Impact of the Data Capture in Malal Del Medio Oeste Field Characterization*

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Abstract

The Malal del Medio Oeste oilfield is located at the front of the Malargüe Fold and Thrust belt in Neuquén basin and had, before the execution of the project, seven wells in production in the lower section of Neuquén Gr. sandstone level. These wells were distributed in an approximately 6 km^2 area. Neuquén Gr., in this area, comprises of a fluvial environment represented by a fine and medium sandstone reservoir with shaly levels in the upper section and conglomerated sandstones in the lower section. After 12 years without drilling activity, in the period between 2017 and 2018, five production wells were drilled in order to characterize the area and incorporate reserves. These well locations were supported by a static and dynamic model, based on the limited information available in the area at that moment and analogous field information. New loggings, cores and pression tests data of these new wells were acquired and the results contributed to a more detailed static and dynamic model characterization. Firstly, a new structural model was built by a new seismic interpretation to reduce the differences observed between forecasted and real formation markers, after drilling the first two wells. On the other hand, important water cut differences were registered in wells located at the same structural levels, evidencing areal discontinuities not considered before. It was also observed in the pressure tests of the new boreholes, reservoir pressures that doubled the estimated value with the previous model. This information supported the idea of the existence of a compartmentalized reservoir. The integration of the data led to the conclusion that the reservoir would be more conditioned by stratigraphic rather than structural barriers, contrary to the model proposed at the beginning of the project, thus inferring a more important degree of disconnection between wells. According to the data acquired, the most efficient way of considering the development of the field is currently being evaluated, with the premise of designing a slow advance and with continuous data collection to carry out the updating of the model permanently.

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August 2019

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- Our estimates of EURs, included in our Development Costs, are by their nature more speculative than estimates of proved, probable and possible reserves and accordingly are subject to substantially greater risk of being actually realized, particularly in areas or zones where there has been limited history. Actual locations drilled and quantities that may be ultimately recovered from our concessions will differ substantially. Ultimate recoveries will be dependent upon numerous factors including actual encountered geological conditions and the impact of future oil and gas pricing.

AGENDA

- Objectives
- General information
- First steps
- Reality vs Model
- New hints of changes
- Results integration
- Final remarks

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OBJECTIVES

To obtain a representative and predictive model to understand the complexity of the fluvial system in Neuquen Group in Malal del Medio Oeste field.

To integrate the information from different sources, acquired at each stages of the field development.

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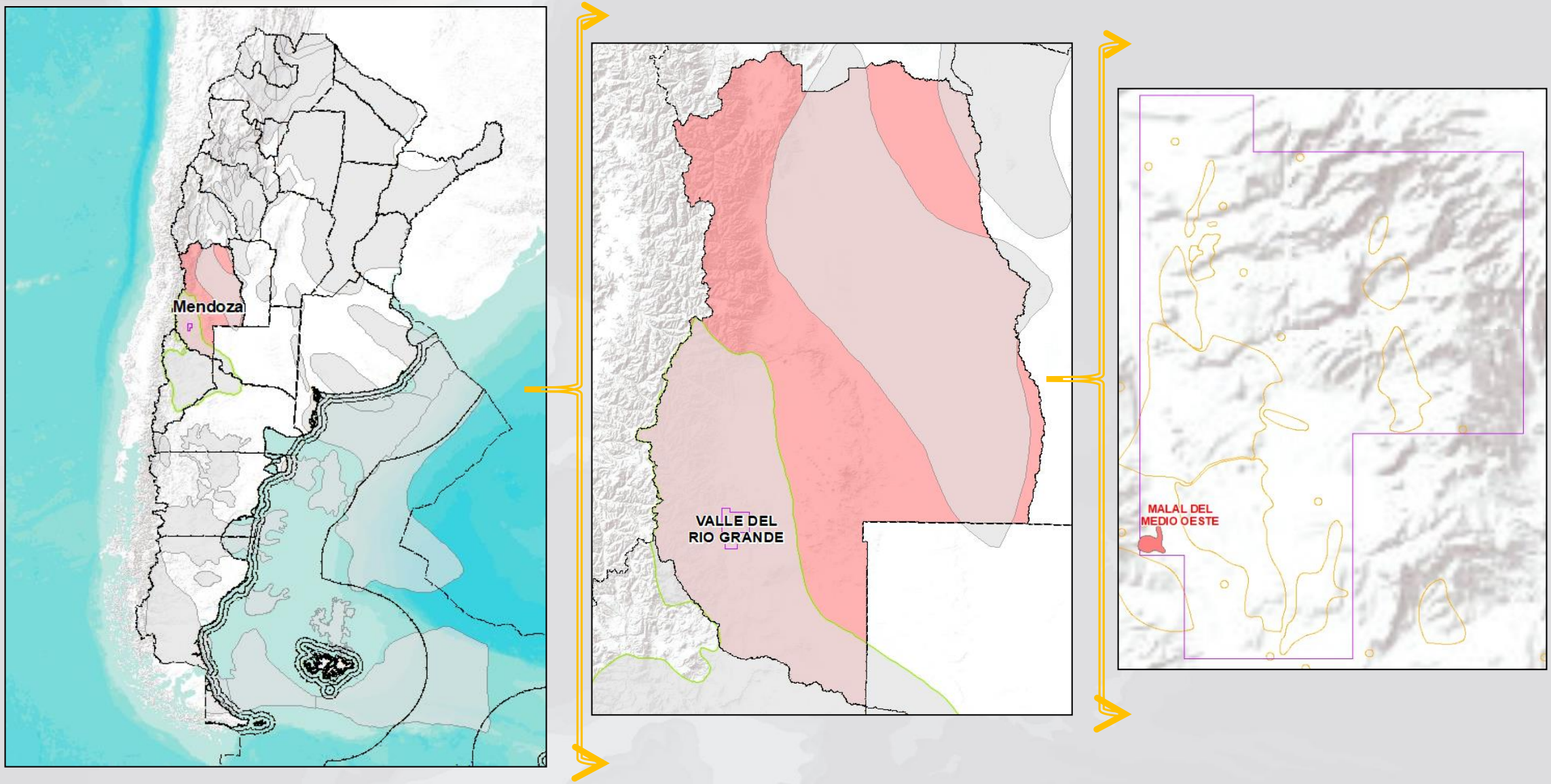
GENERAL INFORMATION



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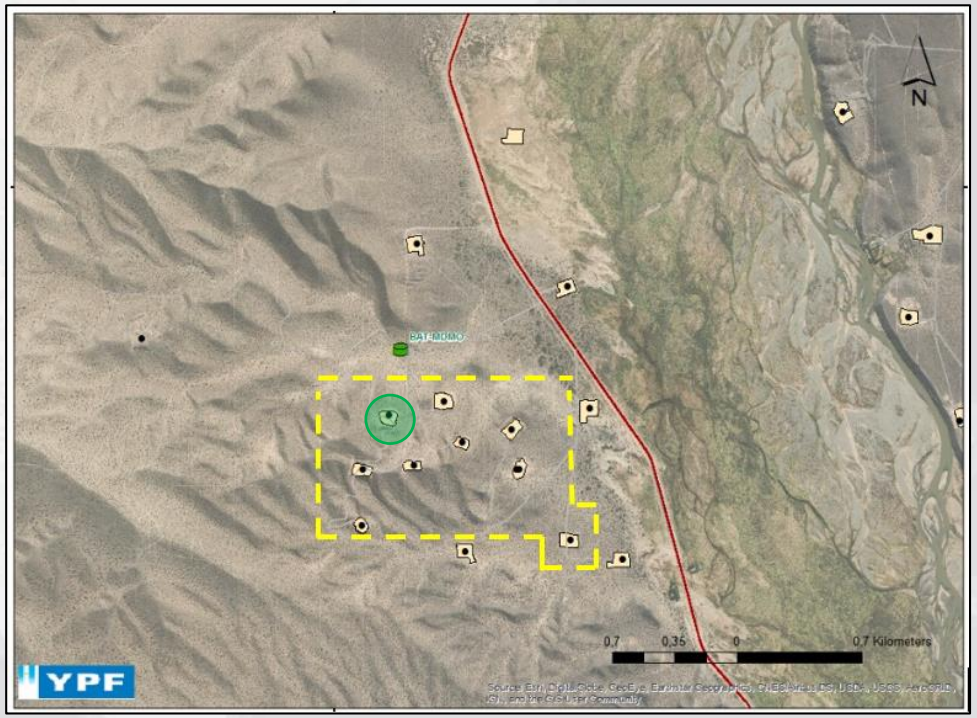
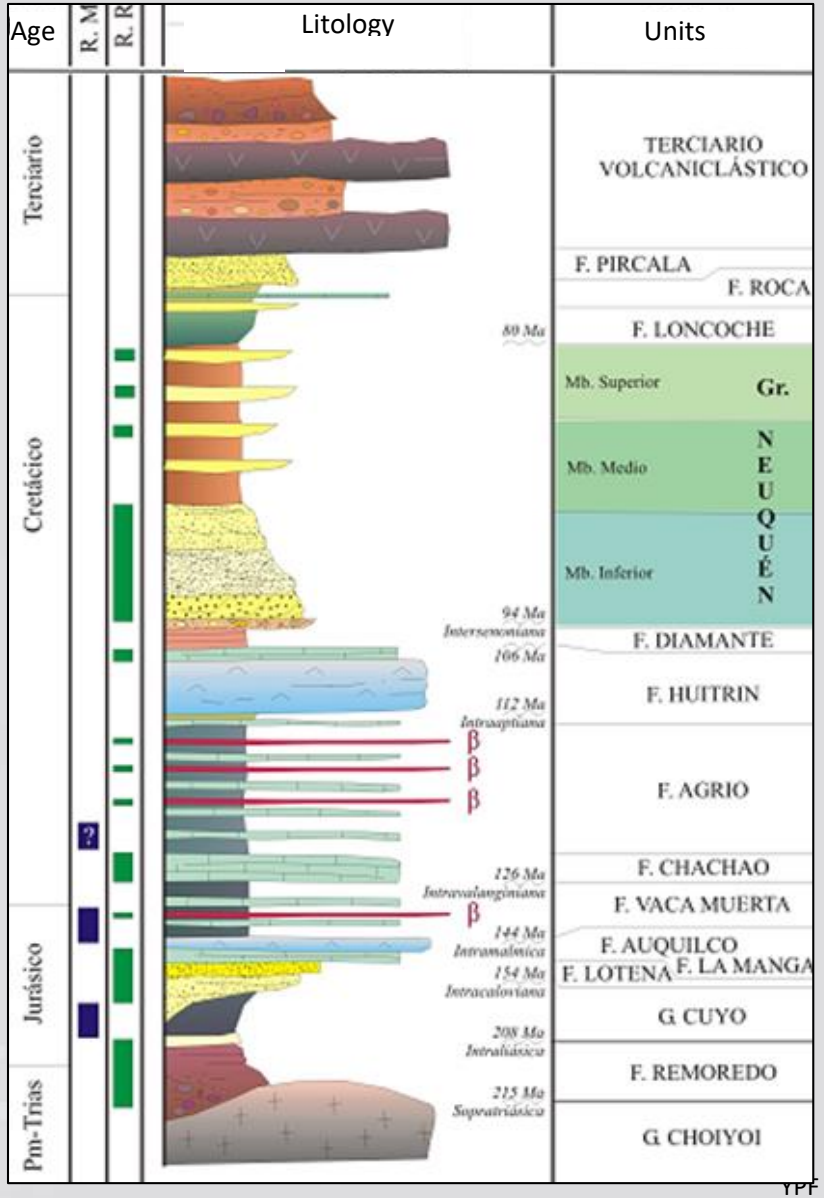


