Sfax Offshore Exploration Permit

October, 2007

GCA Technical Review

Final

GCA's Scope of Work

- **Resources associated with discovered fields**
  - This does not include REB
  - This does include Jawahara discovery and associated structures
- **Review of prospects mapped by APEX**
- **Definition of monetary value of Sfax discoveries and prospects with the exception of REB**

Evaluation Status
APEx's Offshore Sfax Concession

- **GCA has reviewed APEx's log analysis**
  - Random selection of wells was used to review APEx's methodology and limits
  - GCA found APEx's analysis to be reasonable and GCA's petrophysical values are in close agreement with APEx
- **GCA has reviewed all available seismic volumes**
  - The Jawahara 3D volume is difficult to interpret at Douleb/Bireno time and open to multiple interpretations
    - GCA recommended that APEx investigate possibility of reprocessing these data with an emphasis on the structural and stratigraphic elements at the key reservoir levels Consideration should be given to reprocessing these data in concert with the newly acquired 3D volume to create a single data set
- **GCA has reviewed APEx's seismic interpretation and mapping**
  - Due to the quality of the 3D volume multiple interpretations of the Jawahara area are possible
  - Inconsistencies in the Jawahara depth map need to be reviewed
- **GCA has defined various features in the Sfax block as contingent resources, prospects, and leads in accordance to industry definitions**
  - Jawahara -1 ST has been defined as a Contingent Resource (CR)
  - Remaining Jawahara prospects remain as such
  - Other prospects have been defined as leads
  - **Due to a lack of sufficient data to define structural volumes for the Salloum-1 discovery no resource volumes or classification has been assigned to that feature in this report**
- **GCA has completed a NPV valuation for the Jawahara -1 area**

Petroleum Resources Management System Definitions

- **Lead:** A project associated with a potential accumulation that is currently poorly defined and requires more data acquisition and/or evaluation in order to be classified as a prospect.

- **Prospect:** A project associated with a potential accumulation that is sufficiently well defined to represent a viable drilling target. A project maturity sub-class that reflects the actions required to move a project toward commercial production.

- **Contingent Resources:** Those qualities of petroleum estimated, as of a given date, to be potentially recoverable from known accumulations by application of development projects.

Strategic Technical GCA GAFFNEY, CLINE & ASSOCIATES Commercial The Business of Energy

Sfax Offshore Exploration Permit

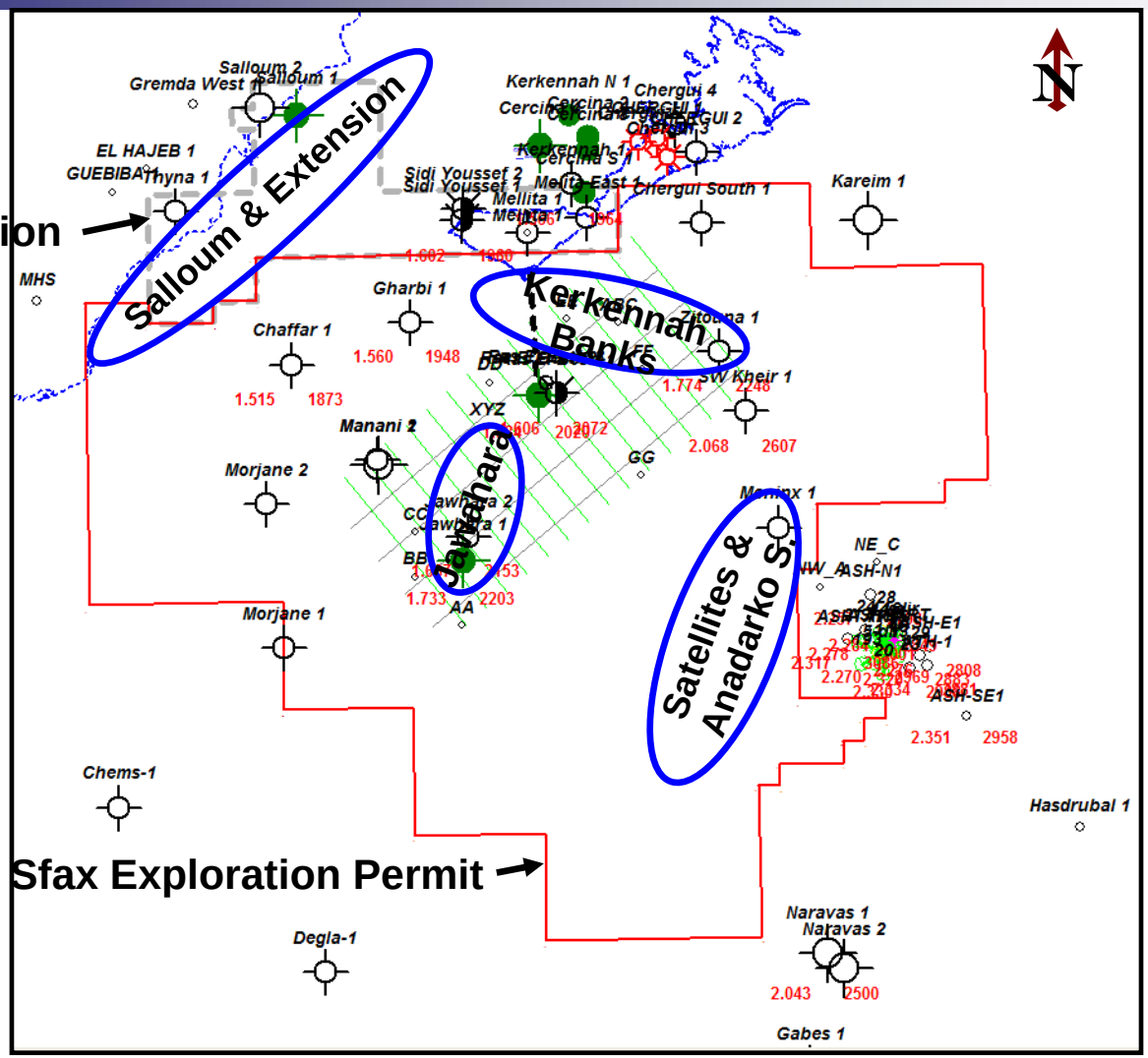
Geophysical Review

General comments

- **Although APEx performed probabilistic calculations of resource volumes, they did not assess any risk to various aspects of the prospects they identified such as trap integrity, source validity, or seal effectiveness.**
- **3D seismic in the Jawahara Area and at Douleb/ Bireno reservoir times is fair but, not of good quality. Mapping is relatively difficult and open to more than a single interpretation.**

Sfax Offshore Permit Outline

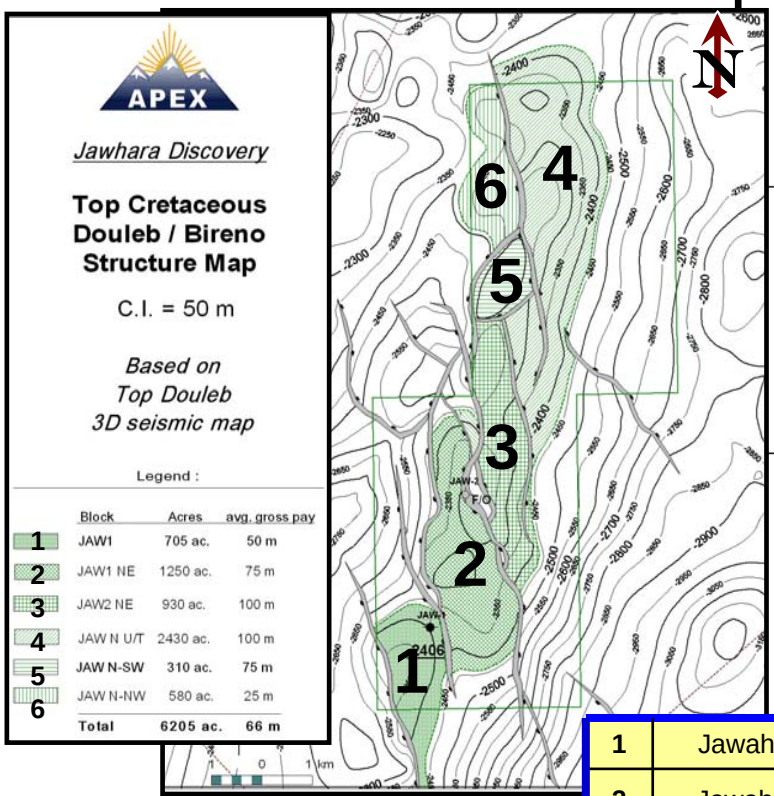
Added Extension →

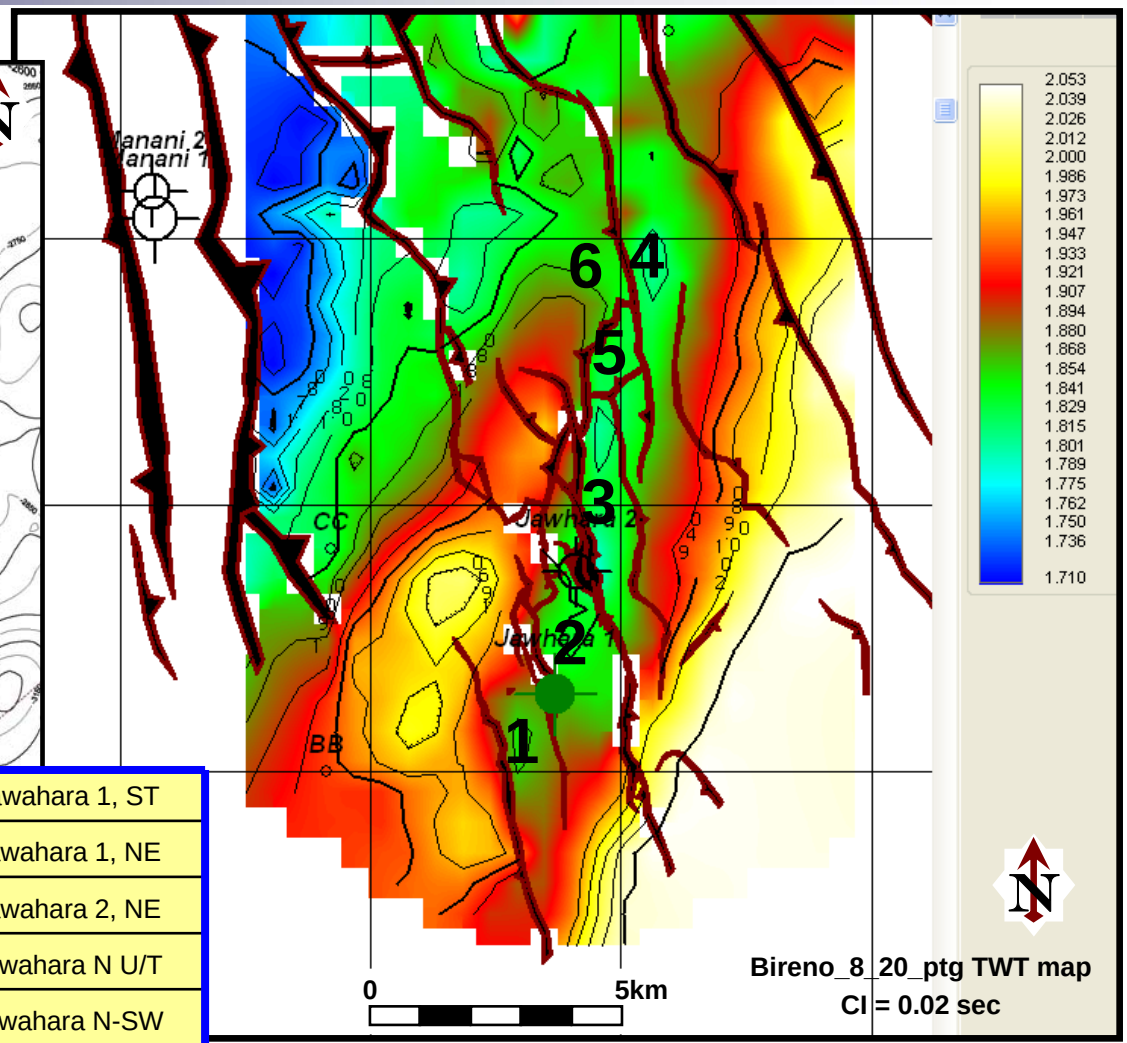


Jawahara Area

Prospect	#	Reservoir	APEX Area (acres)
Jawahara 1, ST	**1**	**Douleb/Bireno**	**702**
Jawahara 1, NE	**2**	**Douleb/Bireno**	**1229**
Jawahara 2, NE	**3**	**Douleb/Bireno**	**910**
Jawahara N U/T	**4**	**Douleb/Bireno**	**2397**
Jawahara N-SW	**5**	**Douleb/Bireno**	**312**
Jawahara N-NW	**6**	**Douleb/Bireno**	**585**

Jawahara Prospects on the Douleb/Bireno TVDSS and TWT Structure Maps





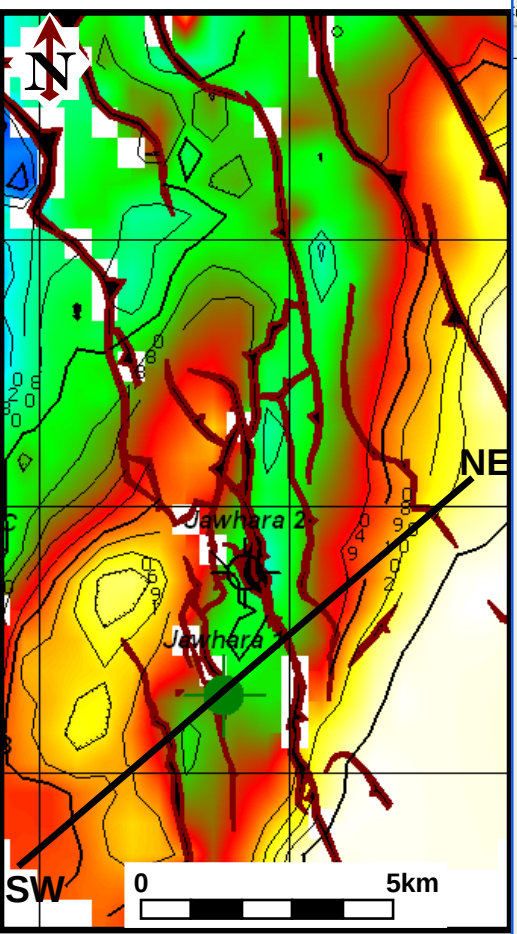
1	Jawahara 1, ST
2	Jawahara 1, NE
3	Jawahara 2, NE
4	Jawahara N U/T
5	Jawahara N-SW
6	Jawahara N-NW

General Notes on Jawahara

- Jawahara -1 found hydrocarbons
- Jawahara -2 did not find D/B reservoir. GCA agrees that it is possible that this section was faulted out of this well
- Seismic data quality is fair which decreases confidence in the resultant maps
- Structuring over the southern-most high, Jawahara -1 area, is relatively clear. Bireno map appears reasonable in this region
- Seismic in the area of the Jawahara -2 well shows indications of faulting at the well. Log data support this interpretation
- Seismic reflectors to the north of the Jawahara -1 well are structurally higher so the possibility of a trap extending in this area is good
- There is concern for the trap integrity to the north of the Jawahara -2 well as the seismic does not support a north dipping section as mapped. The possibility of a stratigraphic pinch-out cannot be ruled out

Jawahara all – Atlas 3D Data quality

- Fair quality of the 3D seismic data does not allow precise seismic mapping
- Key horizons El Garia and Douleb/Binero are not pronounced in the data set
- Uncertainties in trap definition results in higher risk



