 sensor in Empty Condition.

6.1.7.1 Go to the Diagnostics Data screen from the Diagnostics Menu.

6.1.7.2 Scroll down and confirm that the Scaled 37 average value agrees within +/- 1% of the value configured as Gas Leg OW300 HF Sensor Freq. in Air of the Gas Leg configuration of the MPFM.

6.1.7.2.1 If within this range, adjust the value in the configuration to the value observed in the Index 37 variable. Record the configured value on the attached verification form.

6.1.7.2.2 If not within the above range, the OW300 sensor must be inspected and verified that it is not coated with any foreign particles.

6.1.8 Verify orifice plate mechanical condition.

6.1.8.1 Remove the orifice plate from the fitting or flange that contains it.

6.1.8.2 Record the Size of the Orifice Plate Bore Correctly. Ensure that the size stamped on the plate matches the gas orifice ID configured in the MPFM. Record the plate and configured values on the attached verification form.

6.1.8.3 Verify the Bore Size. Check whether the inside diameter of the orifice plate bore matches the size stamped or engraved on the plate using a calibrated micrometer. Repeat the measurement along three different directions on the orifice and obtain the average. Record the average value on the attached verification form.

6.1.8.4 Examine the Condition of Bore Edges. Ensure the bore edges are free of any gouges or nicks. Also, ensure the edge of the plate is sharp and without deformities by running your fingernail across it.

6.1.8.5 Check the Overall Condition of the Plate. Make sure the orifice plate is smooth and free of any gouging or pitting. In addition to this, the plate must be perfectly straight without warpage or bulging.

6.1.8.6 If an orifice plate fitting is used to house the plate, review the condition of its seals. Inspect the seals that hold the orifice plate in the housing and look for any signs of splits, cracks, or other damage.

6.1.8.7 Reinstall the orifice plate or install a new one if any of the previous steps identifies a mechanical anomaly on the plate. Also, if the most recently observed differential pressures during normal operation of the MPFM indicate that the VP1/VP3 transmitters are out of recommended operational range (12 inH2O > DP > 95% of configured Range), replace for a larger or smaller orifice plate size as required to return the transmitters into normal operating range. Record in the attached form the diameter of the new plate and the ID value configured in the MPFM.

6.1.8.8 Replace seals as required and tighten the orifice plate holder fitting or flanged connection.

6.1.9 Visually verify operation of the gas leg valve

6.1.9.1 From the laptop, note and backup the original valve mode configuration and proceed to set the valves in lab mode through the web browser interface (Refer to MPFM user manual for further details).

6.1.9.2 Change the gas leg valve position (Valve 2) to 0%, 50% and 100% opening and verify visually that the gas leg valve moves to the required position both by noticing the valve position indicator on the actuator and the valve indicator on the coupling between the valve and the actuator. Calibrate the gas valve actuator as required for the valve position to match the requested valve positions from the computer. Record the final observed valve positions in the attached form.

6.1.9.3 Return/Restore the valve mode to the original valve mode configuration.

6.1.10 Verify Full of Water condition of the OW300 sensor. Note: These steps are intended to be performed at the same time as the SVT and static tests with fresh water for the MPFM Liquid. Close all purge valves and drain valves. Fill MPFM gas leg with fresh water. Note: This step can be achieved as part of the SVT and static tests with water for the MPFM Liquid Leg.

6.1.10.1 Go to the Diagnostics Data screen from the Diagnostics Menu.

6.1.8.9 Scroll down and confirm that the Index 37 average value is within +/- 15% from Gas Leg OW300 HF Sensor Freq. in Water (typically 670 kHz) in the Gas Leg configuration of the MPFM.

6.1.10.2 Record this value in the attached verification form.

6.1.10.3 Drain the water from the Gas Leg.

6.1.10.4 Close all purge valves and drain valves used to drain the water.

6.1.11 Verify Empty condition of the Gas Leg Differential transmitters with process pressure.

6.1.11.1 Pressurize the MPFM to the process pressure by slowly opening the MPFM inlet valve.

6.1.11.2 Open the purge valves, one at a time, for all the transmitters on the gas leg of the MPFM to bleed any water that is still trapped inside the gas leg tubing. Close each valve as soon as dry gas is observed flowing from the purge.

6.1.11.3 Go to the PT Check screen from the Diagnostics Menu and confirm that the FS error of the Gas Leg Transmitters (VP1, VP2 and VP3) is less than 0.1%. If more than this error, perform final zero trims for the transmitter(s) where error exceeds 0.1% FS. Record the final measured and FS % Error values in the attached verification form.

6.1.11.4 Close all the pressure transmitter enclosures.

1.1. Verify Gas Leg Instrumentation with gas flow.

6.1.12 Divert flows through the MPFM.

6.1.13 Using a clear rag in front of the gas sampling valve in the gas leg, verify that no carryover is present.

6.1.14 Verify OW300 sensor readings in flowing condition.

6.2.3.1.1 If absence of carryover is confirmed from the gas sample, go to the Diagnostics Data screen from the Diagnostics Menu and confirm that the Index 37 average value still agrees within +/- 1% of the value configured as Gas Leg OW300 HF Sensor Freq. in Air of the Gas Leg configuration. Record the observed value on the attached form.

6.2.3.2 If carryover was present, confirm that the observed value is less than the configured value as Gas Leg OW300 HF Sensor Freq. in Air. Record the observed value on the attached form.

6.2 Complete and sign the procedure checklist and verification attached form. Save them the MPFM maintenance logbook.

6.3 Return MPFM to normal well testing operation.

MPFM-50 Gas Leg Verification Check List

MPFM SN#:		**Date:**	
End User:			
MPFM Model:		**Location:**	

Step ID	Activity Description	Completed	Comments
6.1	Verify Gas Leg without flow and empty pipe condition		
6.1.1	Bypass and isolate MPFM		
6.1.2	Purge gas leg tubing and transmitters internally with process gas		
6.1.3	Depressurize and drain the MPFM Gas Leg		
6.1.4	Open gas leg purge valves on the transmitters		
6.1.5	Verify zero of the gas leg transmitters with a Hart Communicator. Perform preliminary zero trim as required.		
6.1.6	Verify zero and span calibration of the gas leg transmitters using a Handheld Gauge and Differential Pressure Calibration Pump. Calibrate the transmitters as required.		
6.1.7	Check OW300 in Empty condition		
6.1.8	Verify Orifice Plate mechanical condition		
6.1.9	Verify operation of the Gas Leg Control Valve		
6.1.10	Check OW300 in full of water condition		
6.1.11	Verify Empty condition of the Gas Leg Differential transmitters with process pressure		

6.2	Verify Gas Leg Instrumentation with gas flow		
6.2.1	Divert flow through the MPFM		
6.2.2	Confirm presence/absence of carryover with gas sample		
6.2.3	Confirm correct value of O300 for flowing condition according to presence/absence of carryover.		

6.3	Complete and sign this checklist and the attached verification form. Store the forms with the MPFM maintenance logbook		

6.4	Return MPFM to normal operation.		

Test Conducted By: Agar Technician: ______________________________

Witnessed By: Contractor Representative: ______________________________

Client/PCB Representative: ______________________________

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Process Measurement and Control Solutions

MPFM-50 Gas Leg Calibration Verification Form

MPFM SN#:		End User:	
MPFM Model:		Date:	
Technician:			

PRESSURE TRANSMITTER CHECKS						
TRANSMITTER	URV	LRV	Applied Pressure	Hart Communicator Value	PT Check Value	FS Error% (PT Val – Hart Val)/ (URV – LRV) x 100
VP0 (psia)			14.68			
VP1 (in H2O)			0.0			
VP2 (in H2O)			0.0			
VP3 (in H2O)			0.0			

ORIFICE PLATE VERIFICATION							
Original Plate	ID Info on Plate (in)	ID Measured					Configured in MPFM ID (m)
		Axis 1 (in)	Axis 1 (in)	Axis 1 (in)	Average ID (in)	Average ID (m)	
Orifice Plate Changed? ☐ Yes ☐ No (If yes, continue below)							
Reason for change ☐ Mechanical Anomaly ☐ DP out of Range					Details of reason:		
New Plate	ID Info on Plate (in)	ID Measured					Configured in MPFM ID (m)
		Axis 1 (in)	Axis 1 (in)	Axis 1 (in)	Average ID (in)	Average ID (m)	

OW300 VERIFICATION		Scale 37 Value	Scale 37 Value	Configured
Puck SN		**Air Value (Hz)**		
		Water Value (Hz)		
Carryover Observed? ☐ **Yes** ☐ **No**		Flowing Value (Hz)		

Gas Leg Verification Conducted By: Name & Signature: ___________________________________

Date: ____________________

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AGAR MPFM 50. MAINTENANCE SCHEDULE.

General

Maintenance of the AGAR MPFM 50 Multiphase Flowmeter should be considered from a component point of view as well as from an overall system point of view. Each individual component should be verified according to the recommended schedule. In addition, AGAR Multiphase meters have a built-in self-verification routine that allows users to verify the operation of the whole system by running a single-phase fluid through it at different flow rates.

Recommended Maintenance Schedule

The following table lists the recommended maintenance schedule for the AGAR MPFM 50 Multiphase Flowmeter, including the maintenance of the individual components and the verification of the overall system performance.