- *Malal del Medio Oeste field (discovered in 1997).*
- *Main reservoir: lower Neuquen Group.*



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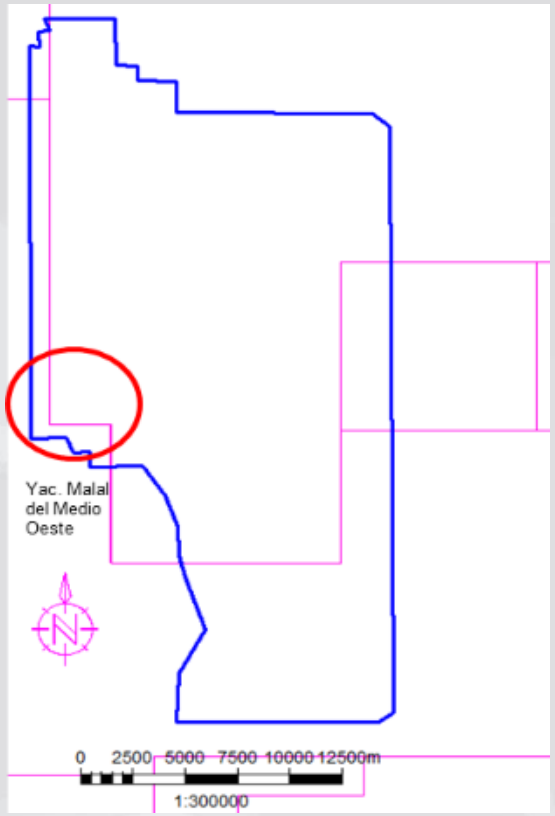
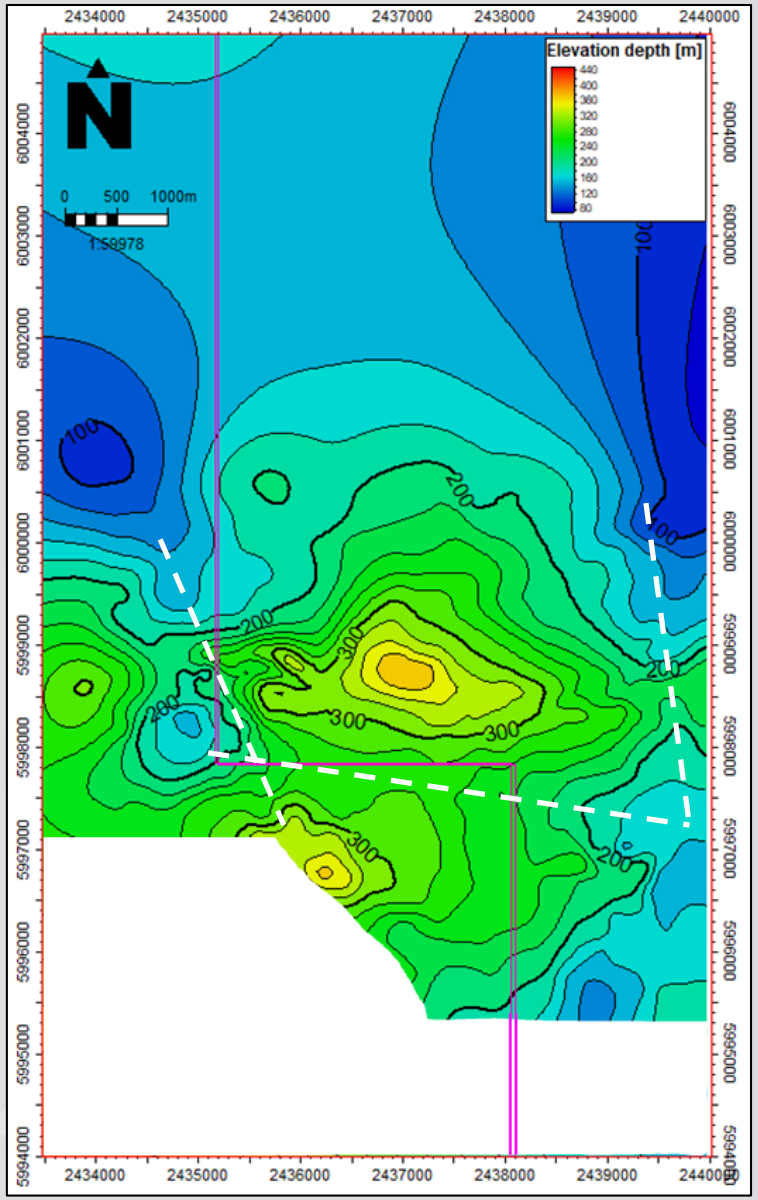
FIRST STEPS

Original seismic cube

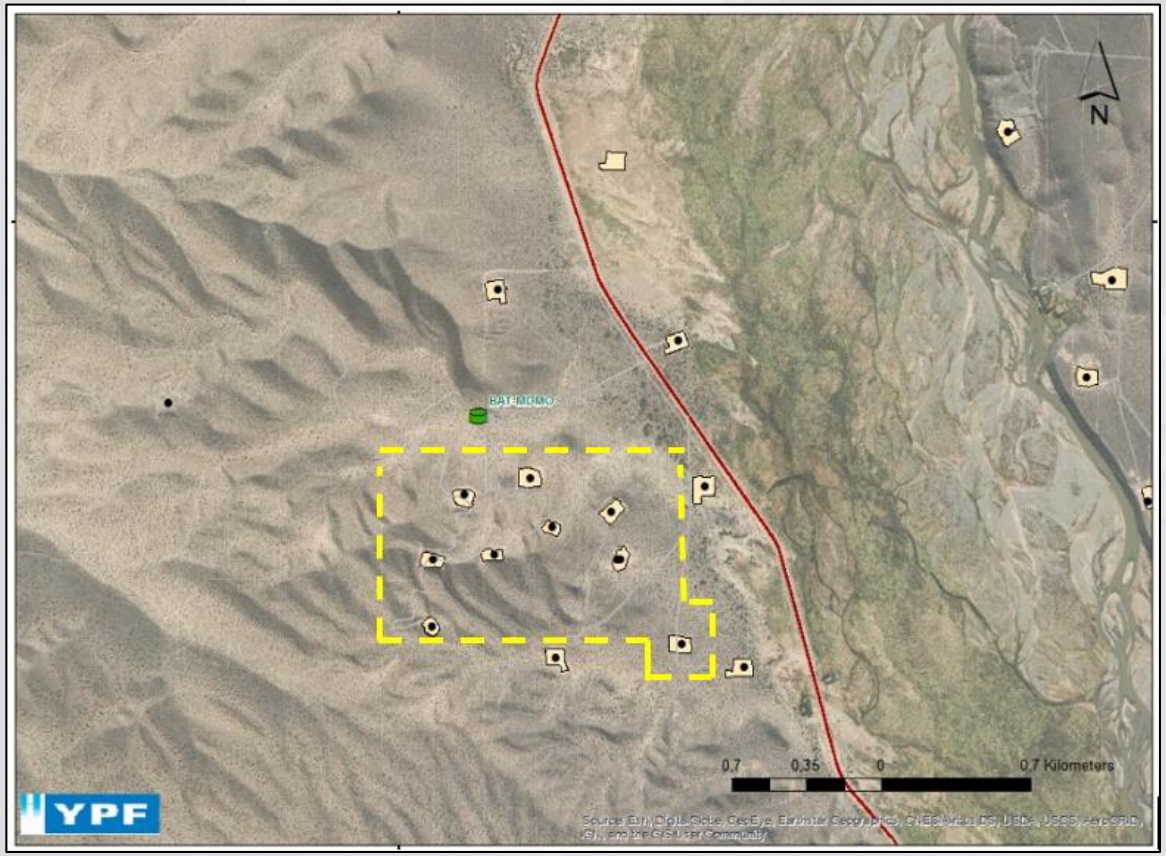
- *Elongated E-W structure*
- *Faults presents in Neuquén Group*