Bireno_8_20_ptg TWT map

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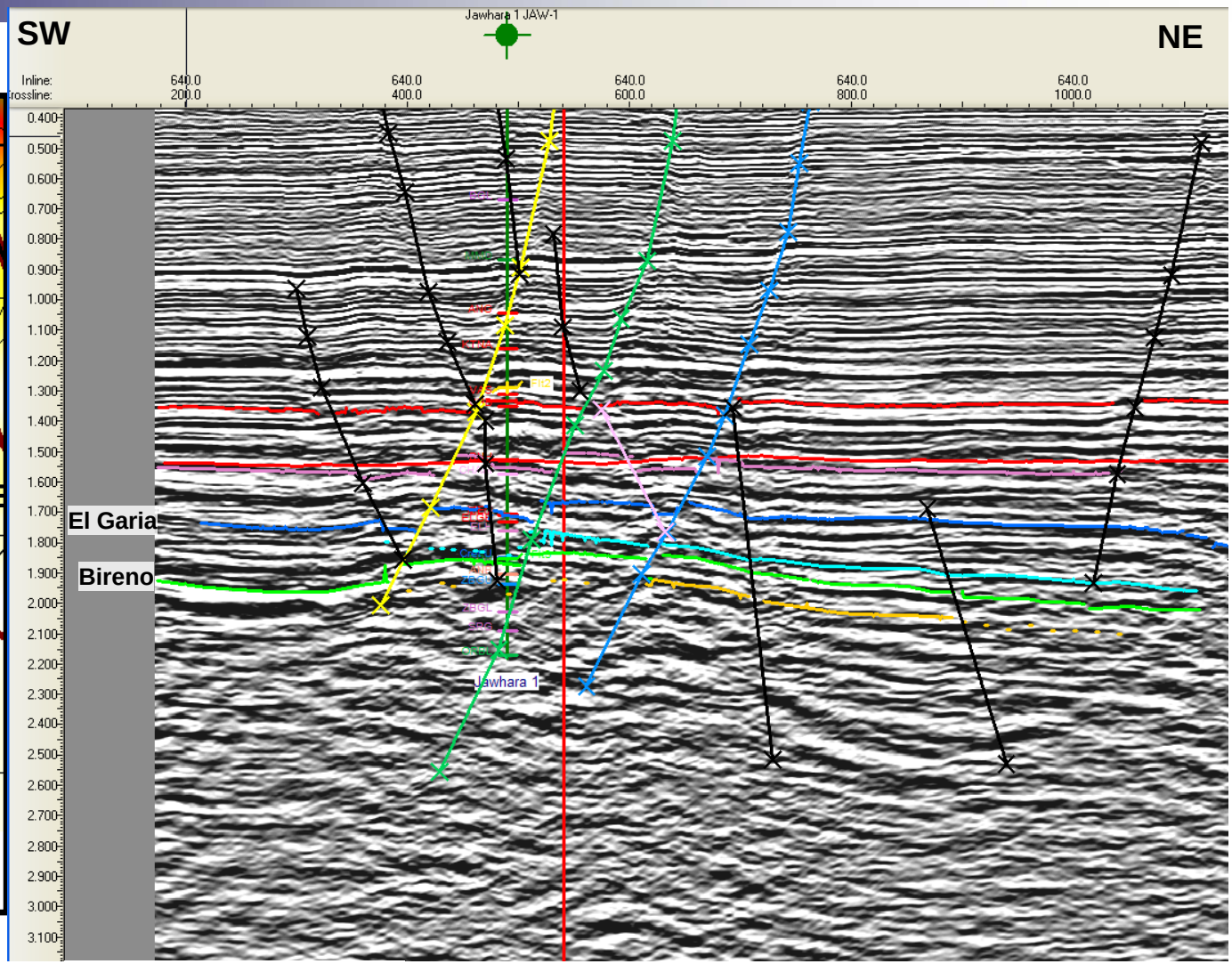
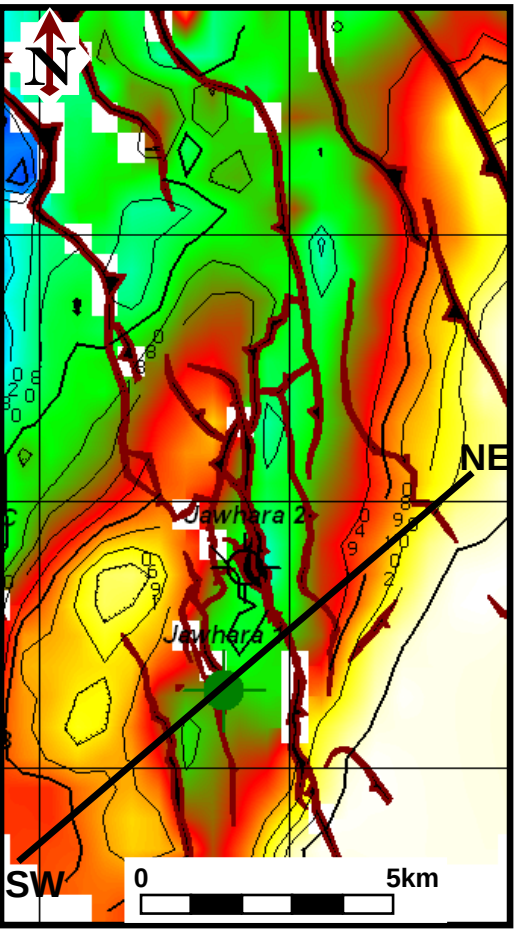


Atlas 3D, In-line 640, Migrated Time

Jawahara all – Atlas 3D un-interpreted

- Lateral ties across faults are ambiguous due to noisy data
- Apparent migration smiles in the deeper section
- Detailed subsurface imaging is not achieved and mapping is difficult



Bireno_8_20_ptg TWT map

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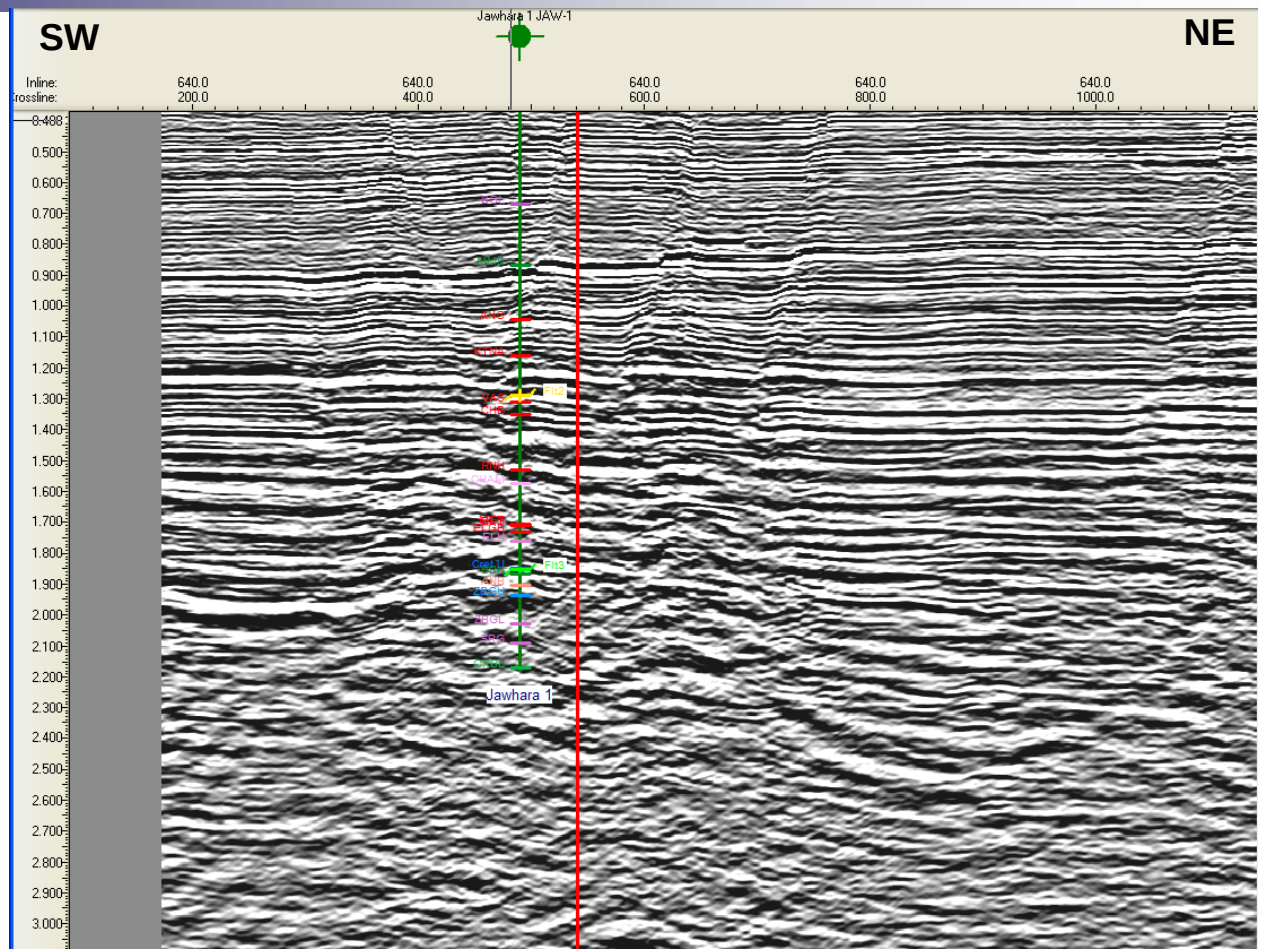
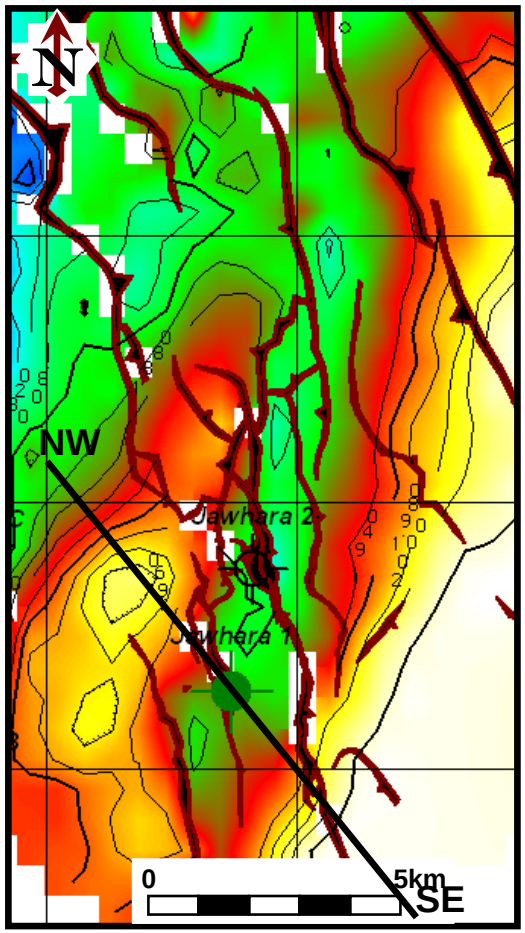


1. Jawahara 1, ST

•The presence of the gross rollover structure is clear but the lack of internal seismic clarity does not allow the precise interpretation of the structuring



Bireno_8_20_ptg TWT map

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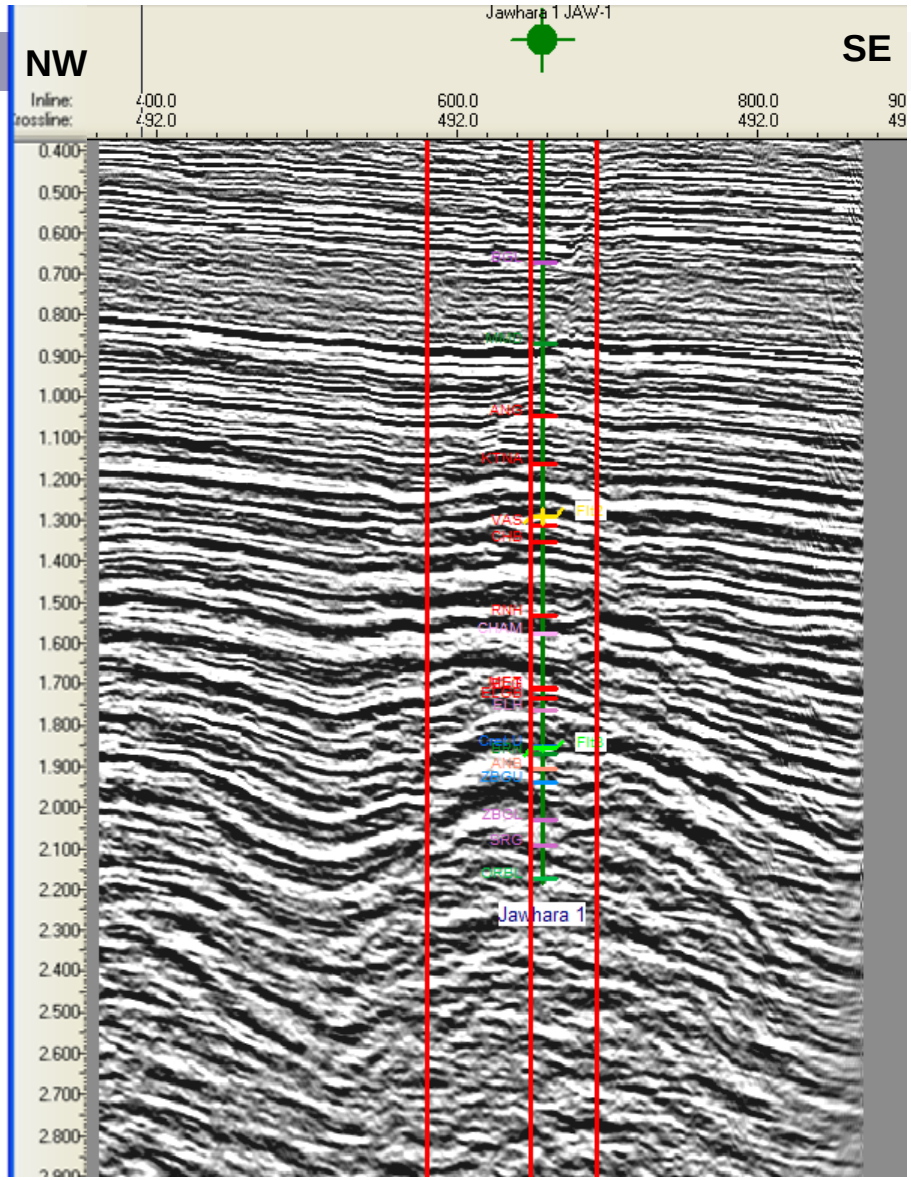
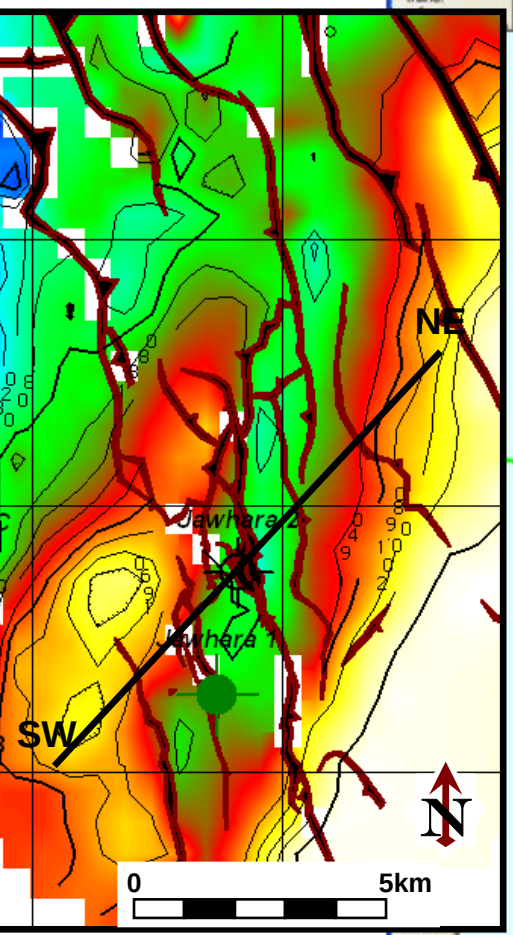
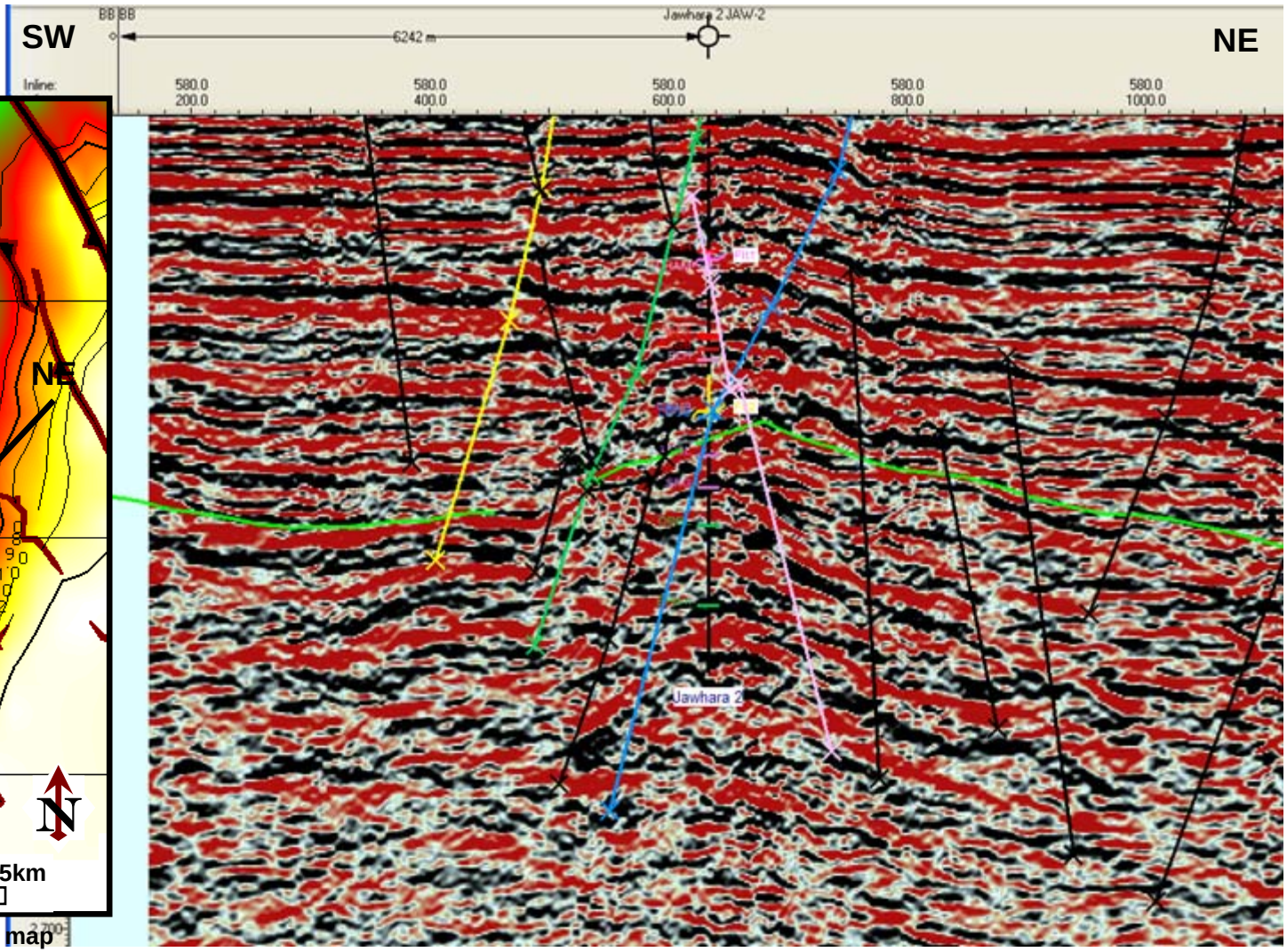


