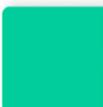


# COLOMBIA ROUND 2021

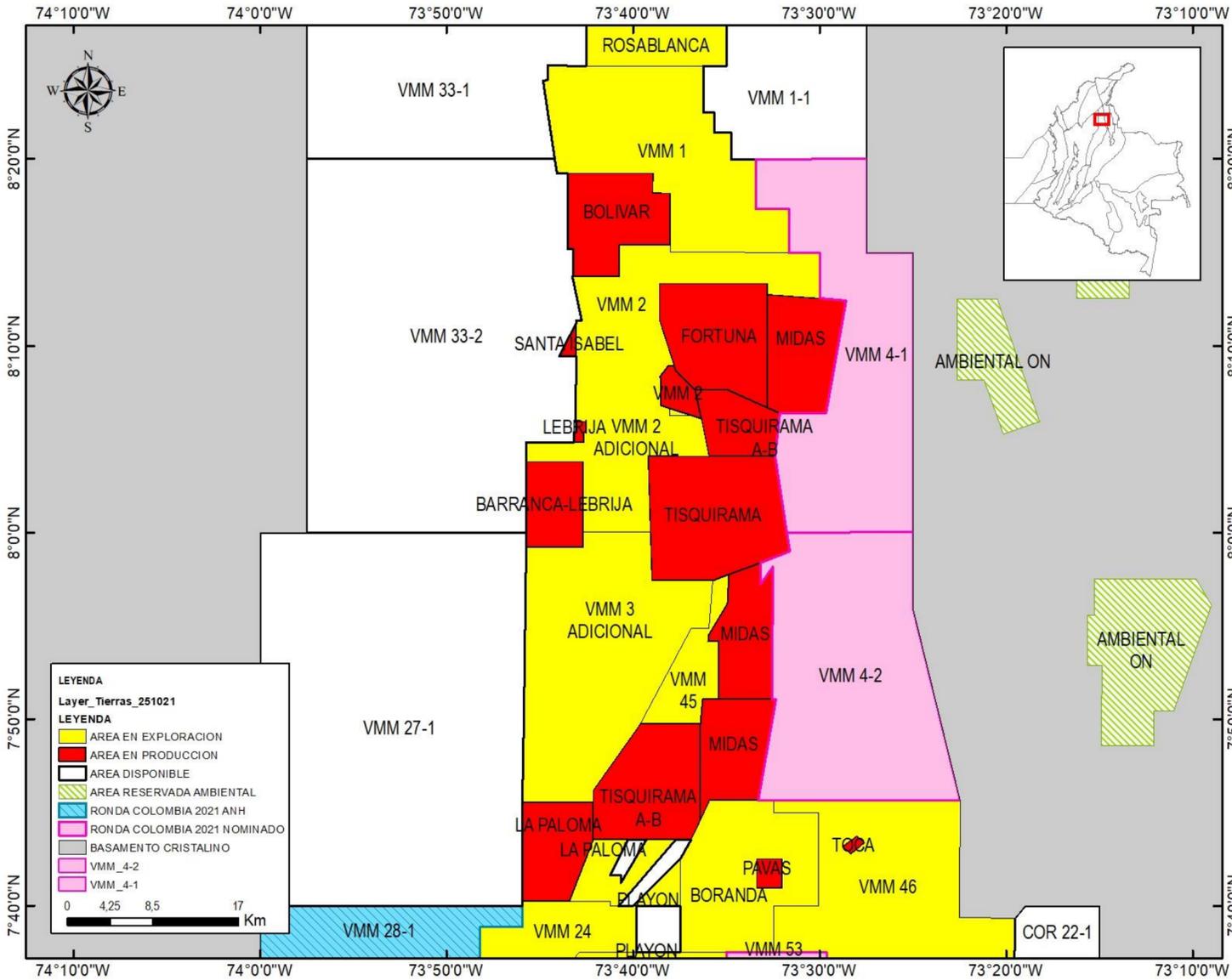
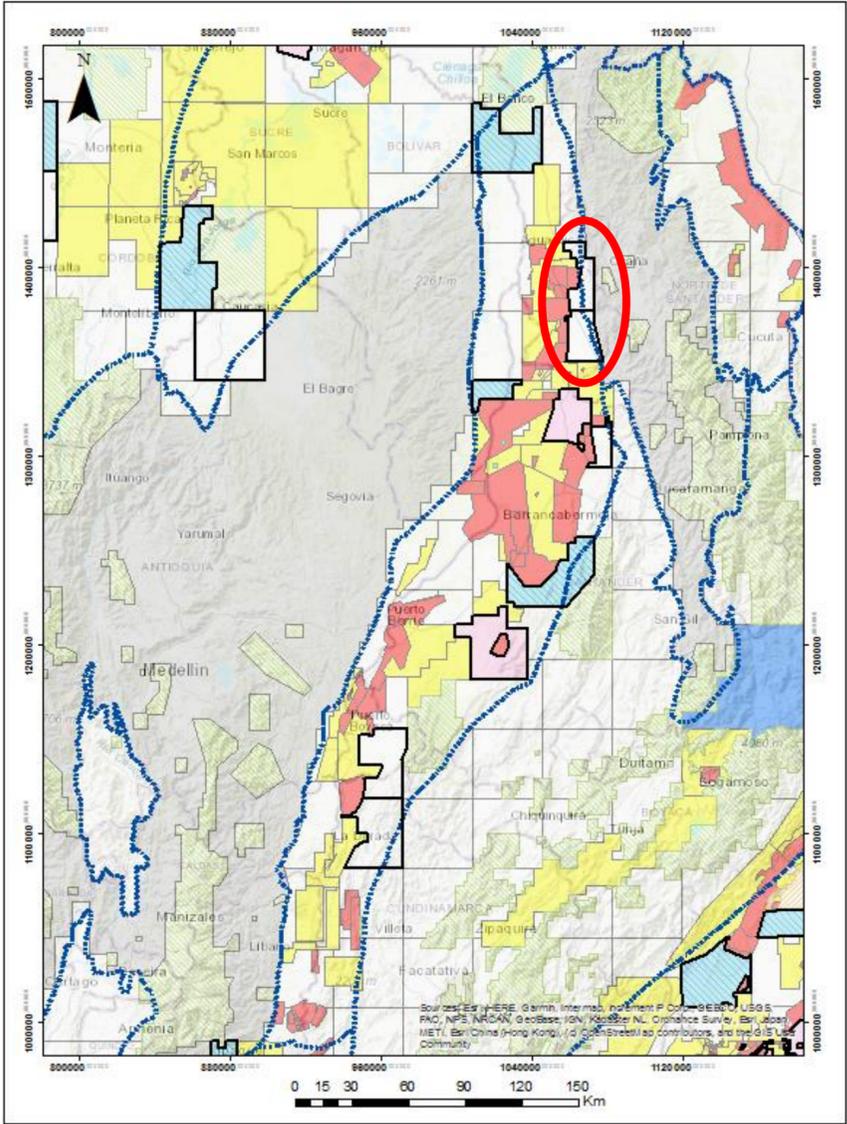


# INCORPORATED AREAS VMM 4-1 & VMM 4-2 MIDDLE MAGDALENA VALLEY BASIN

	Location
	Infrastructure
	Geological Framework
	Incorporated Areas
	VMM 4-1
	VMM 4-2
	Conclusions

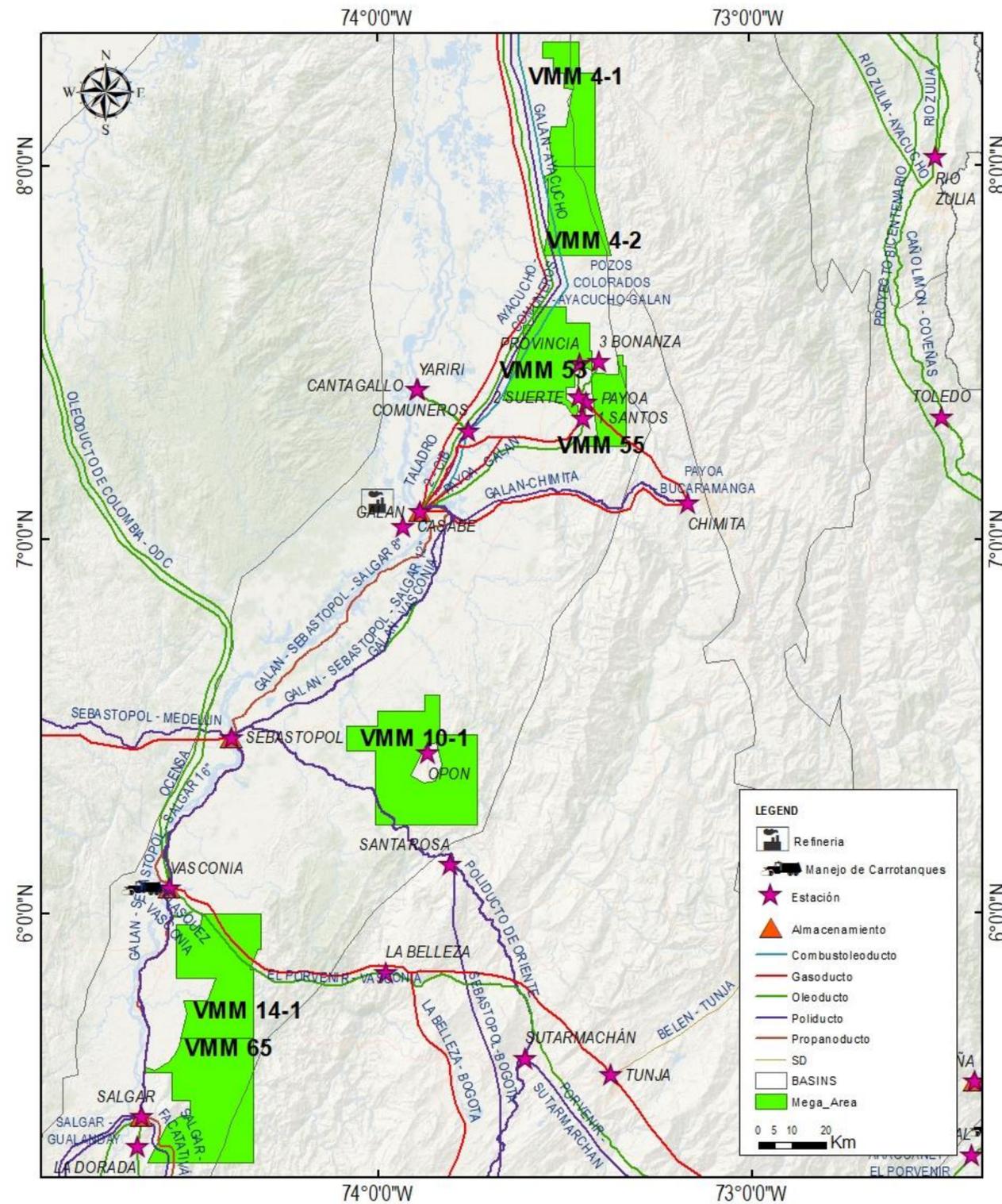
# INTRODUCTION

# LOCATION



## Block Areas

- **VMM 4-1** (36873,56 Ha)  
Cesar and Norte de Santander departments
- **VMM 4-2** (41394,55 Ha)  
Cesar and Norte de Santander departments



## Main Infrastructure nearby

### Oil Pipeline:

- Galán - Ayacucho
- Ayacucho – Comuneros
- Payoa – Galán
- Oleoducto de Colombia – ODC
- Ocensa

### Pipeline:

- Galán - Ayacucho
- Poliducto de Oriente
- Galán - Salgar

### Gas Pipeline:

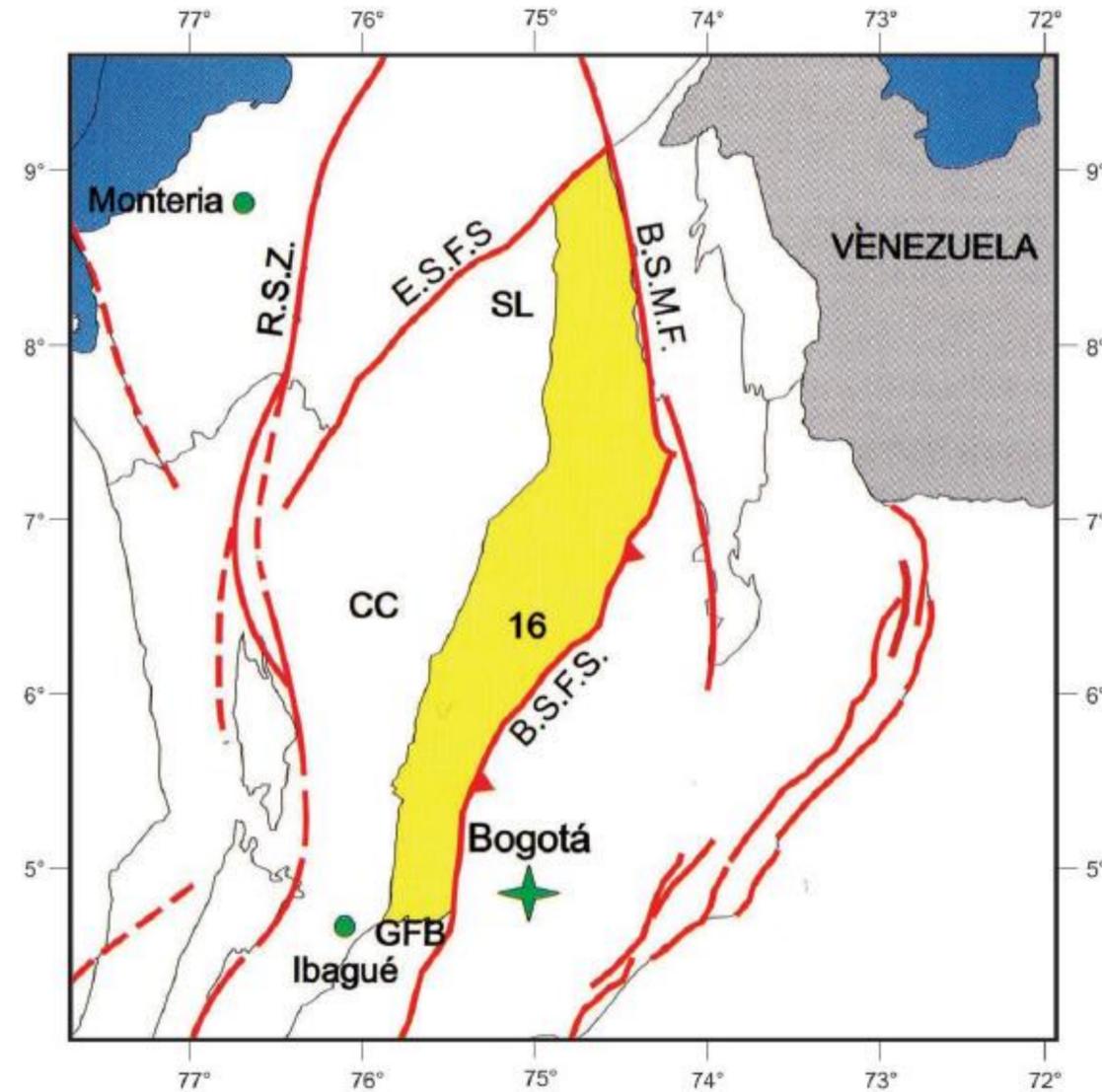
- Galán - Ayacucho
- Galán - Chimita
- Ayacucho – Cumuneros
- Galán - Salgar

