



Vx Meter Accuracy Review

12/19/2024

Agenda

- Overview
- Review previous Civitas Vx meter pilots
- Review Schlumberger Vx meter pilot results (other operators)
- Compare Vx meter results to current testing methods
- Questions

Overview

- **Civitas is requesting permission to use Vx Multiphase meters to measure well production**
- **Vx Meter Accuracy is comparable to current methods**
- **Using Vx meters reduces the need for individual test separators on location**
 - Less Facility Footprint
 - Fewer vessels on location for potential emissions

Civitas Vx Meter (Legacy Hibernia) Pilot

- **Midland Basin**
- Single well – Waylon F 6H
- One to One Pilot – Multiphase Meter and Separator
- Issue with test separator caused separator gas measurement to be inaccurate for test duration

Well Production Profile

	Meter	Separator
GOR	2,283	2,717
Average BS&W	60%	61%
Average Water Cut	60%	63%

Oil Comparison

Vx Meter Oil Total	Separator Oil Total	Delta %
41,348	41,528	-0.44%

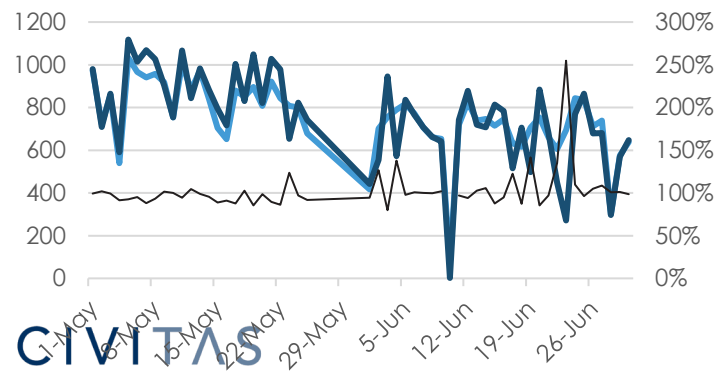
Gas Comparison

Vx Meter Gas Total	Separator Gas Total	Delta %
94,418	112,844	-19.52%

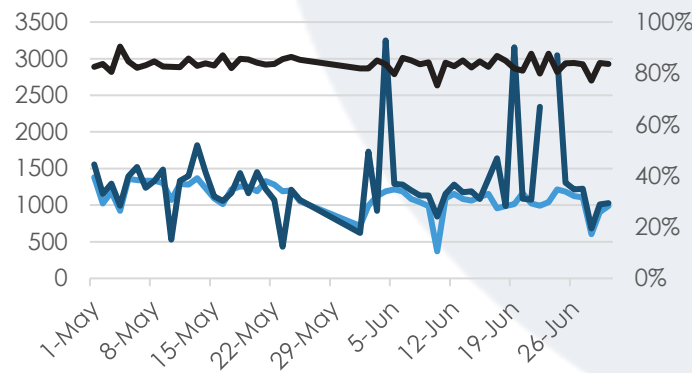
Water Summary

Vx Meter Water Total	Separator Water Total	Delta %
61,349	71,341	2.93%

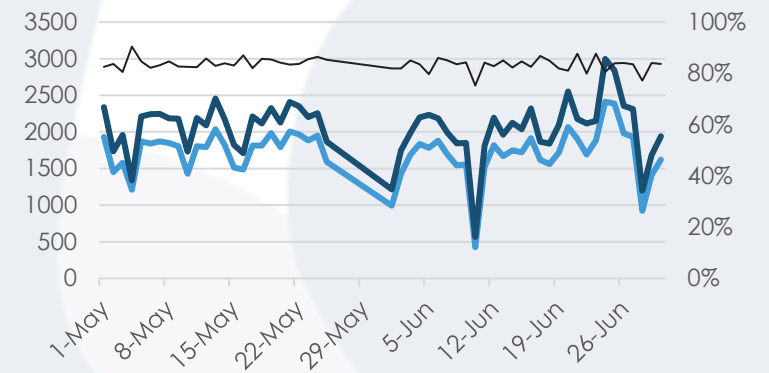
Oil Production Comparison



Water Production Comparison



Gas Production Comparison

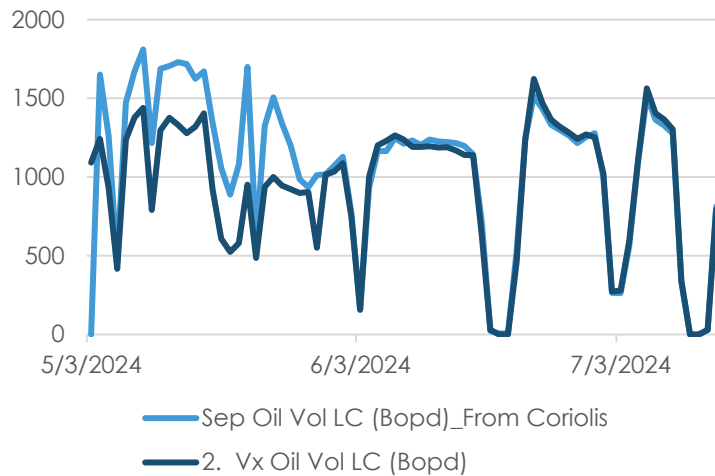


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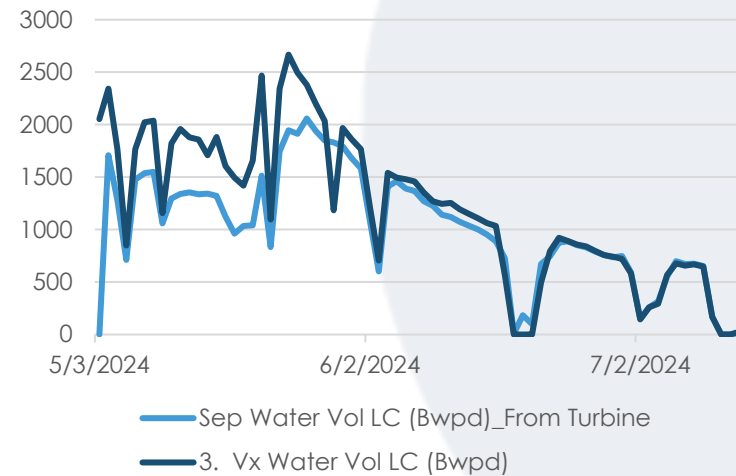
Civitas Vx Meter Pilot

- **DJ Basin**
- One to One Pilot – Multiphase Meter and Separator
- Two wells - AL-5-4-3-1BH and AL-5-4-3-1AH