2. Jawahara 1, NE

- Seismic in the area of the Jawahara -2 well does show indications of faulting at the well
- Log correlation of the Jawahara 1 and 2 wells indicates a 300m missing section in Jawahara 2
- Dip to the SW and NE are clear





Bireno_8_20_ptg TWT map

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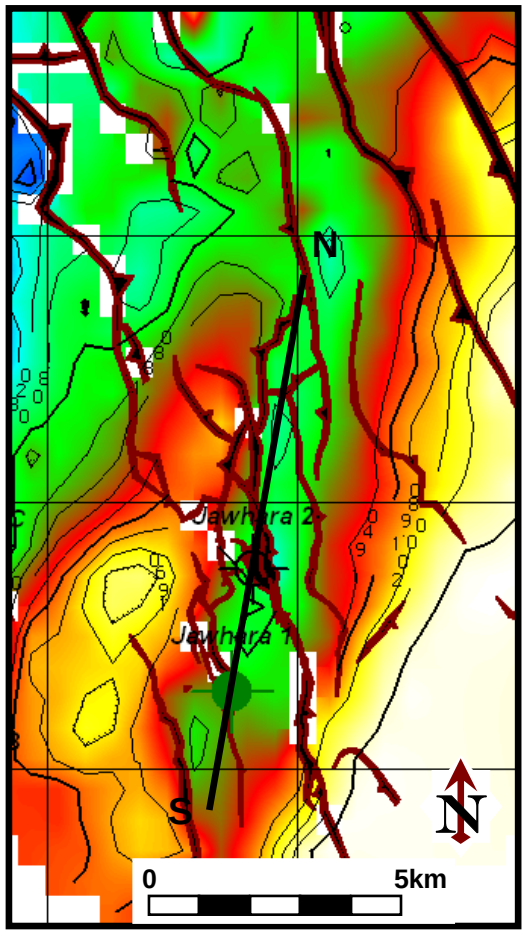
2. Jawahara 1, NE

- Area structurally higher than Jawahara 1 wells indicates that trap extends in this area.
- Concern to the north of the Jawahara 2 well as the seismic does not support a north dipping section as mapped.



Bireno_8_20_ptg TWT map

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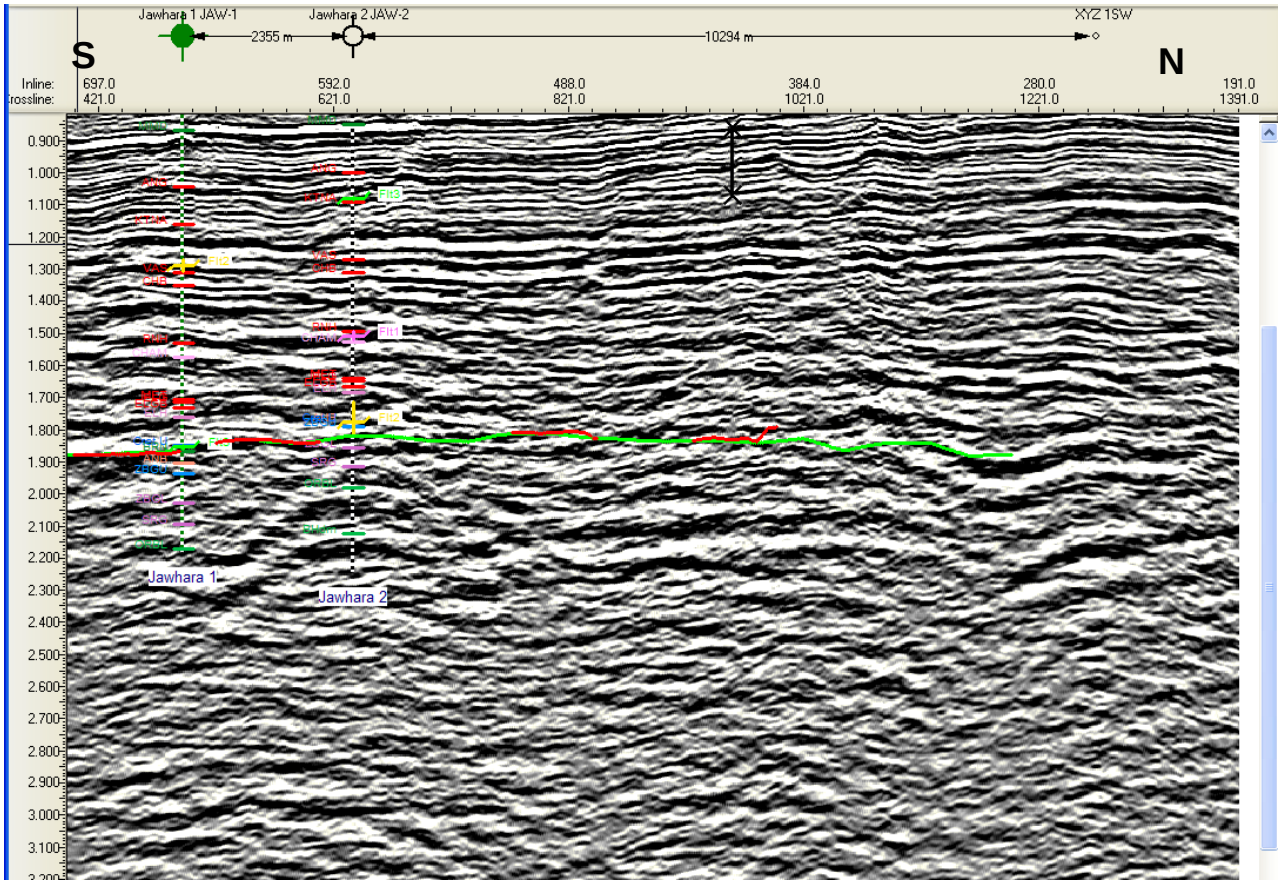
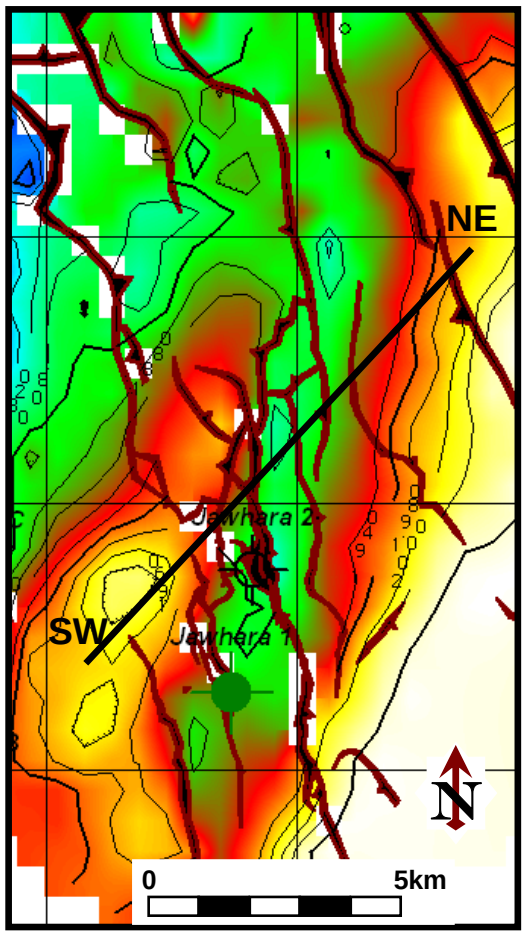


3. Jawahara 2, NE

- Steep regional east dip
- Clear structural closure that matches the current Bireno map



Bireno_8_20_ptg TWT map

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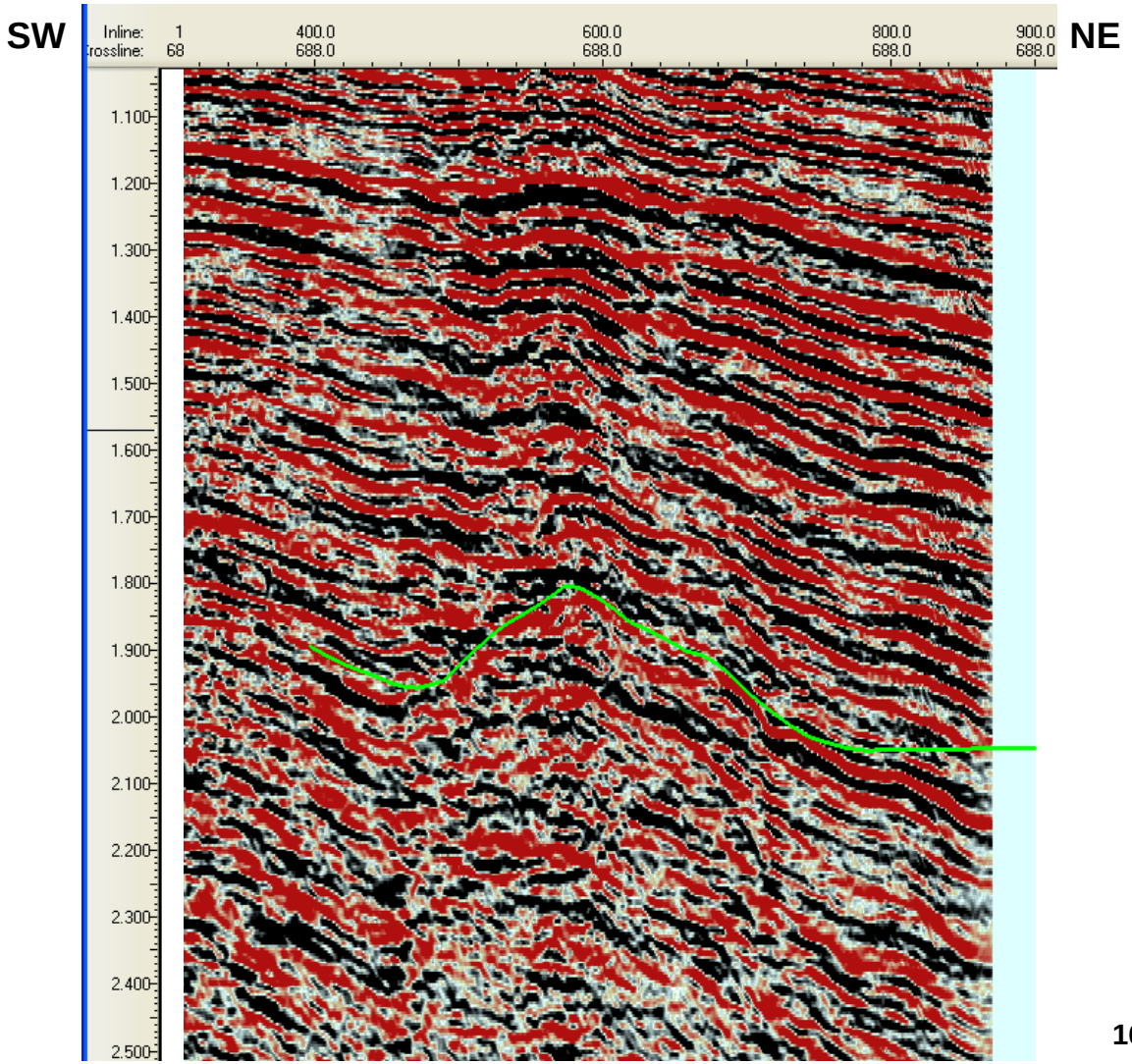
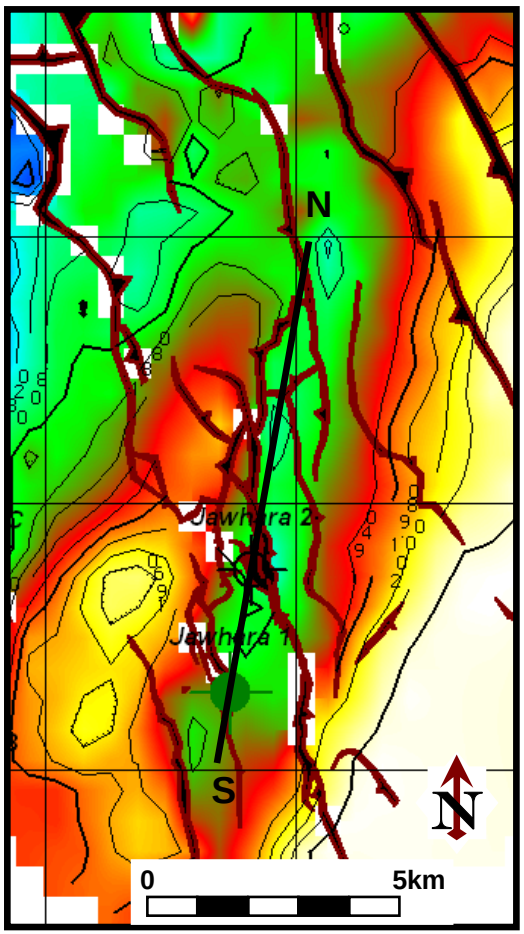


3. Jawahara 2 NE

- As mapped, the traps/prospects to the north of the Jawahara -2 well require dip to the north at the far north end of the structure. There is no apparent time closure in this area
- This is an extension of the Jawahara structure that has tested hydrocarbons. What forms the trap if not northern structural closure, stratigraphy?