# GEOLOGICAL FRAMEWORK

# VMM Basin

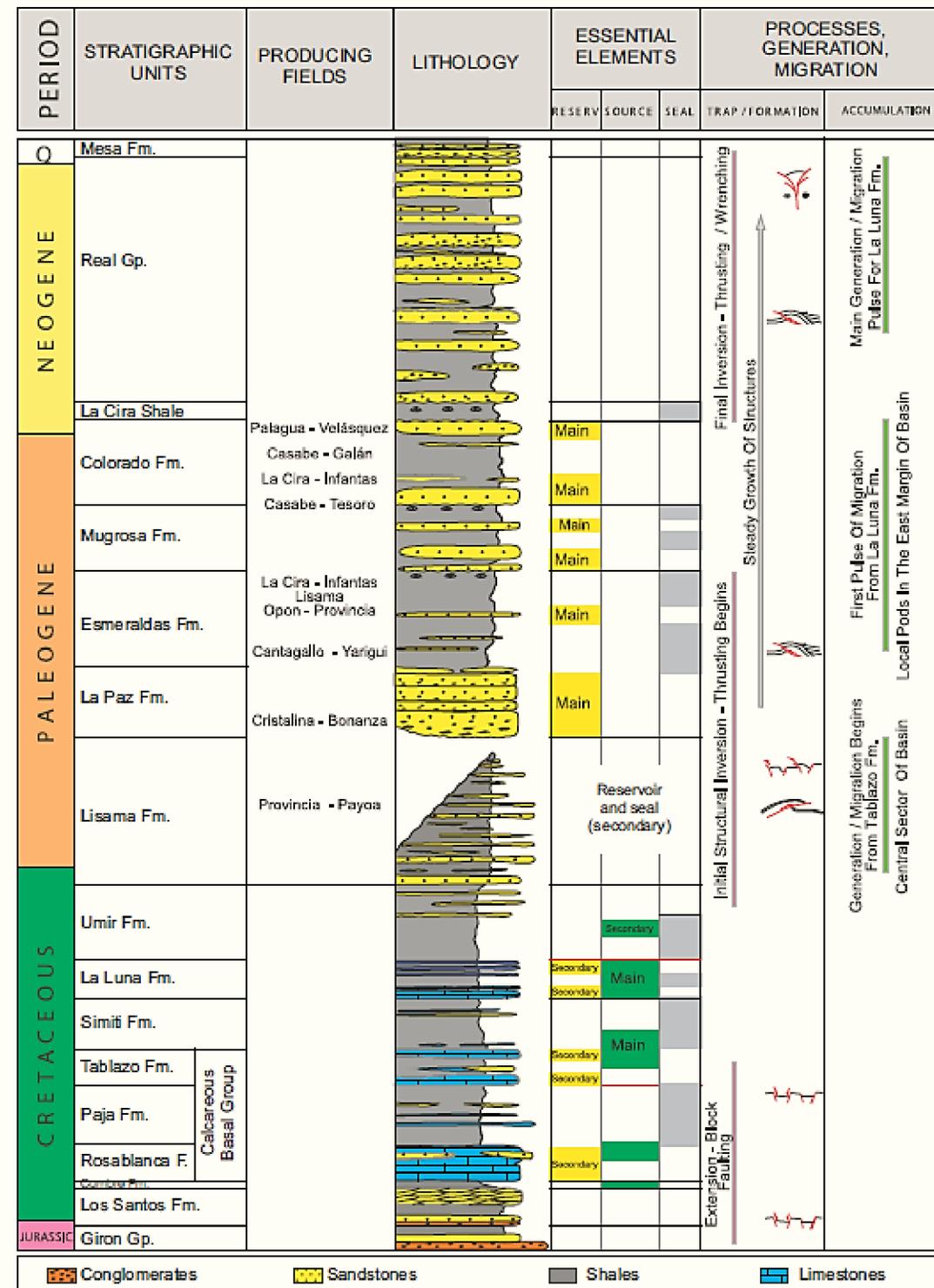


## Boundaries



- North: Espiríto Santo Fault System (E.S.F.S.).
- Northeast: Bucaramanga – Santa Marta fault system (B.S.M.F.).
- Southeast: Bituima and La Salina fault systems (B.S.F.S.).
- South: Girardot fold beld (GFB).
- West: Onlap of Neogene sediments over the Serranía de San Lucas (SL) and Central Cordillera (CC) basement.

# STRATIGRAPHY



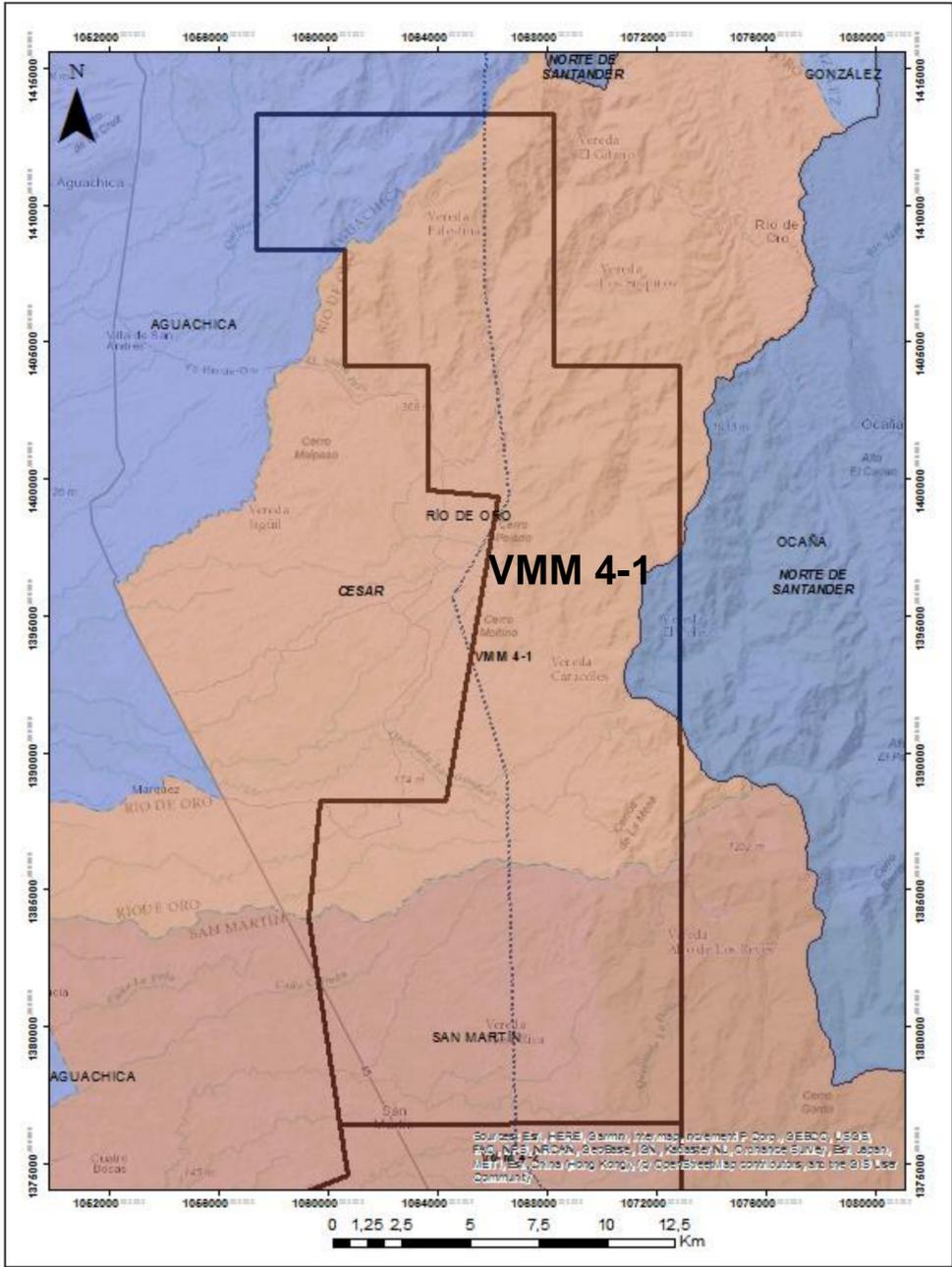
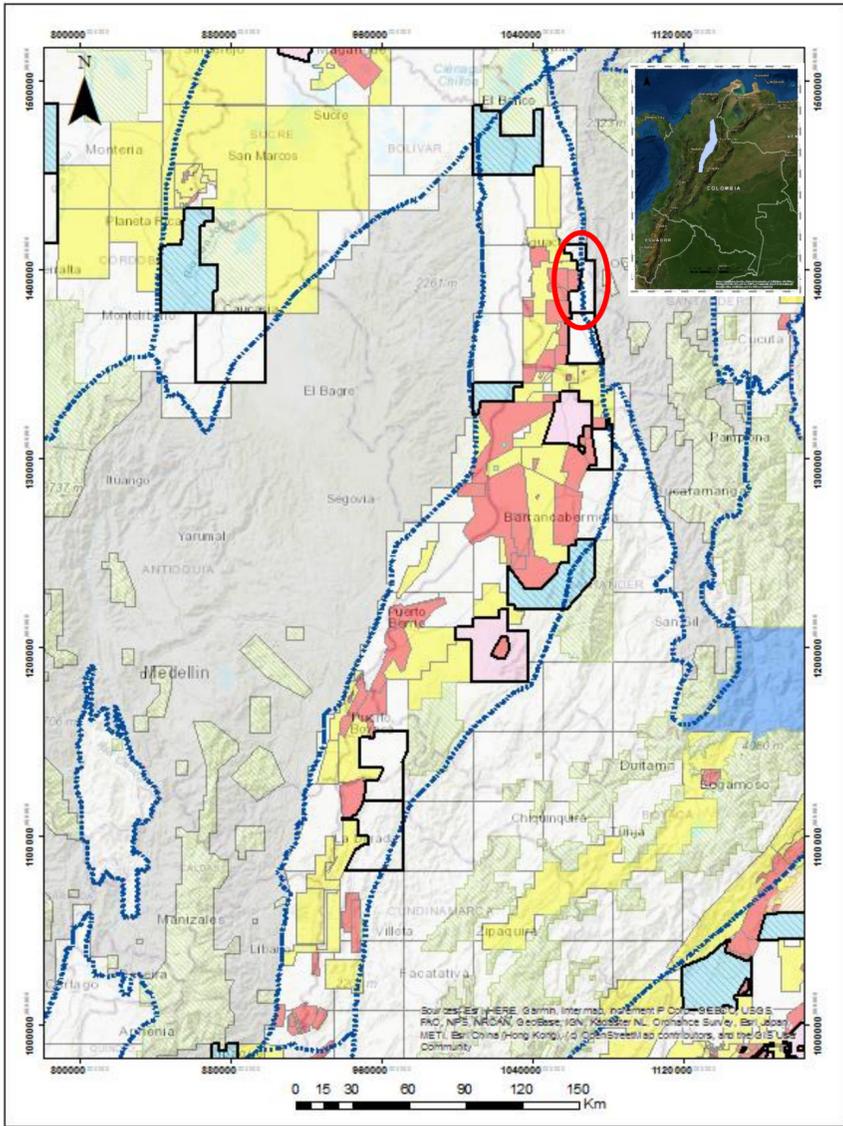
From Barrero et al.. 2007

- Paleogene fluvial channel sandstones of Esmeraldas, La Paz, Mugrosa and Colorado Formations have been identified as the main reservoirs in the area.
- La Luna Formation is the main source in the area, but Cretaceous limestones and shales of the Simití-Tablazo Formations are also source rocks in the basin. TOC are high (1-6%) and organic matter is mainly type II, Ro reaches values of 0.6 -1.2 %.

# INCORPORATED AREA

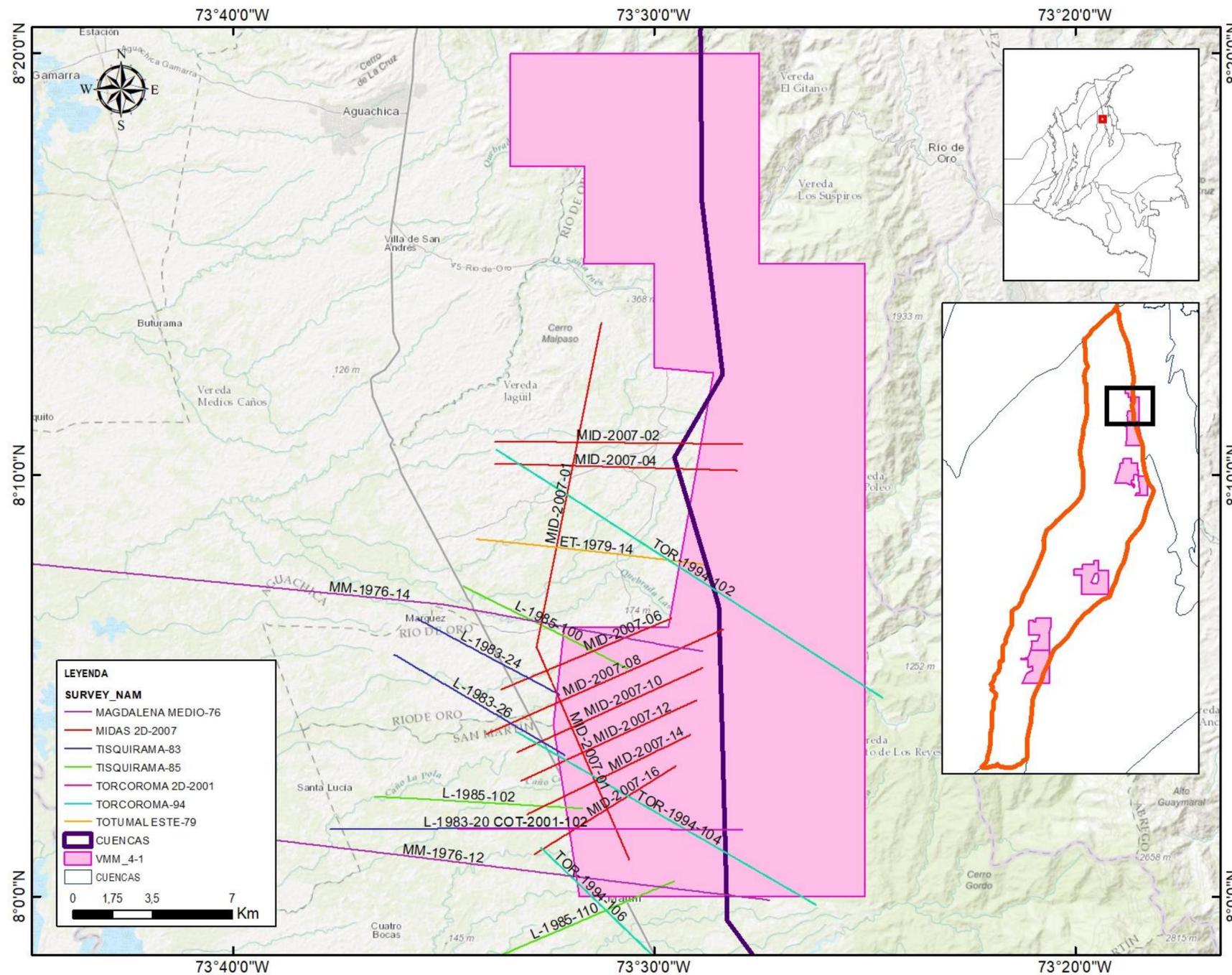
## VMM 4-1

# LOCATION



- **Area:** 36873,56 Ha
- **Municipalities:** Aguachica, Río de Oro, San Martín, Ocaña.
- **Departments:** Cesar, Norte de Santander.