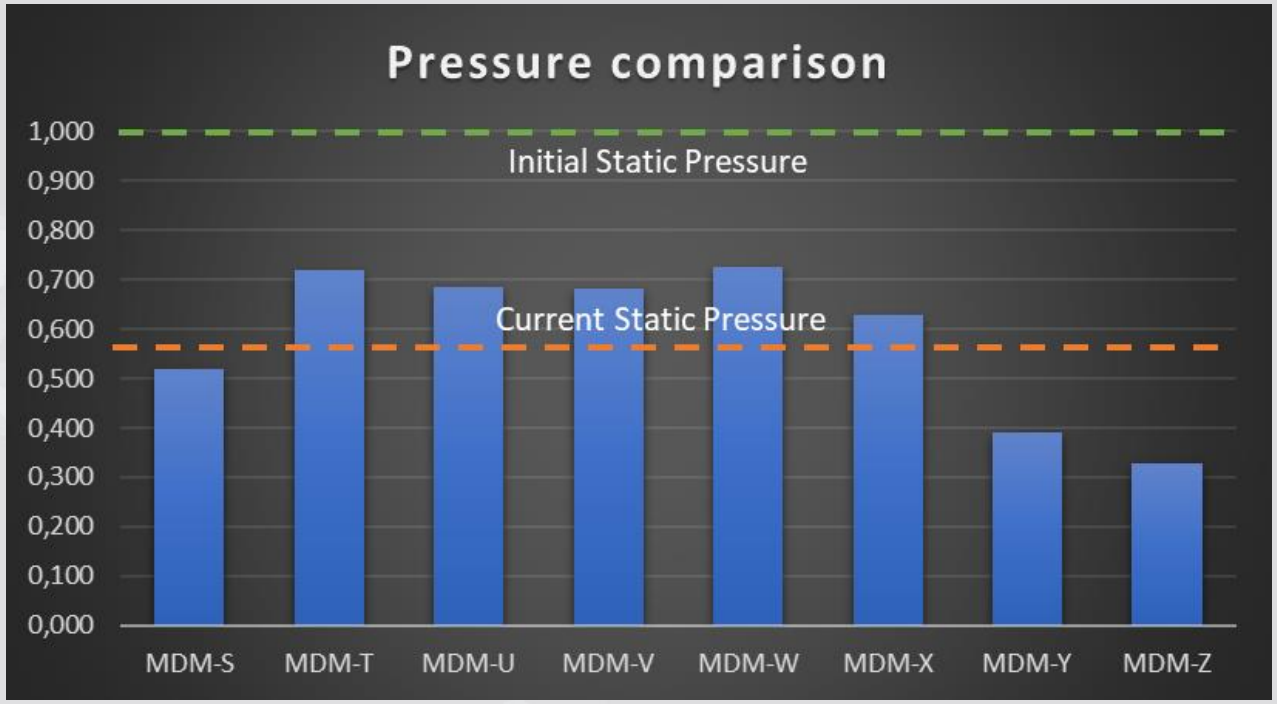




FIRST STEPS

Previous wells





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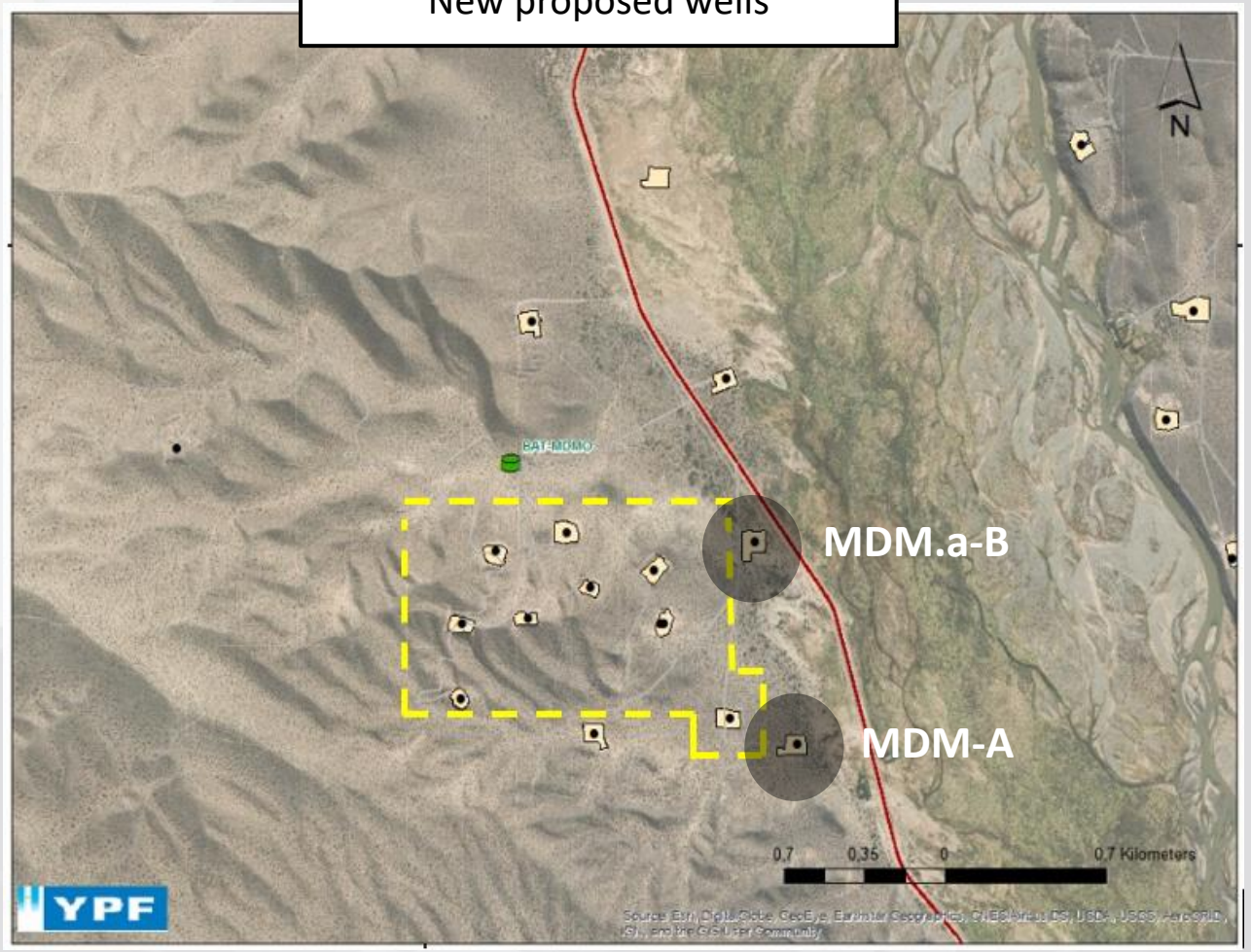
REALITY VS MODEL

New proposed wells



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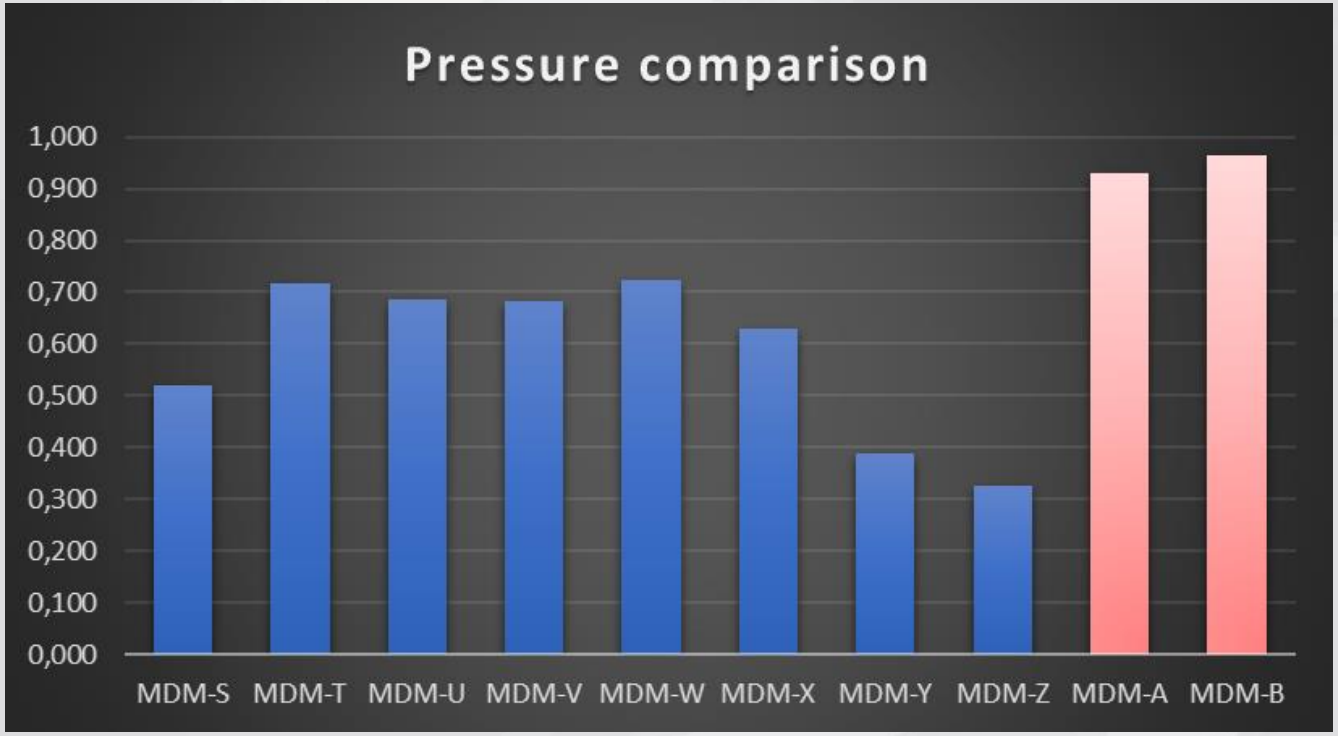
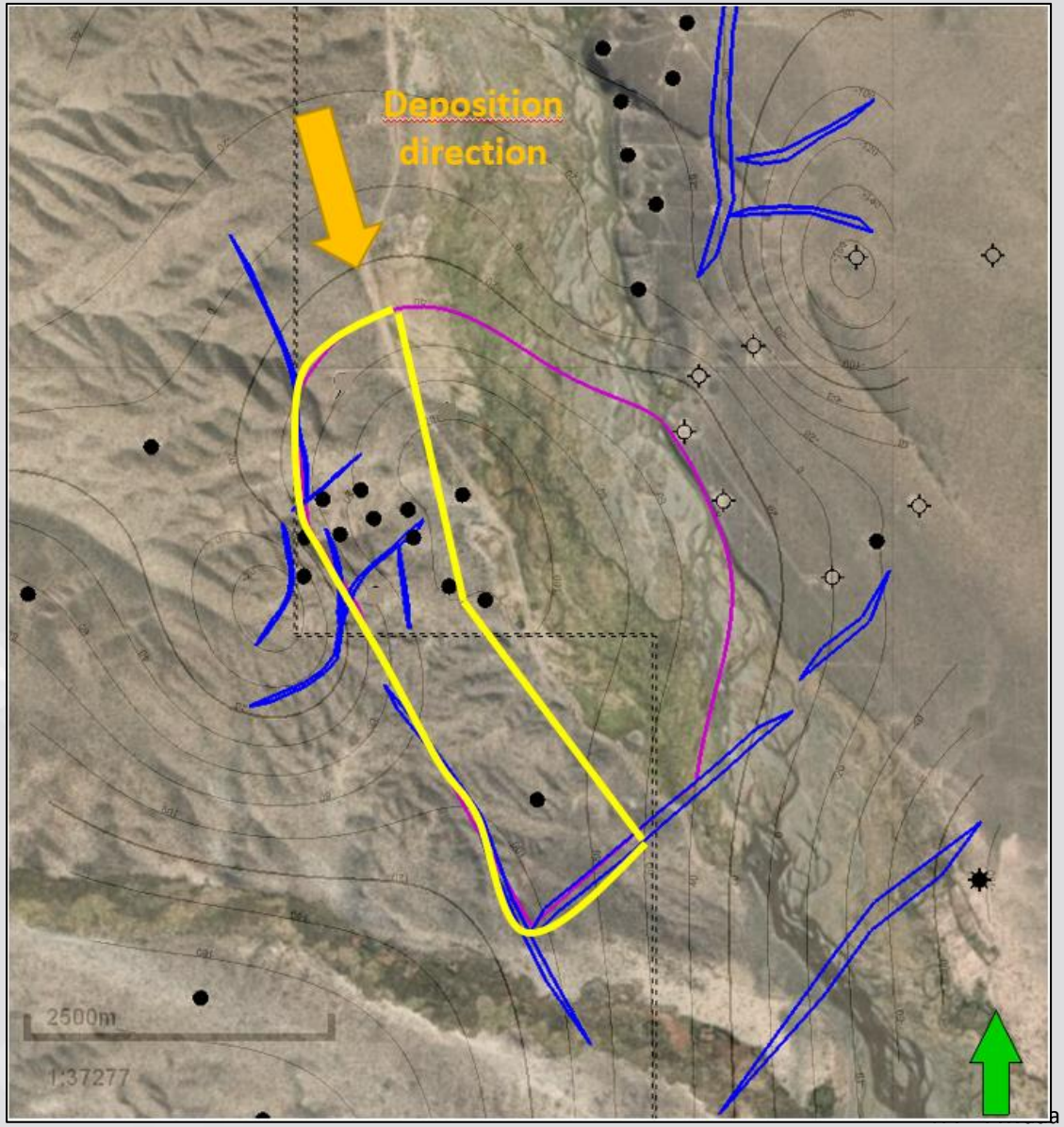
REALITY VS MODEL