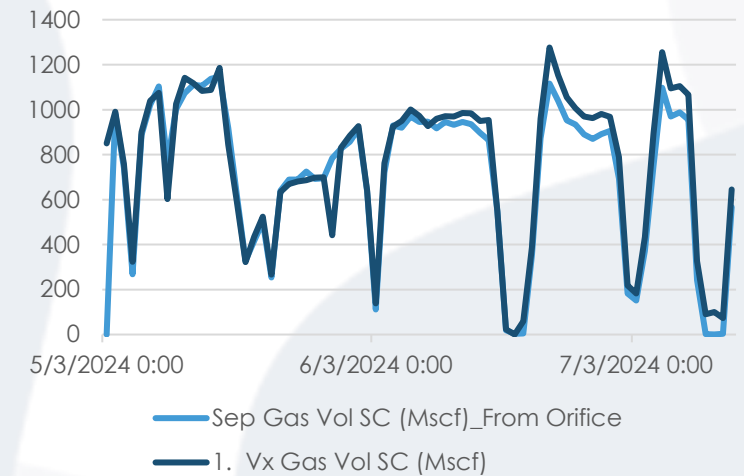
Oil Production Comparison



Water Production Comparison



Gas Production Comparison

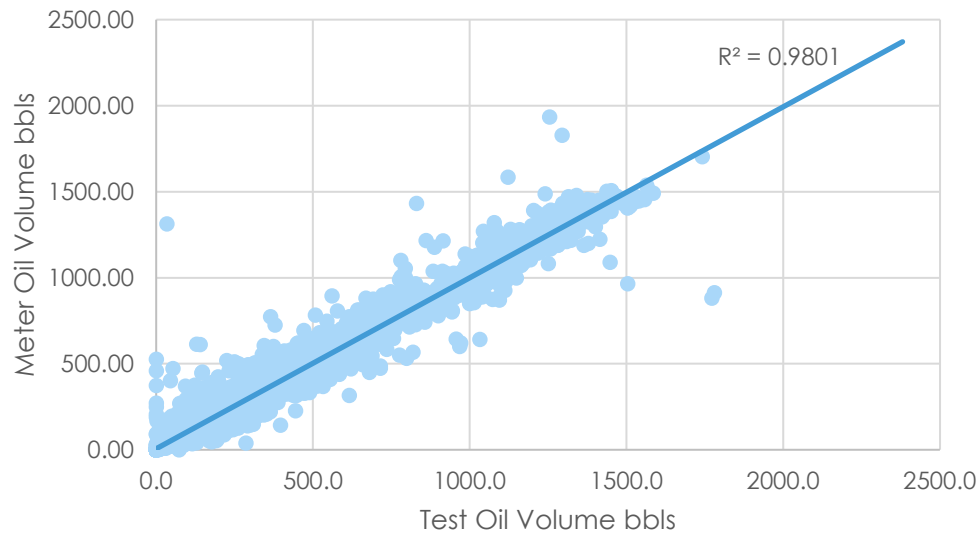


	Test Duration			June 2024		
	Vx Meter Total	Separator Total	Delta	Vx Meter Gas Total	Separator Gas Total	Delta
Gas	55024	51886	6.05%	24,370	22,931	2.77%
Oil	69459	77191	-10.02%	30,521	30,585	-0.08%
Water	87763	73200	19.90%	28722	27,528	1.63%

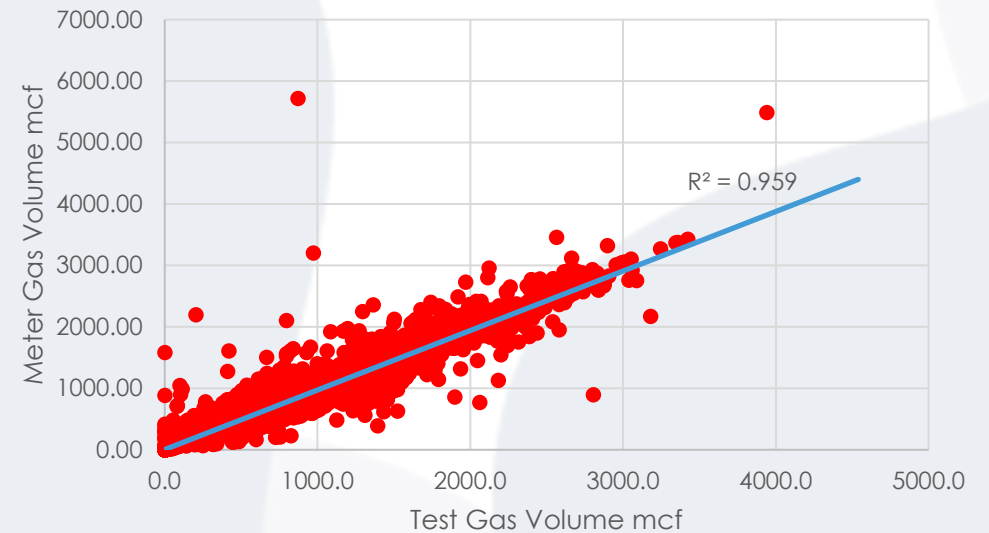
Schlumberger Vx Meter Pilots (Multiple Operators)

- Comparison of test oil to meter oil shows high degree of accuracy overall
- Overall average error:
 - 5.3% Oil
 - 5.9% Gas
 - 8.2% Water