# DATABASE : 2D Seismic

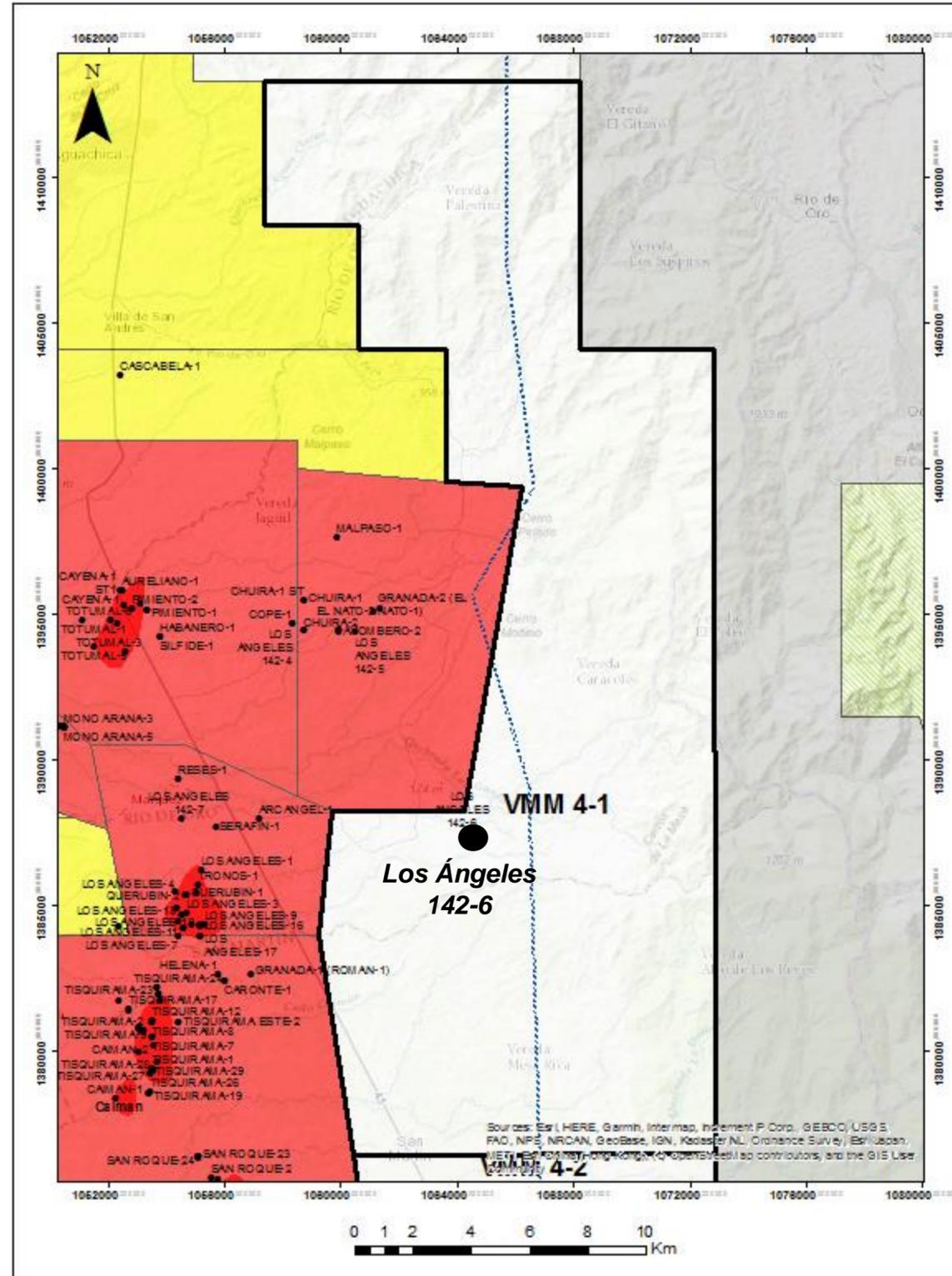
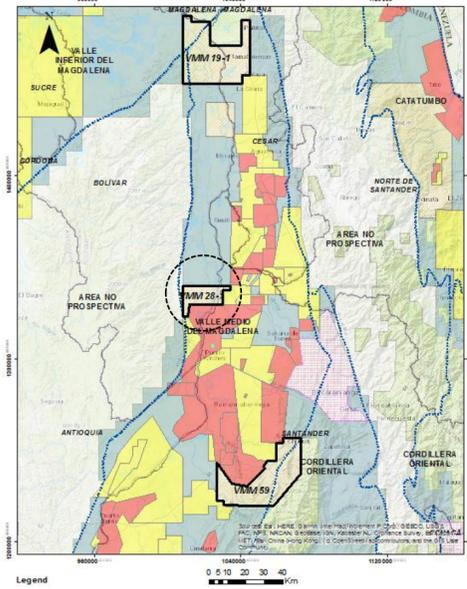


- **SEISMIC**
- **2D Seismic Surveys (7 surveys)**

SURVEY_NAME	LINE_NAME	Long_KM
<b>MAGDALENA MEDIO-76</b>	MM-1976-12	7,13
	MM-1976-14	6,01
<b>MIDAS 2D-2007</b>	MID-2007-01	7,94
	MID-2007-02	1,82
	MID-2007-04	1,79
	MID-2007-06	4,34
	MID-2007-08	7,98
	MID-2007-10	7,09
	MID-2007-12	6,58
	MID-2007-14	6,13
<b>TISQUIRAMA-83</b>	L-1983-20	0,60
	L-1983-24	0,12
	L-1983-26	0,39
<b>TISQUIRAMA-85</b>	L-1985-100	3,15
	L-1985-102	0,71
	L-1985-110	1,72
<b>TORCOROMA 2D-2001</b>	COT-2001-102	7,55
<b>TORCOROMA-94</b>	TOR-1994-102	9,64
	TOR-1994-104	12,26
	TOR-1994-106	0,88
<b>TOTUMAL ESTE-79</b>	ET-1979-14	1,04

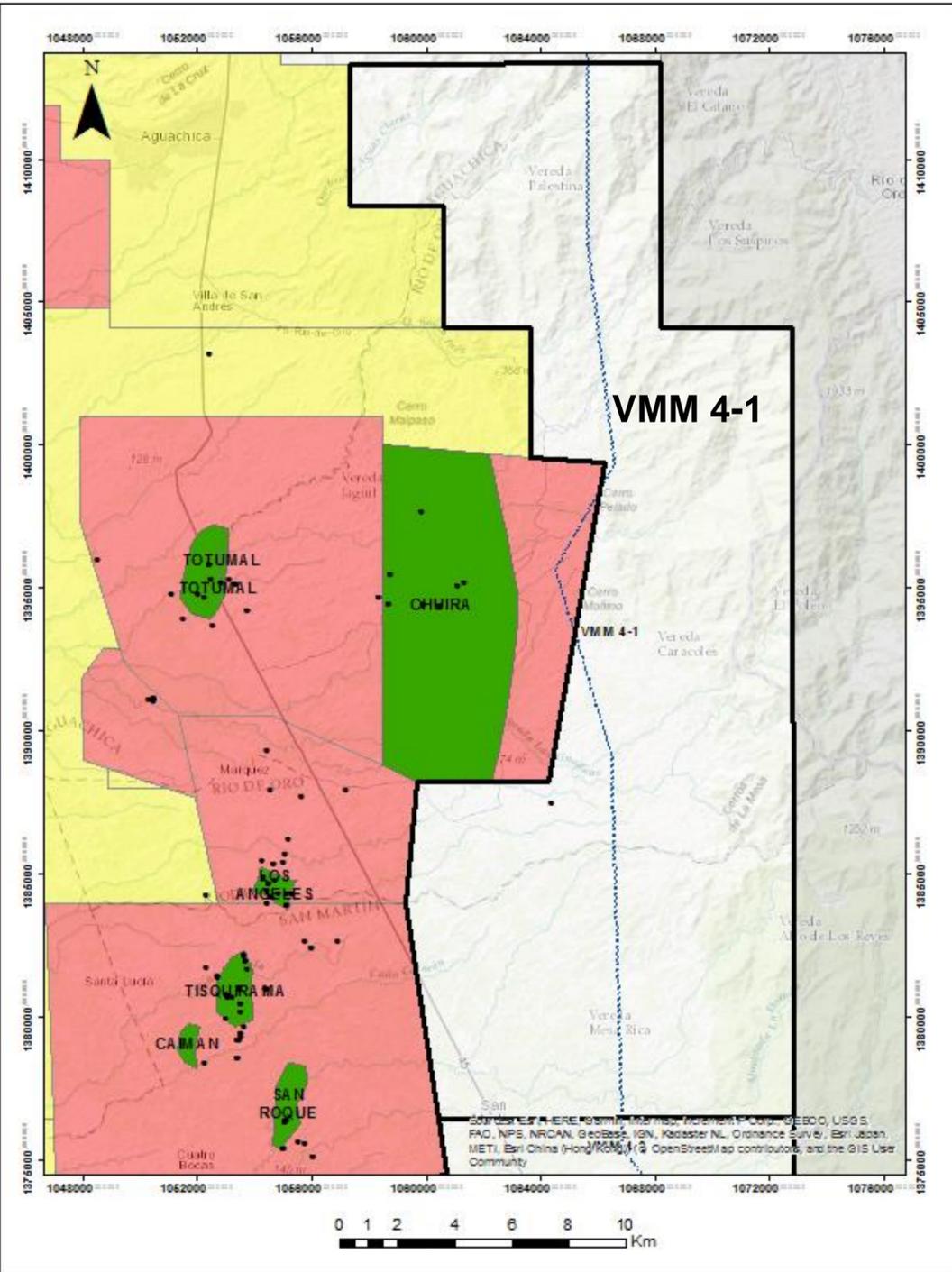
- **Total length in the Area: 100,36 Km**

# DATABASE : Wells



WELL NAME	MD (ft)	DATE	OPERATING COMPANY
LOS ÁNGELES 142-6	3905	1952	International Petroleum Limited