Bireno_8_20_ptg TWT map

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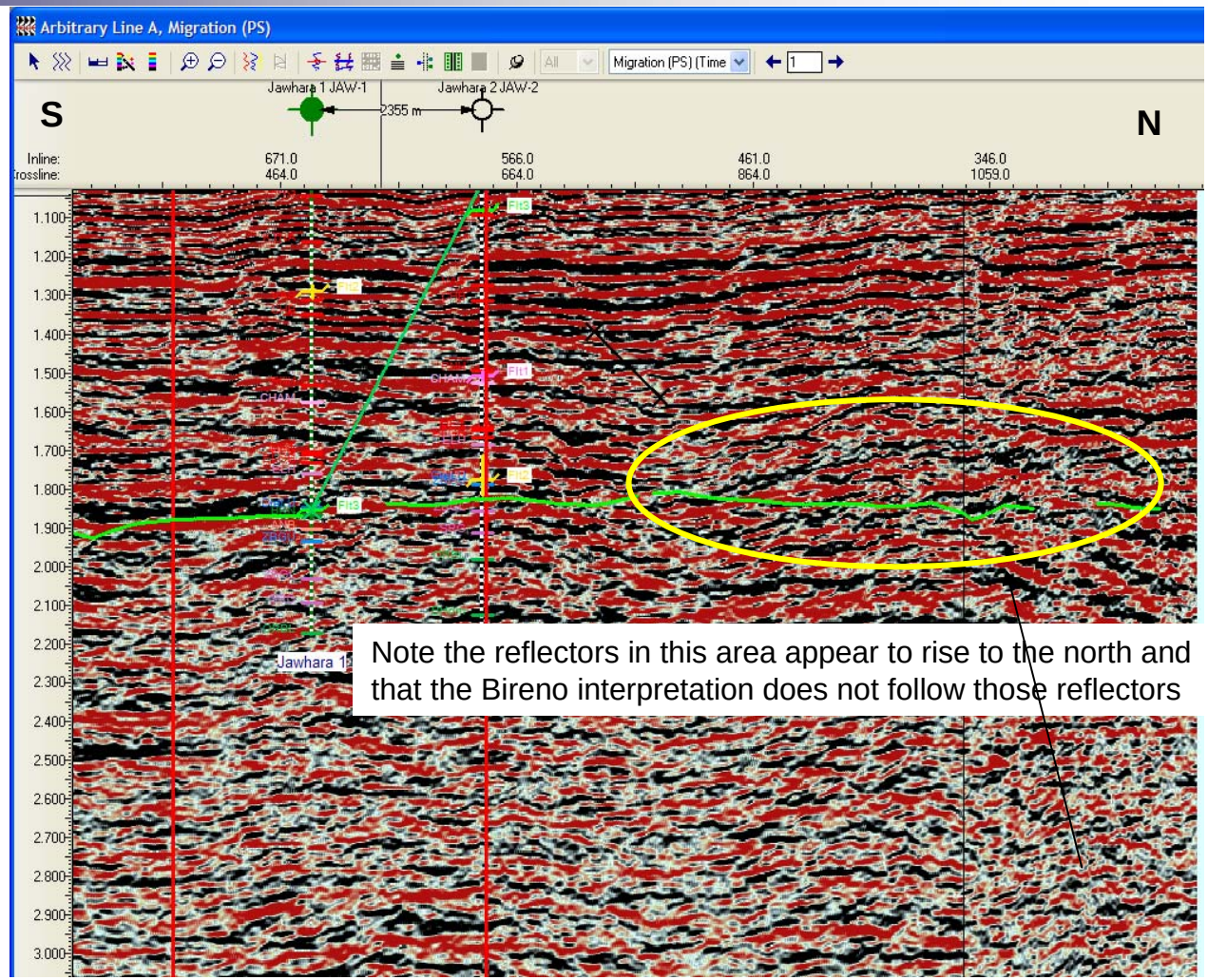
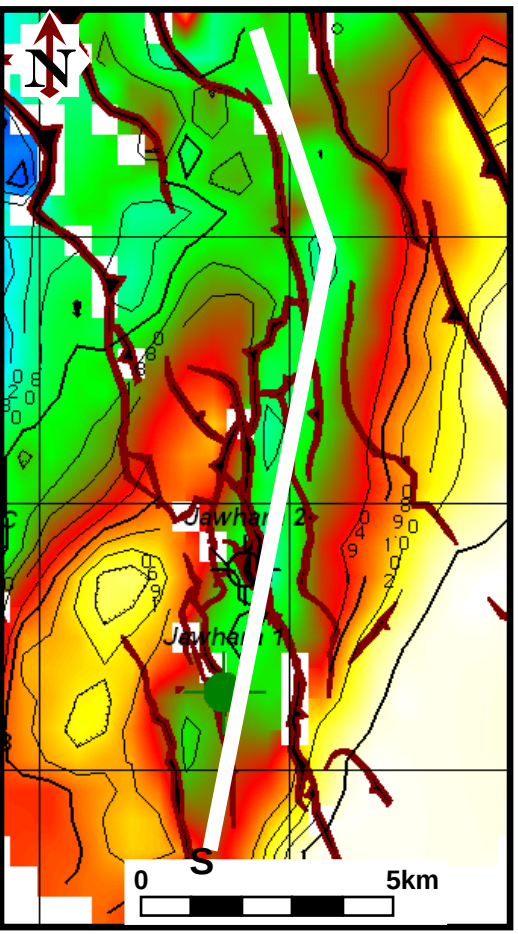


Note the reflectors in this area appear to rise to the north and that the Bireno interpretation does not follow those reflectors

4. Jawahara N U/T

- Lack of closure at the northern end of the feature



Bireno_8_20_ptg TWT map

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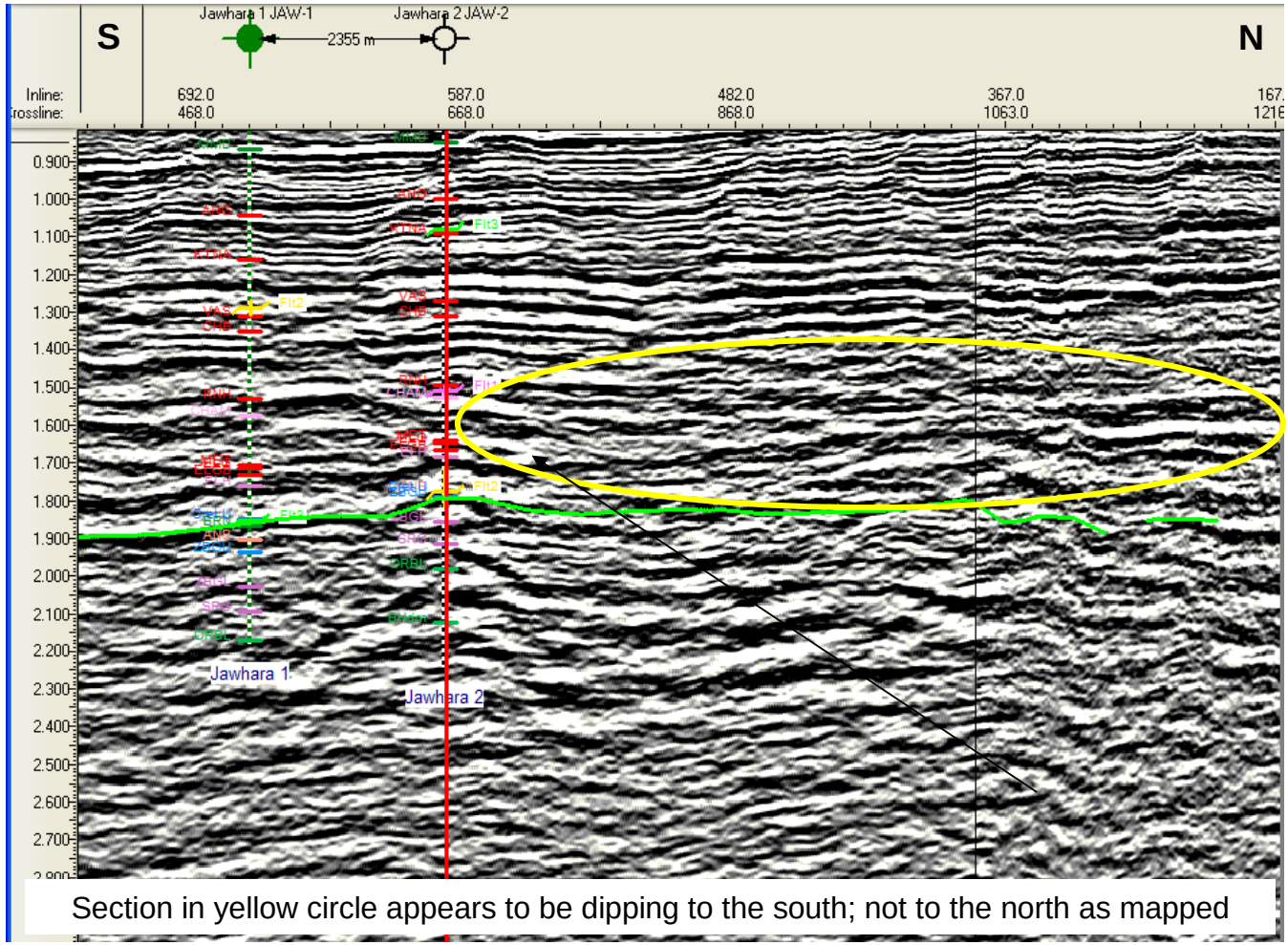
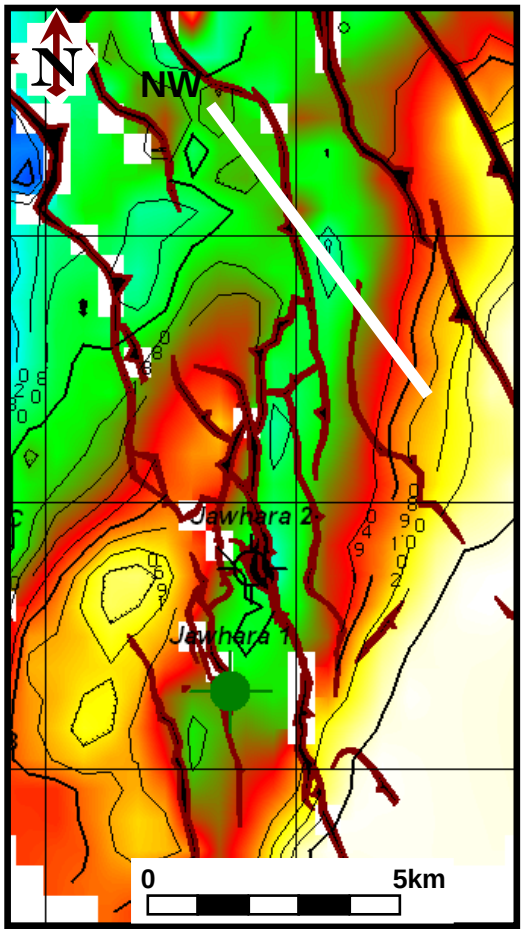


Section in yellow circle appears to be dipping to the south; not to the north as mapped

4. Jawahara N U/T

- Fair data contributes to mapping uncertainties
- The structuring at the north end of the prospect is somewhat suspect



Bireno_8_20_ptg TWT map

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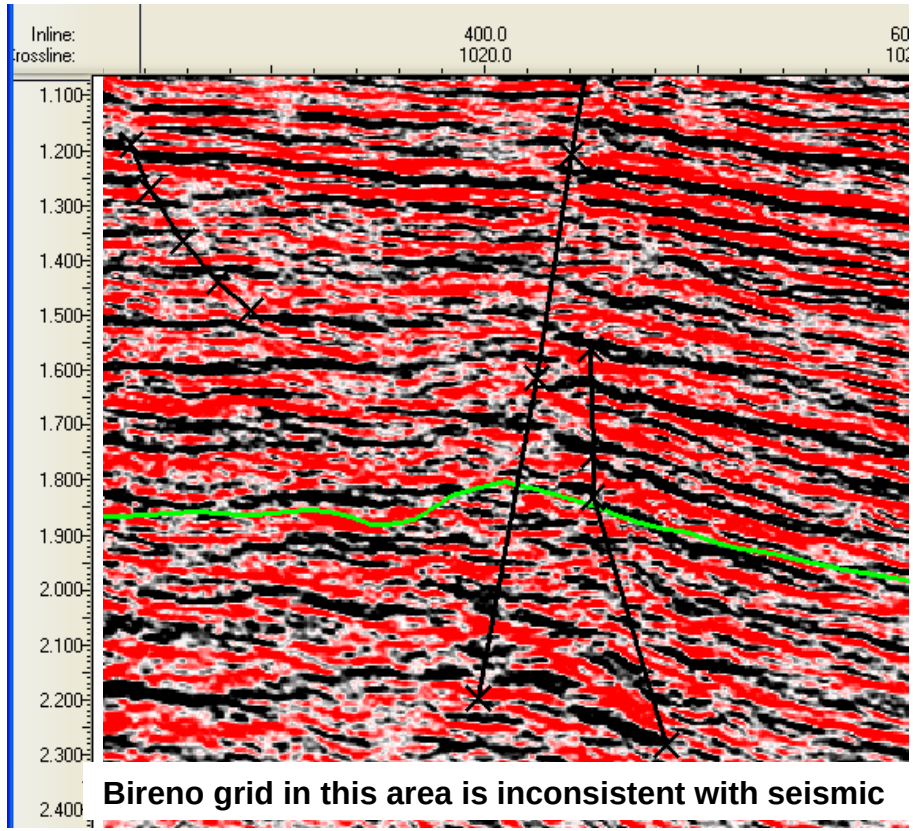
NW



SE

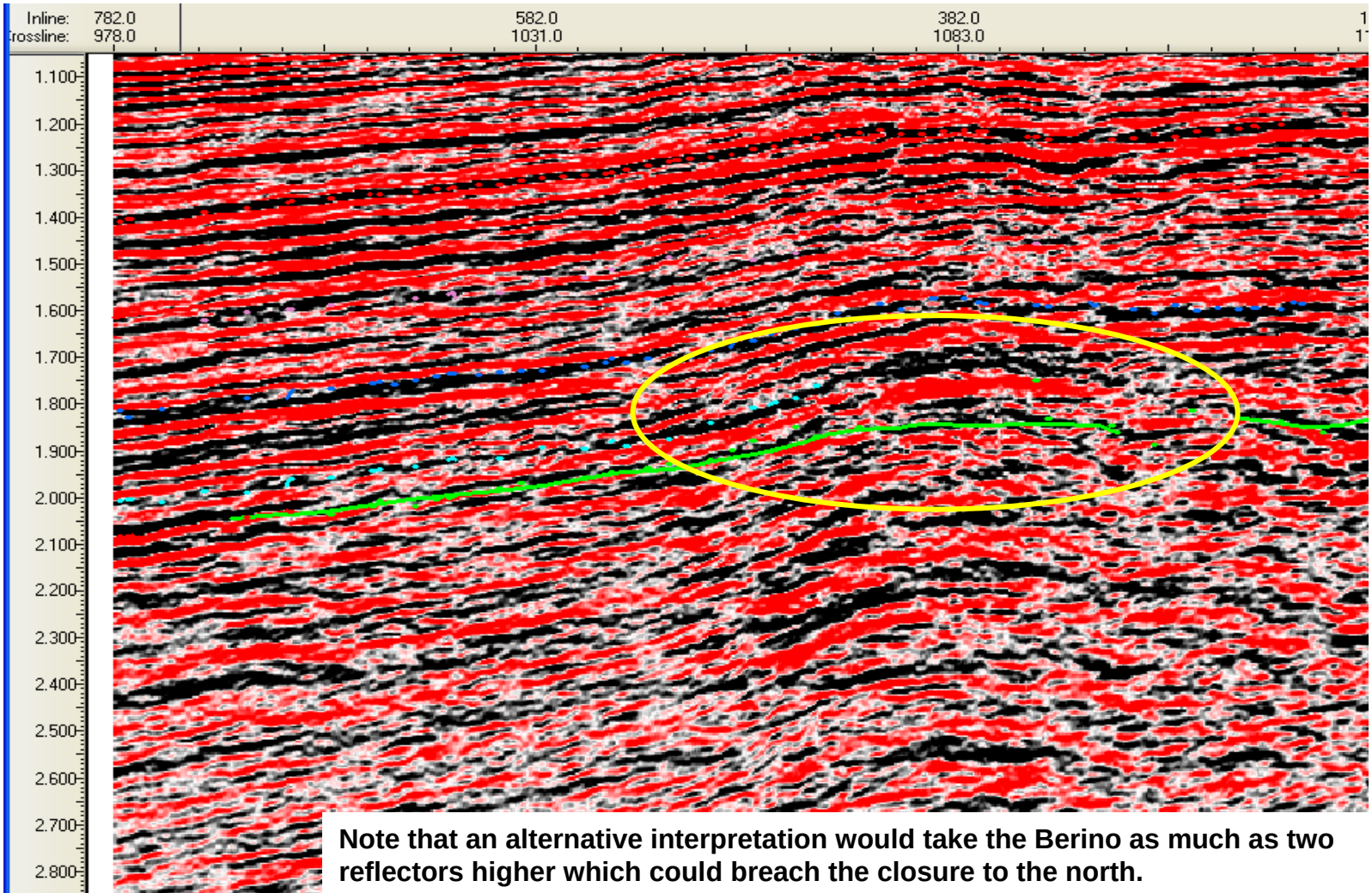
Bireno grid in this area is inconsistent with seismic

4. Jawahara N U/T

- Large northern area that does not appear to have time closure to the north
- The structuring at the north end of the prospect is some what suspect
- Negative displacement (area as mapped is deeper on the upthrown side in areas) makes fault barrier/seal risky

Arbritary line

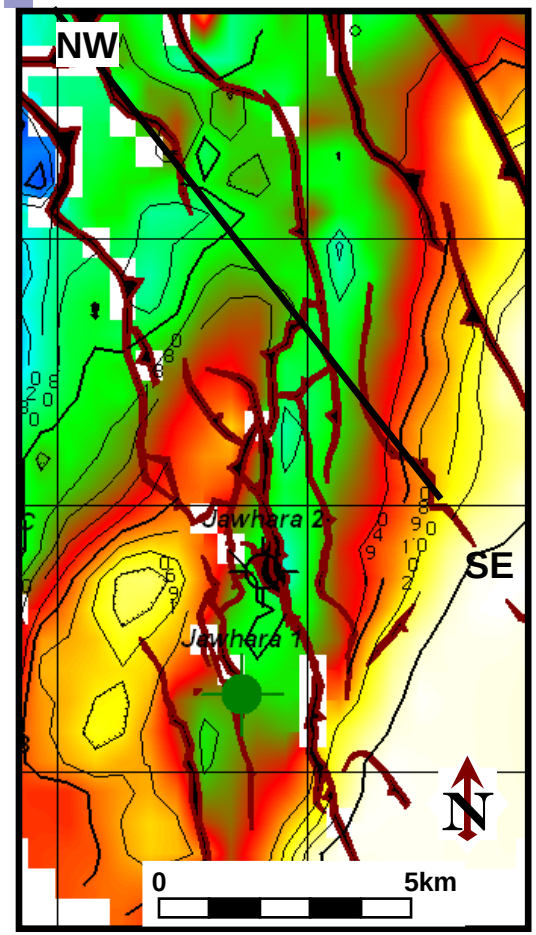
W **E**



Note that an alternative interpretation would take the Berino as much as two reflectors higher which could breach the closure to the north.