Activity	At Startup	Every 6 Months	Every 12 Months
Coriolis Meter Check	Frequency Reading Check	Frequency Reading Check	Frequency Reading Check
Pressure Transducer Check	Zero Trim	Zero Trim	Zero Calibration Check
Temperature Transducer Check	--	--	Temperature Calibration Check
Water in Oil Meter Check	PAMS Calibration Check Static Readings Check	Static Readings Check	PAMS Calibration Check Static Readings Check
Valve/Actuator Check	Actuator Travel Check	Actuator Travel Check	Actuator Travel Check
Self-Verification Test	Perform self-verification check	--	Perform self-verification check

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Fluidic Flow Diverter (FFD) Operation in the MPFM-50 System.

The MPFM-50 system, featuring the Agar Multiphase Coriolis Meter and Agar Water Cut Meter, is designed to deliver precise and reliable measurements across the full range of Gas Void Fraction (GVF) and Water Cut conditions. For wells with high GVF (above 85%), the Fluidic Flow Diverter provides additional benefits for measurement accuracy and robustness.

Optimized Measurement Through Intelligent Flow Management:

The FFD guides the incoming stream into two parallel paths:

- **Inner leg:** A liquid-rich, lower-GVF stream.
- **Outer leg:** A gas-rich, high-GVF (wet-gas) stream.

This arrangement increases local liquid holdup in the inner leg, which greatly enhances the representativeness of phase and stabilizes the dielectric and Coriolis measurement. As a result, this configuration significantly enhances accuracy in any flow regimes. The enhancement ensures that measurement accuracy remains stable and controlled, meeting the requirements for allocation and regulatory reporting.

Seamless Integration and Reliable Results:

The Fluidic Flow Diverter is designed to redistribute flow, not to separate phases. This approach enables more reliable water-cut measurements without the need for empirical adjustments or correlations, ensuring consistency and confidence in results.

Advanced Sensing for Comprehensive Flow Analysis:

The outer (wet-gas) leg features:

- An Agar OW300 Wetness Detector, which uses Microwave dielectric sensing to quantify the wetness (liquid fraction) of the gas-rich stream in real time.
- A dual-range differential pressure (DP) orifice plate, providing momentum change data for the wet-gas stream.

By combining mixture density from the OW300 with the DP signal, the system accurately measures both gas and liquid flow rates in the outer leg. These measurements are then integrated with those from the inner leg to provide total oil, water, and gas flow rates.

Consistently High Accuracy:

Because the liquid flow in the outer leg is relatively small compared to the inner leg, any uncertainty in the outer leg has minimal impact on the overall results. The dominant measurement accuracy is driven by the inner leg, ensuring robust and reliable total liquid rate and water cut determination.

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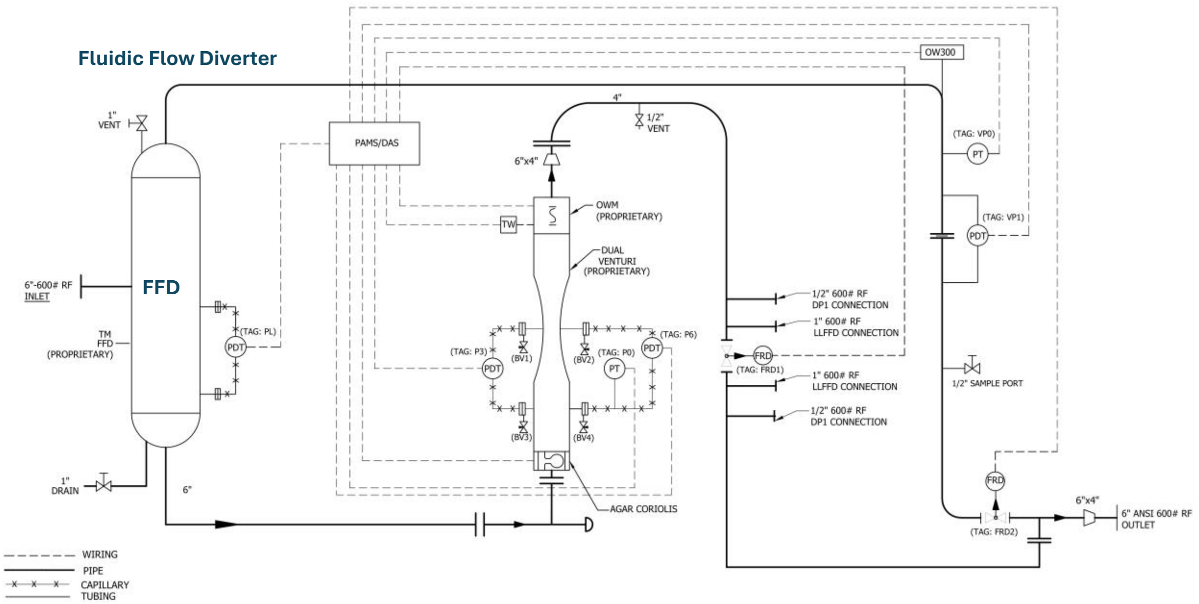
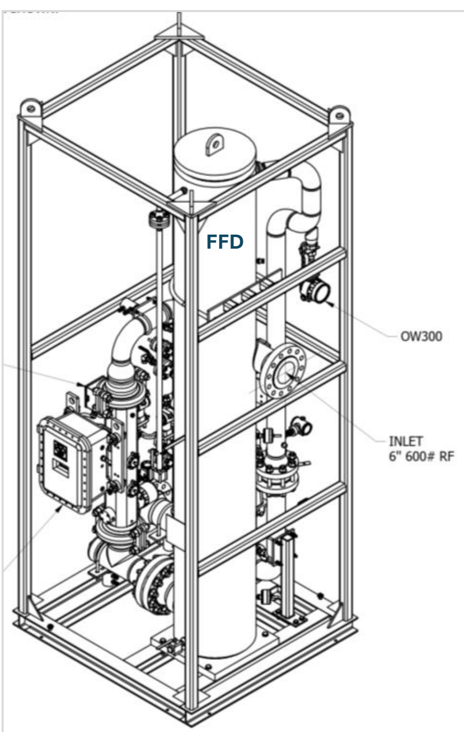
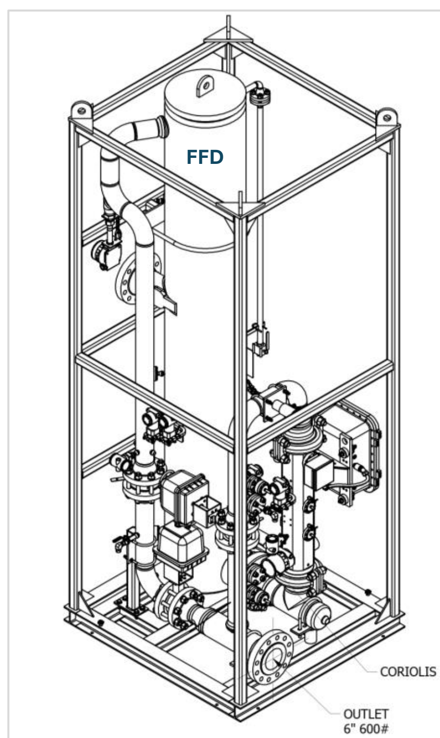
MPFM 50 P& ID.



MPFM 50 Drawing.





AGAR CORPORATION

Process Measurement & Control

MPFM SERIES

Multiphase Flow Meter (Oil/Water/Gas)

The AGAR MPFM is a low-cost multiphase meter that continues the long tradition of excellent multiphase meters provided by Agar for over 30 years. The AGAR MPFM combines advanced coriolis technology with traditional flow-measurement devices to achieve superior accuracy in the entire gas void fraction (GVF) range; 0-100%, including the wet gas regime from 95-100%. It is a low-cost, compact multiphase flow meter that can accurately measure oil, water, and gas flow rates without separation. The AGAR oil/water monitor is capable of measuring water cuts from 0-100% and is not affected by changing salinities.

The AGAR MPFM eliminates the need for expensive, secondary equipment such as phase separators, valves, and pumps for flow measurement. It is fully self-contained and compact for use in rugged field conditions and can easily be trailer-mounted for portable service.

MPFM Compact
Standard In-Line

MPFM SERIES ADVANTAGES:

- Gas void fraction 0-100%
- Water-cut 0-100%
- Not affected by flow regimes
- High accuracy, real-time flow measurement
- High and low viscosities
- No nuclear (radioactive) sources
- Compact, portable, and easy to transport and install
- Wet gas application

MPFM Series Features

THE STANDARD MPFM CONFIGURATION IS COMPRISED OF FOUR PRIMARY SUBSYSTEMS:

- The **mass flow and density measurement** is based on Agar's proprietary coriolis design and other ancillary sensors. Engineering advances allow Agar to utilize these sensors at extended operating multiphase flow ranges.The density data is fed into the AGAR Data Analysis System (DAS), which determines the net GVF.

- The **Agar Dual Venturi Meter** is used to measure momentum of the multiphase in extreme conditions where the flow is not homogeneous. This measurement with the Agar coriolis provide the net liquid flow rate and net gas flow rate.

- The **AGAR Water-Cut Meter** is used to measure water content accurately over the full range of 0-100% in both oil and water-continuous phases. Accuracy is not affected by changes in velocity, salinity, pH, viscosity, temperature, or density. Water-cut data is fed into the DAS and used to determine the individual oil and water flow rates from the net liquid flow rate.