Vx Meter Pilot - Oil Comparison to Test



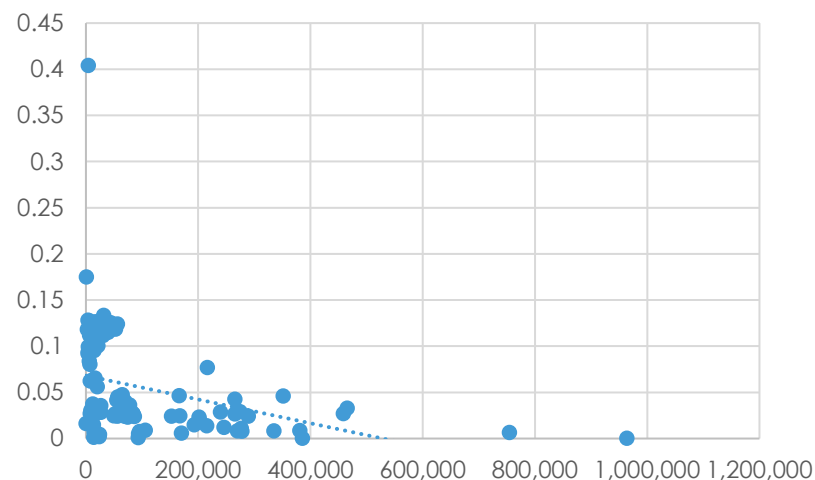
Vx Meter Pilot - Gas Comparison to Test



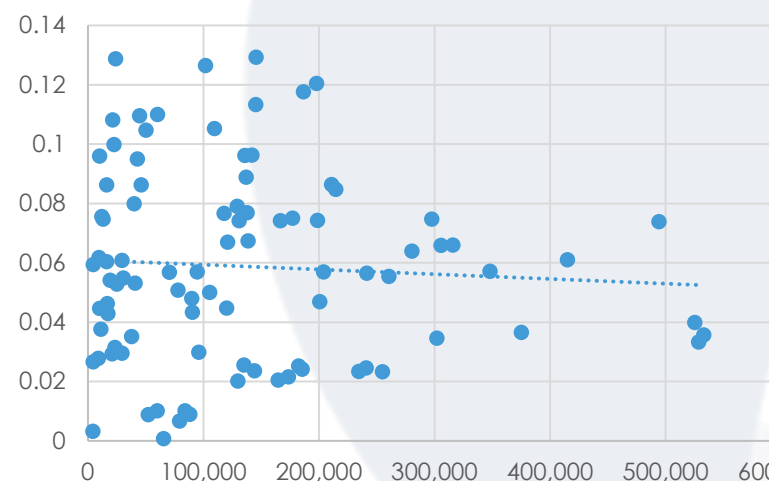
Schlumberger Vx Meter Study

- Oil and water error improves with greater volumes
- Gas error is not consistently affected by volume