5. Jawahara N SW

- Mapped as a tilted fault block but, could be interpreted as a pop-up structure
- Structure complexity and low confidence in picking the Bireno seismic horizon increase risk related to trap



Bireno_8_20_ptg TWT map
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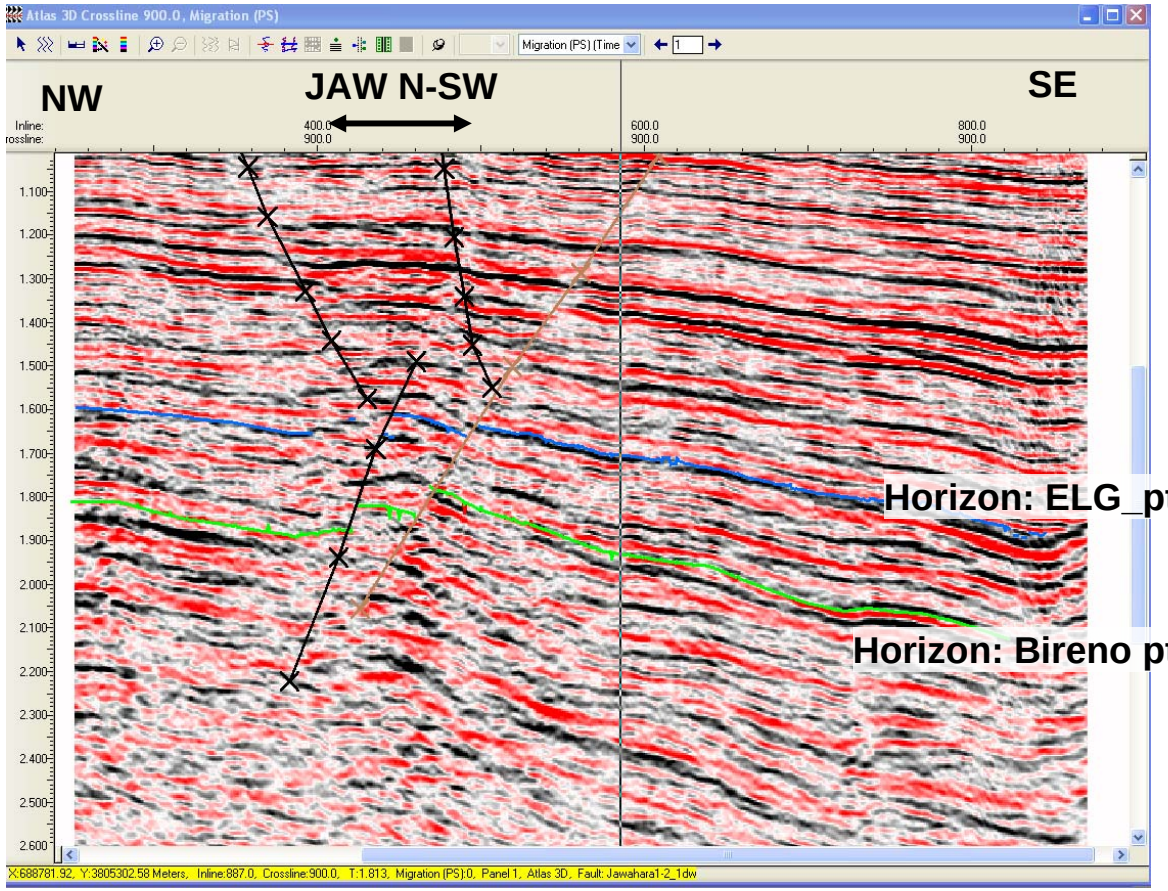
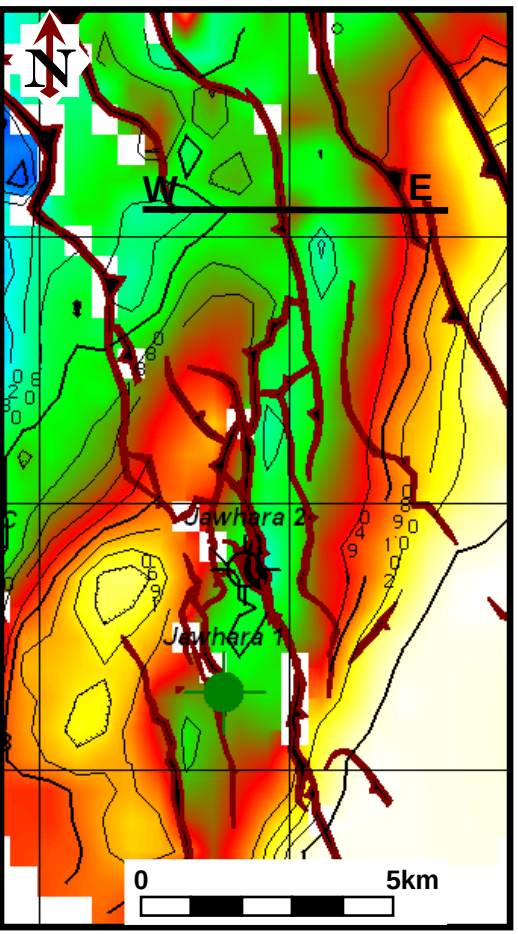


6. Jawahara N-NW

- Lack of seismic support for needed west dip
- The bounding fault between Jaw N U/T and Jaw N-NW is not well defined



Bireno_8_20_ptg TWT map

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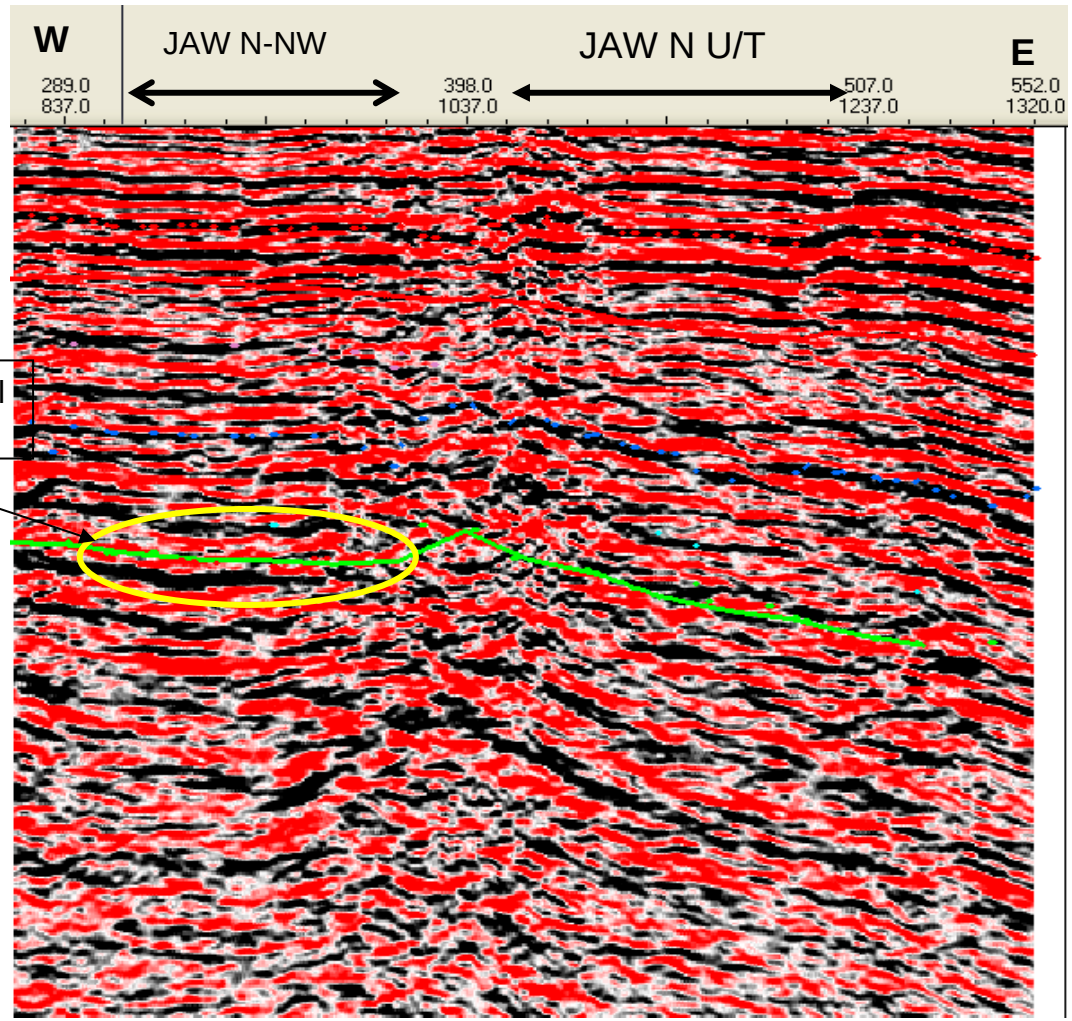
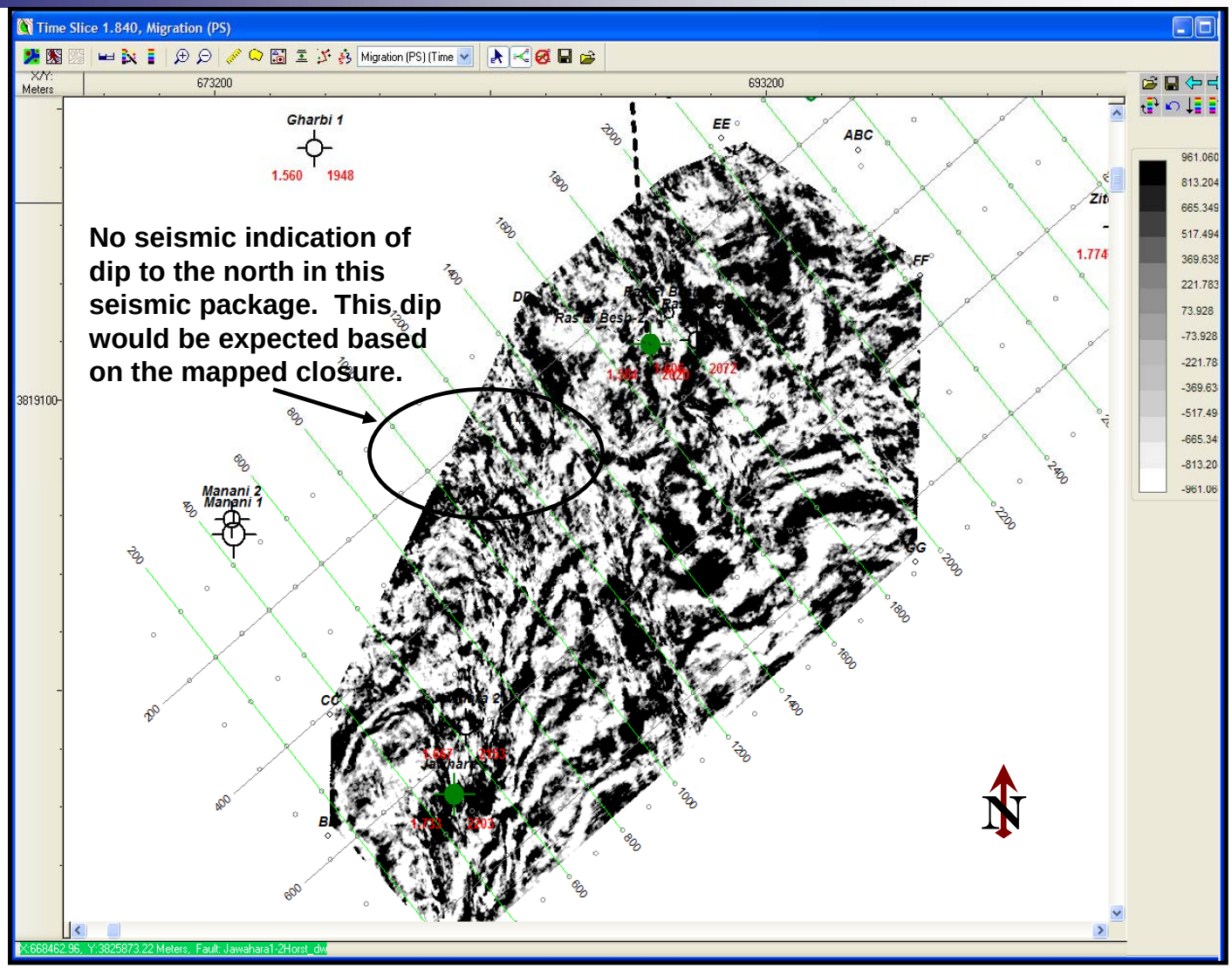


6. Jawahara N-NW

- Apparent NE/SW ridge drilled by Jawahara -1 and -2 wells
- Sycline to the west of wells as mapped
- No idication of closure in the North/Northeast



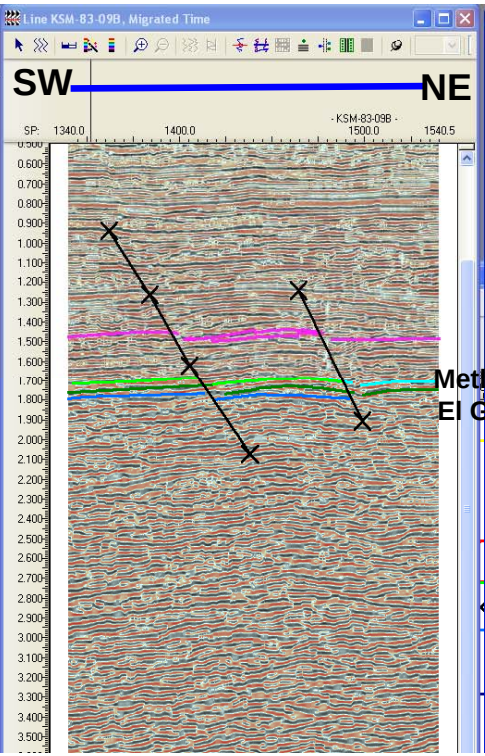
2D Area Review

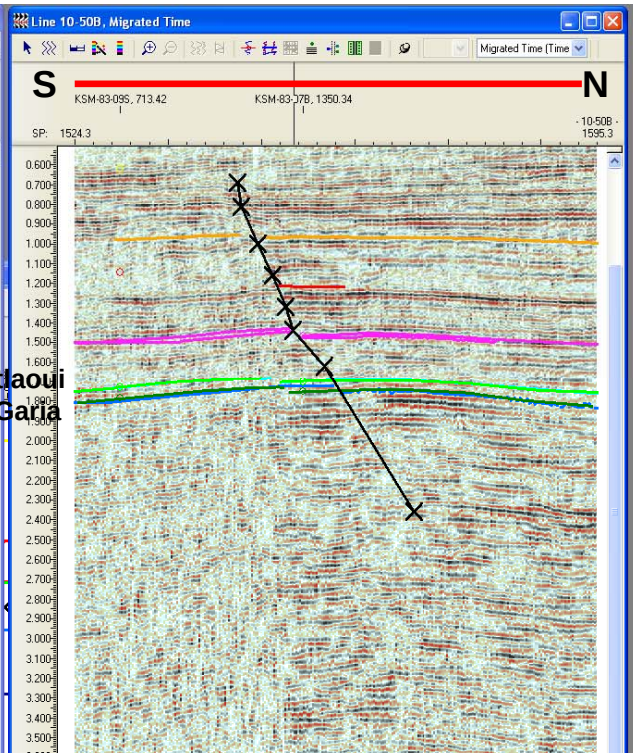
Salloum Area

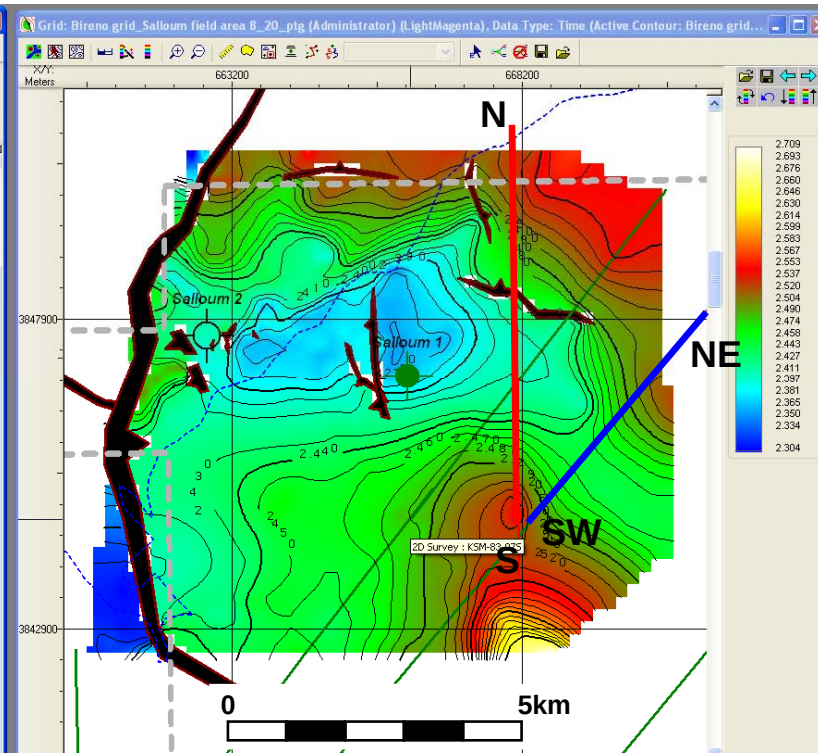
Prospect	#	Reservoir	APEX Area (acres)
Salloum 1	**7**	**Douleb/Bireno**	**3742**