- The **AGAR Data Analysis System (DAS)** performs on-line analysis of data acquired from the above sub-systems to determine the oil, water, gas, and total fluid flow rates. It supports standard black oil models for the PVT calculations that convert the flow from process conditions to standard conditions. It can also support multiple customer specific PVT models or equations.

  Optional subsystems are available for extreme high gas and/or low liquid flow ranges.

Compact MPFM Installation, South Texas

MPFM General Specifications

PERFORMANCE:

Gas Void Fraction	0 to 100%
Water cut	0 to 100%
Flow Regimes	All: (e.g. Bubbly, Wavy, Slug, Annular, etc.)
Pressure	Standard: Up to ANSI 1500# (higher pressures are optional)
Ambient Temperature	-4°F to 140°F (-20°C to 60°C) Optional Low Temp -40°F to 140°F (-40°C to 60°C)
Process Temperature	Standard Model 32°F to 212°F (0°C to 100°C) High Temperature Model 32°F to 450°F (0°C to 232°C) Extreme High Temperature model 32°F to 572°F (0°C to 300°C)
Liquid Viscosity	Low Viscosity Model: 0.1-100 cP High Viscosity Model: 0.1-2000 cP
Salinity	0 to 30% NaCl by weight (up to saturation)
Sand/Particulate	Up to 2% by volume and less than 1mm particle size
Max. Pressure Drop	Less than 15 psi (1 bar)
Wetted Parts	Standard: 316 Stainless Steel; Hastelloy, and other materials available on special order; According to ASME B31.1 and B31.3. PEEK; Ceramics Isolators; NACE compliant

MPFM General Specifications

PREFERRED INSTALLATION: Vertical upward flow

ELECTRICAL:

Power Supply: 24 VDC, 110 & 220 VAC

Power Requirements: 50 Watts for the basic option

SAFETY CERTIFICATIONS:

ATEX - Zone 1 Ex d -20ºC<Ta<60ºC

UL/C-UL - Class 1, Division 1, Group C&D

ROSTECHNADZOR (Russia, CIS), GOST-R, Metrology Pattern Approval

DATA COMMUNICATION: (STANDARD AND OPTIONAL)

Standard: 5 x 4-20 mA (oil flow rate, water flow rate, gas flow rate, temperature, pressure)

Standard: 3 x Pulses 0-5V square shape (oil flow rate, water flow rate, gas flow rate)

Standard: Modicon Modbus: RS-232/422/485 ASCII or RTU mode, Modbus TCP

Standard: Ethernet HTML user interface

Optional: Cellular modem and/or WiFi communication

The AGAR MPFM is a multiphase flow metering tool for field and well optimization, capable of handling all flow regimes.

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AGAR CORPORATION

agarcorp.com

WELL TEST VALIDATION PROCEDURE

The following is an overview and detailed description of how well tests are validated or flagged for review in Nexus. The process ensures that most normal tests are approved without manual effort, while outliers and potential data quality issues are identified quickly for further investigation.

Overview

Well tests are validated using the following methodologies, in the order listed below.

1. **Business Rule Checks** – The system first reviews the test against a set of operational rules. If one of these rules applies, the test is flagged accordingly. List of rules and conditions are detailed in Business Rule Checks section of this procedure.

2. **Decline Curve Statistical Model** – If no immediate classification is made, Nexus uses a decline-curve forecast to compare the test against expected production based on historical data:

   - Hyperbolic decline is applied for newer wells (early life, fewer than 1000 days online).

   - Exponential decline is applied for older wells (greater than 1000 days online).

   - The model calculates an expected range (upper/lower bounds). Tests within this range are auto-validated as allocatable. Tests outside this range are flagged for review.

     - Meter Issue Check – Within this step, if the last three test rates for oil, gas, or water are the same to two decimals, it's flagged as a possible meter issue.

3. **Manual Validation Review** – Flagged tests are reviewed by well analysts, who assign the appropriate validation code:

   - A = Allocatable

   - B = Bad

   - M = Memo

   - D = Delete

Business Rule Checks

Before any statistical modeling is run, Nexus applies a standard set of rules and logic checks to the well test data. These are designed to quickly identify obvious conditions that indicate the test is either valid, invalid, or needs review. The following checks are performed:

- Well Sold – If the well's completion status is "Sold," the test is marked Deleted.

- Well Type Check – If the well type is not "PROD_OIL" or "PROD_GAS," the test is flagged for review.

- Well Not Active – If the well status is not "Active," the test is flagged for review.

- All Rates Zero – If oil, gas, and water test rates are all zero, the test is flagged for review.
- Negative Rates – If oil, gas, or water test rates are negative, the test is flagged for review.
- Oil Well Minimum Rate Threshold – If the well is type "PROD_OIL" and oil rate < 0.25 bbl/day, the test is flagged for review.
- Gas Well Minimum Rate Threshold – If the well is type "PROD_GAS" or operated via gas lift, and gas rate < 1 mcf/day, the test is flagged for review.
- Only Water Producing – If oil and gas rates = 0, but water rate > 0, the test is flagged for review.
- Within Percent Threshold – If the new test is within ±5% of the last valid test, the test is marked as good / Allocatable.
- Good New Well – If the well is in the Permian, source system = "Flowback," and test date is within 30 days of first fluid date, the test is marked as good / Allocatable.
- No Test History – If there's no historical test data for the well, the test is flagged for review.
- Gas Test Dropped to Zero – If current gas rate = 0, but recent average gas rate ≥ 10 mcf/day, the test is flagged for review.

MULTI-PHASE FLOW METER ALARMS

The following is list of alarms to ensure healthy Multi-Phase Flow Meters (MPFM) operations. The General Alarm is configured as a call out to Operations and Automation when any alarm is active.

ALARM	DESCRIPTION	TYPICAL CAUSE	RESOLUTION/ACTION
General Alarm	One or more alarm in the system is activated	One or more specific alarms have triggered	Check alarm log to identify the root cause. Address underlying alarm first.
Sensor Range Alarm	Any reading from sensor transducer is out of range	Sensor wiring fault, failed transducer, or extreme high flowrate	Inspect wiring, check sensor health, or replace sensor if needed.
Press Critically Hi	System pressure is too High	Blocked line, stuck manifold valve, regulator failure, over-pressurized feed	Open relief, check valves, inspect regulator, verify downstream flow path.
Gas Leg Valve Alarm	Valve in the external loop Stuck	Actuator failure, debris in valve, power/air loss	Cycle valve manually, check actuator supply.
Liq Leg Valve Alarm	Valve in the Internal loop Stuck	Actuator failure, debris in valve, power/air loss (liquid leg)	Cycle valve manually, check actuator supply.
Orifice Press High	DP Too High in External Loop	Orifice plate fouled, blockages, fluid buildup, extremely high gas rate	Inspect orifice for fouling, verify process flow.
Orifice Press Low	DP Too Low in External Loop	Leak, bypass open, very low flow	Verify flow, check bypasses, inspect sensors.
Coriolis Sensor Error	Coriolis Communication Error	Communication loss, cable loose, EMI interference	Check wiring, communication, restart.
Bypass Valve Stuck	Bypass Valve Stuck	Mechanical jam, actuator comm issues	Cycle valve manually, inspect actuator.
PAMS 1 Alarm	Water Cut Meter Communication Error	unit offline, communication issue, cable fault	Check wiring, communication, restart.

OW300 1 Alarm	Gas Leg GVF Sensor Error	Sensor failure	Check wiring, communication, restart.
Coriolis 1 Alarm	Coriolis Out of Range, Flow outside meter range	Flow outside meter range, excessive gas in line	Verify process flow conditions.
License Expire Alarm	Software license expired or not updated	Software license expired or not updated	Update license key, contact factory for renewal if applicable.
File System Error	Disk corruption, unexpected power loss	Disk corruption, unexpected power loss	Restart system, run file system check, reload firmware if needed.
Internal Error	Software bug, memory corruption	Software bug, memory corruption	Replace Flash memory.
Error Writing Log	Disk full, corrupted log file, bad storage media	Disk full, corrupted log file, bad storage media	Free disk space, reformat/reload log storage, replace media if needed.
Low Disk Space	Low Disk Space	Data logs filling storage	Delete/archive old logs
WBPAMS 1 Alarm	Water Cut Meter Communication Error	unit offline, communication issue, cable fault.	Check wiring, communication, restart.
DLL Init Error	Software library failed to load, bad config, missing file	Software library failed to load, bad config, missing file	Restart system, verify DLL presence, reinstall or patch software.
Software Error	General application fault	General application fault	Restart application, escalate if recurring, patch firmware/software.

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

8.7.2025

Supplemental Data

Oxy conducted additional Agar MPFM trials in 2022 and 2023. The following data is provided as an addendum to the trial results previously submitted in June 2025.

Valkyrie State 57-2-40 Unit 12HA

The trial compared Agar MPFM oil and gas counts for a single well to counts from the test separator for a total of 21 days. The Valkyrie State 57-2-40 Unit 12HA was a prolific producer with flowrates significantly higher than the Llama Mall 22H well, which was the subject of the most recent trial submitted to NMOCD. The Valkyrie trial is included in this addendum to display the meter's ability to handle a wide range of flow regimes. On day 13, the well was converted from flowing to gas lift. No operational upsets occurred during the testing period.