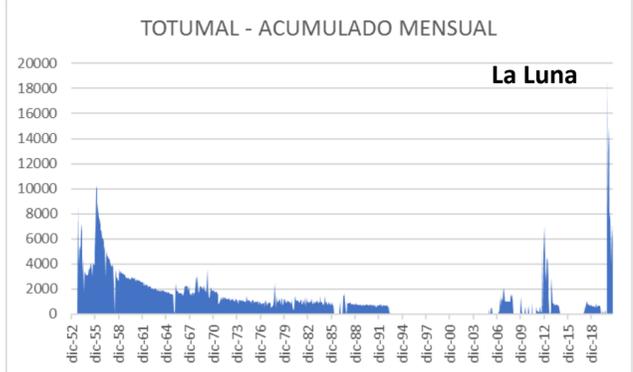
# NEAR FIELDS



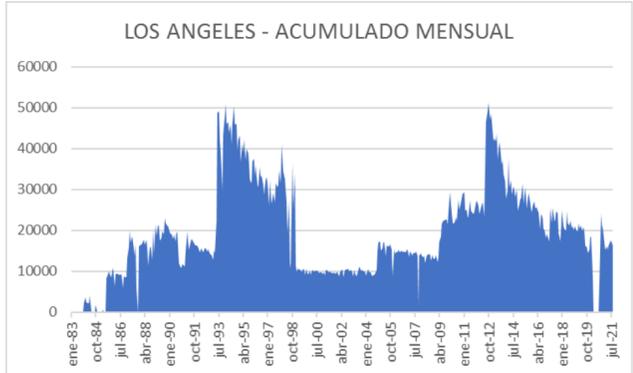
**Cumulative Production: 0,426 MMBO**



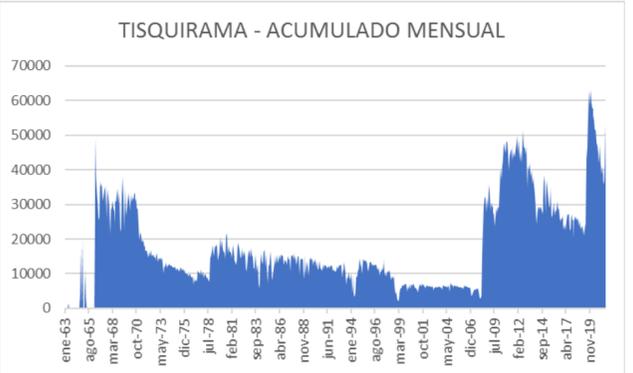
**Cumulative Production: 1,03 MMBO**



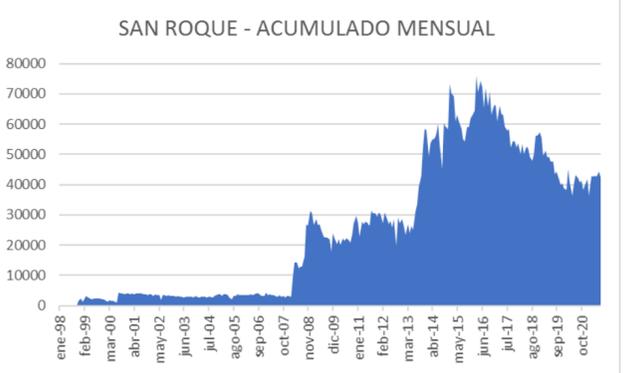
**Cumulative Production: 8.91 MMBO**



**Cumulative Production: 12,5 MMBO**



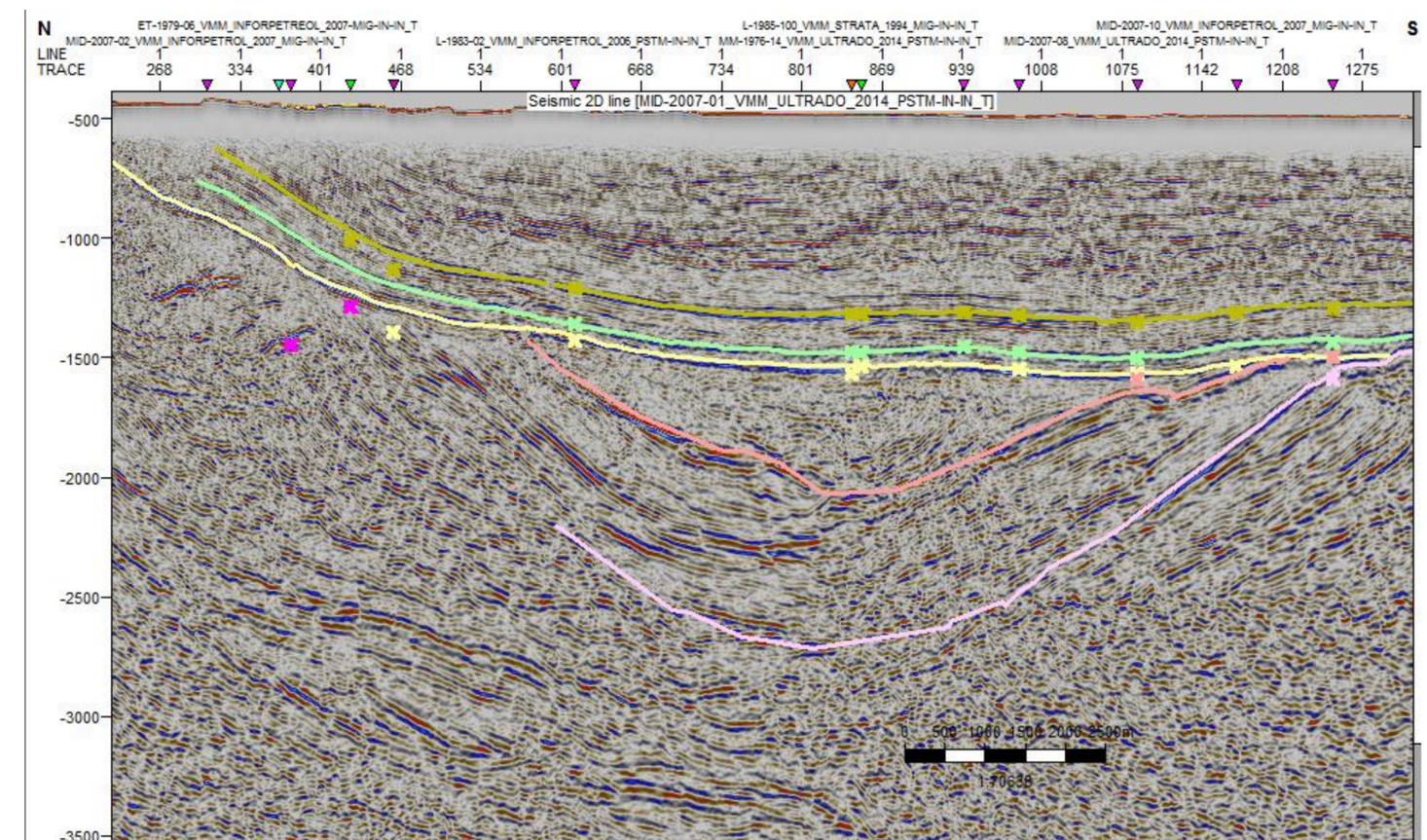
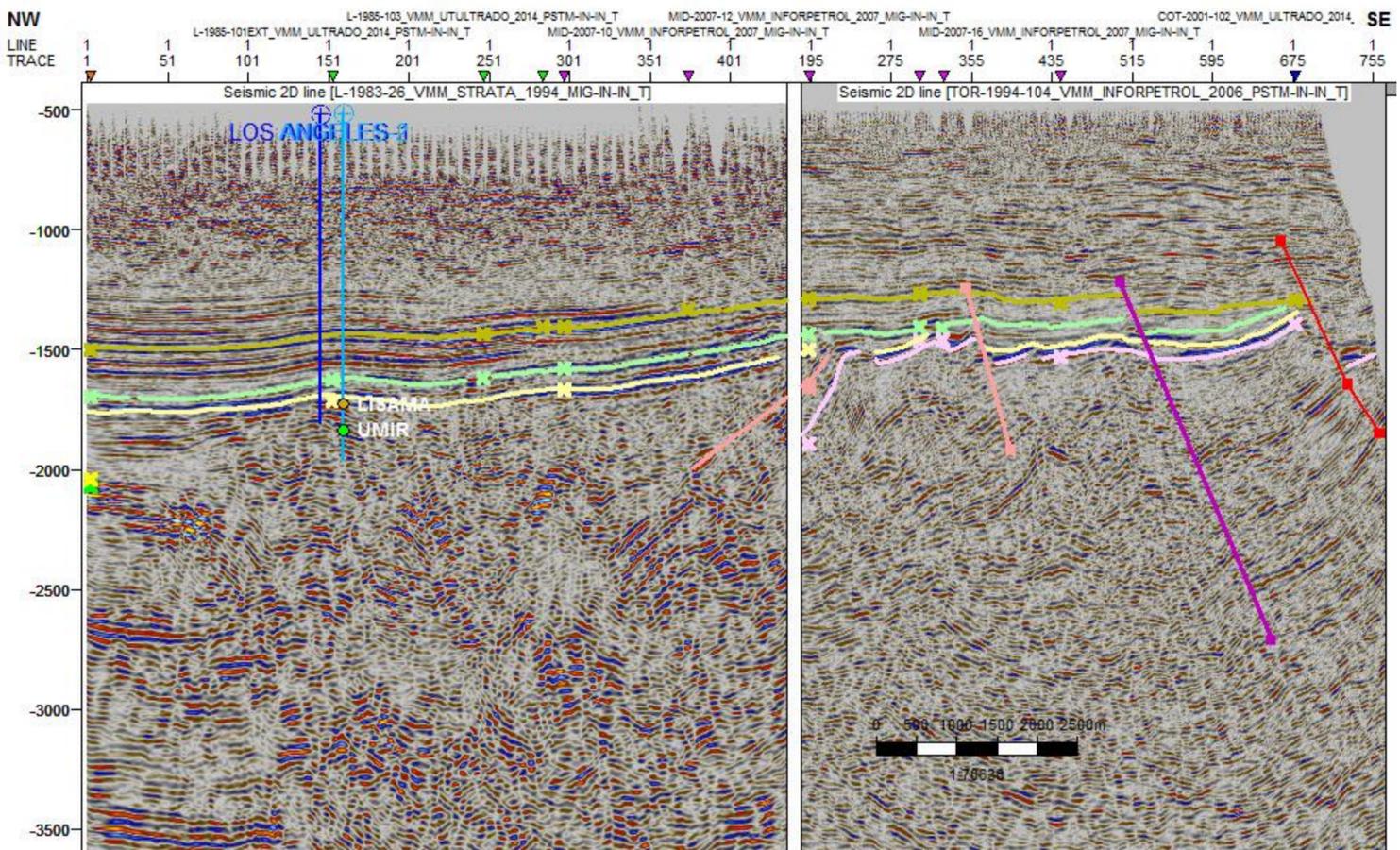
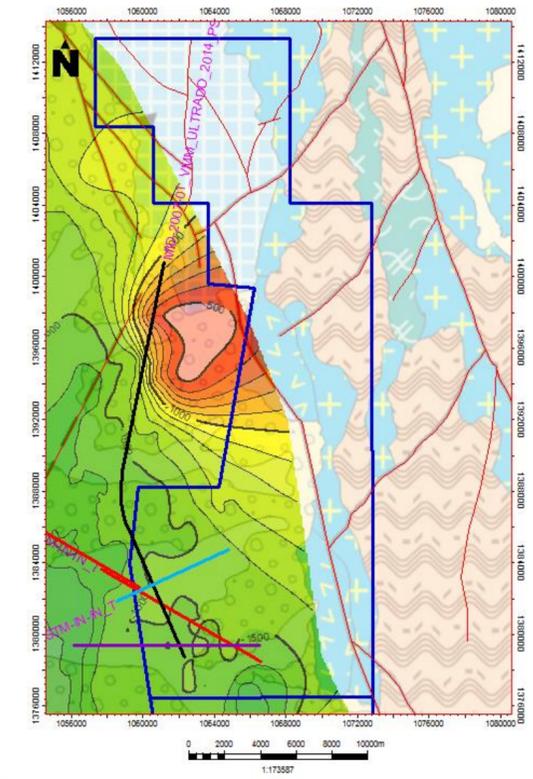
**Cumulative Production: 7,13 MMBO**





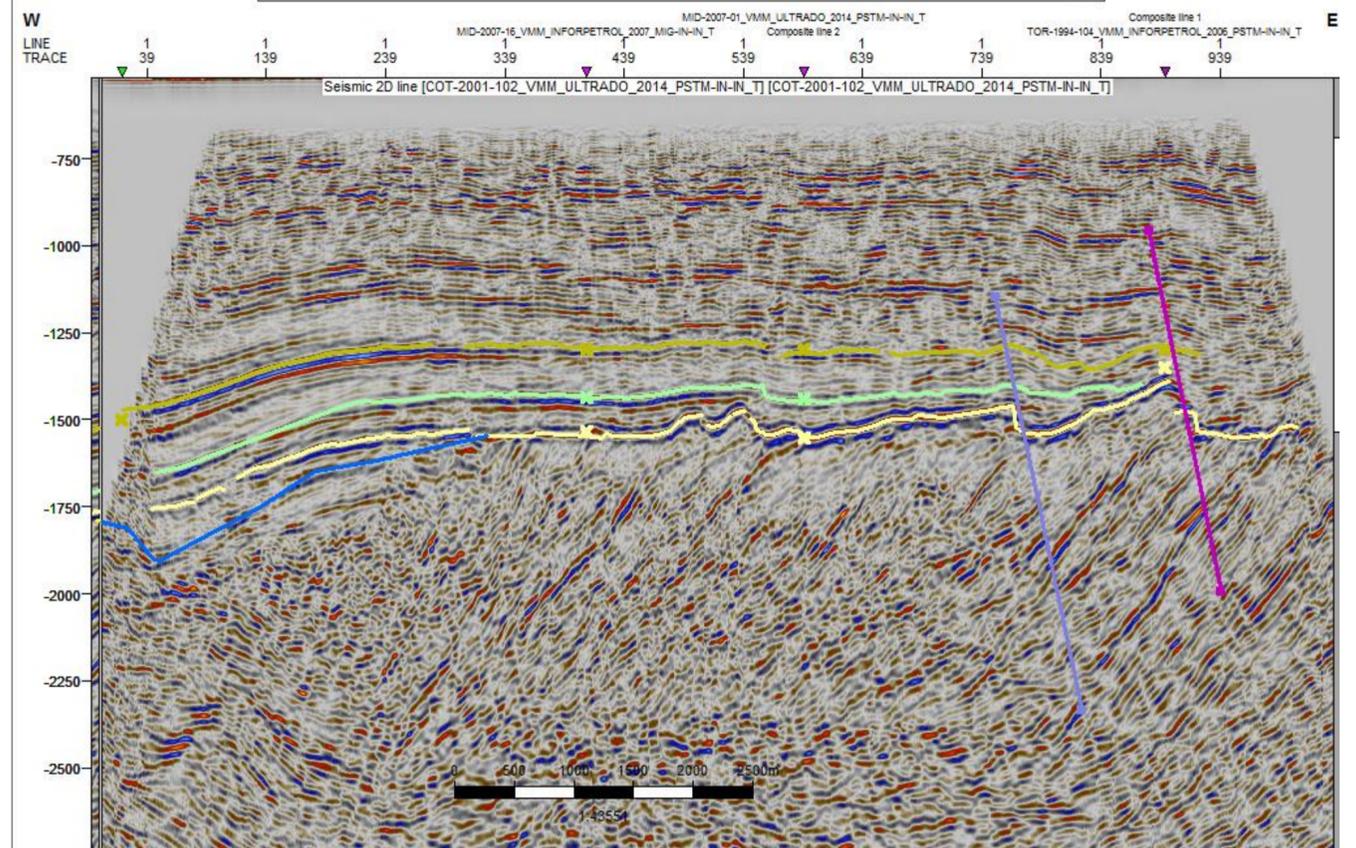
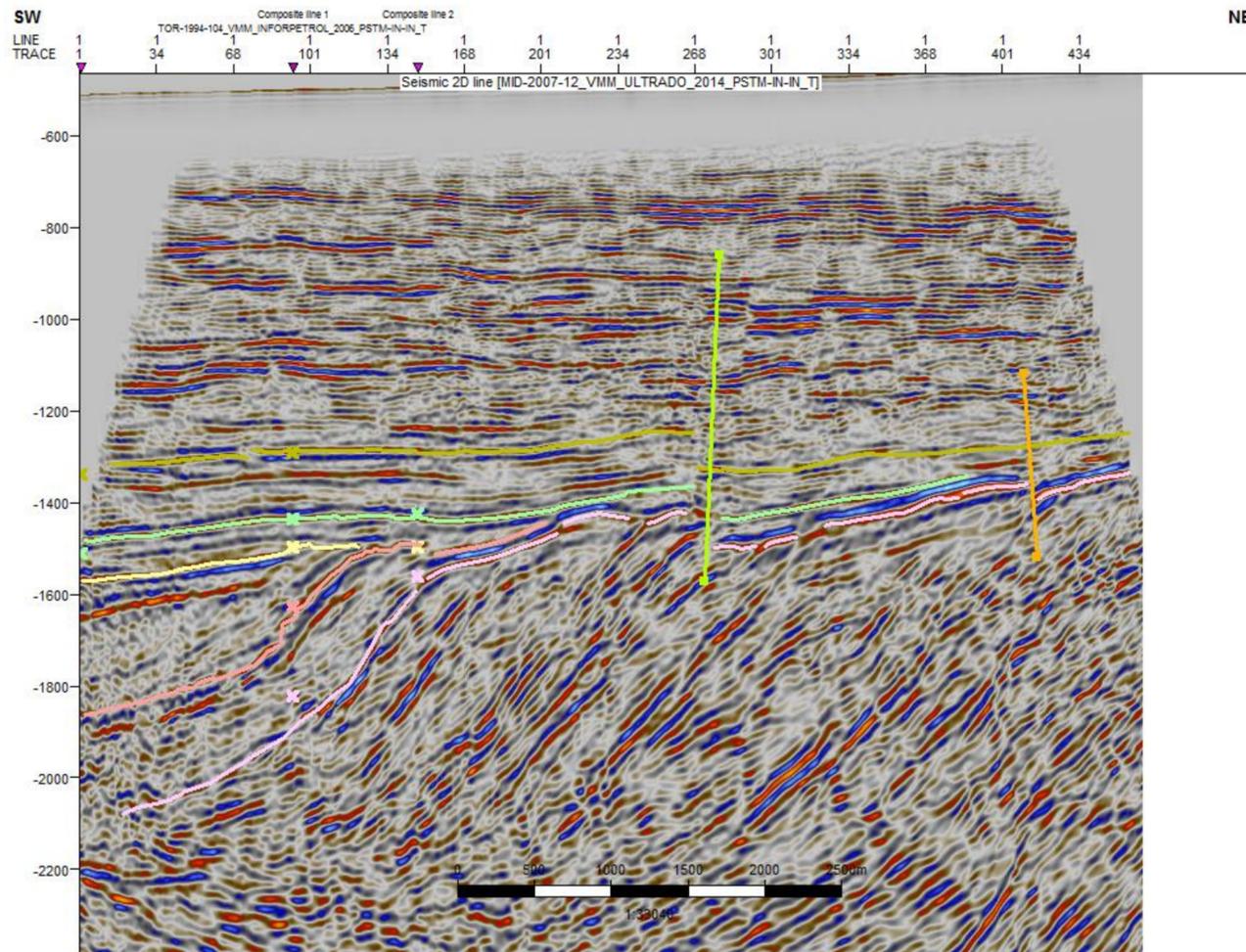
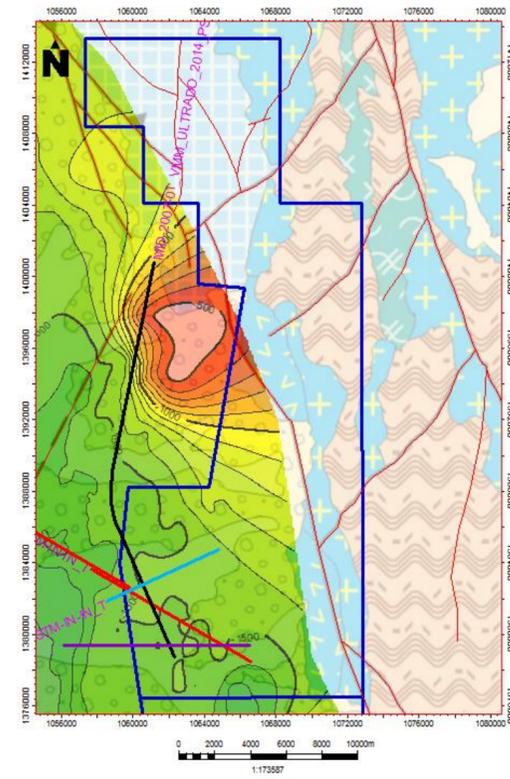
# SEISMIC INTERPRETATION