7. Salloum

- There were only two seismic lines with data in this area
- No Douleb/Bireno horizon picks. Bireno Map could not be verified
- GCA could not verify mapping or volumes based on data supplied







Bireno grid Salloum field area_8_20_ptg TWT map
CI = 0.01 sec

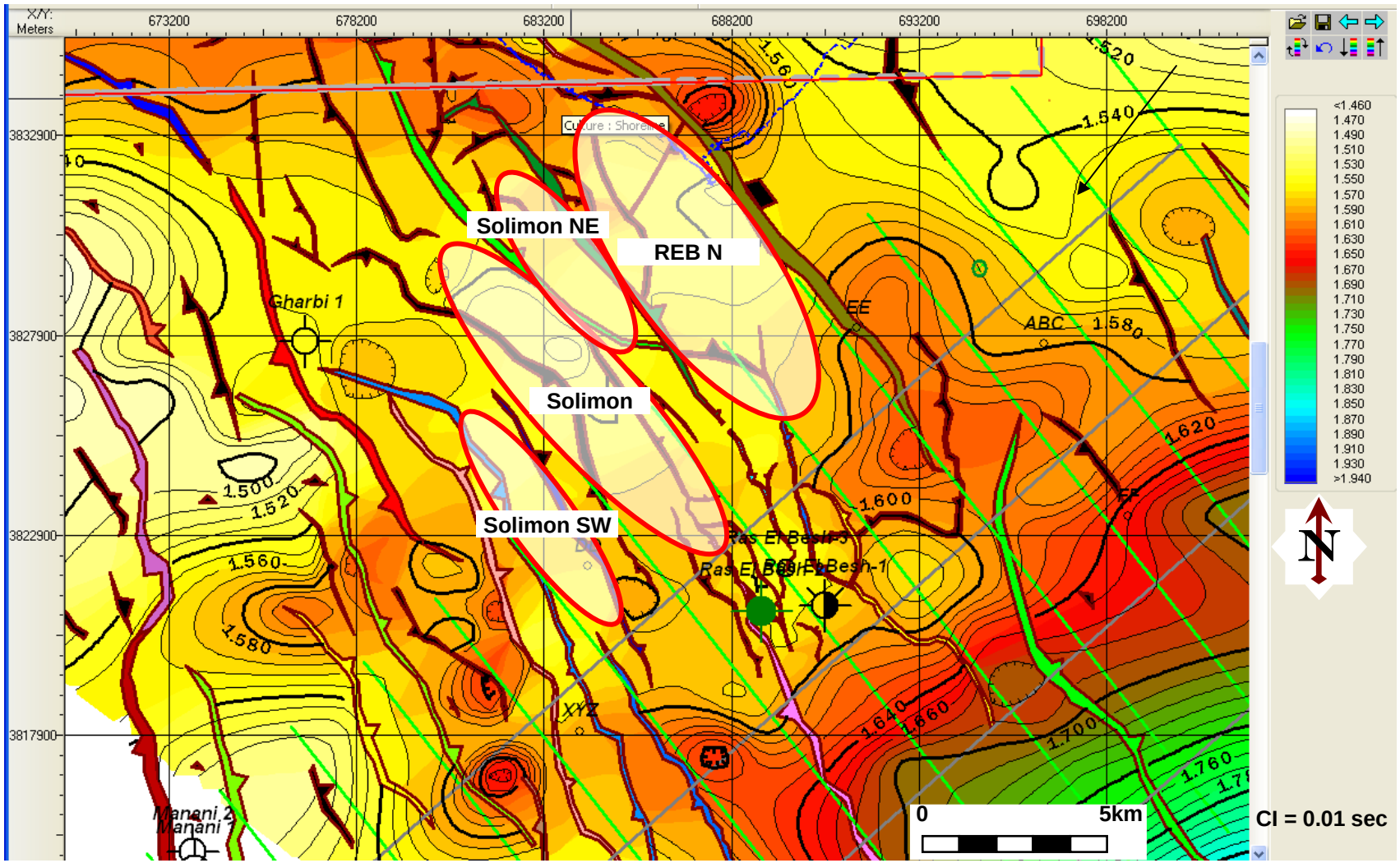
New 3D seismic data currently in processing should provide adequate understanding of the Salloum area and could allow Contingent Resource classification of reserve volumes

KERKENNAH BANKS
REB North and Solimon Areas

Leads	#	Reservoir	APEX Area (acres)
Ras El Besh North	**8**	**El Garia**	**4067.8**
Ras El Besh North	**9**	**Reineche**	**9122**
Solimon	**10**	**El Garia**	**2439.5**
Solimon SW	**11**	**El Garia**	**1403**
Solimon NE	**12**	**El Garia**	**940.3**
Zitouna	**13**	**Reineche**	**11816**

Kerkennah Banks

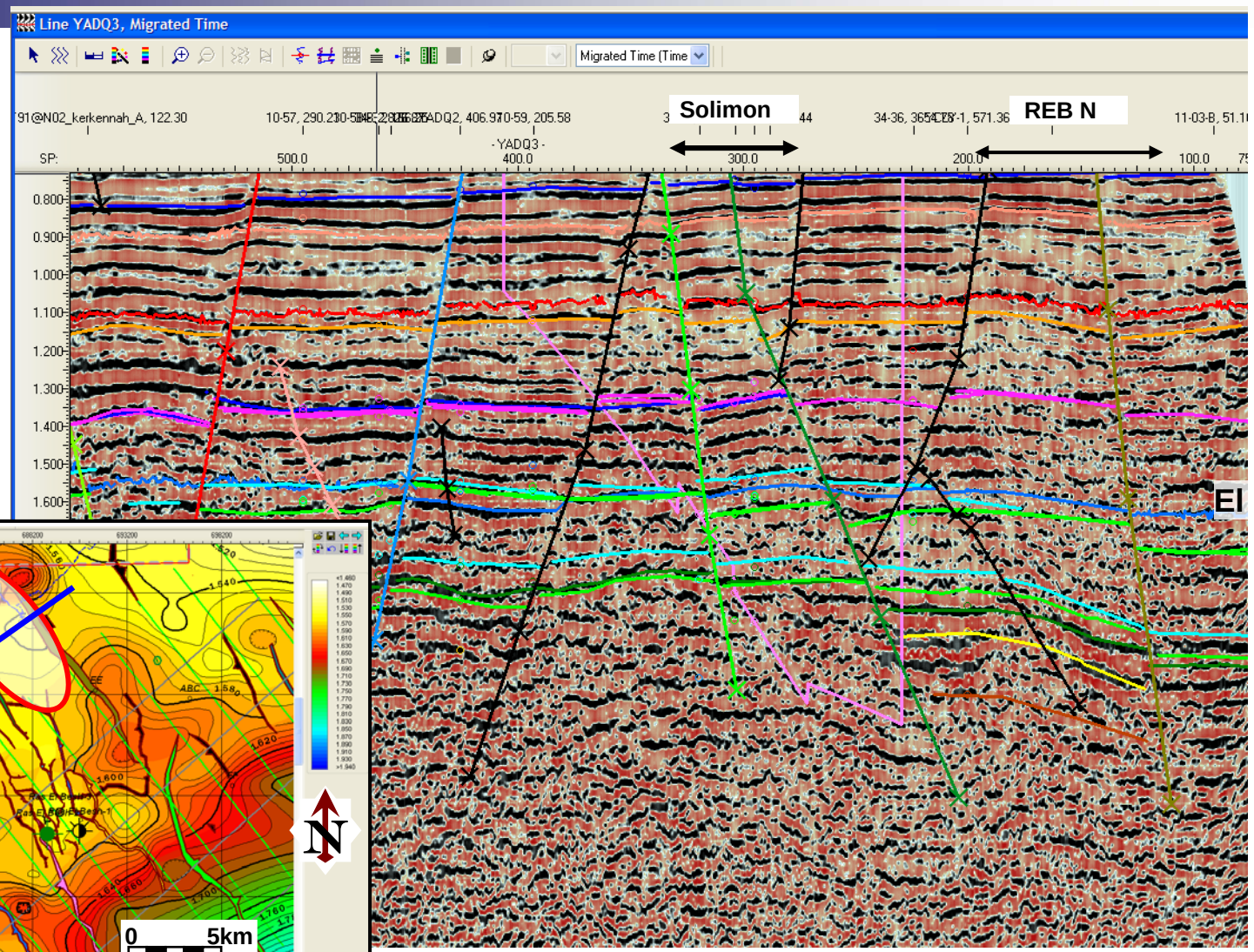
- Very limited data at this point. New 3D will give a very different picture.
- None of these prospects have sufficient data to make them “drill ready”



Time ElGaria ptg 1_18 grid and contours

8. REB North

• Prospect is lower and structurally separated from the Solimon high which in GCA's opinion should be tested first.

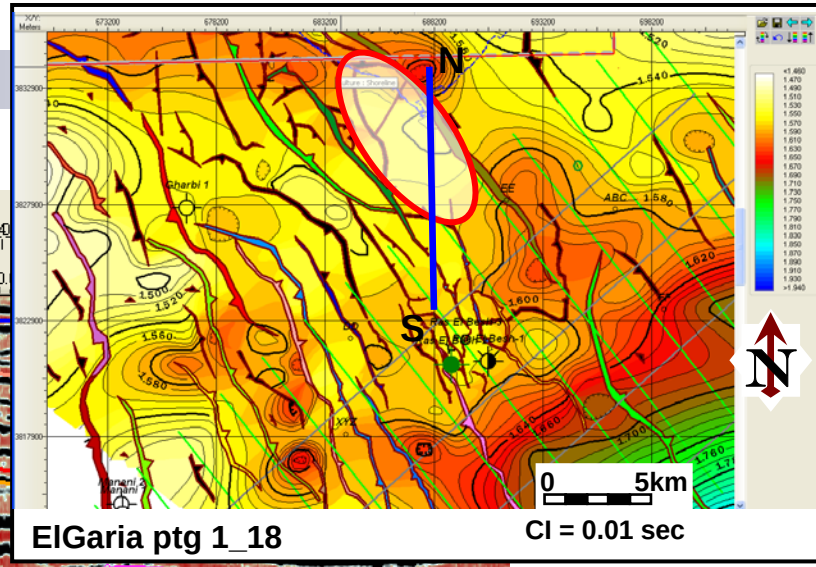


ElGaria ptg 1_18

CI = 0.01 sec

8 & 9. REB North

- No seismic tie to the Melita-1 well to the north
- North/South section showing very broad gentle structure at the El Garia level
- GCA was not able to verify a Reineche reservoir in the REB N area due to lack of data



ElGaria ptg 1_18

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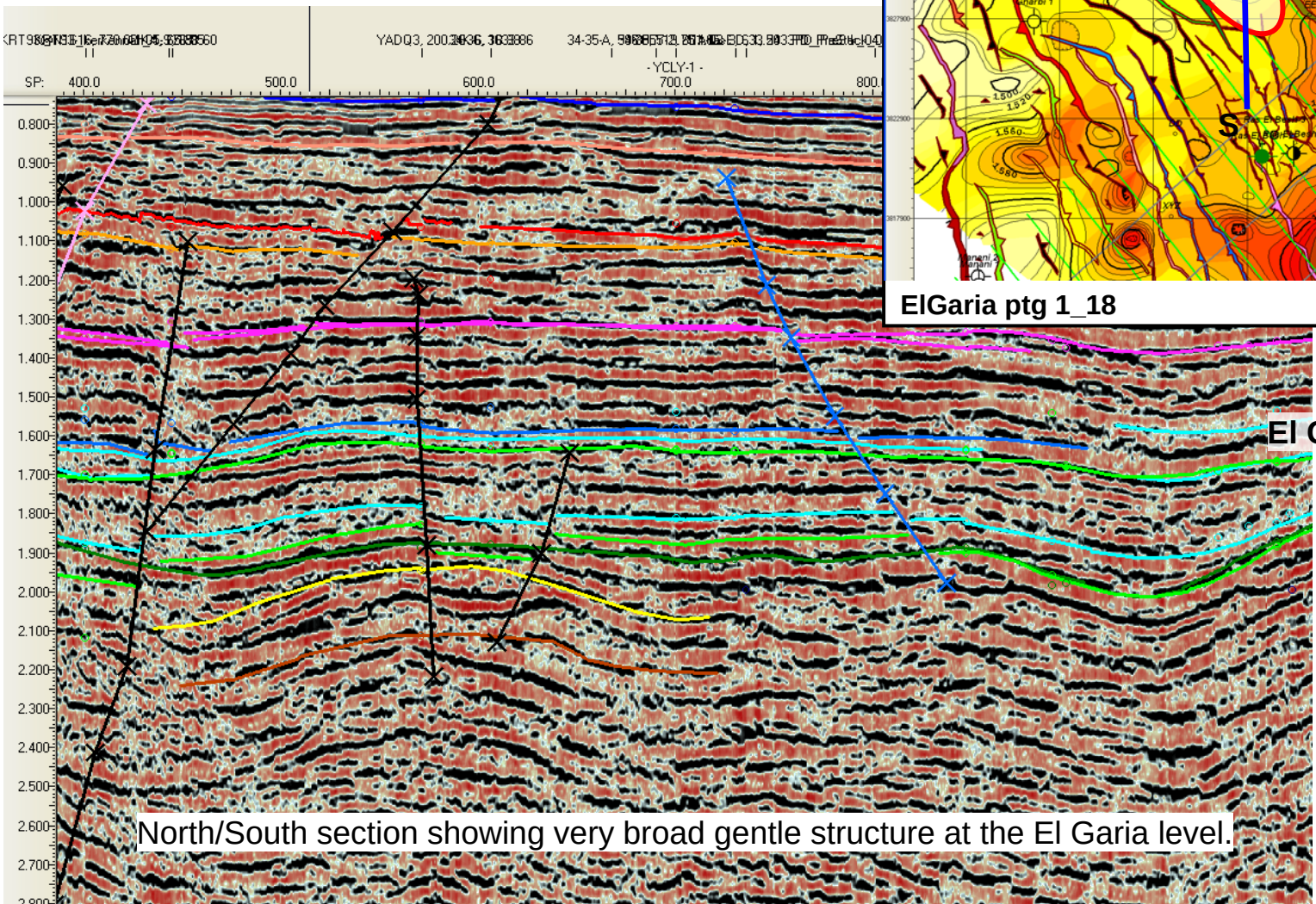
N