Overview of Test Setup:

- **Production Separator Size:** 6' X 20'
- **Oil Meter:** Coriolis
- **Gas Meter:** Orifice

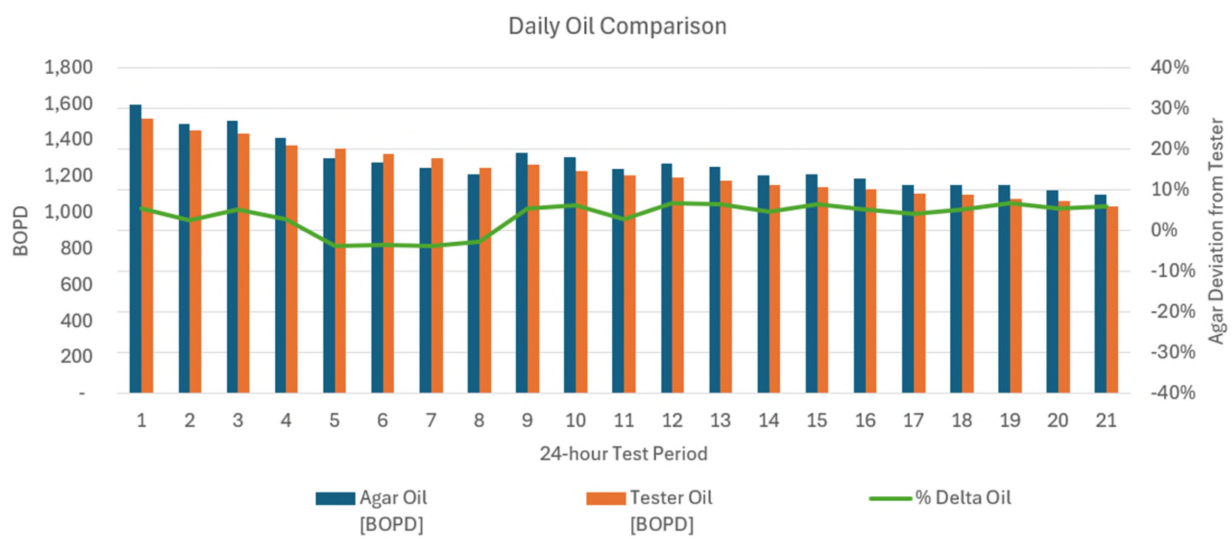
Fluid Rates and Characteristics:

- **Oil:** 1,036-1,517 BOPD
- **Water:** 5,400-6,200 BWPD
- **Gas:** 7,519-9,721 MSCFD
- **Water Cut:** ~83%

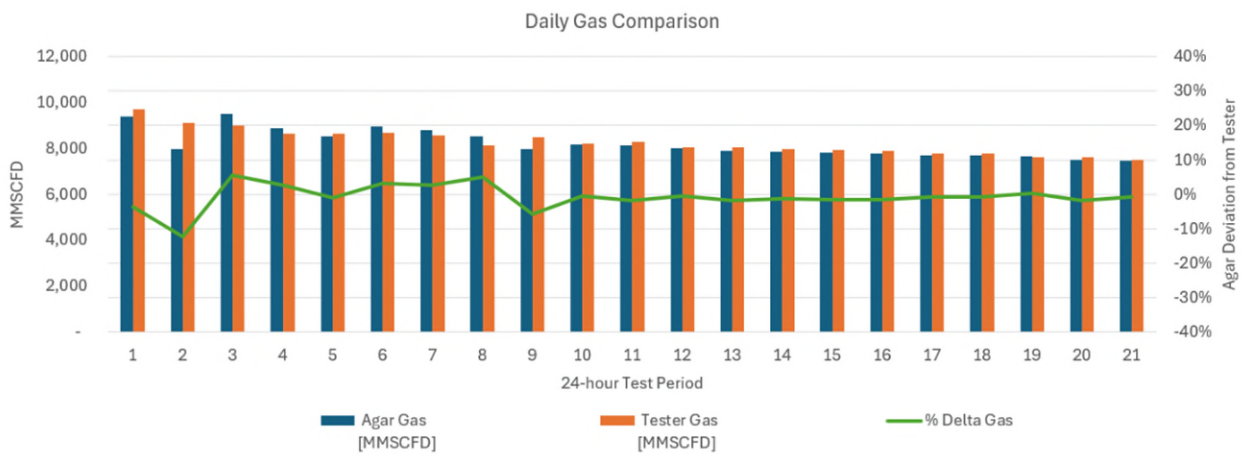
Results of this trial were highly successful with ~3% cumulative oil deviation and <1% cumulative gas deviation over the trial period. Data from the 21-day trial are below.

			Agar Counts		Tester Counts		Delta		
Test Start	Test End	Duration	Agar Oil [BOPD]	Agar Gas [MMSCFD]	Tester Oil [BOPD]	Tester Gas [MMSCFD]	% Delta Oil	% Delta Gas	Operational Notes
2022-04-27 11:31	2022-04-28 12:00	24.02	1,597	9,378	1,517	9,721	5.3%	-3.5%	
2022-04-28 11:31	2022-04-29 12:00	24.02	1,487	7,991	1,451	9,127	2.5%	-12.4%	
2022-04-29 11:31	2022-04-30 12:00	24.02	1,507	9,501	1,435	9,007	5.0%	5.5%	
2022-04-30 11:31	2022-05-01 12:00	24.02	1,409	8,864	1,371	8,626	2.8%	2.8%	
2022-05-01 11:31	2022-05-02 12:00	24.02	1,299	8,538	1,350	8,638	-3.8%	-1.2%	
2022-05-02 11:31	2022-05-03 12:00	24.02	1,275	8,959	1,324	8,690	-3.7%	3.1%	
2022-05-03 11:31	2022-05-04 12:00	24.02	1,248	8,794	1,298	8,577	-3.8%	2.5%	
2022-05-04 11:31	2022-05-05 12:00	24.02	1,211	8,512	1,245	8,113	-2.8%	4.9%	
2022-05-05 11:31	2022-05-06 12:00	24.02	1,329	7,979	1,262	8,468	5.3%	-5.8%	
2022-05-06 11:31	2022-05-07 12:00	24.02	1,306	8,178	1,231	8,212	6.1%	-0.4%	
2022-05-07 11:31	2022-05-08 12:00	24.02	1,242	8,127	1,207	8,277	2.9%	-1.8%	
2022-05-08 11:31	2022-05-09 12:00	24.02	1,271	8,018	1,191	8,057	6.7%	-0.5%	
2022-05-09 11:31	2022-05-10 12:00	24.02	1,251	7,898	1,177	8,047	6.3%	-1.8%	Well Converted from Flowing to Gas Lift
2022-05-10 11:31	2022-05-11 12:00	24.02	1,207	7,852	1,153	7,956	4.7%	-1.3%	
2022-05-11 11:31	2022-05-12 12:00	24.02	1,212	7,815	1,140	7,928	6.3%	-1.4%	
2022-05-12 11:31	2022-05-13 12:00	24.02	1,189	7,783	1,130	7,912	5.2%	-1.6%	
2022-05-13 11:31	2022-05-14 12:00	24.02	1,152	7,709	1,107	7,777	4.1%	-0.9%	
2022-05-14 11:31	2022-05-15 12:00	24.02	1,154	7,716	1,098	7,777	5.1%	-0.8%	
2022-05-15 11:31	2022-05-16 12:00	24.02	1,149	7,656	1,076	7,635	6.8%	0.3%	
2022-05-16 11:31	2022-05-17 12:00	24.02	1,123	7,496	1,065	7,636	5.5%	-1.8%	
2022-05-18 11:31	2022-05-19 12:00	24.02	1,096	7,459	1,036	7,519	5.8%	-0.8%	

TABLE 1: Valkyrie State 57-2-40 Unit 12HA



GRAPH 1: Valkyrie State 57-2-40 Unit 12HA



GRAPH 2: Valkyrie State 57-2-40 Unit 12HA

Cedar Canyon LACT

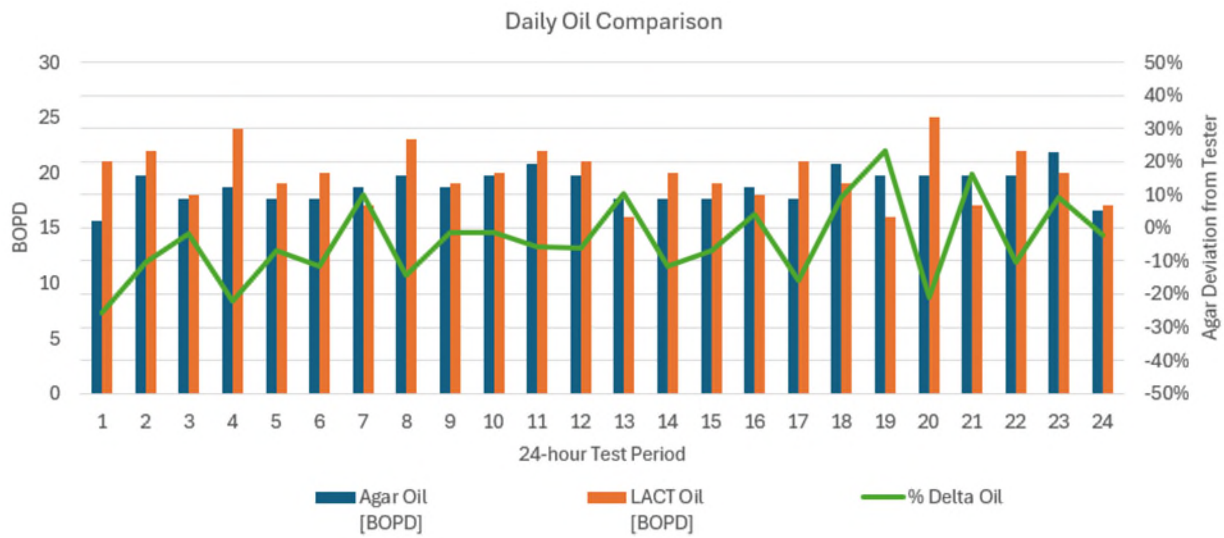
The trial compared Agar MPFM oil counts to counts from the LACT for 24 days. At the end of each day, Oxy SCADA recorded the accumulated counts from each device during the 24-hour period. No operational upsets occurred during the testing period. Daily production through the LACT ranged from 16-25 BOPD.