New data

- *Higher new wells pressures than olders.*





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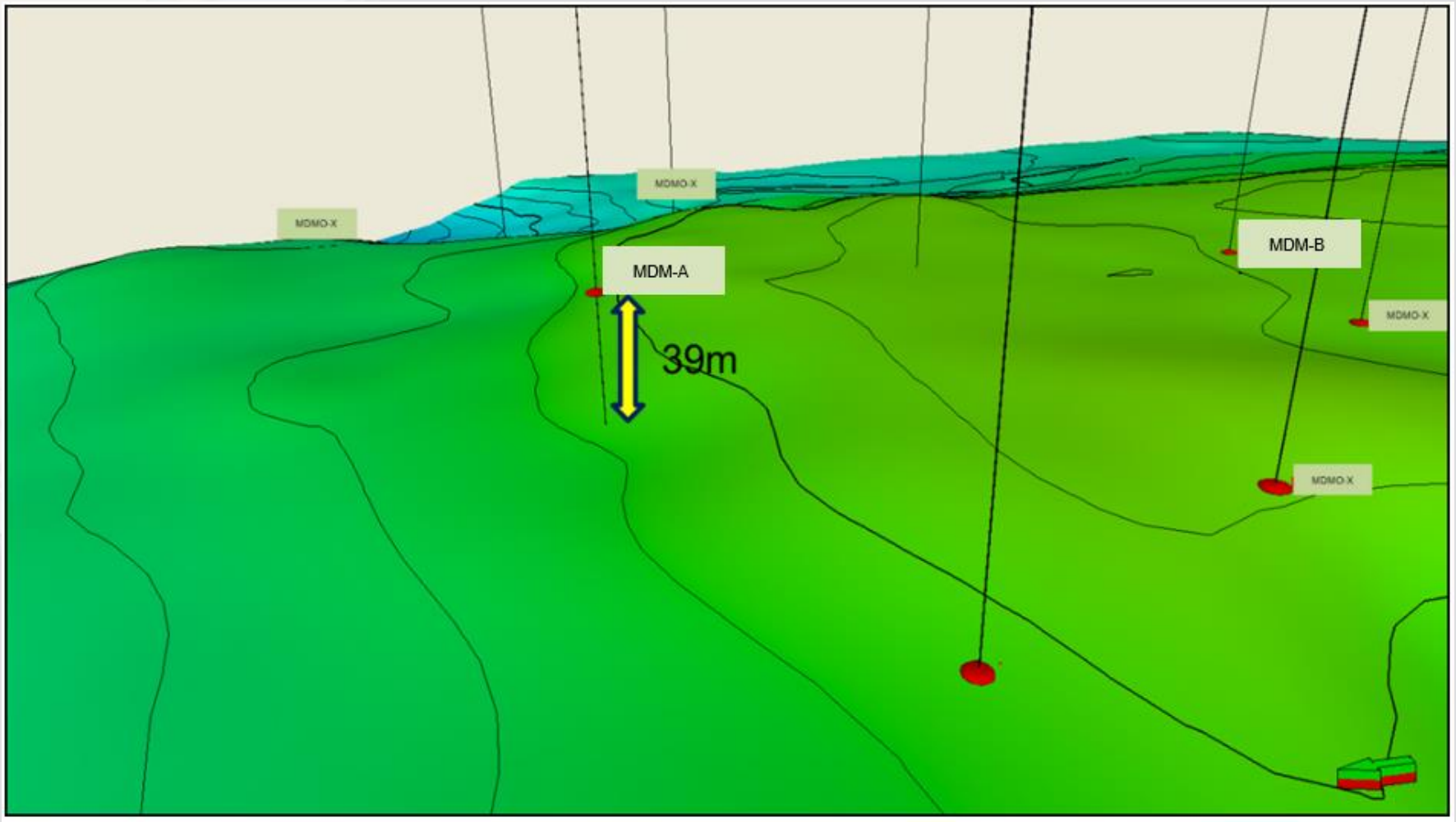
REALITY VS MODEL



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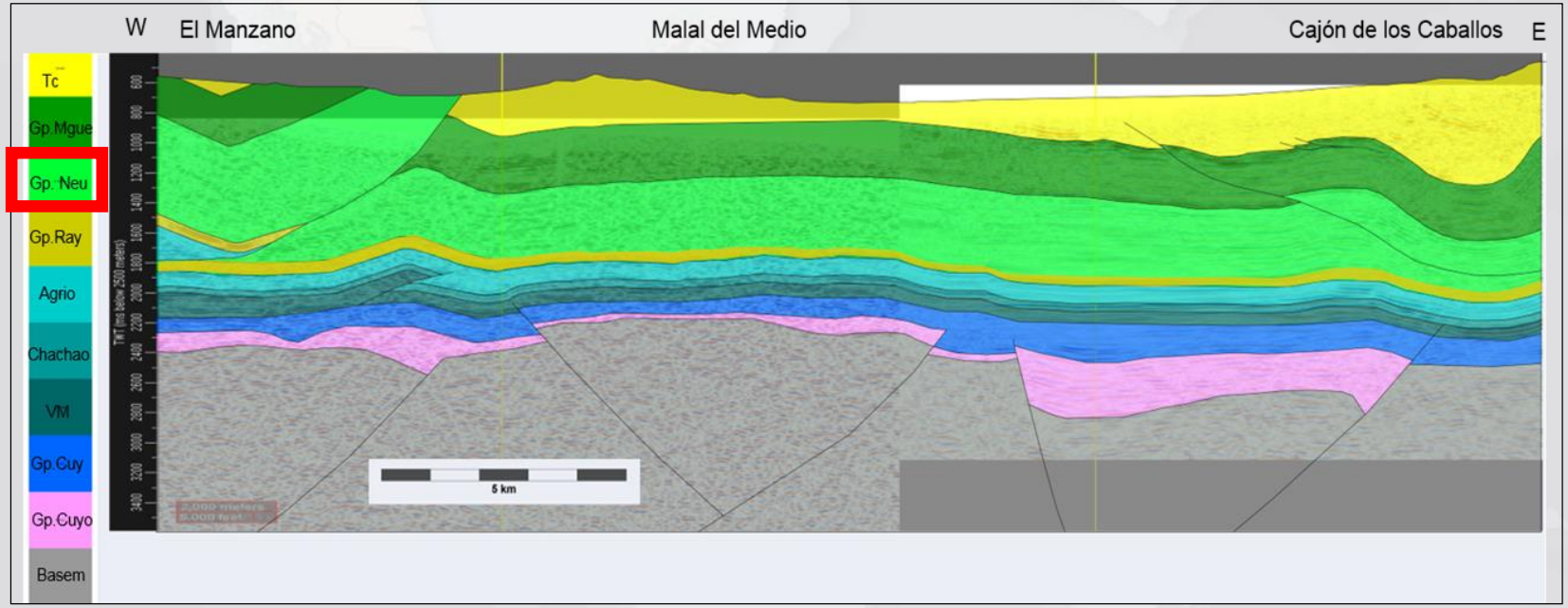
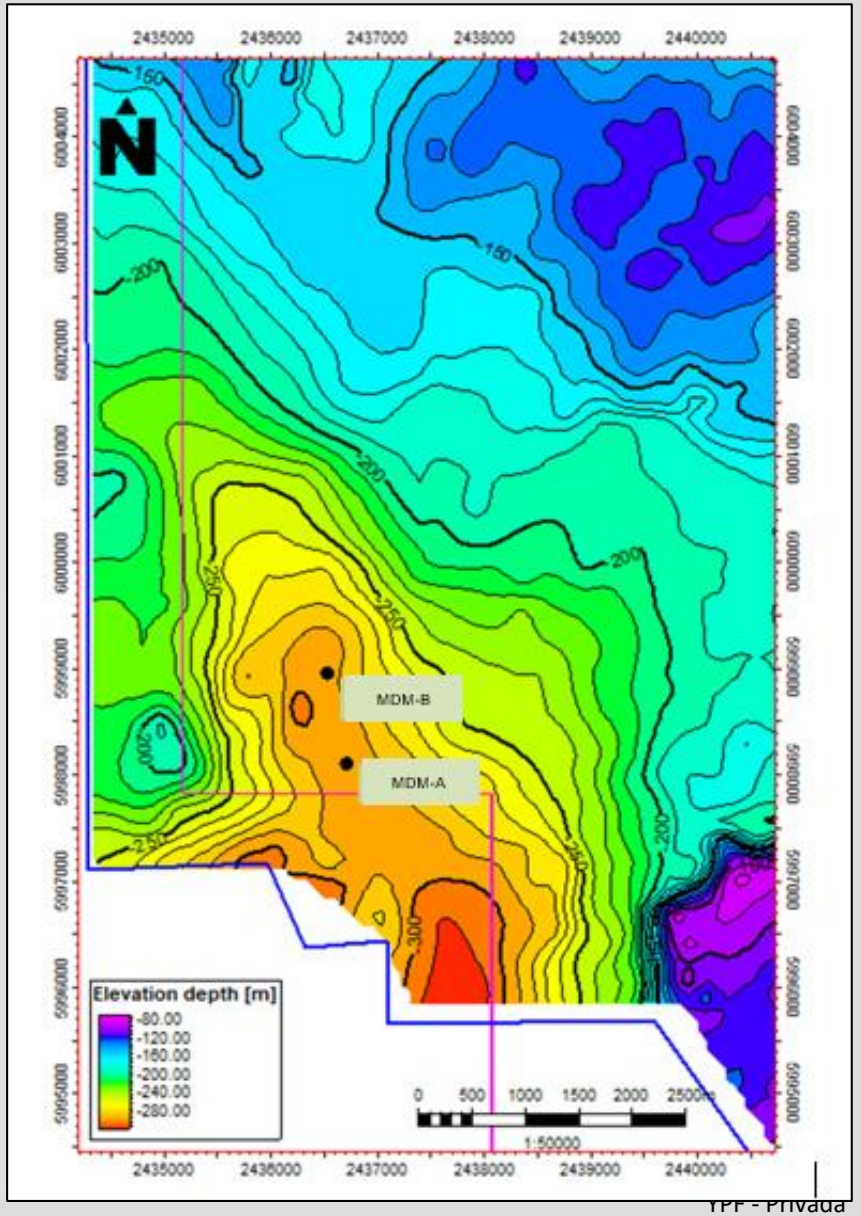
REALITY VS MODEL