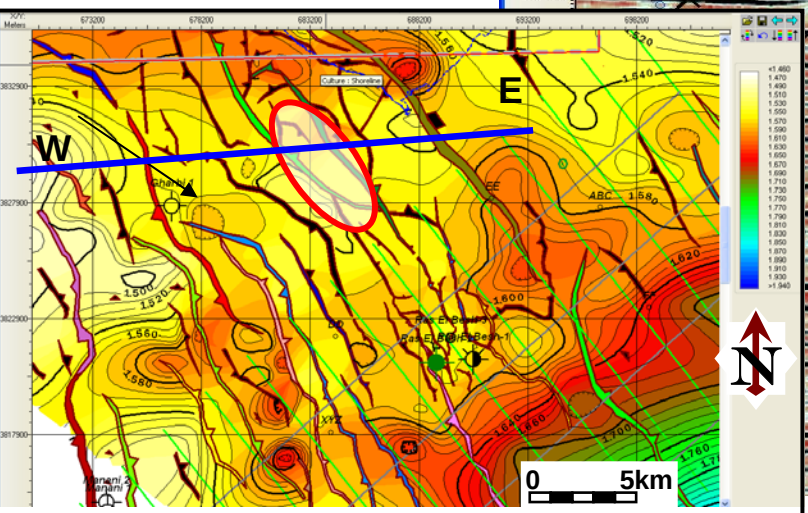


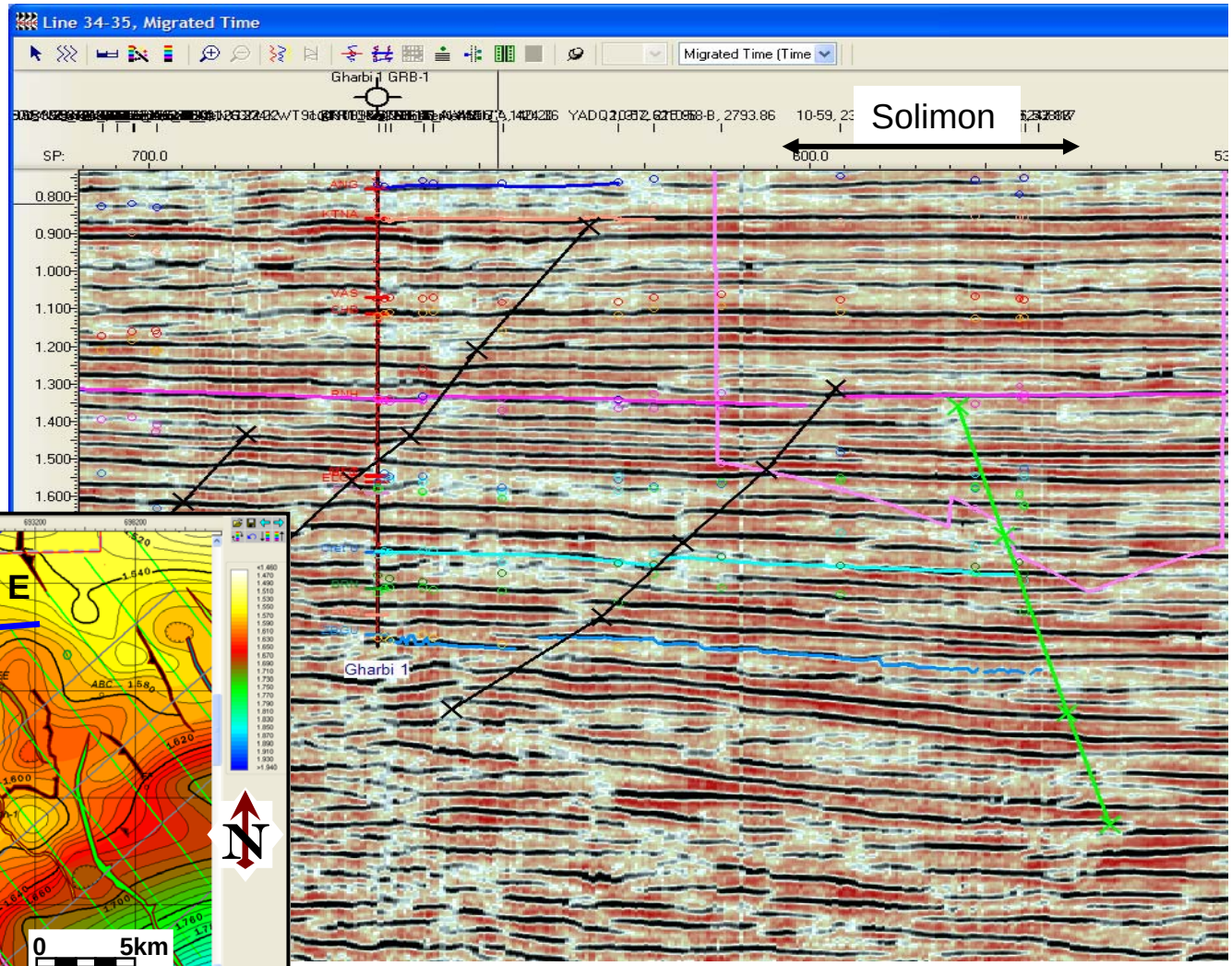
El Garia

North/South section showing very broad gentle structure at the El Garia level.

10. Solimon

- Down dip to the Gharbi-1 well which is shown as a dry hole
- Log analysis states there is no El Garia reservoir at Gharbi-1
- The Bireno has 10 meters with a So=65% and Porosity of 15%. Zone was not tested





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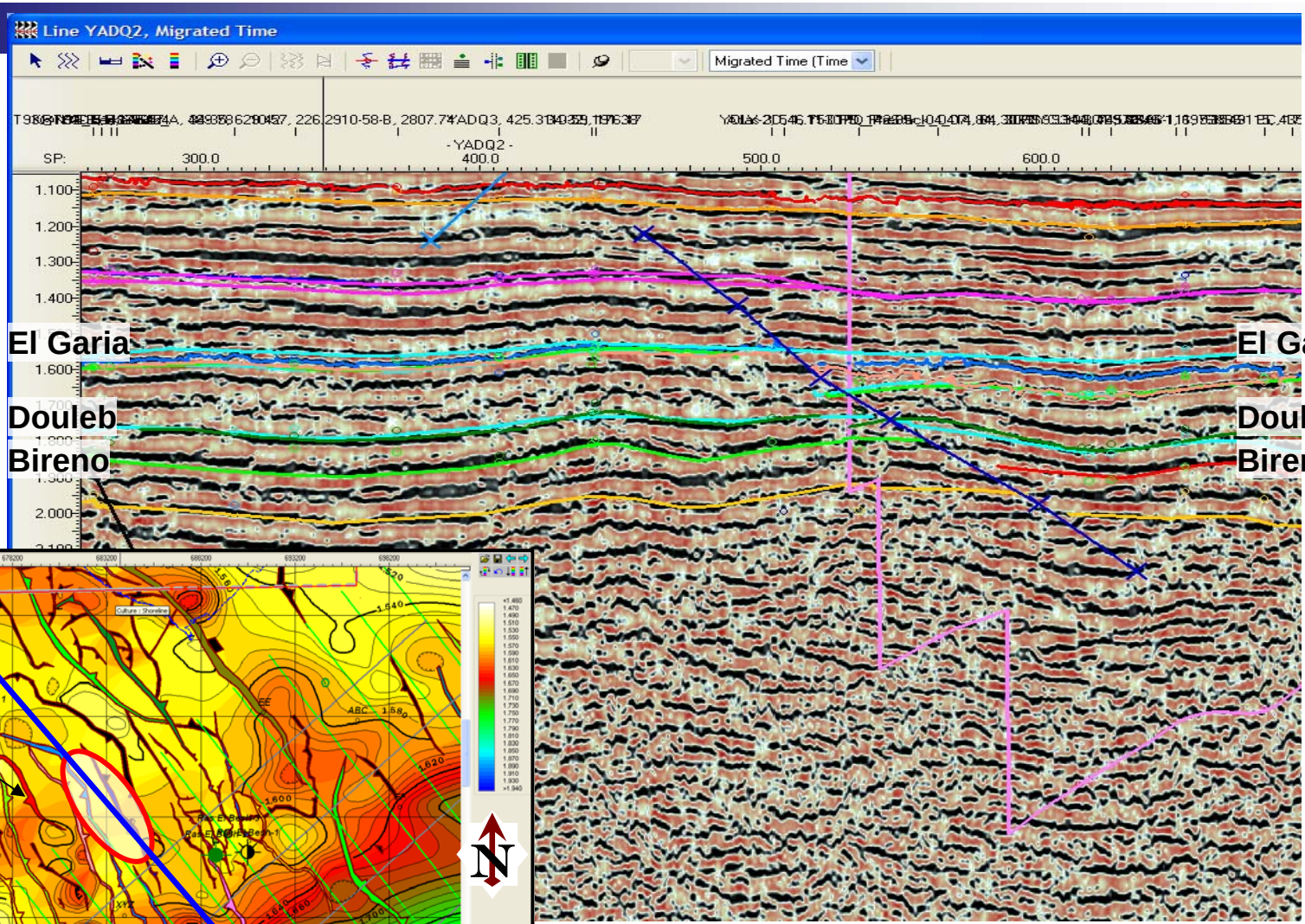
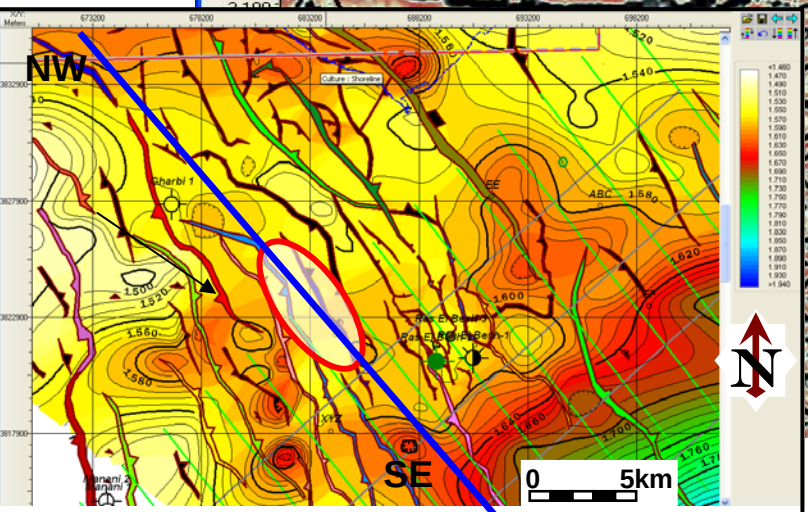
11. Solimon SW

- Relatively clear structure on this NW\SE line though the lead
- Not as clear data in other lines for proper mapping



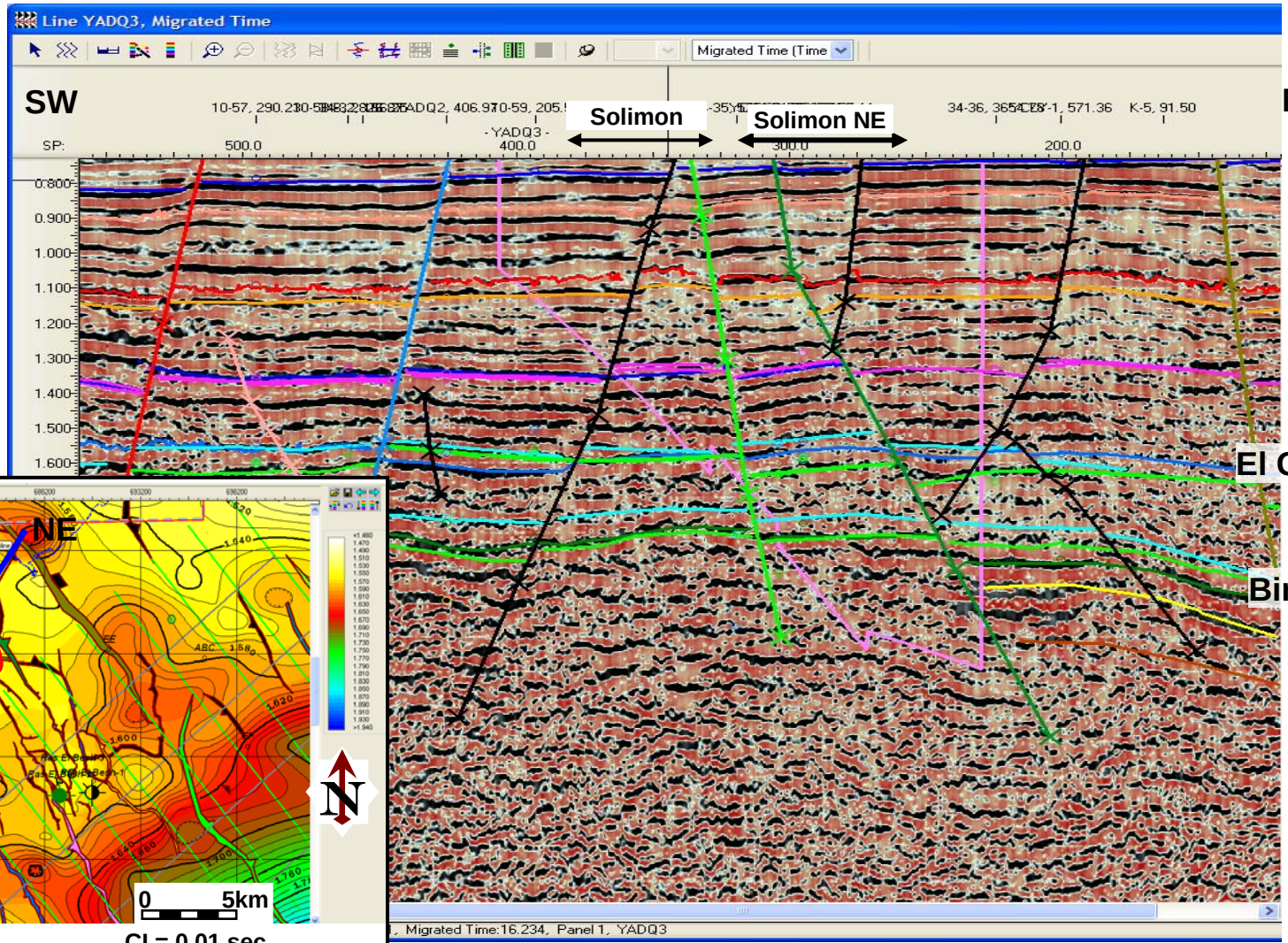


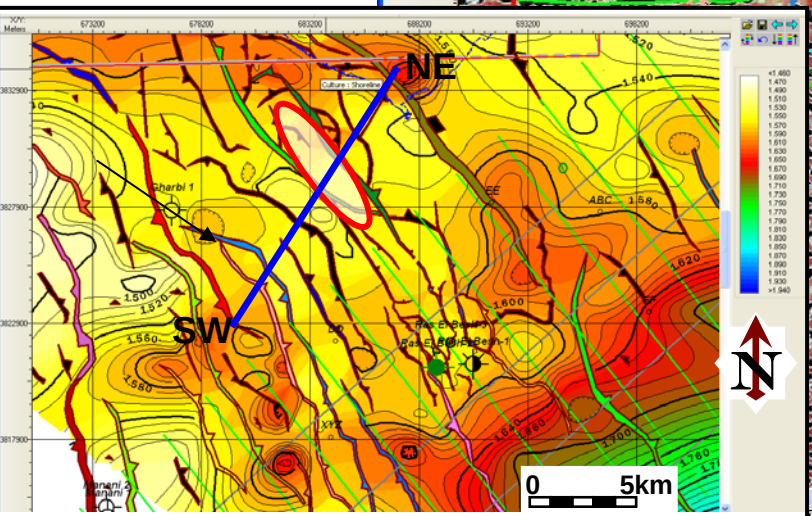
ElGaria ptg 1_18

CI = 0.01 sec

12. Solimon NE

- Down dip to the Gharbi-1 well which is shown as a dry hole
- Solimon NE is lower and has been interpreted as structurally separated from the Solimon, which in GCA's opinion should be drilled first.