The Cedar Canyon LACT trial results are included in this addendum to show the meter's accuracy when compared to a custody transfer meter. In addition, the oil flowrate for this trial was significantly lower than the Llama Mall 22H trial, displaying the meter's ability to handle more marginal or mature producers.

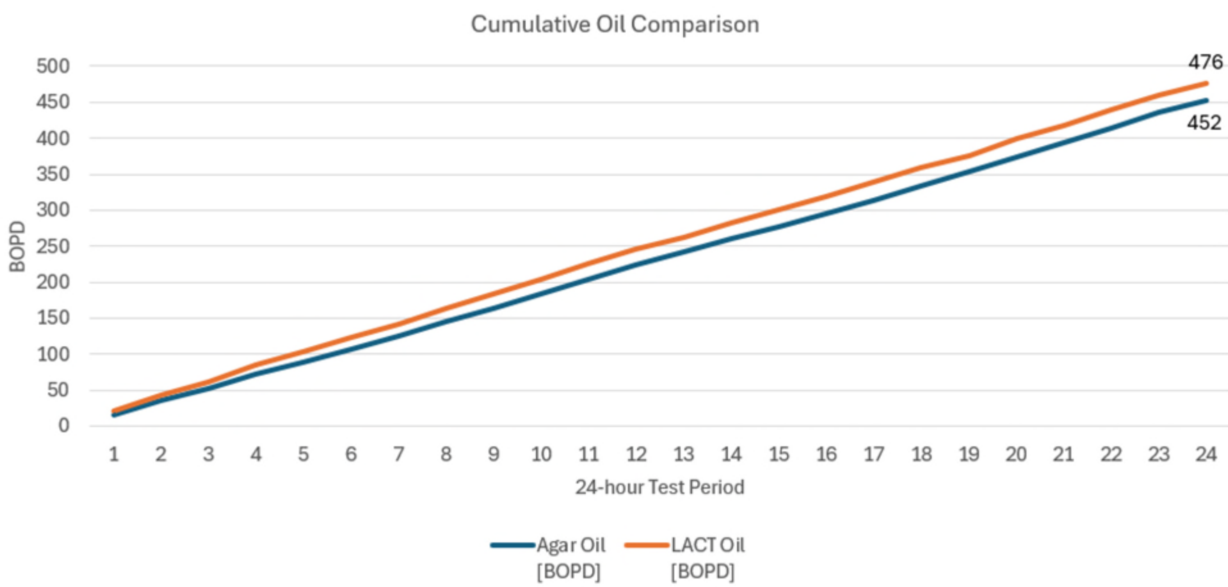
This trial resulted in 5% cumulative oil deviation over the trial period. Data from the 24-day trial are below.

Test Start	Test End	Duration	Agar Oil [BOPD]	LACT Oil [BOPD]	% Delta Oil	Operational Notes
2022-08-18 00:00	2022-08-19 00:00	24.0	15.6	21.0	-26%	Daily deviation due to LACT cycling
2022-08-19 00:00	2022-08-20 00:00	24.0	19.7	22.0	-10%	Daily deviation due to LACT cycling
2022-08-20 00:00	2022-08-21 00:00	24.0	17.7	18.0	-2%	Daily deviation due to LACT cycling
2022-08-21 00:00	2022-08-22 00:00	24.0	18.7	24.0	-22%	Daily deviation due to LACT cycling
2022-08-22 00:00	2022-08-23 00:00	24.0	17.7	19.0	-7%	Daily deviation due to LACT cycling
2022-08-23 00:00	2022-08-24 00:00	24.0	17.7	20.0	-12%	Daily deviation due to LACT cycling
2022-08-24 00:00	2022-08-25 00:00	24.0	18.7	17.0	10%	Daily deviation due to LACT cycling
2022-08-25 00:00	2022-08-26 00:00	24.0	19.7	23.0	-14%	Daily deviation due to LACT cycling
2022-08-26 00:00	2022-08-27 00:00	24.0	18.7	19.0	-2%	Daily deviation due to LACT cycling
2022-08-27 00:00	2022-08-28 00:00	24.0	19.7	20.0	-1%	Daily deviation due to LACT cycling
2022-08-28 00:00	2022-08-29 00:00	24.0	20.8	22.0	-6%	Daily deviation due to LACT cycling
2022-08-29 00:00	2022-08-30 00:00	24.0	19.7	21.0	-6%	Daily deviation due to LACT cycling
2022-08-30 00:00	2022-08-31 00:00	24.0	17.7	16.0	10%	Daily deviation due to LACT cycling
2022-08-31 00:00	2022-09-01 00:00	24.0	17.7	20.0	-12%	Daily deviation due to LACT cycling
2022-09-01 00:00	2022-09-02 00:00	24.0	17.7	19.0	-7%	Daily deviation due to LACT cycling
2022-09-02 00:00	2022-09-03 00:00	24.0	18.7	18.0	4%	Daily deviation due to LACT cycling
2022-09-03 00:00	2022-09-04 00:00	24.0	17.7	21.0	-16%	Daily deviation due to LACT cycling
2022-09-04 00:00	2022-09-05 00:00	24.0	20.8	19.0	9%	Daily deviation due to LACT cycling
2022-09-05 00:00	2022-09-06 00:00	24.0	19.7	16.0	23%	Daily deviation due to LACT cycling
2022-09-06 00:00	2022-09-07 00:00	24.0	19.7	25.0	-21%	Daily deviation due to LACT cycling
2022-09-07 00:00	2022-09-08 00:00	24.0	19.7	17.0	16%	Daily deviation due to LACT cycling
2022-09-08 00:00	2022-09-09 00:00	24.0	19.7	22.0	-10%	Daily deviation due to LACT cycling
2022-09-09 00:00	2022-09-10 00:00	24.0	21.8	20.0	9%	Daily deviation due to LACT cycling
2022-09-10 00:00	2022-09-11 00:00	24.0	16.6	17.0	-2%	Daily deviation due to LACT cycling

TABLE 2: Cedar Canyon LACT



GRAPH 3: Cedar Canyon LACT



GRAPH 4: Cedar Canyon LACT

Lagarto 425SP and 445DP

The trial compared Agar MPFM oil and gas counts for two producers to counts from the test separator for a total of 23 days. The wells alternated test periods via an automated well test (AWT) header. No operational upsets occurred during the testing period.

Overview of Test Setup:

- **Production Separator Size:** 6' X 20'
- **Well Count:** 2 wells alternated with AWT
- **Oil Meter:** Turbine
- **Gas Meter:** Orifice

Fluid Rates and Characteristics:

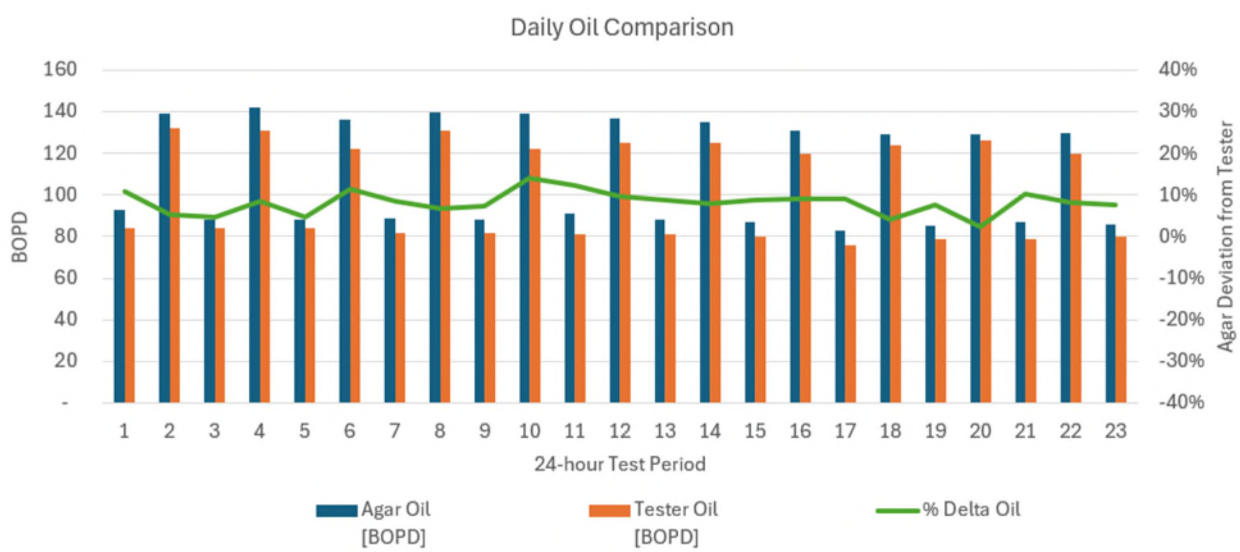
- **Oil:** 76-132 BOPD
- **Water:** 149-189 BWPD
- **Gas:** 159-211 MSCFD
- **Water Cut:** ~62%

The Lagarto trial was one of the earliest Agar MPFM trials conducted by Oxy. The oil and gas deviations between well tests were repeatable, highlighting the meter's utility in an AWT application. The learnings from the Lagarto trial lead Oxy and Agar to include gas and liquid control valves on all future Agar packages, enabling better handling of higher GVF wells and higher measurement accuracy. The control valve configuration has been implemented on 100+ deployments throughout Texas and Colorado.