- PLAYS
- Stratigraphic: Truncation of Lisama Formation against the Eocene Unconformity.



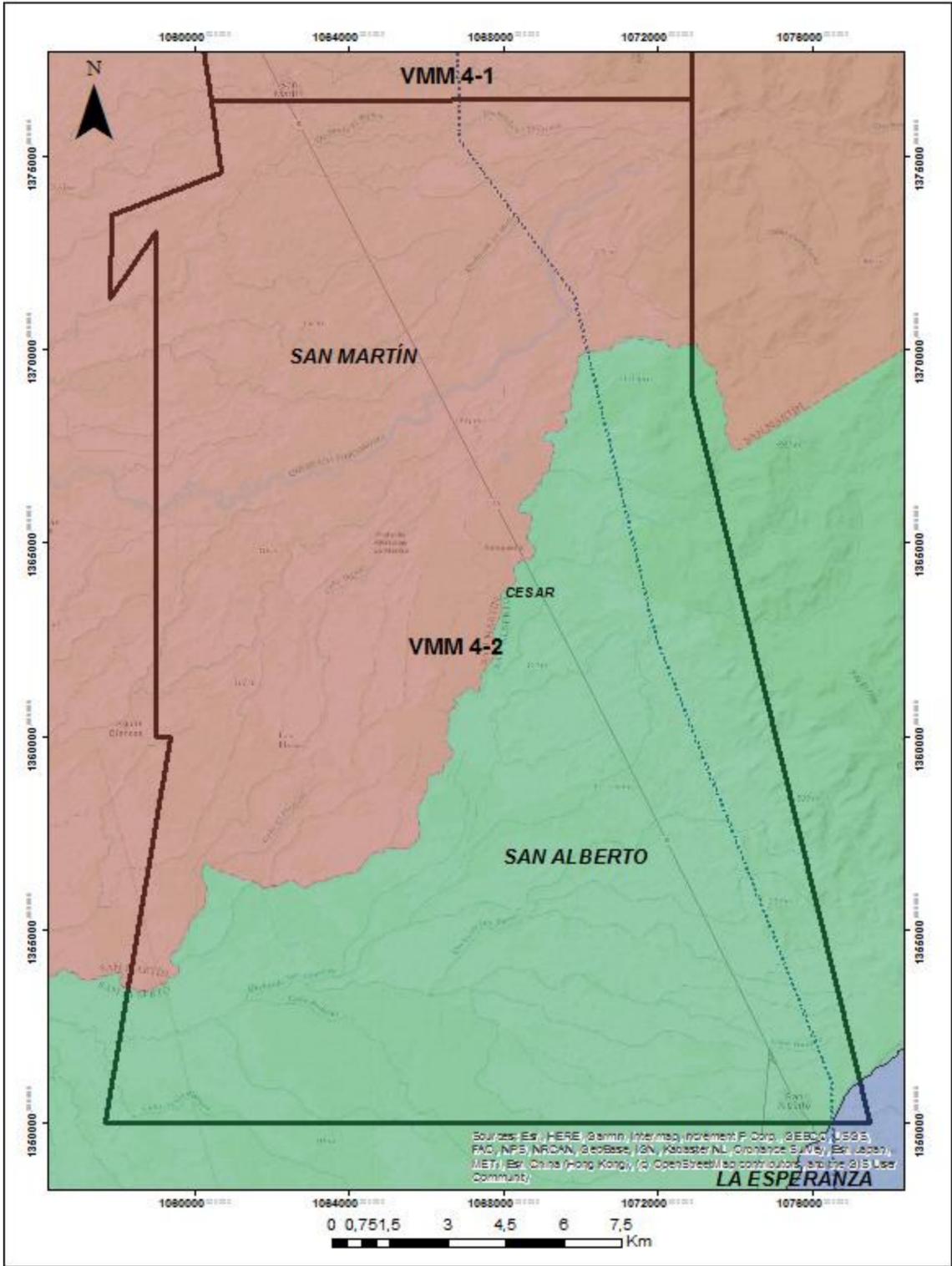
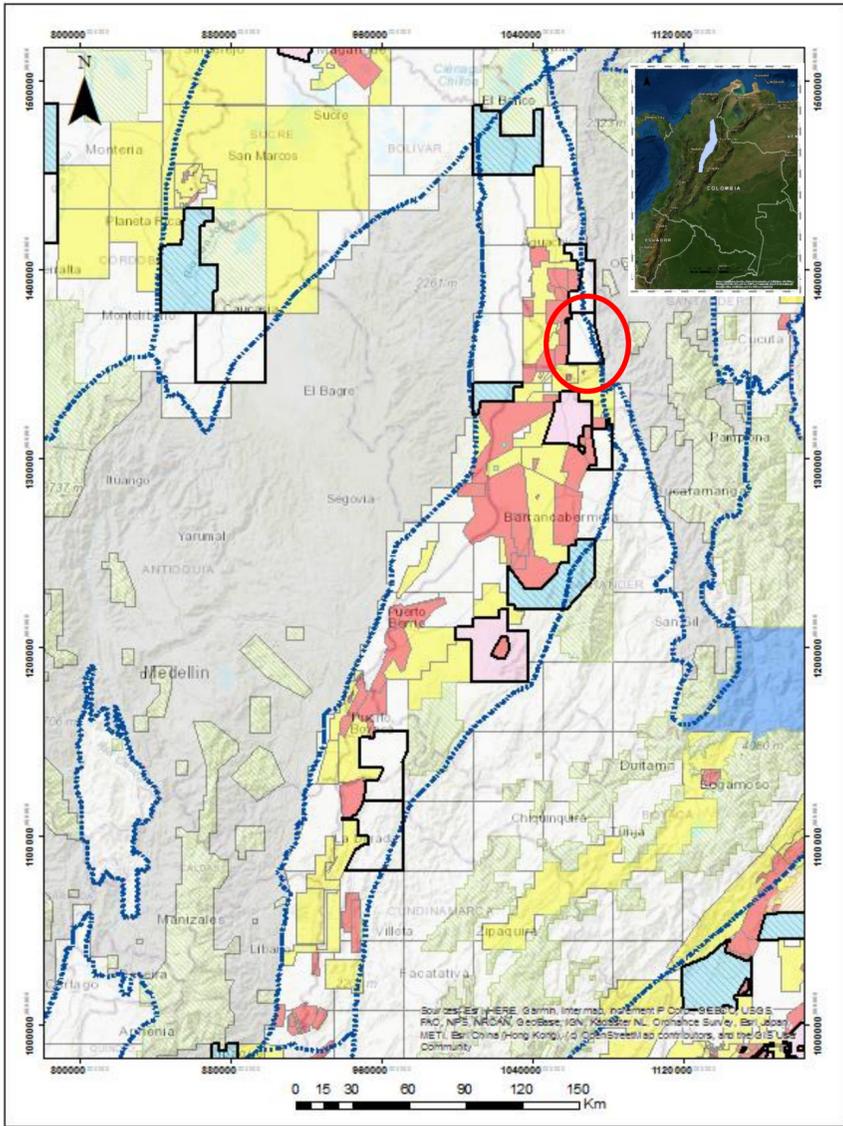
# SEISMIC INTERPRETATION

- PLAYS
- Structural and stratigraphic



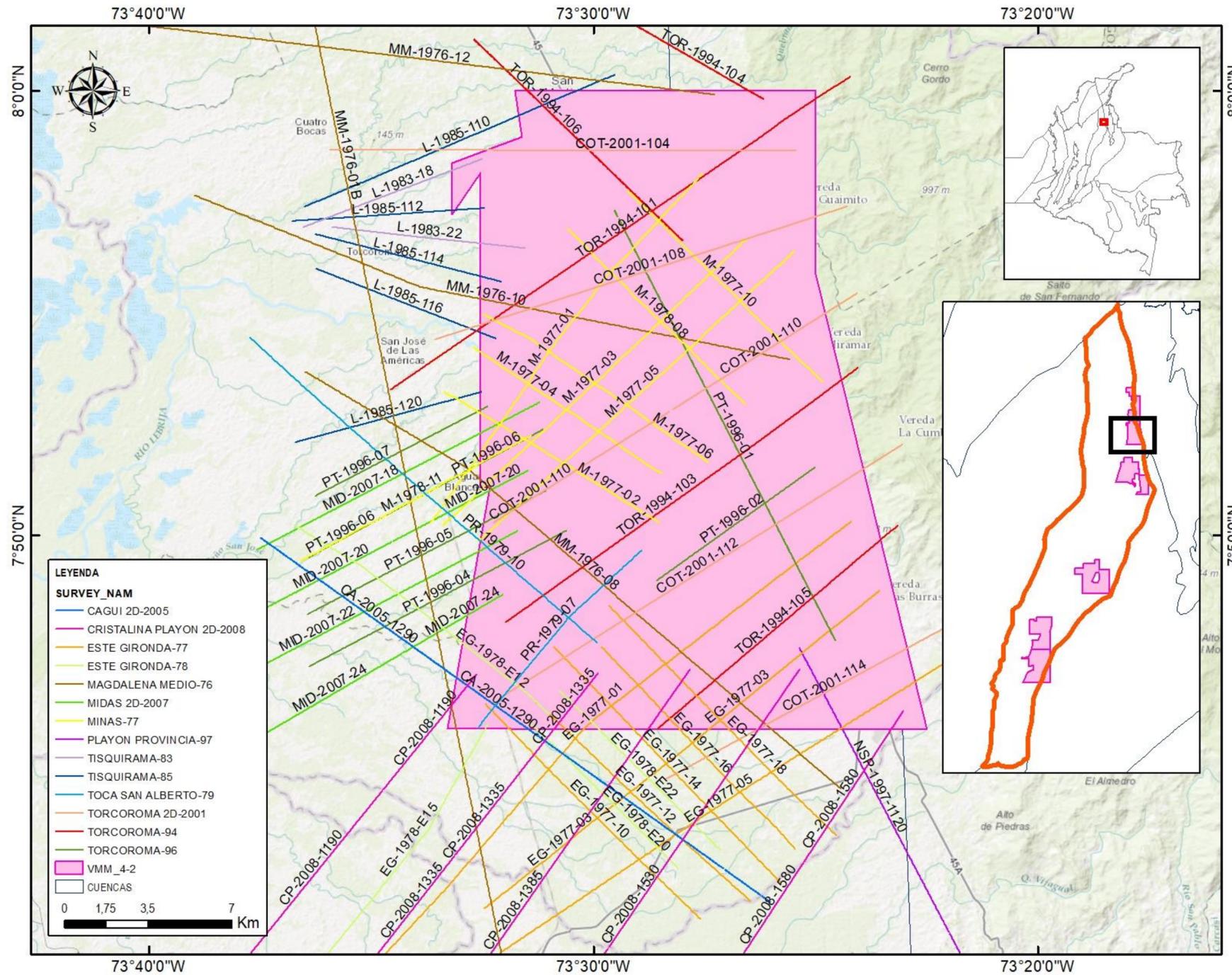
# INCORPORATED AREA VMM 4-2

# LOCATION



- **Area:** 41394,55 Ha
- **Municipalities:** San Martín, San Alberto, and La Esperanza.
- **Departments:** Cesar, Norte de Santander.