Re processed seismic cube

- *Elongated NW-SE structure.*
- *Non Faults presents in Neuquén Group.*





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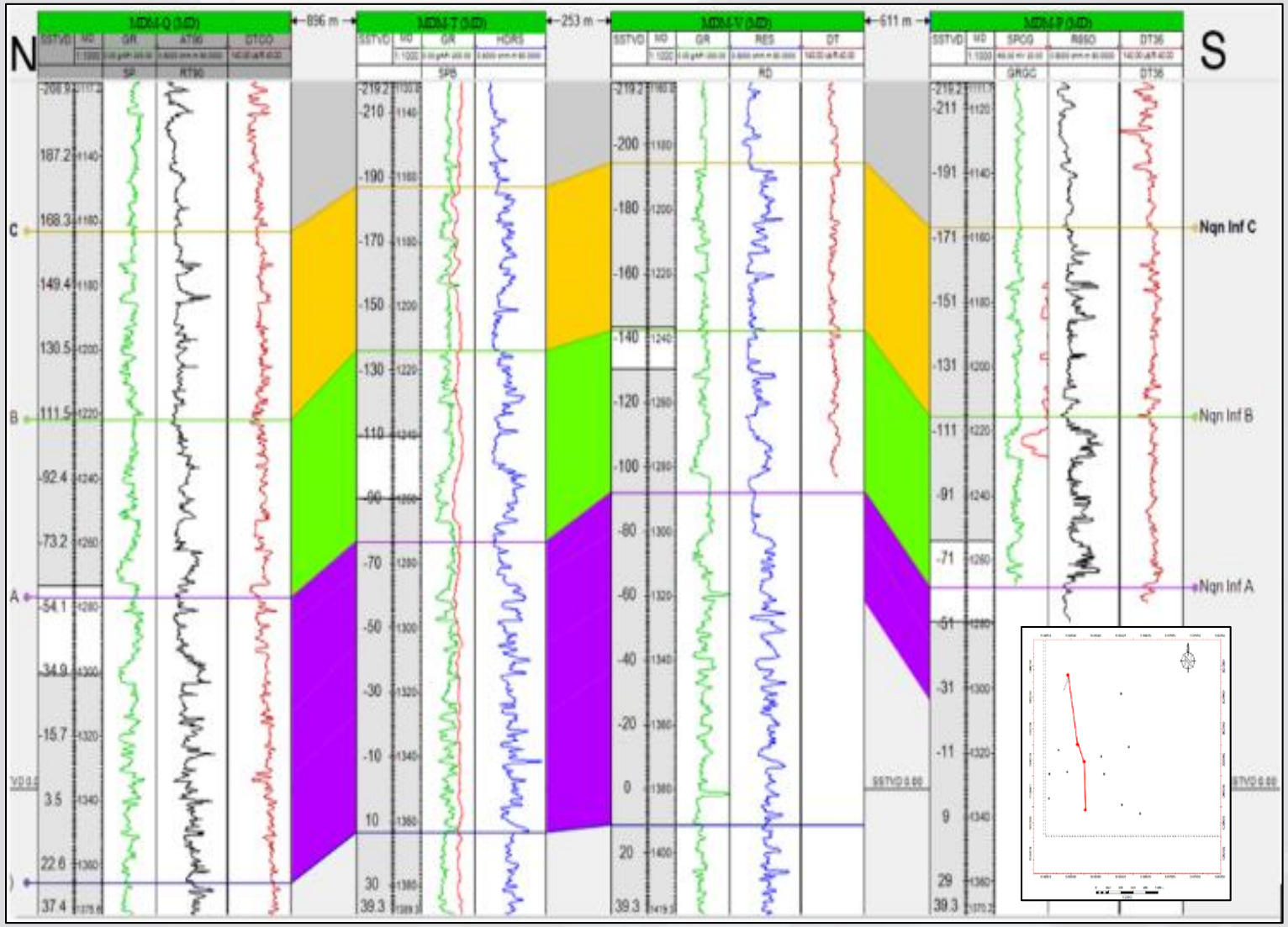
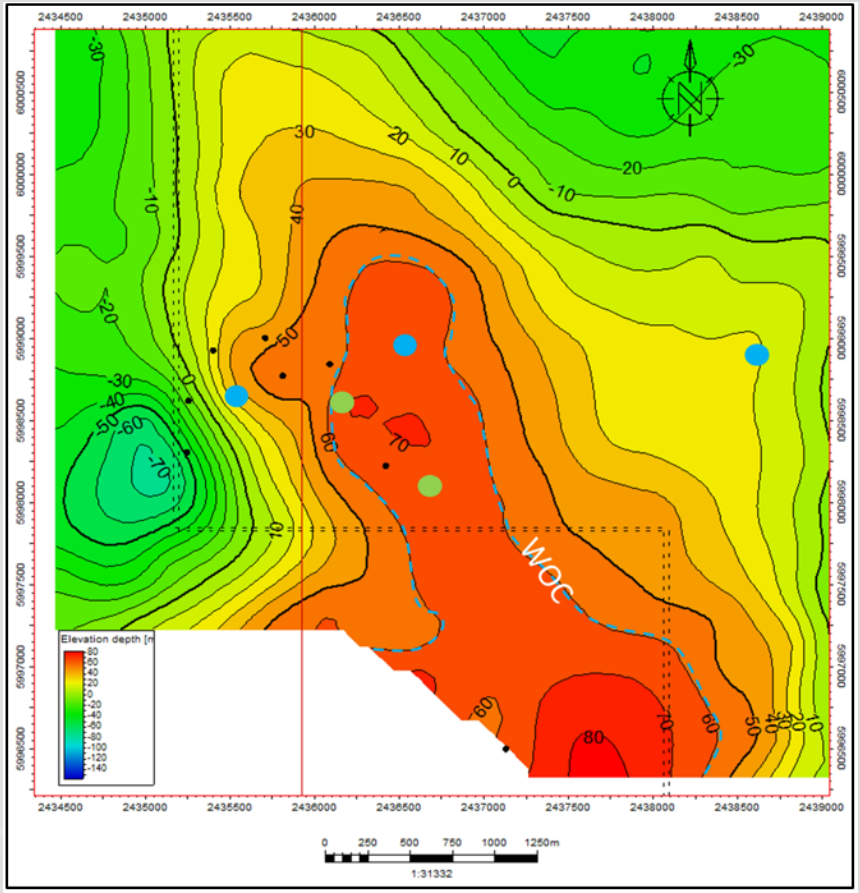
REALITY VS MODEL



New structural model -1

- *Upper water test tan WOC*



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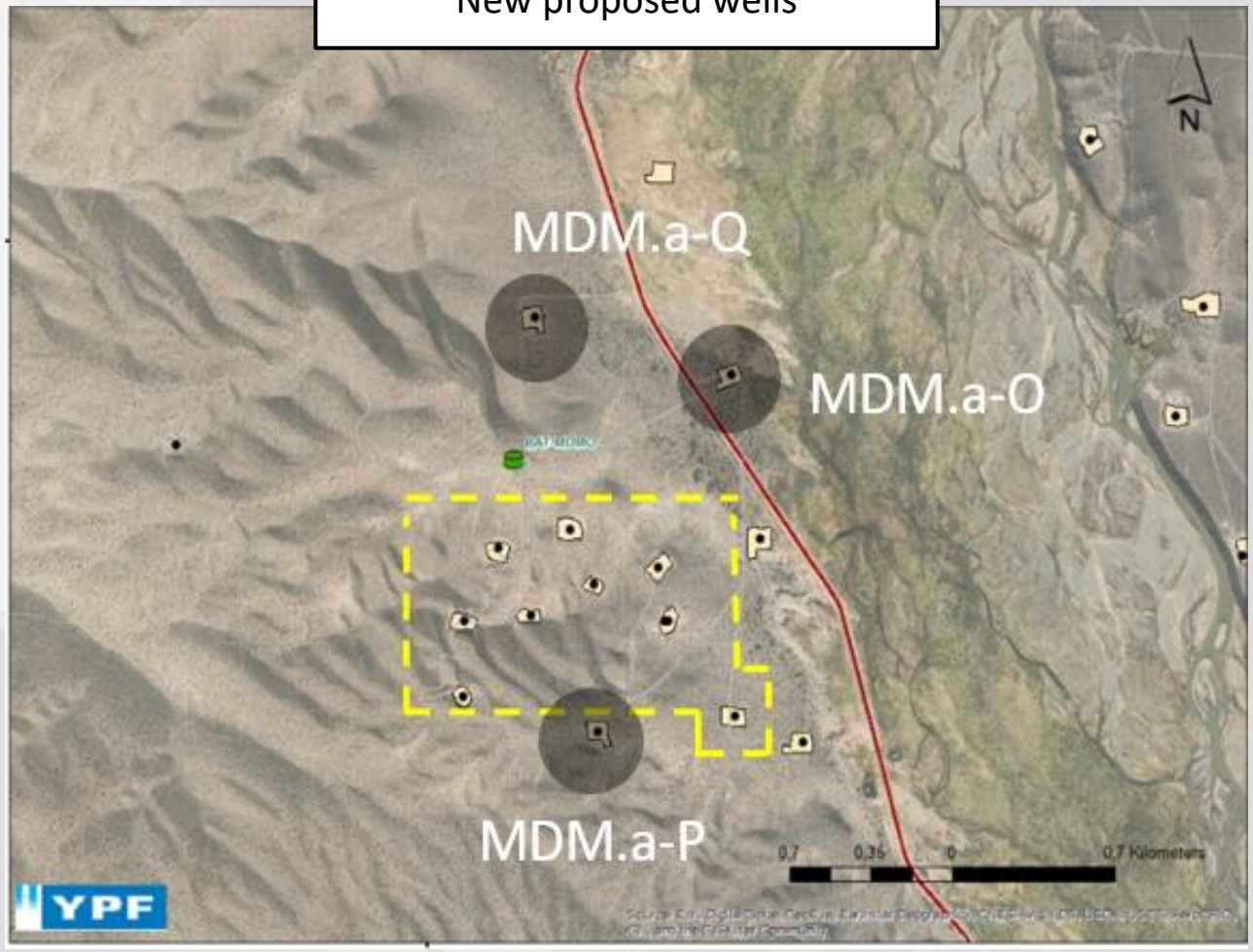
NEW HINTS OF CHANGES

New proposed wells



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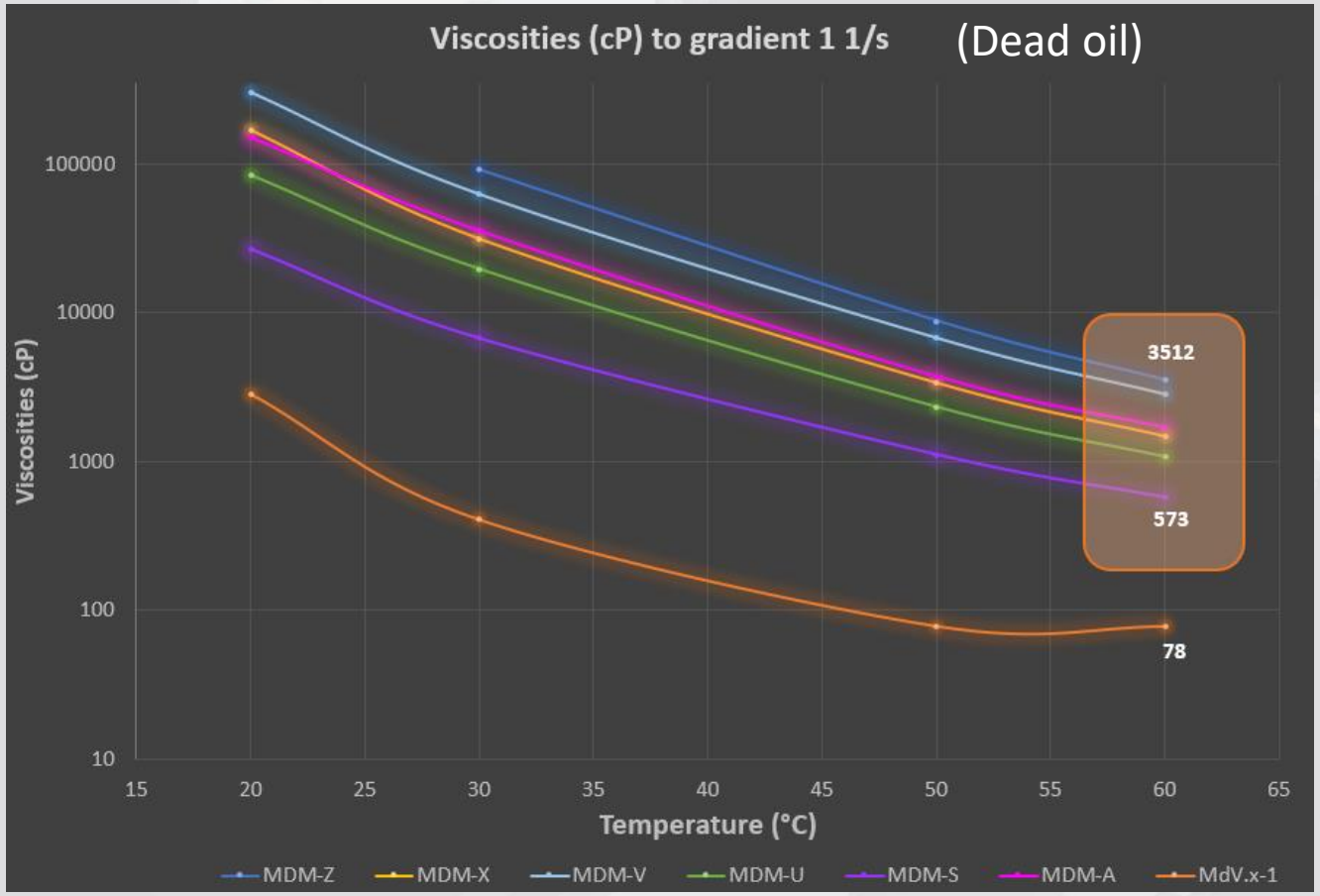
NEW HINTS OF CHANGES