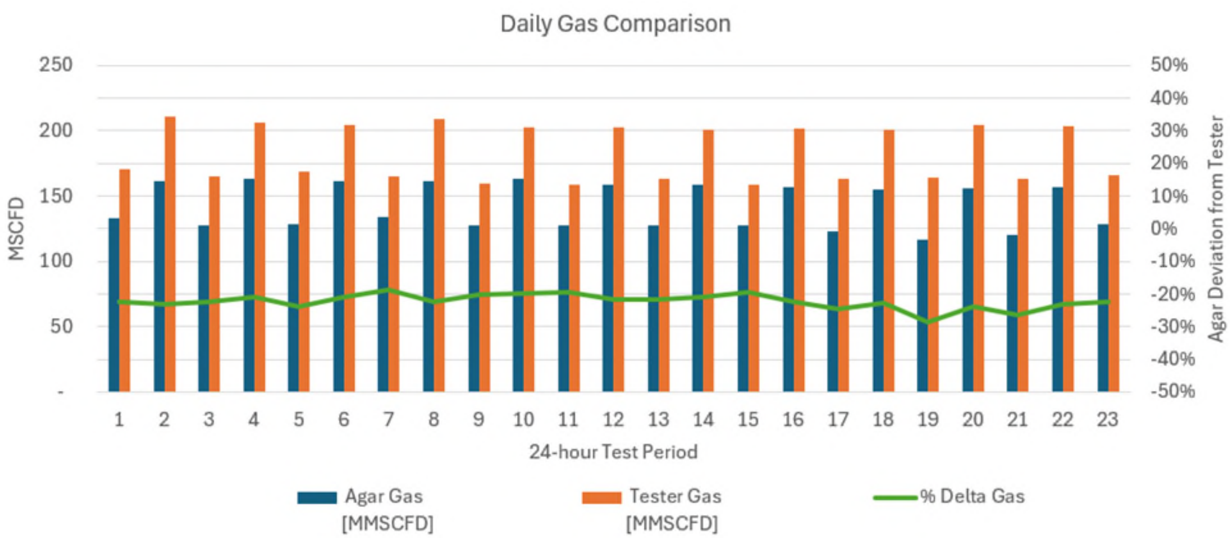
The test results are shown below.

				Agar Counts		Tester Counts		Delta		
Test Start	Test End	Well Name	Duration	Agar Oil [BOPD]	Agar Gas [MMSCFD]	Tester Oil [BOPD]	Tester Gas [MMSCFD]	% Delta Oil	% Delta Gas	Operational Notes
2022-04-06 18:05:28	2022-04-07 02:13:51	425 SP	8.1	93	133	84	171	10.7%	-22.2%	
2022-04-07 02:15:27	2022-04-07 10:23:49	445 DP	8.1	139	162	132	211	5.3%	-23.2%	
2022-04-07 10:25:24	2022-04-07 18:33:53	425 SP	8.1	88	128	84	165	4.8%	-22.4%	
2022-04-07 18:35:30	2022-04-08 02:43:52	445 DP	8.1	142	163	131	206	8.4%	-20.9%	
2022-04-08 02:45:26	2022-04-08 10:53:51	425 SP	8.1	88	129	84	169	4.8%	-23.7%	
2022-04-08 10:55:27	2022-04-08 19:03:54	445 DP	8.1	136	162	122	205	11.5%	-21.0%	
2022-04-08 19:05:31	2022-04-09 03:13:48	425 SP	8.1	89	134	82	165	8.5%	-18.8%	
2022-04-09 03:15:23	2022-04-09 11:23:46	445 DP	8.1	140	162	131	209	6.9%	-22.5%	
2022-04-09 11:25:24	2022-04-09 19:33:54	425 SP	8.1	88	128	82	160	7.3%	-20.0%	
2022-04-09 19:35:32	2022-04-10 03:43:47	445 DP	8.1	139	163	122	203	13.9%	-19.7%	
2022-04-10 03:45:20	2022-04-10 11:53:47	425 SP	8.1	91	128	81	159	12.3%	-19.5%	
2022-04-10 11:55:24	2022-04-10 20:03:48	445 DP	8.1	137	159	125	203	9.6%	-21.7%	
2022-04-10 20:05:23	2022-04-11 04:13:52	425 SP	8.1	88	128	81	163	8.6%	-21.5%	
2022-04-11 04:15:29	2022-04-11 12:23:45	445 DP	8.1	135	159	125	201	8.0%	-20.9%	
2022-04-11 12:25:20	2022-04-11 20:33:51	425 SP	8.1	87	128	80	159	8.8%	-19.5%	
2022-04-11 20:35:28	2022-04-12 04:43:45	445 DP	8.1	131	157	120	202	9.2%	-22.3%	
2022-04-12 04:45:19	2022-04-12 12:53:45	425 SP	8.1	83	123	76	163	9.2%	-24.5%	
2022-04-12 12:55:19	2022-04-12 21:03:45	445 DP	8.1	129	155	124	201	4.0%	-22.9%	
2022-04-12 21:05:19	2022-04-13 05:13:44	425 SP	8.1	85	117	79	164	7.6%	-28.7%	
2022-04-13 05:15:19	2022-04-13 13:23:45	445 DP	8.1	129	156	126	205	2.4%	-23.9%	
2022-04-13 13:25:20	2022-04-13 21:33:46	425 SP	8.1	87	120	79	163	10.1%	-26.4%	
2022-04-13 21:35:24	2022-04-14 05:43:47	445 DP	8.1	130	157	120	204	8.3%	-23.0%	
2022-04-14 05:45:22	2022-04-14 13:53:52	425 SP	8.1	86	129	80	166	7.5%	-22.3%	

TABLE 3: Lagarto 425SP and 445DP



GRAPH 5: Lagarto 425SP and 445DP



GRAPH 6: Lagarto 425SP and 445DP

Respectfully,

Steven Leung

On behalf of

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REGULATORY DIRECTOR
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OIL CONSERVATION DIVISION
NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

6.10.2025

Executive Summary and Path Forward

Oxy recently completed a trial comparing the daily oil and gas counts from the Agar MPFM to a three-phase test separator. The trial was conducted at the Red Tank 26 Central Processing Facility, which utilizes 6X20 three-phase test vessels with Coriolis for oil measurement and orifice for gas measurement. The Agar multiphase meter was placed directly upstream of tester V-1107. For this trial, Oxy continuously tested the Llama Mall 22H for 8 days.

Results of this trial were highly successful with <3% daily oil deviation and <1% cumulative oil deviation over the trial period. Gas had similar results with <2% daily gas deviation and <1% cumulative gas deviation. Data from the eight-day trial are below.

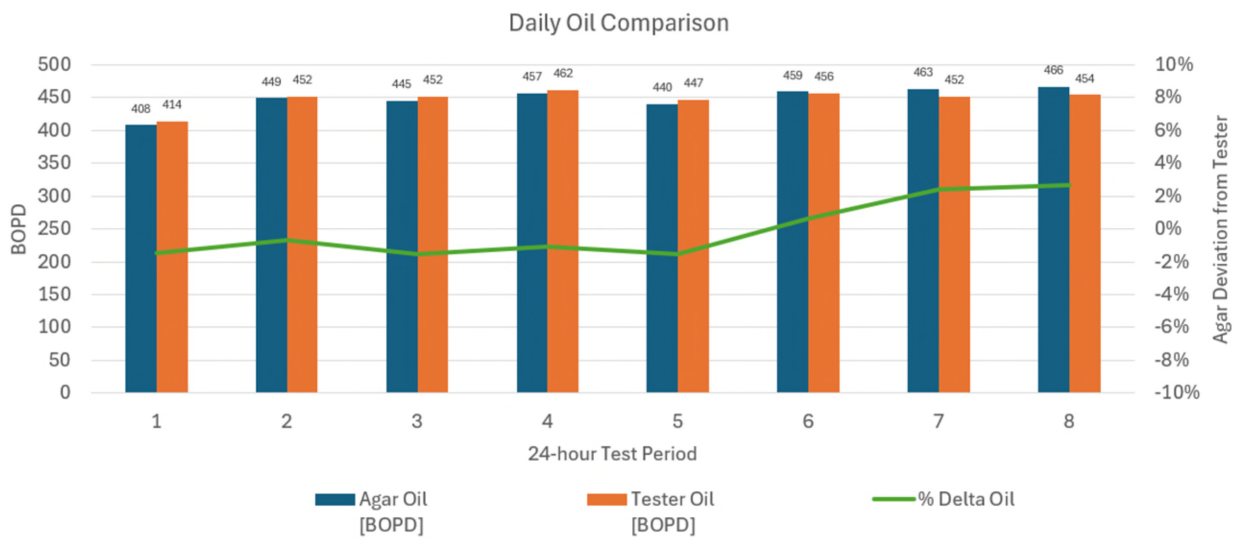
The trial data validates Oxy's stance that the Agar MPFM can be used in-lieu of conventional three-phase test vessels and should accepted in all applications in which conventional testers are currently approved. Oxy is requesting approval to use the Agar MPFM in all ranges of allocation, including allocation of commingled production by well test of both identical and diverse ownership.