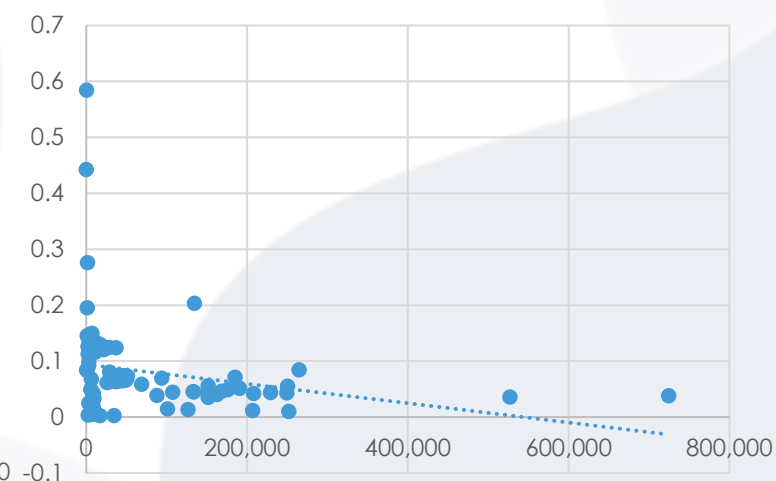
Oil Error by Oil Total Volume



Gas Error by Total Volume



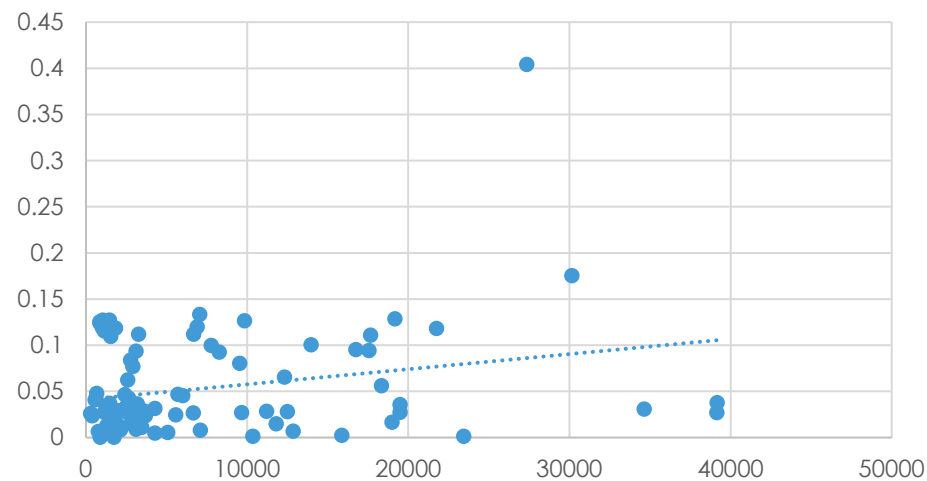
Water Error by Water Total Volume



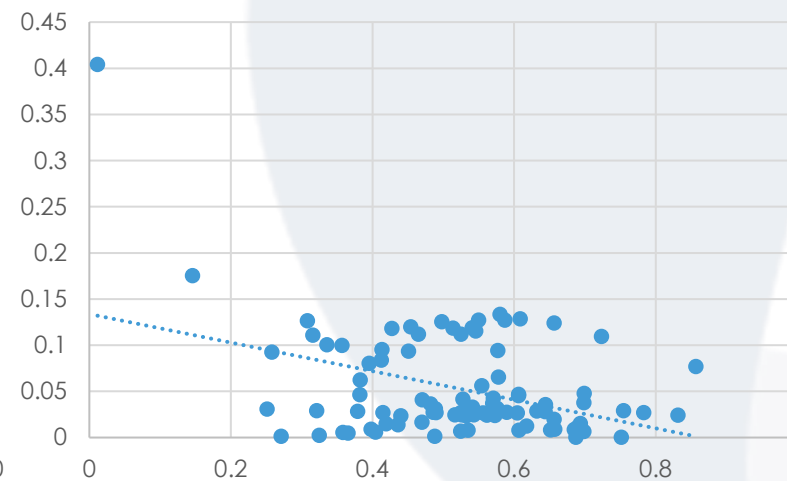
Schlumberger Vx Meter Study

- Higher GOR wells could have a greater oil error
- Higher water cut wells have greater accuracy, especially for water
 - Could be due to higher volumes