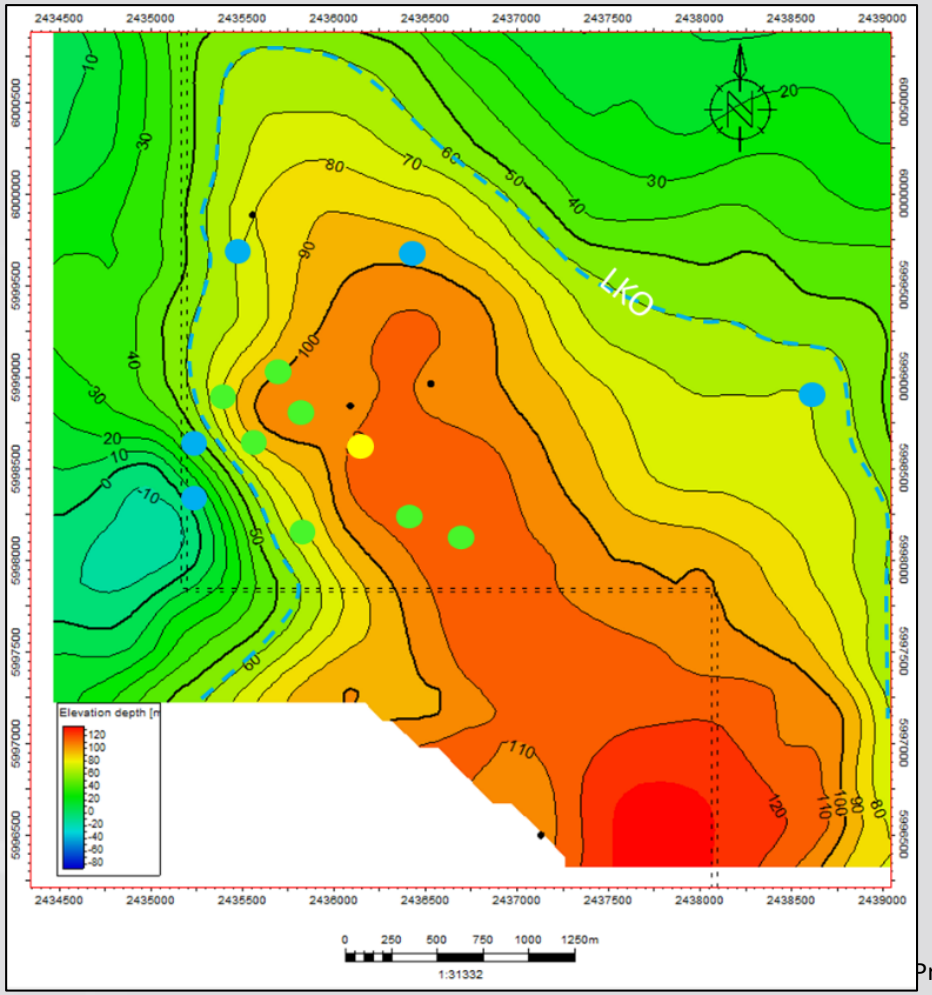
New wells information

- *High viscosities dispersion.*



New structural model -2

- *water test above WOC.*



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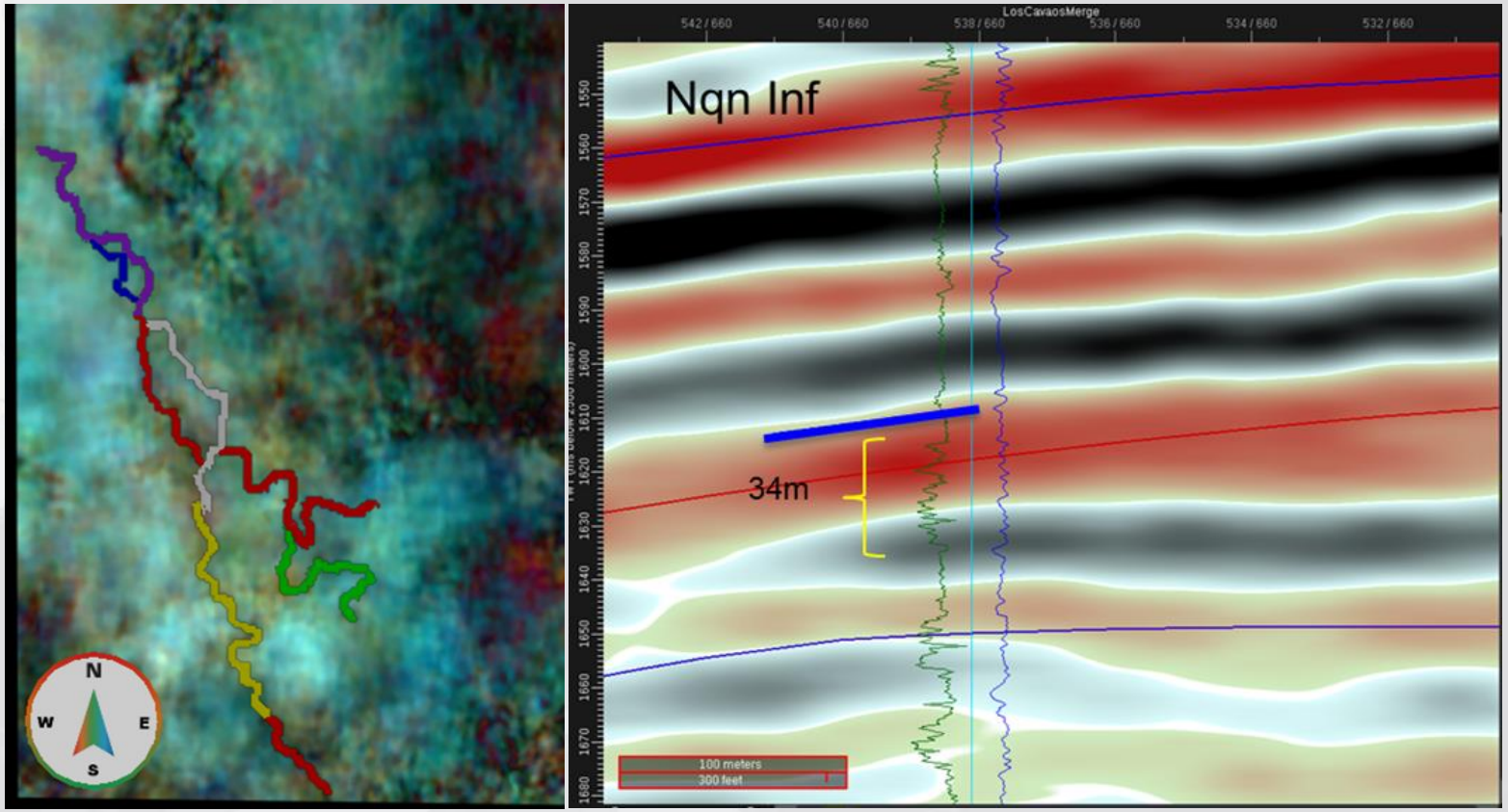
RESULTS INTEGRATION

RGB metodology: Blend Frecuency Decomposition

- *Canalized chanels: 70m width, 35m thickness.*
- *Chanels belts: 300m length.*



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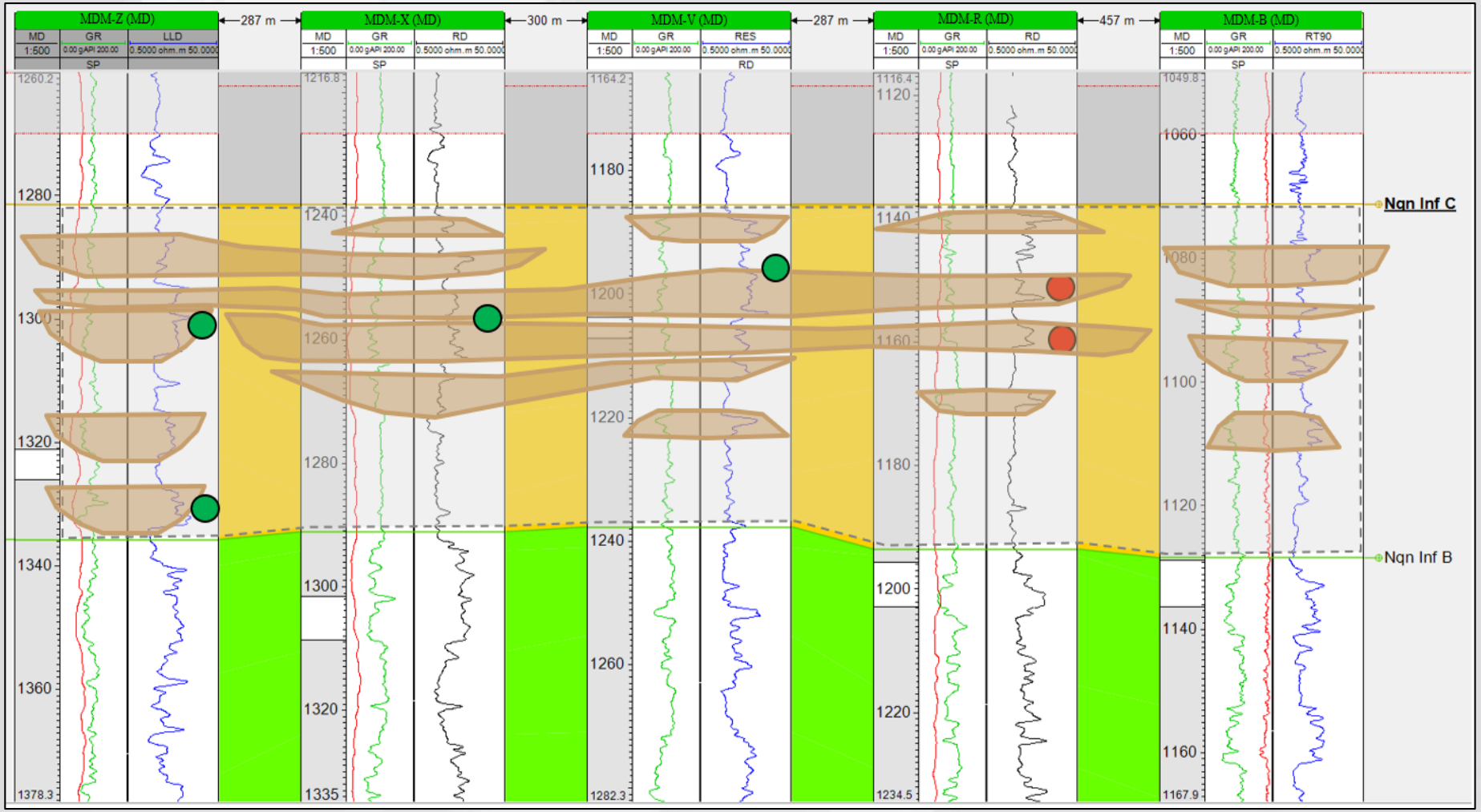
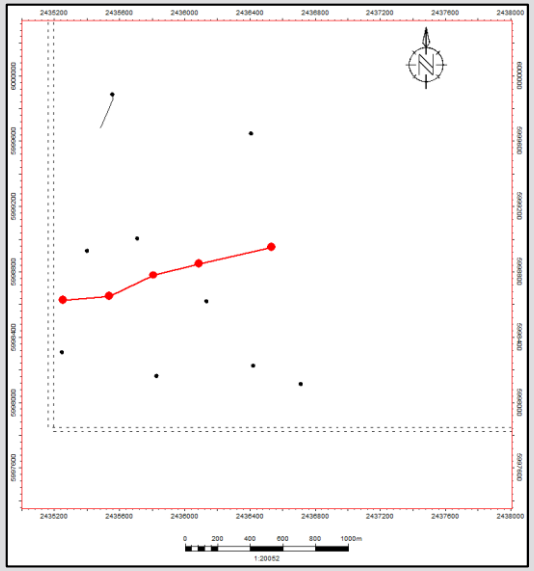
RESULTS INTEGRATION