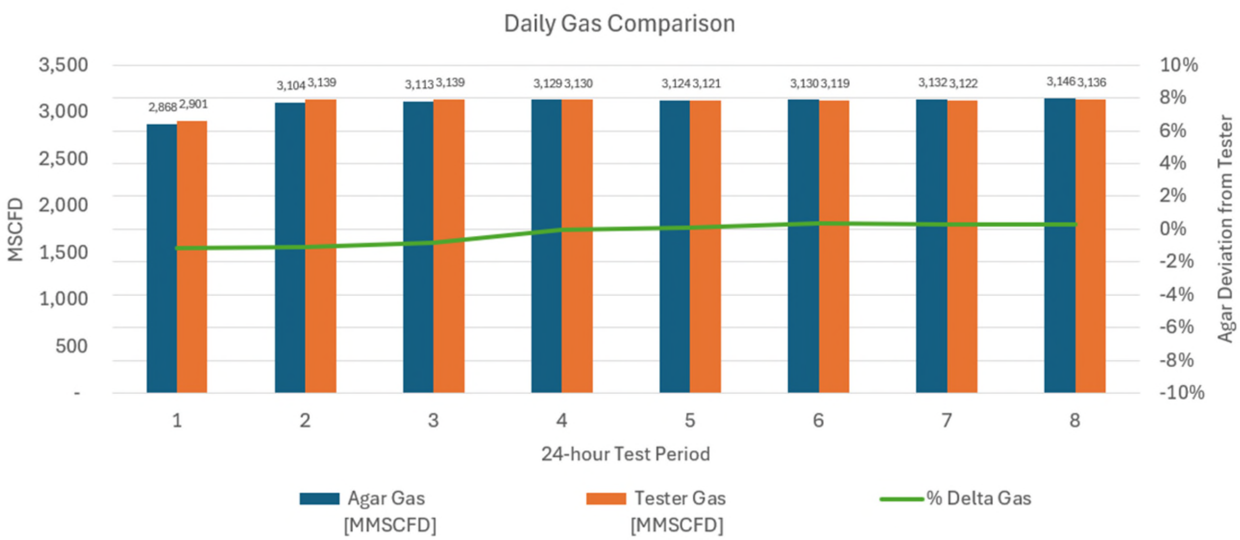
Duration and Data

The trial compared Agar MPFM oil and gas counts to counts from the test separator for a total of eight days. At the end of each day, Oxy SCADA recorded the accumulated counts from each device during the 24-hour period. No operational upsets occurred during the testing period.

Test results are shown below.

			Agar Counts		Tester Counts		Delta		
Test Start	Test End	Duration	Agar Oil [BOPD]	Agar Gas [MMSCFD]	Tester Oil [BOPD]	Tester Gas [MMSCFD]	% Delta Oil	% Delta Gas	Operational Notes
5/15/25 1:00 AM	5/16/25 12:59 AM	24	408	2,868	414	2,901	-1.4%	-1.1%	
5/16/25 1:00 AM	5/17/25 12:59 AM	24	449	3,104	452	3,139	-0.7%	-1.1%	
5/17/25 1:00 AM	5/18/25 12:59 AM	24	445	3,113	452	3,139	-1.5%	-0.8%	
5/18/25 1:00 AM	5/19/25 12:59 AM	24	457	3,129	462	3,130	-1.1%	0.0%	
5/19/25 1:00 AM	5/20/25 12:59 AM	24	440	3,124	447	3,121	-1.6%	0.1%	
5/20/25 1:00 AM	5/21/25 12:59 AM	24	459	3,130	456	3,119	0.7%	0.4%	
5/21/25 1:00 AM	5/22/25 12:59 AM	24	463	3,132	452	3,122	2.4%	0.3%	
5/22/25 1:00 AM	5/23/25 12:59 AM	24	466	3,146	454	3,136	2.6%	0.3%	


Daily Oil Comparison
BOPD
Agar Deviation from Tester
24-hour Test Period
408
414
449
452
445
452
457
462
440
447
459
456
463
452
466
454
Agar Oil [BOPD]
Tester Oil [BOPD]
% Delta Oil

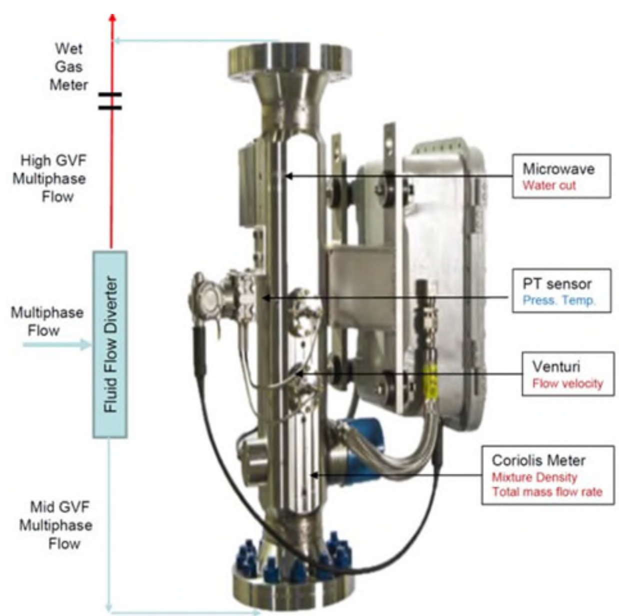

Daily Gas Comparison
MSCFD
Agar Deviation from Tester
24-hour Test Period
2,868
2,901
3,104
3,139
3,113
3,139
3,129
3,130
3,124
3,121
3,130
3,119
3,132
3,122
3,146
3,136
Agar Gas [MMSCFD]
Tester Gas [MMSCFD]
% Delta Gas

Oxy’s Selected MPFM Technology

Oxy will be using the multiphase flowmeter manufactured by Agar Corp., a Houston-based company, in this trial. Agar’s MPFM has been tested extensively by Oxy and over 100 units have been deployed in the Permian Basin and Colorado to date.

The Agar MPFM is a non-nuclear, partial-separation multiphase flowmeter that measures each phase by combining readings from more conventional devices, namely a proprietary Coriolis, a dual venturi, a microwave meter (water cut), and an orifice plate gas meter. Along with other MPFM technologies, the Agar MPFM is recognized in API MPMS Chapter 20 as an approved method of allocating well production, both by continuous measurement and well test.

The Agar skid contains two legs downstream of an inlet fluid flow diverter, which provides partial separation and reduces the amount of gas flowing through the liquid measurement elements. The liquid leg sees predominantly liquid and contains the Coriolis, venturi, and microwave meter. The gas leg contains an orifice and a liquid cut meter.

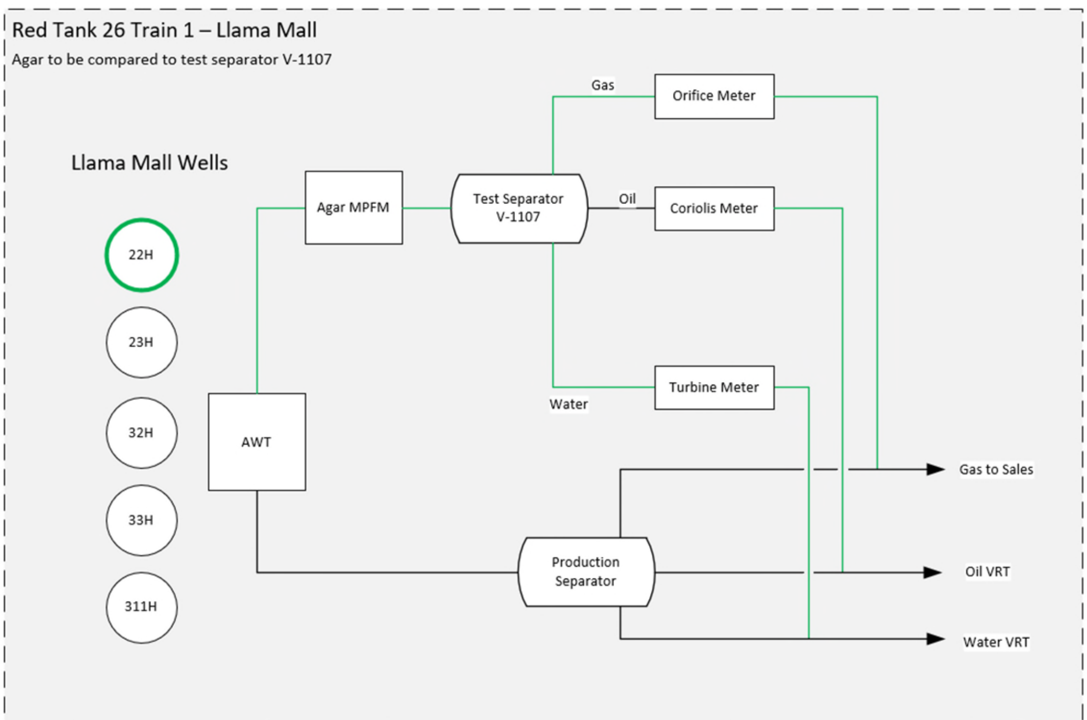


Overview of Test Setup

As shown in the flow diagram below, production from the five Llama Mall wells is routed through an automated well testing manifold at the Red Tank 26 Central Processing Facility and tested with three-phase tester V-1107. For this trial, Oxy continuously tested well 22H.