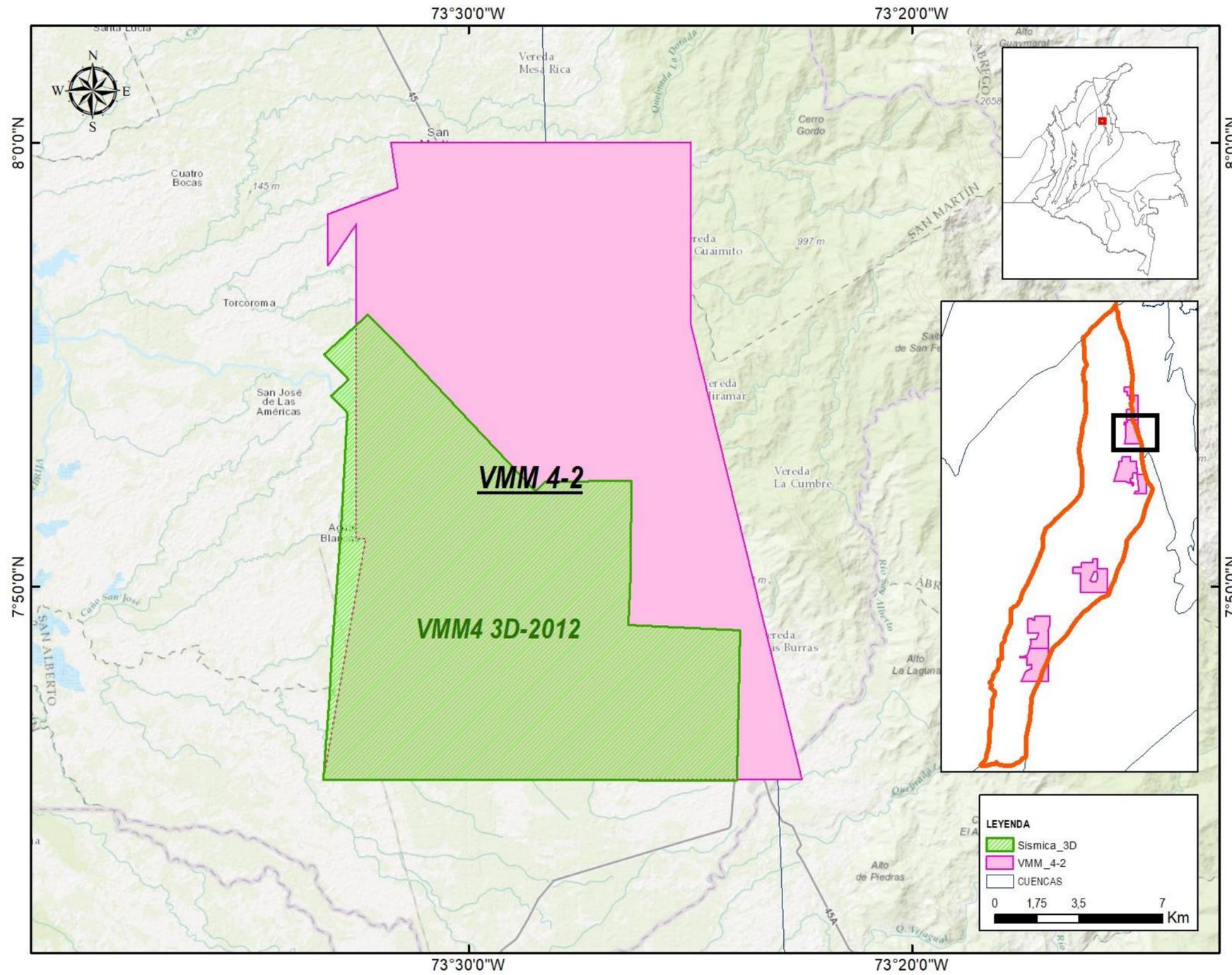
# DATABASE : 2D Seismic



## SEISMIC

- **2D Seismic Surveys:** (14 surveys)
- Cagui 2D-2005
- Cristalina Playón 2D-2008
- Este Gironda-77
- Este Gironda-78
- Magdalena Medio-76
- Midas 2D-2007
- Minas-77
- Playón Provincia-97
- Tisquirama-83
- Tisquirama-85
- Toca – San Alberto-79
- Torcorama 2D-2001
- Torcorama-94
- Torcorama-96
- **Total length in the area:**  
**399,63 Km**

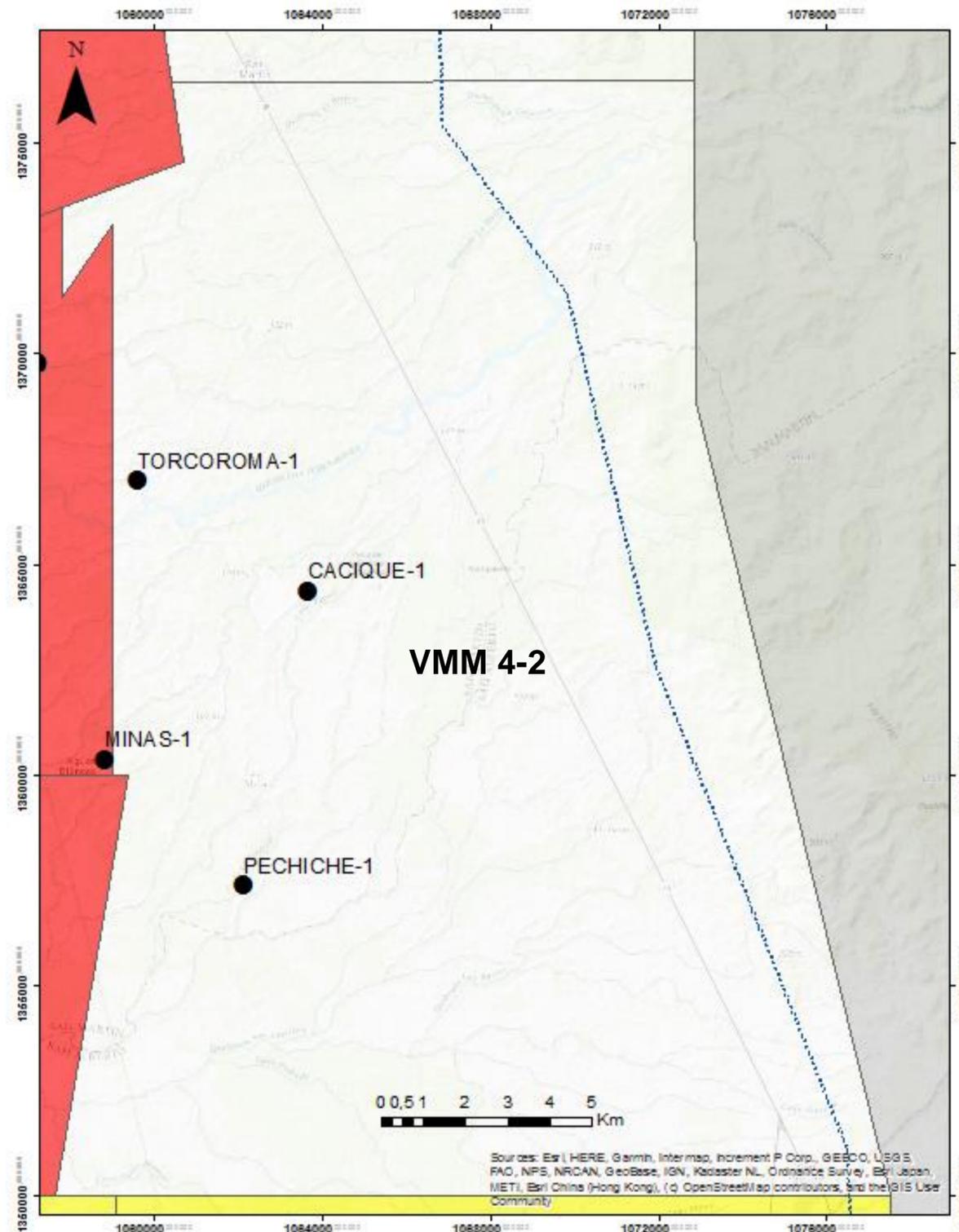
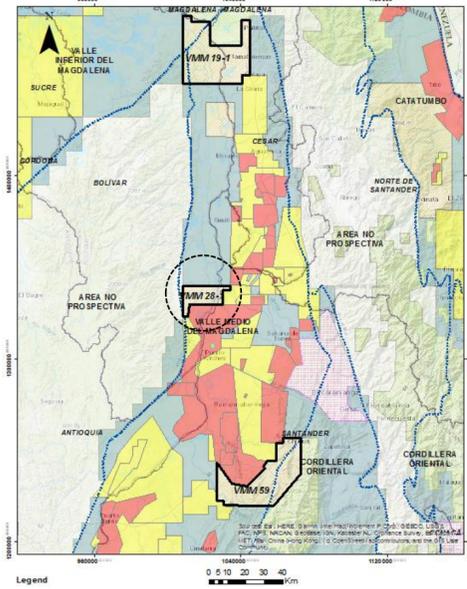
# DATABASE : 3D Seismic



- **3D Seismic:**

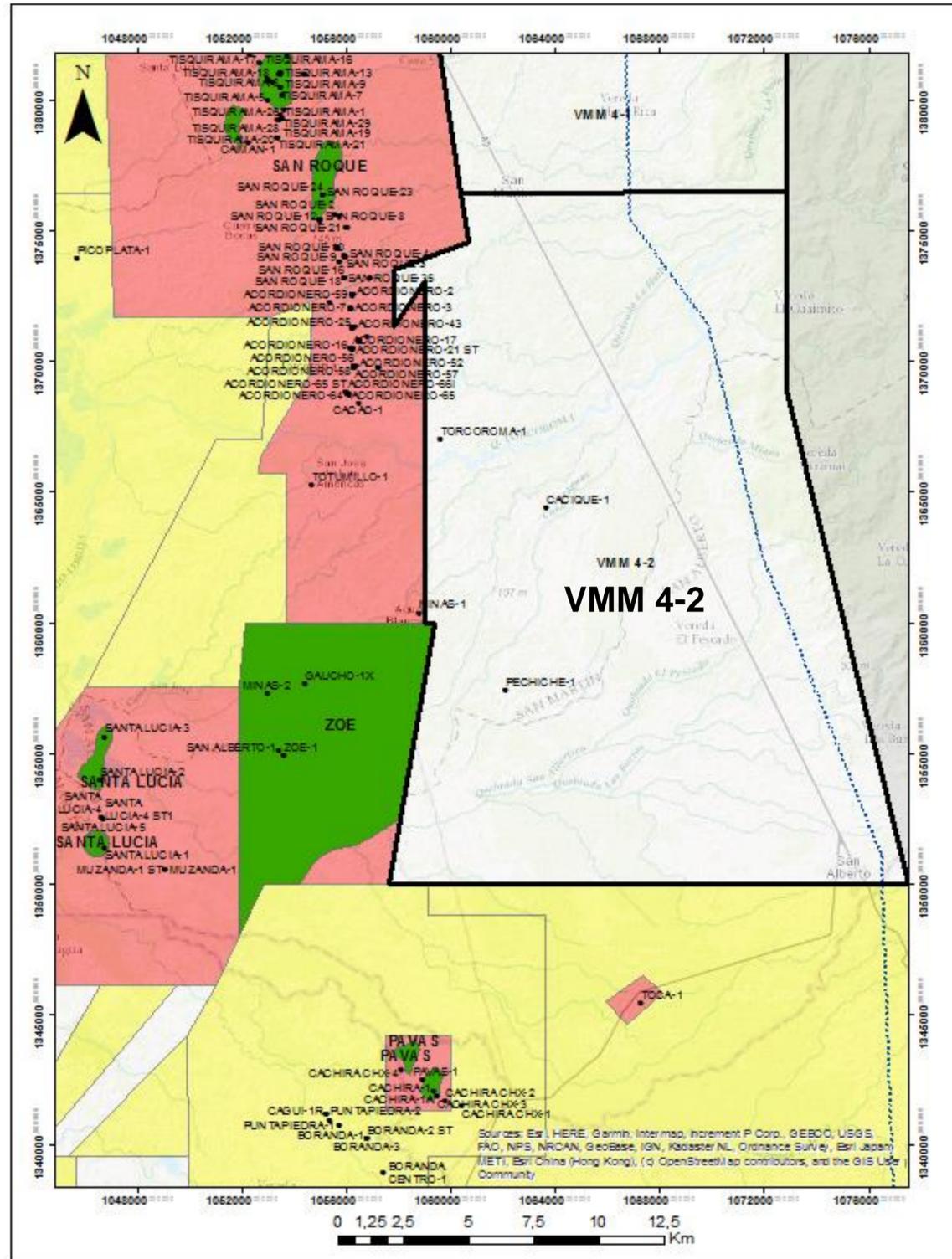
SURVEY	AREA (Km <sup>2</sup> )
VMM4 3D-2011	200,23

# DATABASE : Wells

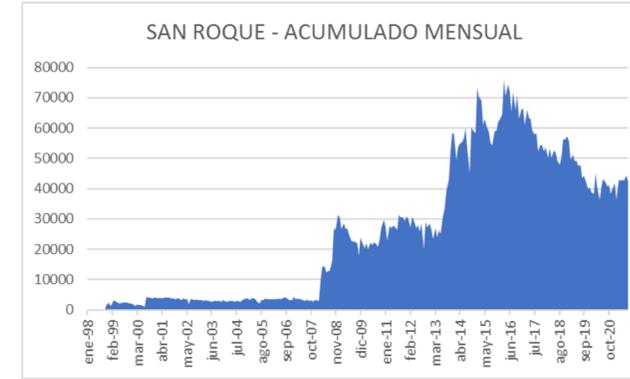


WELL NAME	MD (ft)	DATE	OPERATING COMPANY
MINAS-1	8285	1961	INTERCOL
TORCORAMA-1	7859	1965	TEXAS PETROLEUM COMPANY
CACIQUE-1	6547	2018	LA LUNA
PECHICHE-1	10348	2018	LA LUNA