Vertical reservoirs geometry





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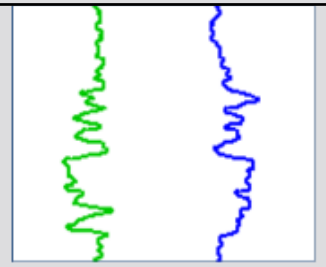
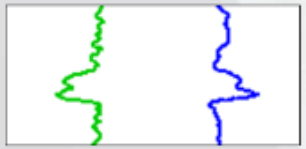
RESULTS INTEGRATION

Distal plain.
Ej: crevasse splay

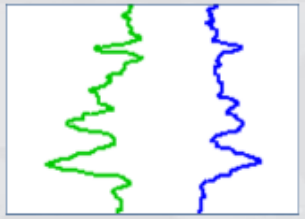
Channel fill + bar.
Ej: principal channel



Bar + proximal plain.
Ej: principal channel + levee

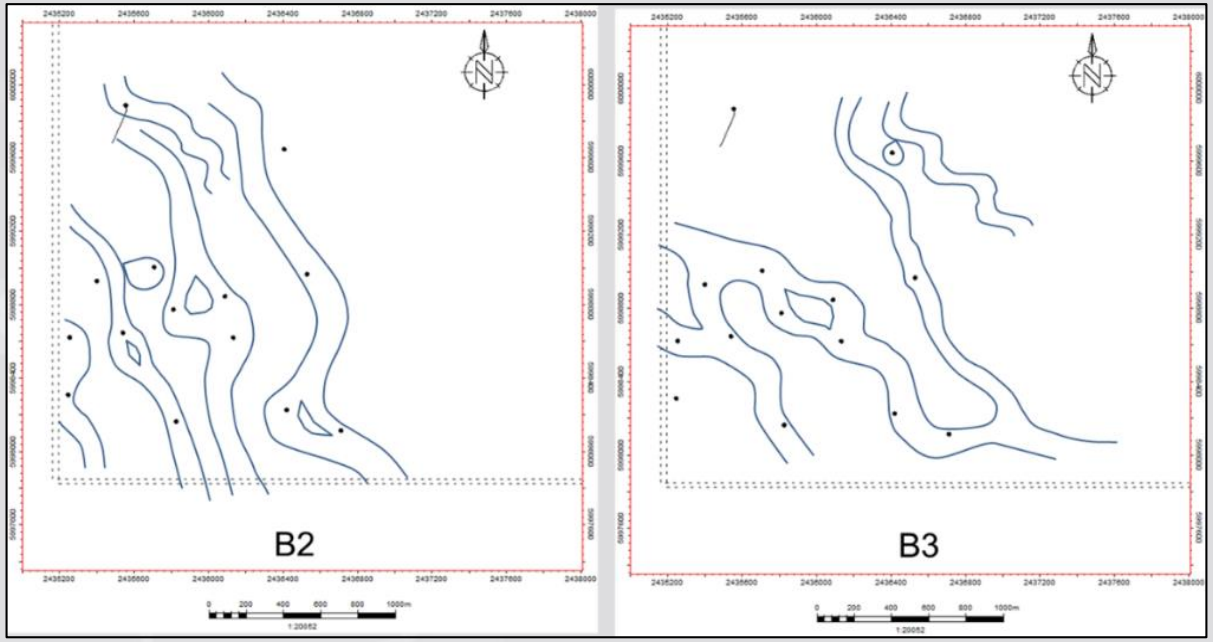


Proximal plain.
Ej: secondary channel



Proximal plain.
Ej: levee

Depositional System Interpretation



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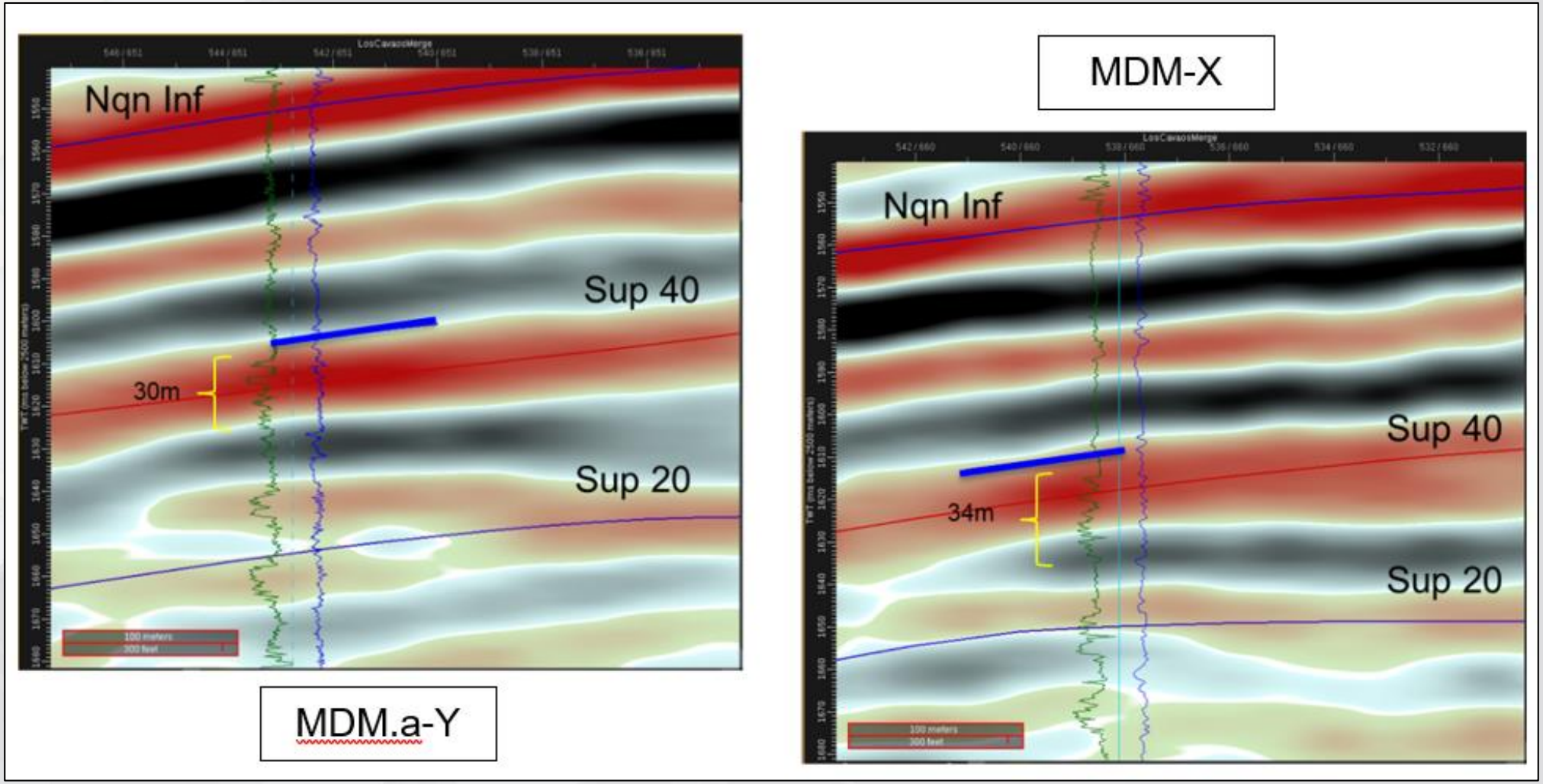
RESULTS INTEGRATION