Specifics on the test separator and its equipment is shown below:

- **Production Separator Size:** 6' X 20'
- **Oil Meter:** Coriolis
- **Water Meter:** Turbine
- **Gas Meter:** Orifice



Fluid Rates and Characteristics for Llama Mall 22H

The Llama Mall 22H well is a gas lift well producing the following:

- **Oil:** 539 BOPD
- **Water:** 521 BWPD
- **Total Fluid:** 1,060 BFPD
- **Gas:** 3,300 MSCFD
  - 900 MSCFD reservoir
  - 2,400 MSCFD lift gas
- **Water Cut:** 49%

Acceptance Criteria

As communicated by the NMOCD, the ideal data set for this test would demonstrate the MPFM has an error of less than 5% on oil and gas.

The test calculated percent error of the MPFM compared to the tester separator via the following equation:

$$\frac{Agar\ Oil\ Count - Separator\ Oil\ Count}{Separator\ Oil\ Count}\ x\ 100 = Percent\ Error$$

The Agar MPFM is designed to operate with less than 14 psi of pressure drop at max throughput. As the Agar is installed directly upstream of the test vessel and will not be operating at its max design rate, oil shrinkage is assumed to be negligible and is not accounted for when comparing readings.

Oxy appreciates NMOCD for their consideration of this proposal. The trial data validates Oxy's stance to use the Agar MPFM as a suitable replacement for conventional three-phase test vessels. Oxy is requesting approval for the Agar MPFM to be accepted in all applications in which conventional testers are currently approved, including allocation of commingled production by well test of both identical and diverse ownership.

Respectfully,

Steven Leung

On behalf of

Beth Schenkel
REGULATORY MANAGER
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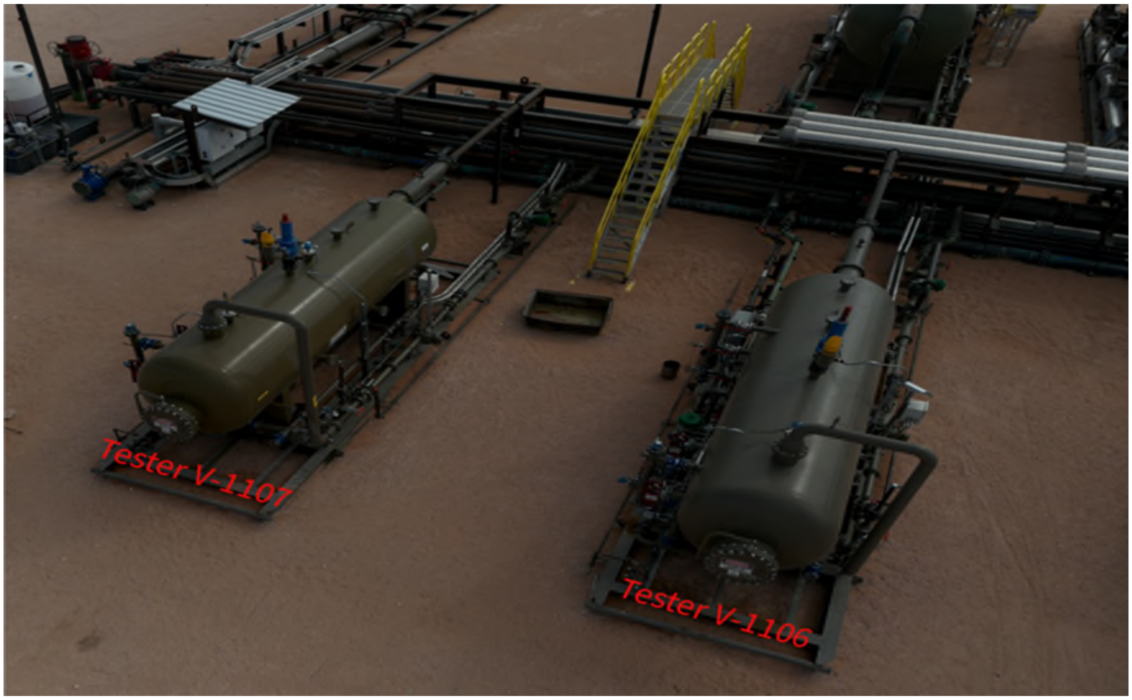
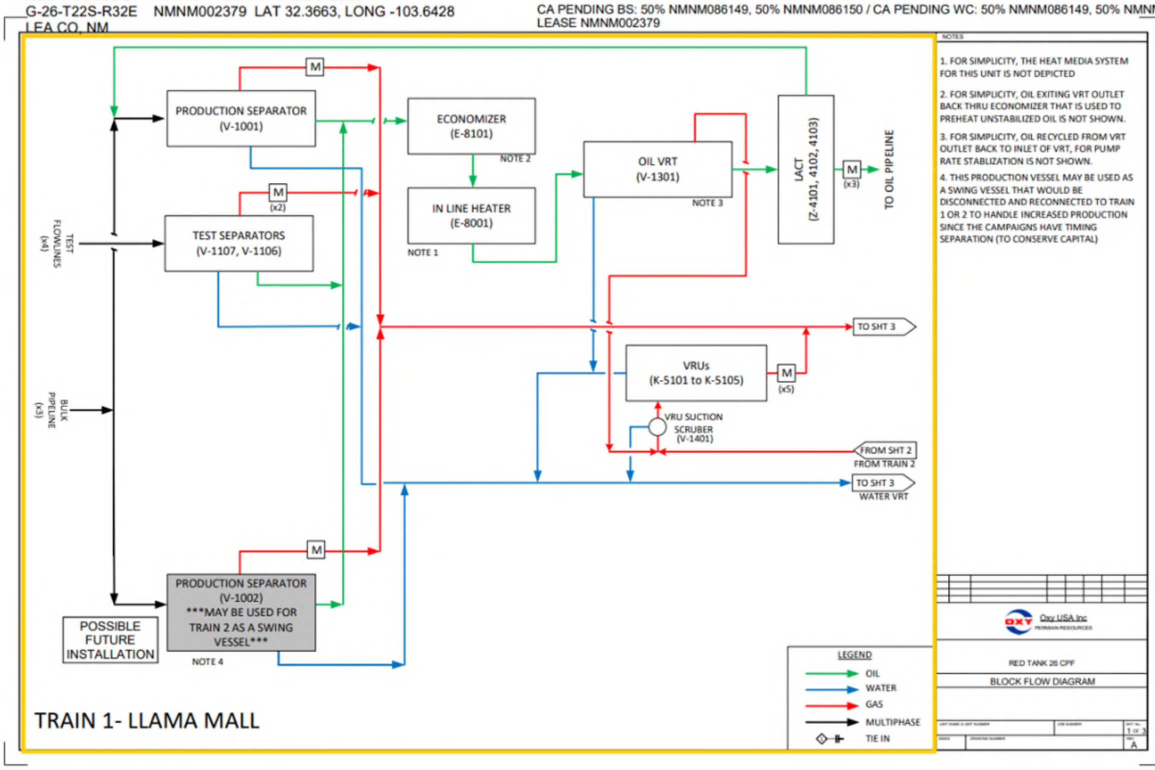


RED TANK 26 CPF TRAIN 1 - LLAMA MALL WELLS
G-26-T22S-R32E NMNM002379 LAT 32.3663, LONG -103.6428
LEA CO, NM

SURFACE COMMINGLE SUBMITTED PER AFMSS 2760898
CA PENDING BS: 50% NMNM086149, 50% NMNM086150 / CA PENDING WC: 50% NMNM086149, 50% NMNM086150
LEASE NMNM002379



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Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 522859

CONDITIONS

Operator:	
OXY USA INC P.O. Box 4294 Houston, TX 772104294	OGRID: 16696
	Action Number: 522859
	Action Type: [IM-SD] Admin Order Support Doc (ENG) (IM-AAO)

CONDITIONS

Created By	Condition	Condition Date
dmcclure	Please review the content of the order to ensure you are familiar with the authorities granted and any conditions of approval. If you have any questions regarding this matter, please contact me.	11/4/2025