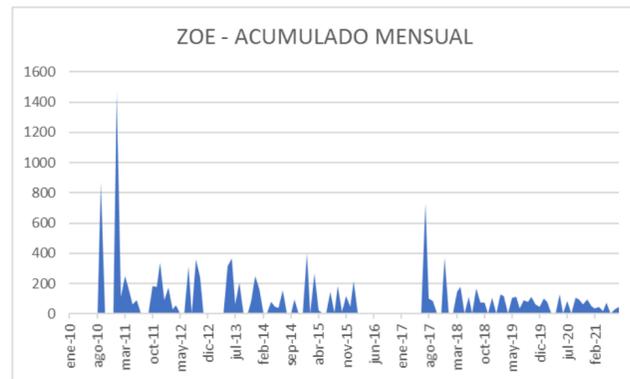
# NEAR FIELDS



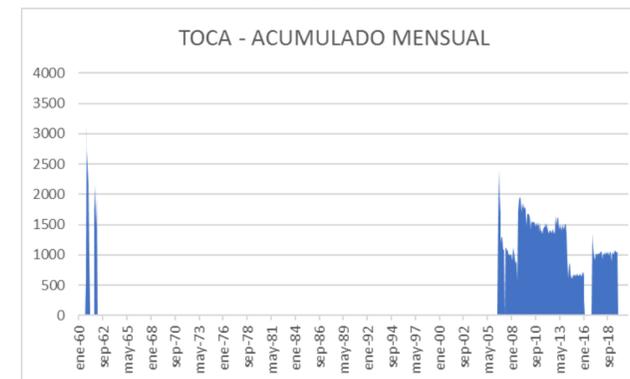
Cumulative Production: 7,13 MMBO



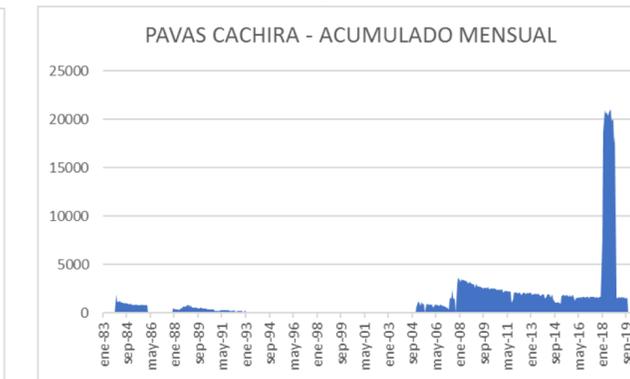
Cumulative Production: 29,17 MMBO



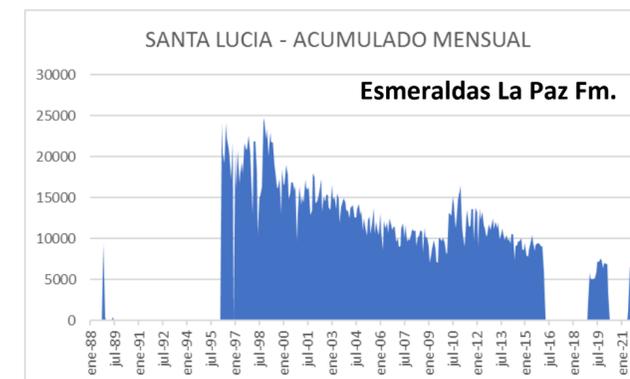
Cumulative Production: 0,20 MMBO



Cumulative Production: 0,574 MMBO



Cumulative Production: 3,32 MMBO



# Wells

## Torcorama-1 (1965) (TD 7859')

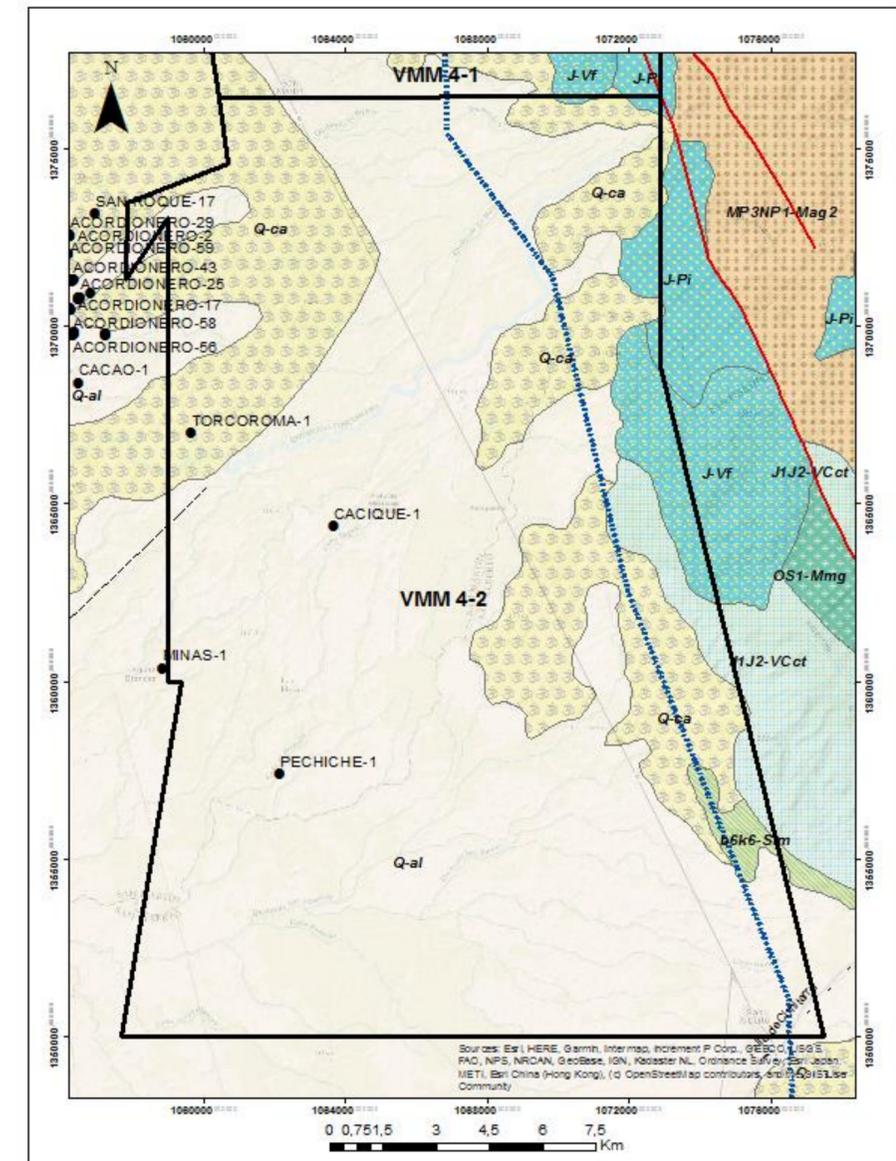
- Drilled by Texas Petroleum Company. Ecopetrol. Trap: faulted anticline. Target: Basal sands of the Chorro Group and Lisama
- Negative production tests. There were only methane gas shows in the lower intervals (>6000 ft).
- Status: Dry. Plugged and abandoned.

## Cacique-1 (2018) (TD 6547')

- Drilled by La Luna Company. Trap: closure against fault. Target: Basal sands of the Chorro Group.
- Cacique-1 drilled Real, Colorado and Esmeraldas Formations.
- Based on the petrophysical evaluation carried out, it is concluded that the CACIQUE-1 well is 100% saturated in water.

## Pechiche-1 (2018) (TD 10348')

- Drilled by La Luna Company. Trap: Stratigraphic. Target: Lisama sandstones and secondary target: Grupo Chorro sandstones.
- Petrophysical evaluation: Areas without hydrocarbons accumulation, the rock is 100% saturated in water. Oil manifestations were very poor showing residual oil in the Lower Lisama sandstones.
- The upper sands do not showed oil manifestations and the second packet showed traces at 10% of spotty black to dark brown oil staining. The shows were rated as very poor residual oil (TAR).



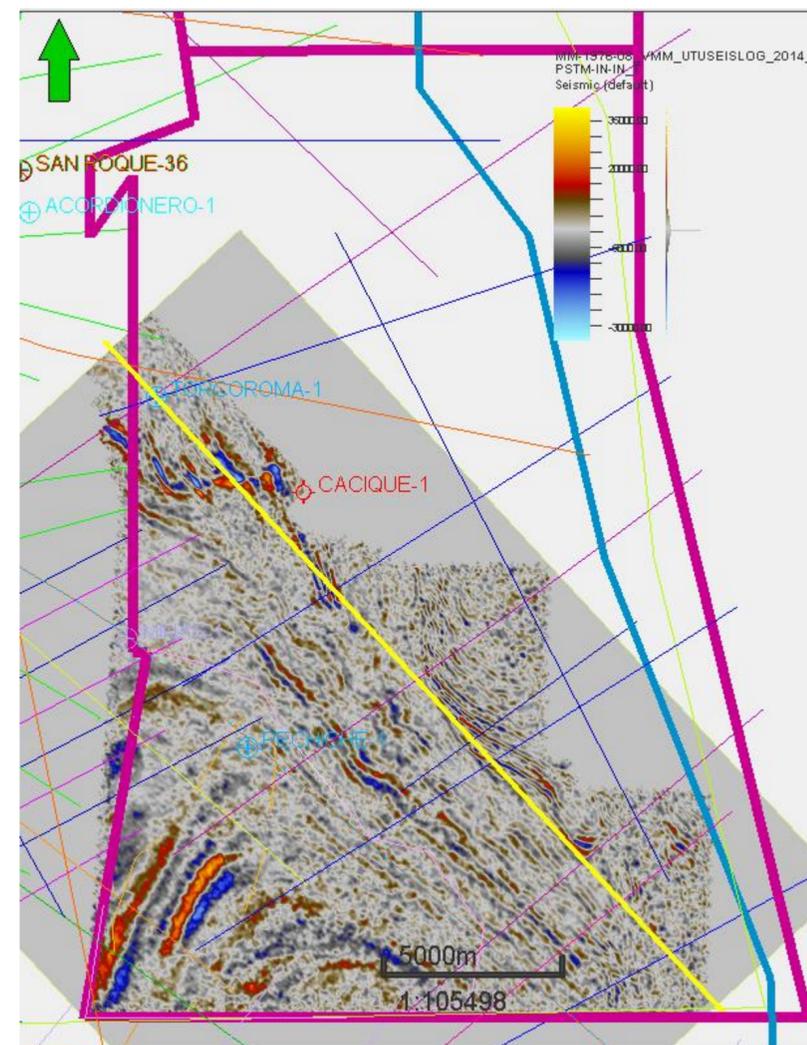
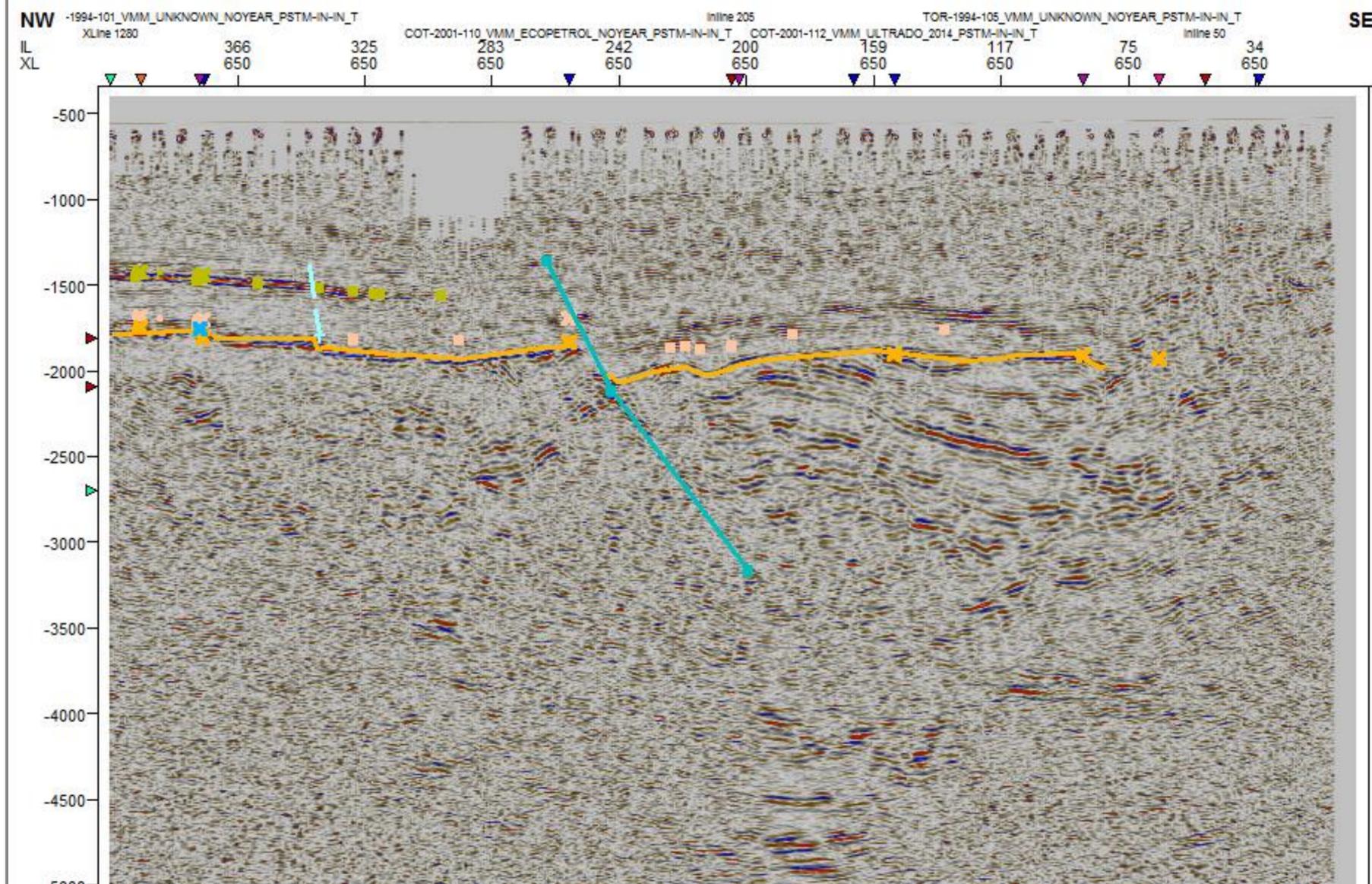
**GEOLOGICAL UNITS**

Q-al	
Q-ca	
Q-t	
Q1-ca	
Q2-l	
N2Q1-VCc	Mesa Fm.
n4n6-Sc	Real Group
e8n3-Sc	Chuspas Group
e6e8-Sc	Chorro Group
E1-Sc	Lisama Fm.
b6k6-Stm	La Luna
b2b6-Sm	Simiti Fm.
b1-Sct	Tambor Fm.