Facies calibration with seismic response



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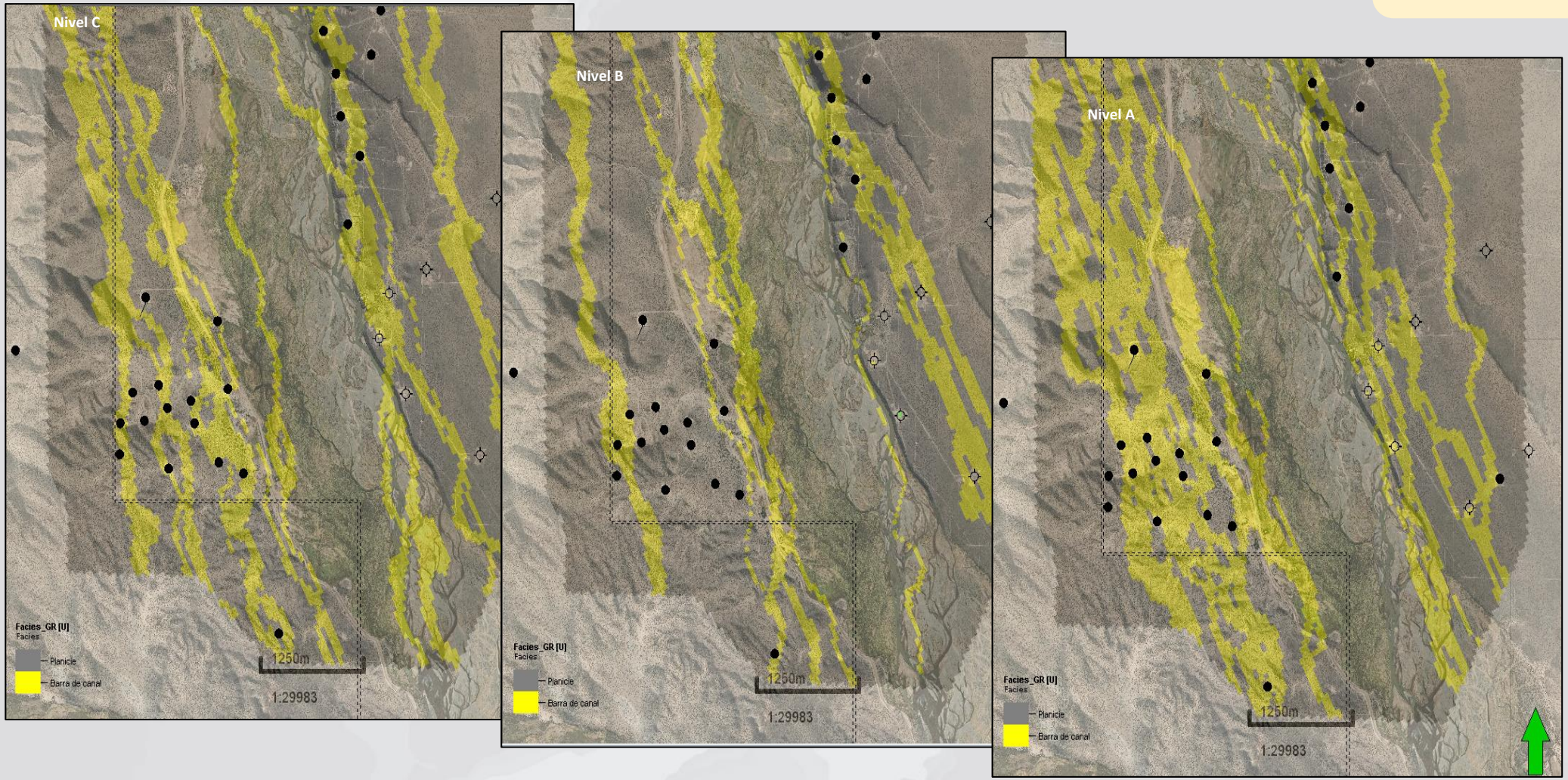
RESULTS INTEGRATION

Intrepreted fluvial system



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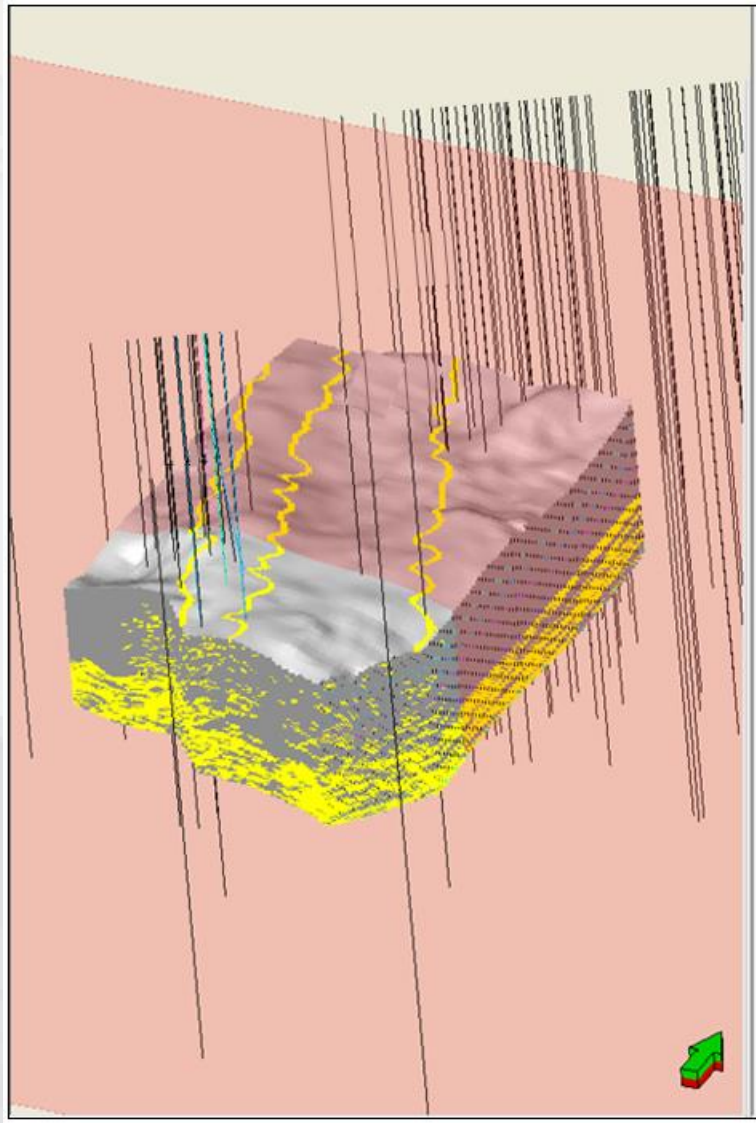
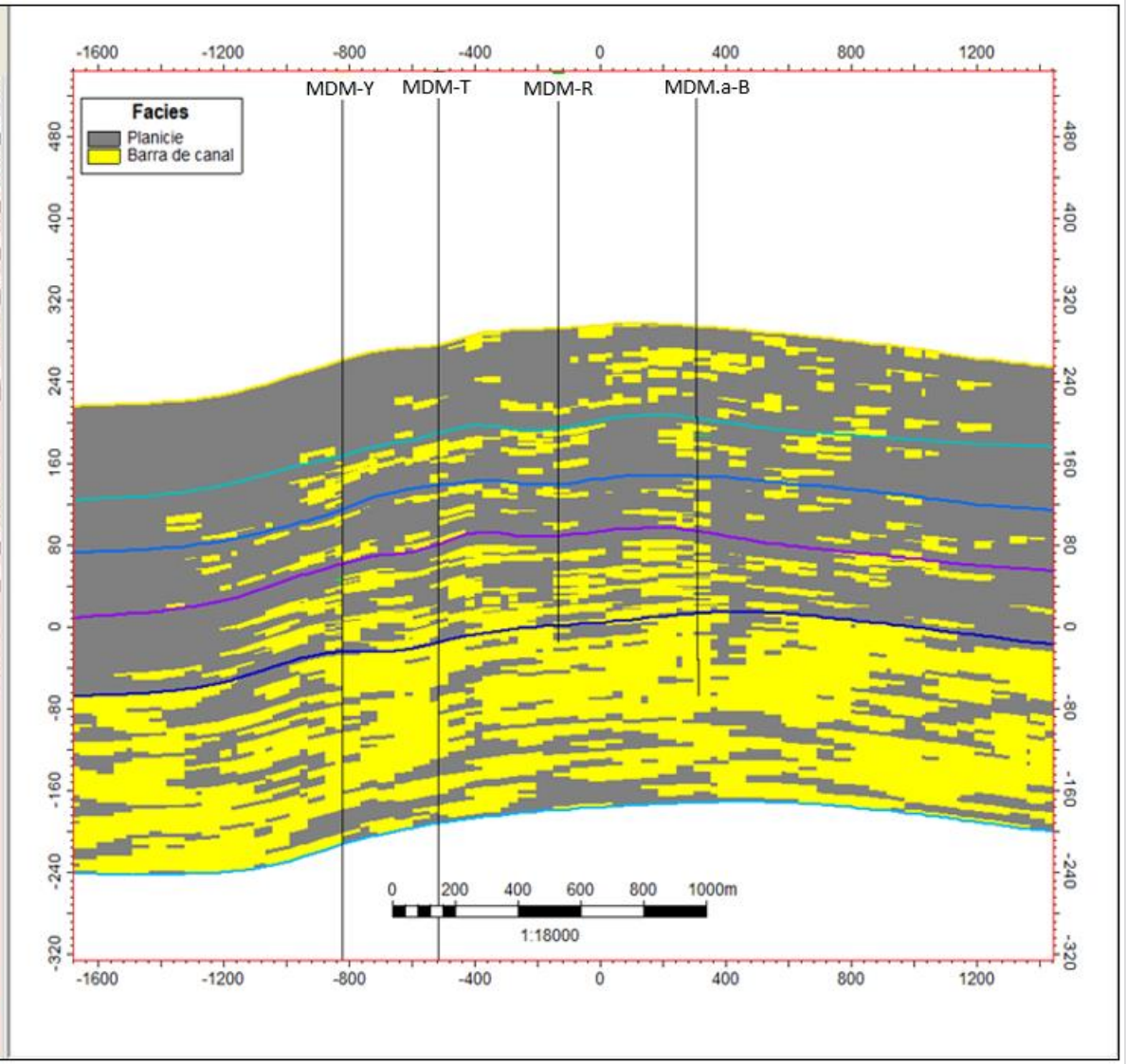
RESULTS INTEGRATION

3D Model Facies





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FINAL REMARKS

High areal variability: mismatch in previous models.

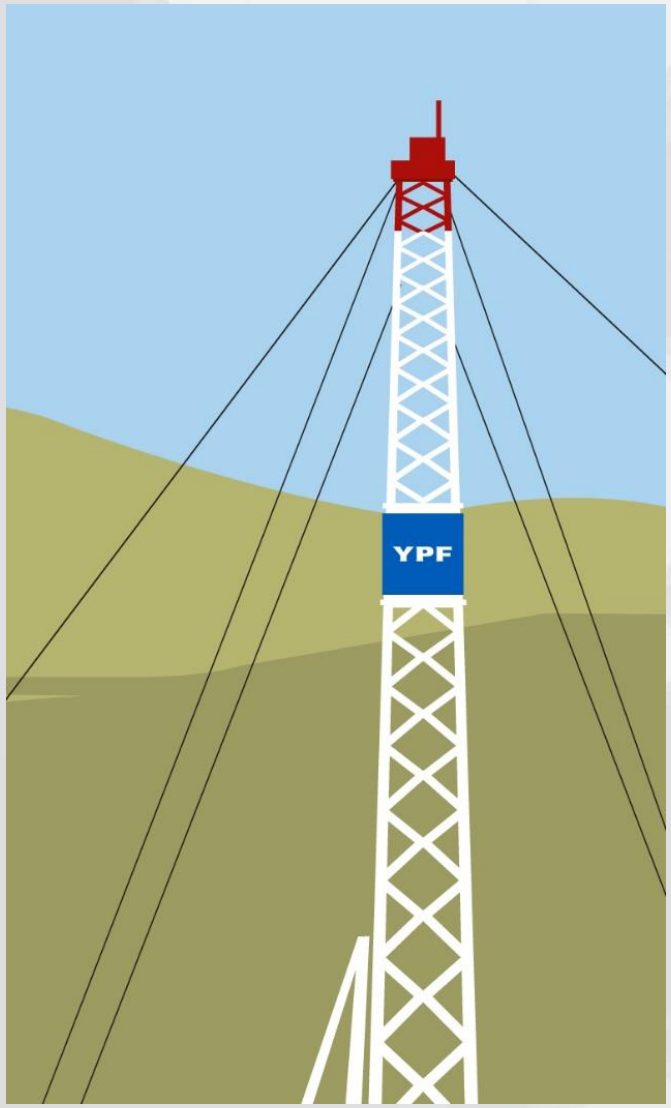
System characterization: need for feedback.

Representative model: obtained with information integration.

High complexity area: ***stratigraphic influence***

It force a ***slow and sequence development***

Study the results ***to reduce uncertainties and risks***



Thank you for your attention.

Muchas gracias por su atención.