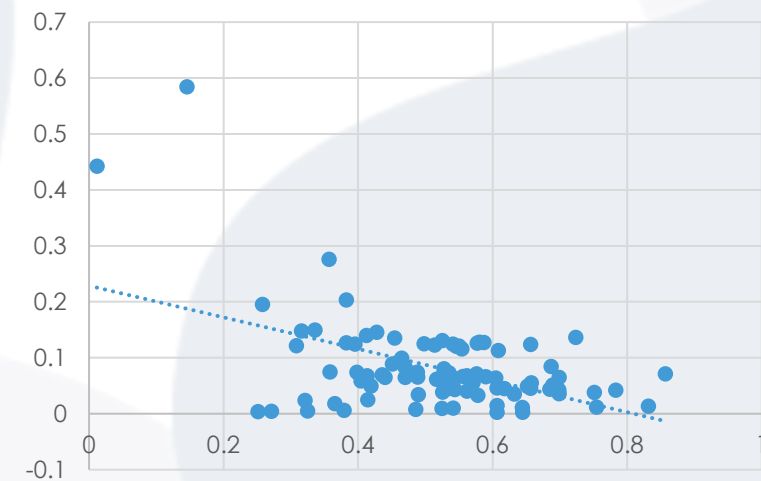
Oil Error by GOR



Oil Error by Water Cut



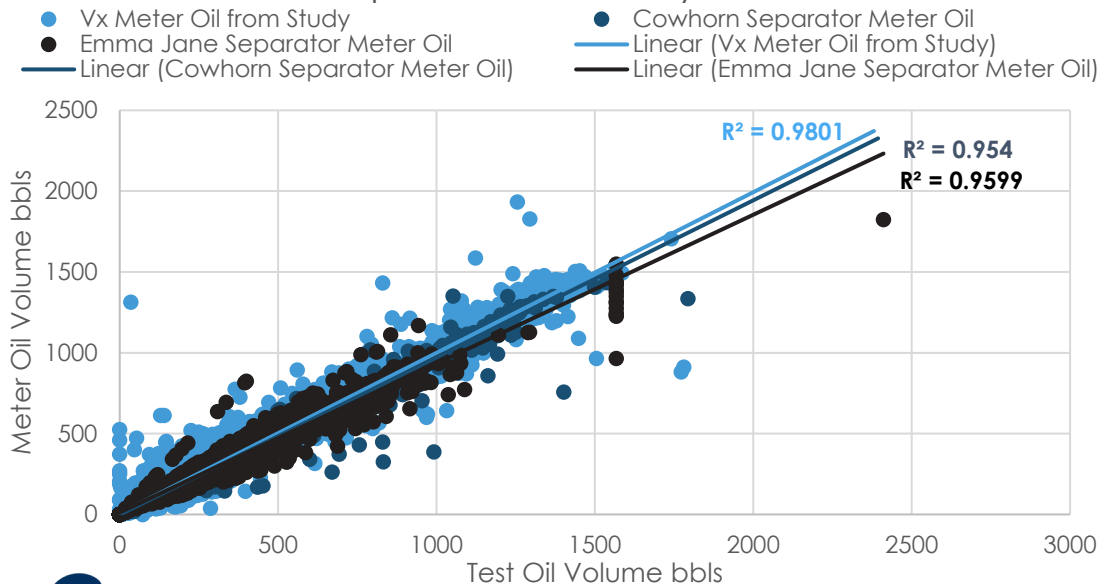
Water Error by Water Cut



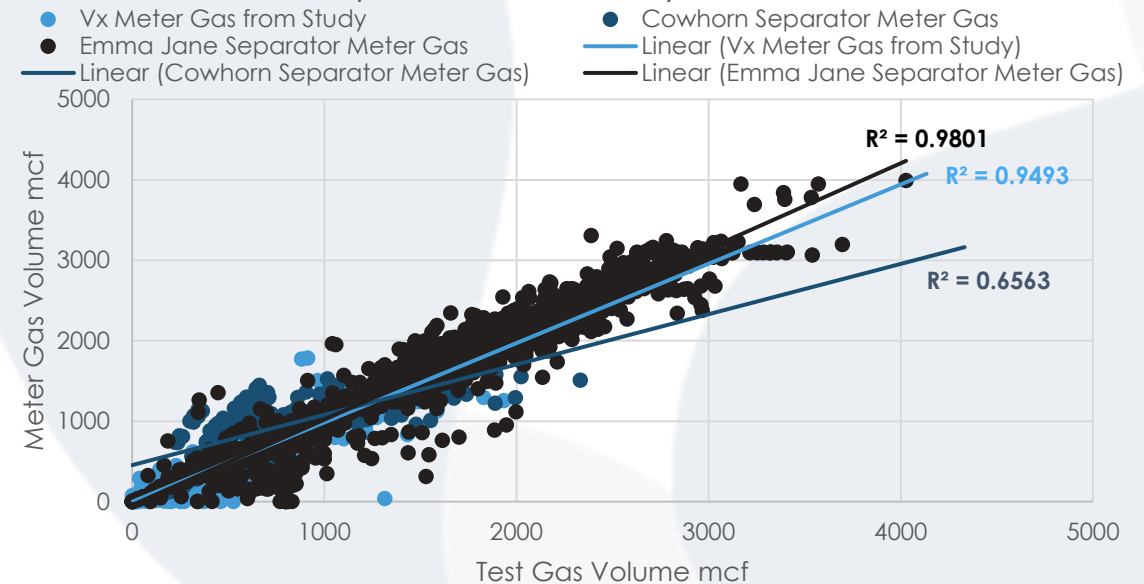
Vx Meter Comparison to One-to-One Test Separator

- Compared Vx Meter to Test Results with new Civitas facility one-to-one test separators
- Used allocation factor to test accuracy of separator
- Vx meters appear to have very close or higher accuracy than current methods

Vx Meter Results Comparison to One-To-One Test
Separator Accuracy - Oil



Vx Meter Results Comparison to One-To-One Test
Separator Accuracy - Gas



Questions?



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CONDITIONS

Action 496882

CONDITIONS

Operator: Civitas Permian Operating, LLC 555 17th Street Denver, CO 80202	OGRID: 332195
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CONDITIONS

Created By	Condition	Condition Date
dmcclure	None	8/18/2025