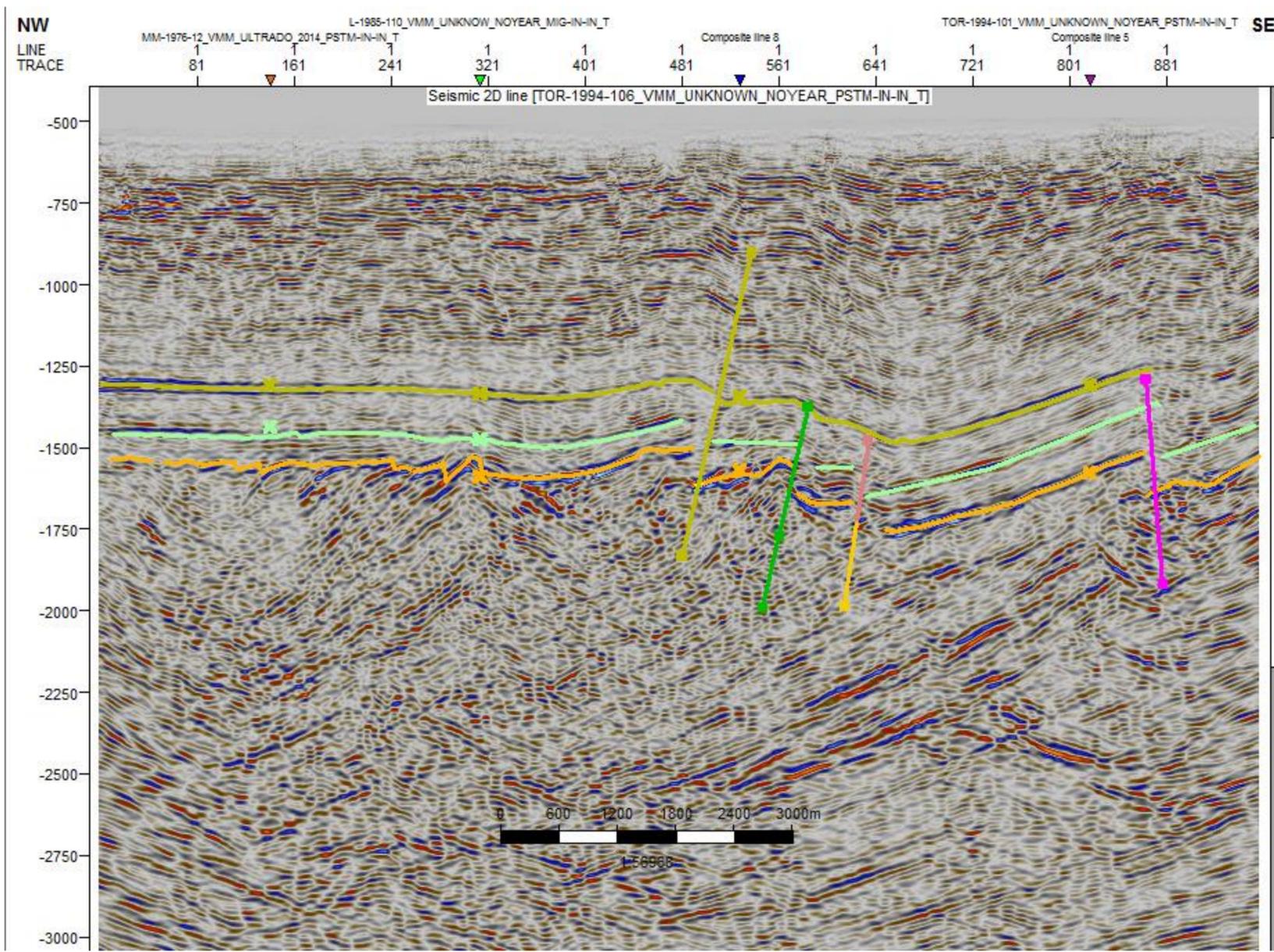
# SEISMIC INTERPRETATION

- PLAYS
- Anticline structure below Eocene Unconformity.

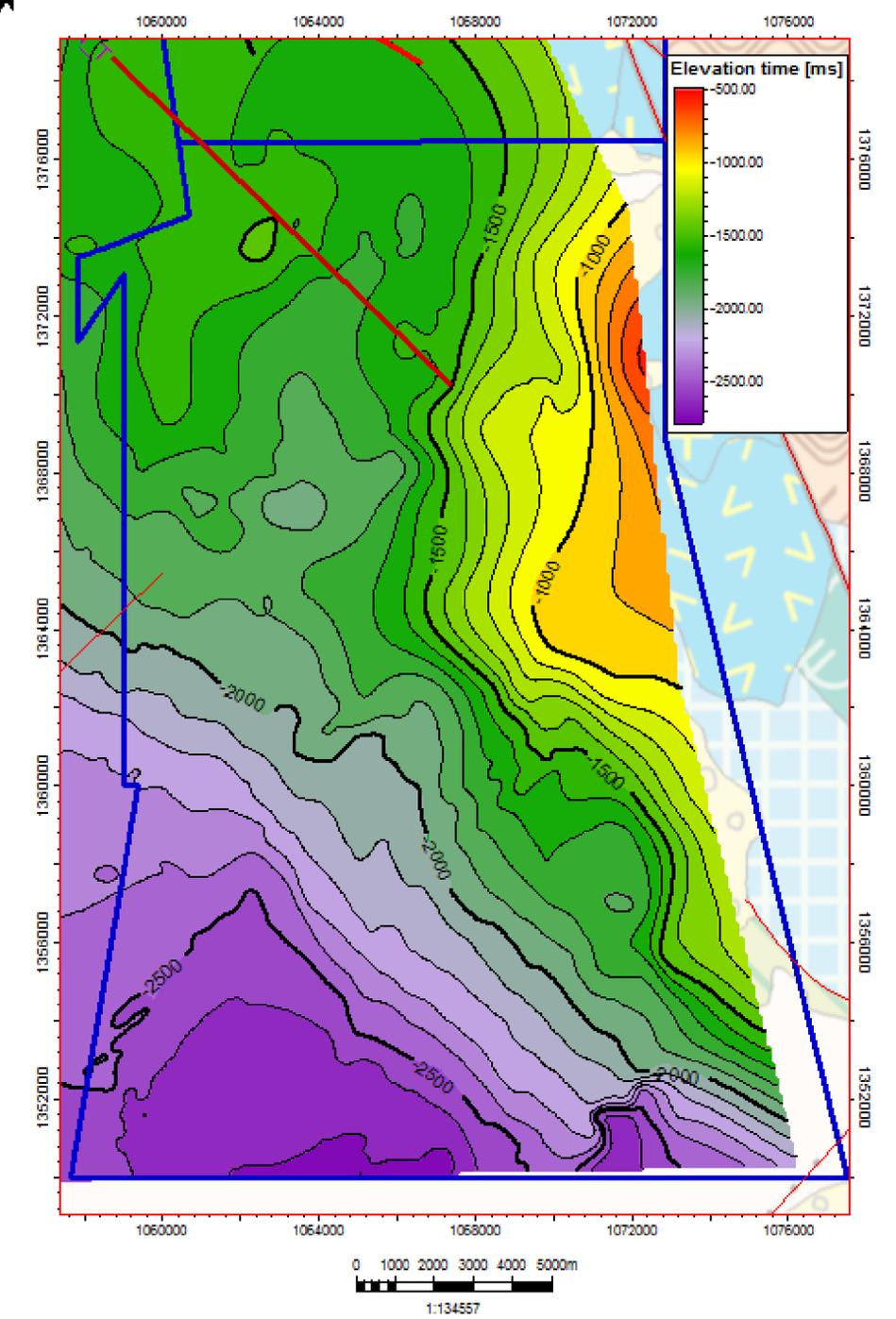


# SEISMIC INTERPRETATION

- **PLAYS**
- Structural plays: Closures against faults, where the target could be corresponds to Basal sands of the Chorro Group..

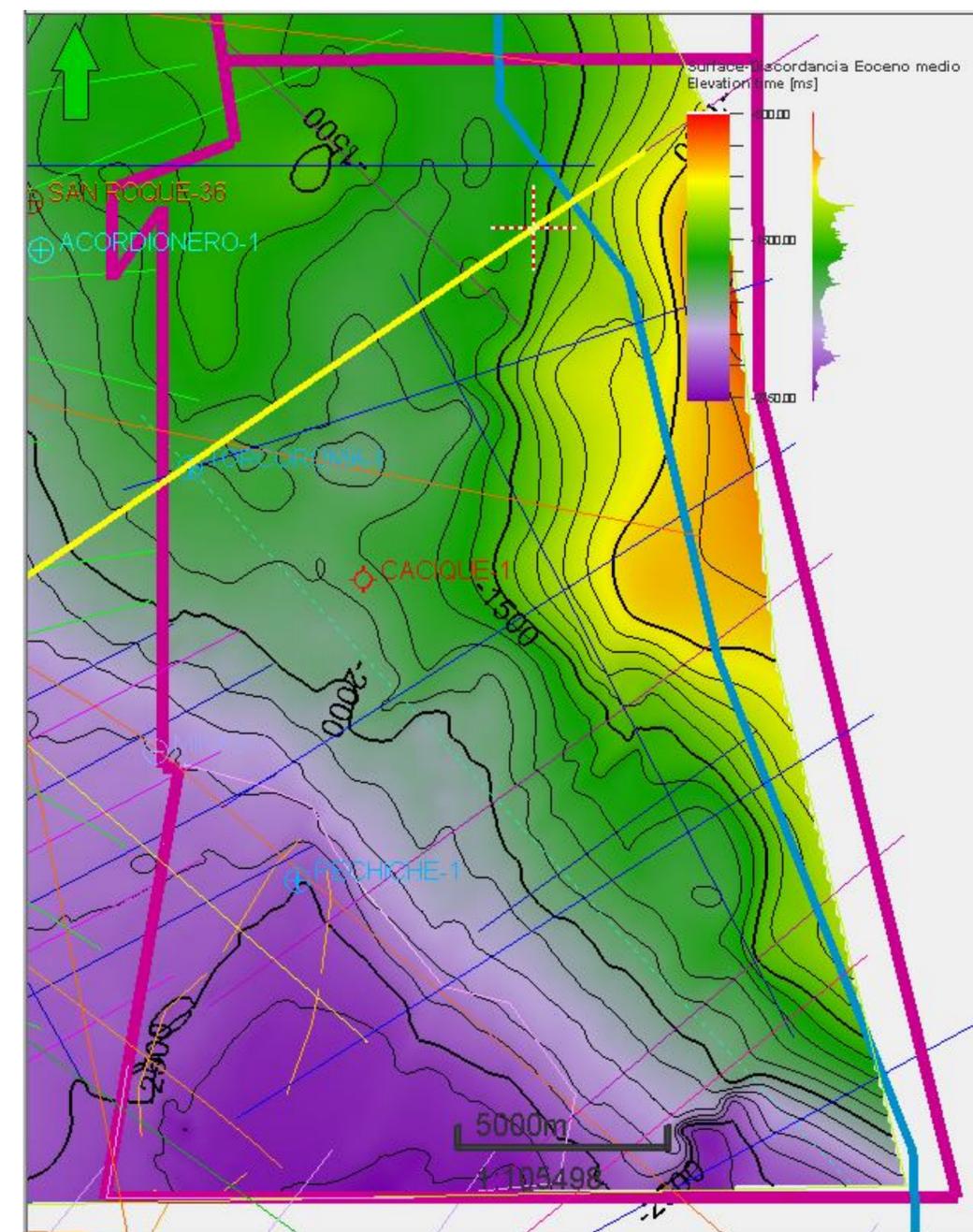
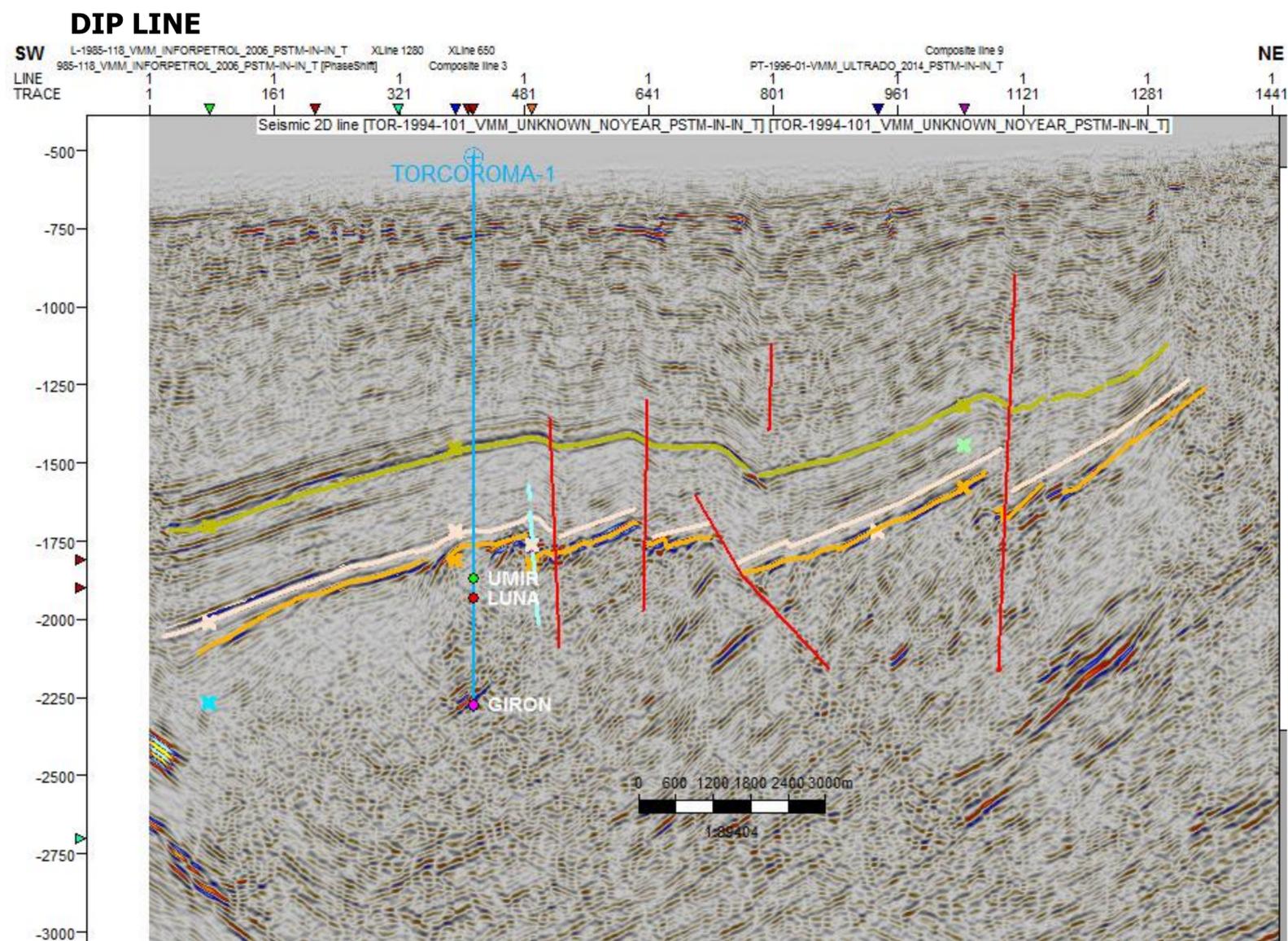


TWT Map Eocene Unconformity



# SEISMIC INTERPRETATION

- **PLAYS**
- Structural plays that involves the Esmeraldas - La Paz Formation.



# CONCLUSIONS

- In the incorporated area VMM 4-1 the ANH have identified different exploratory opportunities associated to structural traps that involve the Esmeraldas –la Paz Formations of Upper Eocene age, and stratigraphic plays that involve the Lisama Formation truncating against the Eocene Unconformity (?).
- In the incorporated area VMM 4-2 the ANH have identified different exploratory opportunities associated to stratigraphic plays that correspond to onlaps of Esmeraldas Fm and truncations of Lisama Formation against the Eocene Unconformity. As a structural plays there are closures against faults, where the target could be corresponds to Basal sands of the Chorro Group.

# Thanks

[www.anh.gov.co](http://www.anh.gov.co)