ElGaria ptg 1_18

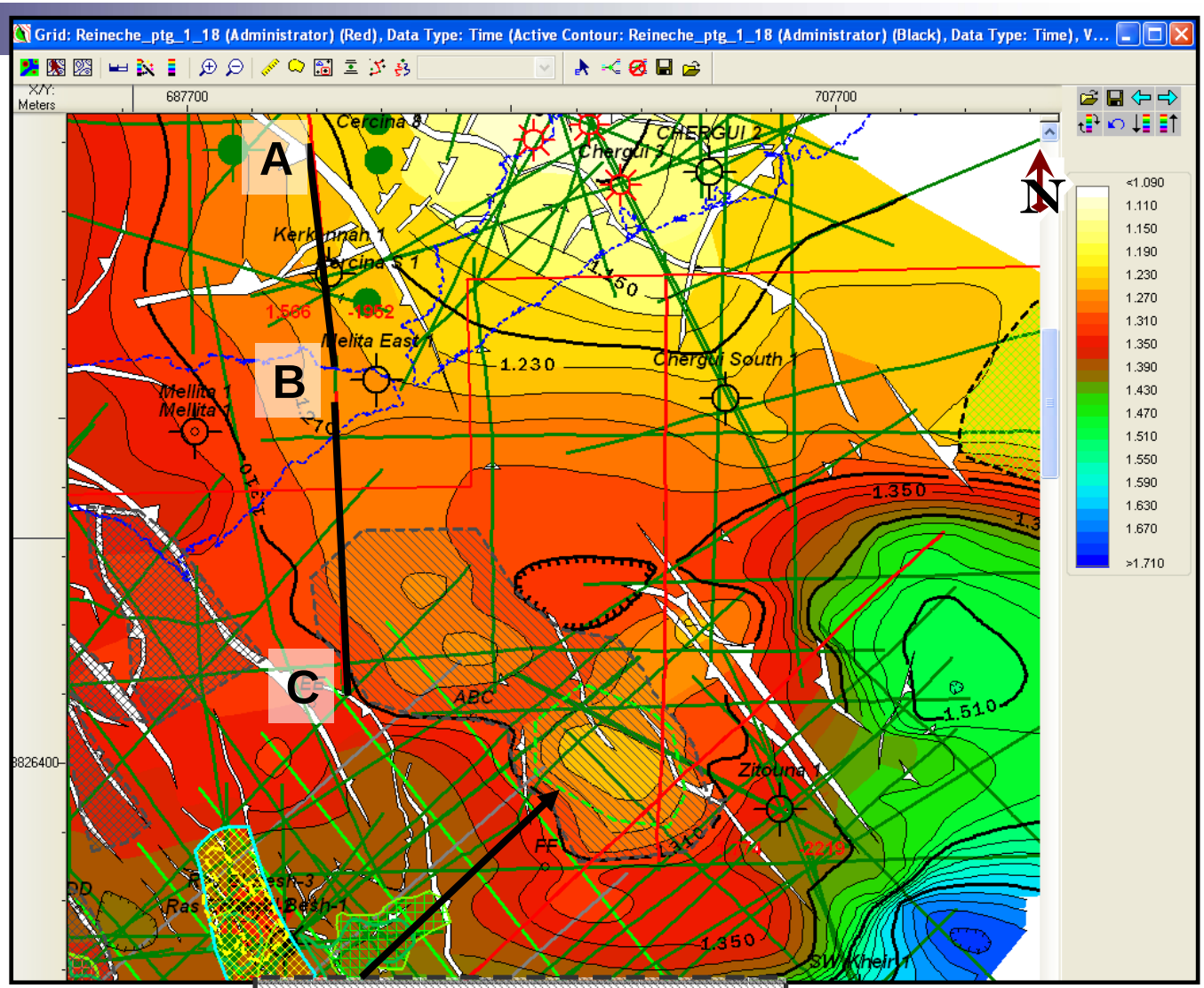
CI = 0.01 sec

13. Zitouna – Reineche

- Insufficient data to verify maps
- Insufficient data to verify Reiniche reservoir section

Zitouna well is:

- structurally higher from dry hole “SW Kher 1”
- structurally lower and separated from dry holes “Melita East 1” and “Chergui South 1” well
- Chergui wells, up dip from “Chergui South 1”, are reported as Reiniche gas producers.
- Cercina wells, up dip from the “Melita East 1”, are reported to be Reiniche oil producers



APEX Zitouna Area

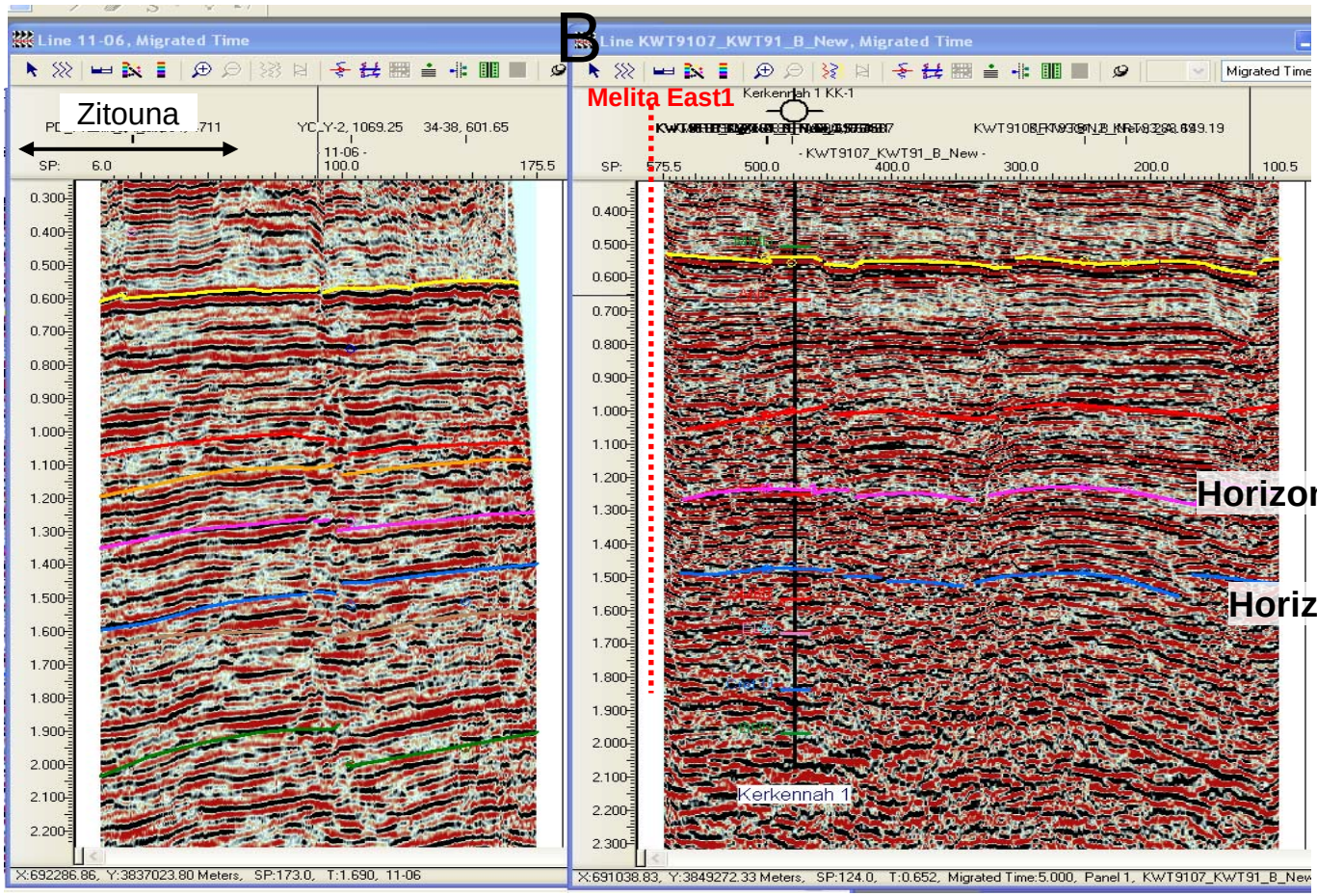
13. Zitouna – Reineche

- Structurally lower than Melita East dry hole well and other dry holes to the North
- Zitouna 1 well did not find the reservoir

A

B

C

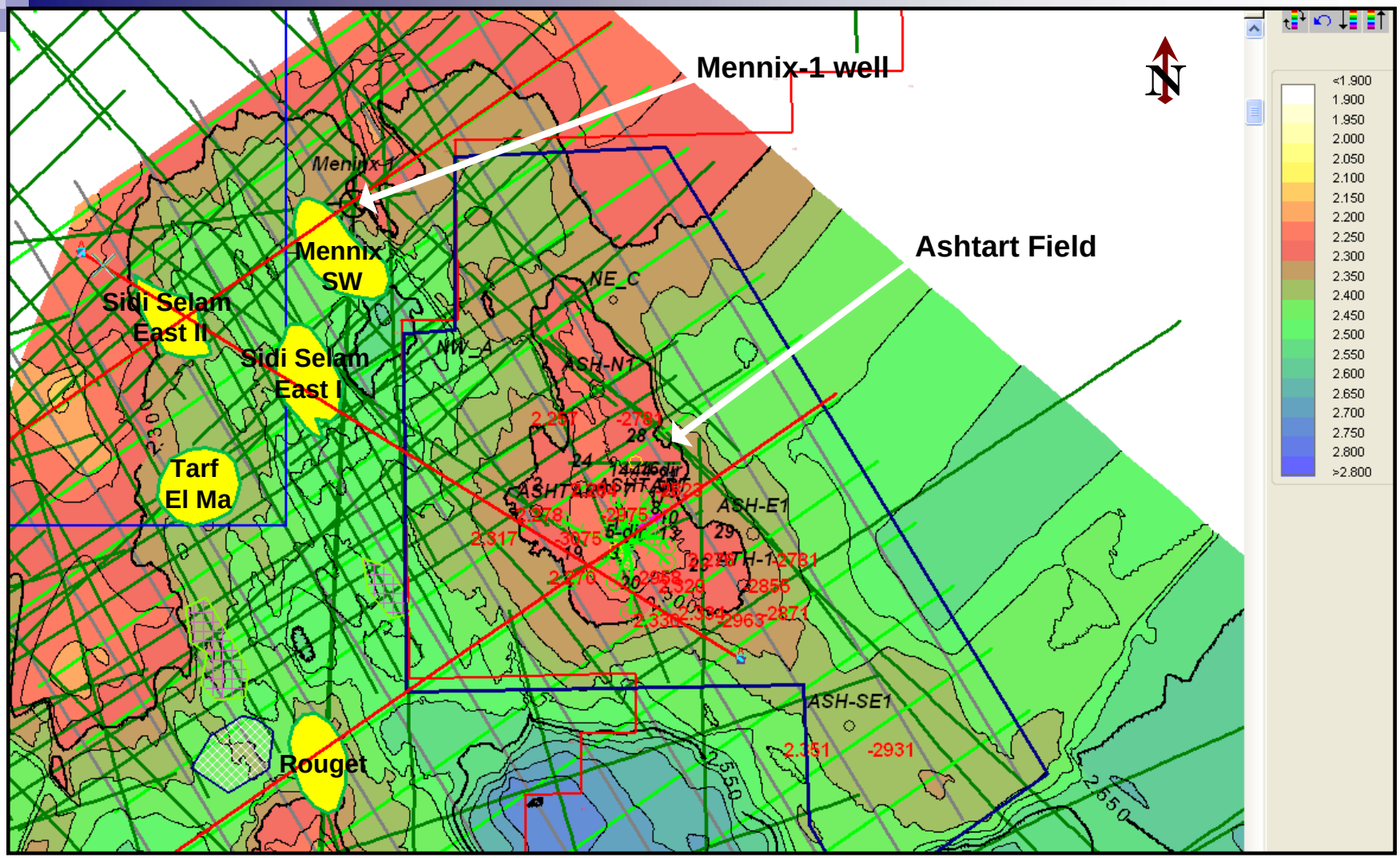


SATELLITES

Prospect	#	Reservoir	APEX Area (acres)
Rouget	**14**	**El Garia**	**2186**
Mennix SW	**15**	**El Garia**	**309**
Sidi Selam East I	**16**	**El Garia**	**577**
Sidi Selam East II	**17**	**El Garia**	**401**
Sidi Selam West	**18**	**El Garia**	**698**
Tarf El Ma	**19**	**El Garia**	**759**
Tarf El Ma East	**20**	**El Garia**	**354**

SATELITES

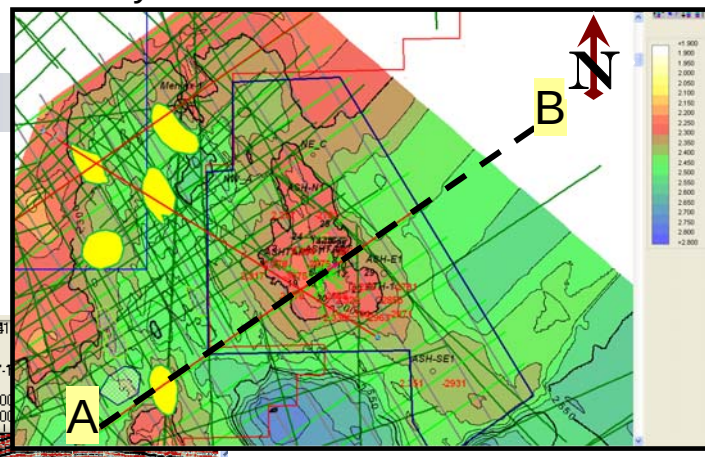
- The Mennix – 1 and other wells around the Ashtart field did not find the El Garia reservoir
- The Satellites are structurally below the oil water contact in the Ashtart Field

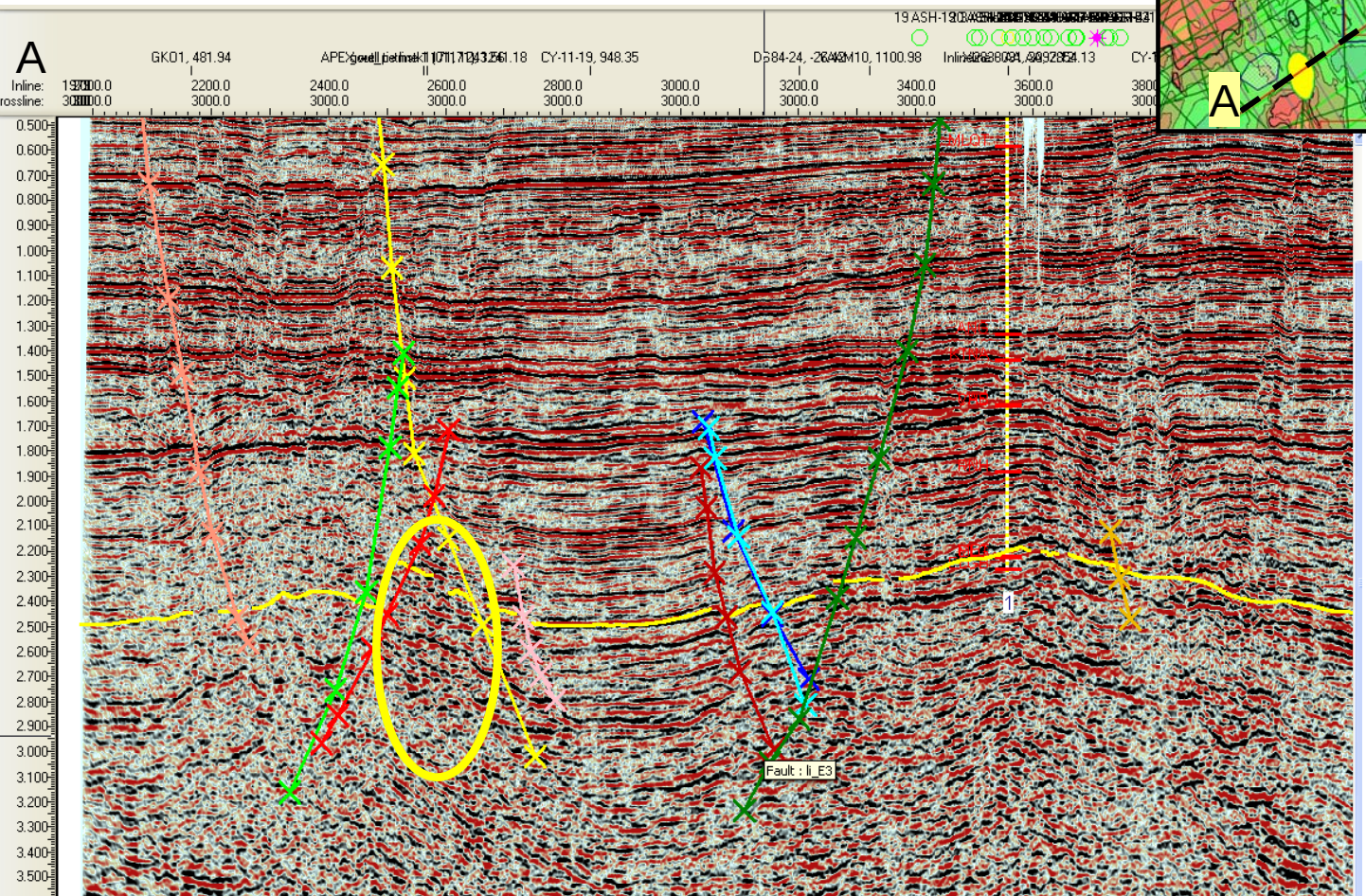


"Metl._SE/2grid3/11" Metloui grid and contours in time

14. Rouget

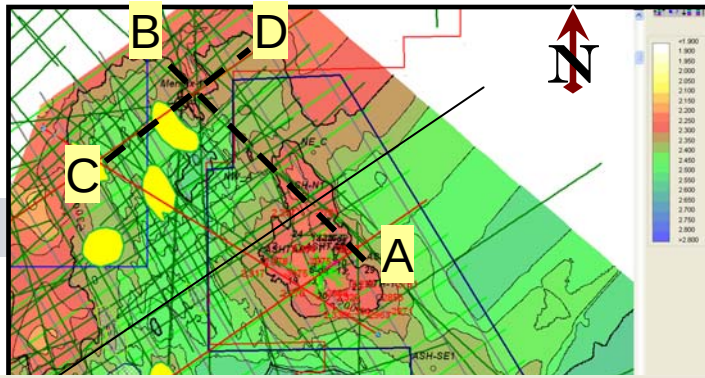
- Poor data quality over the lead increases uncertainty in trap definition
- Non-producing Naravas wells, although they may be structurally separated, are located structurally higher

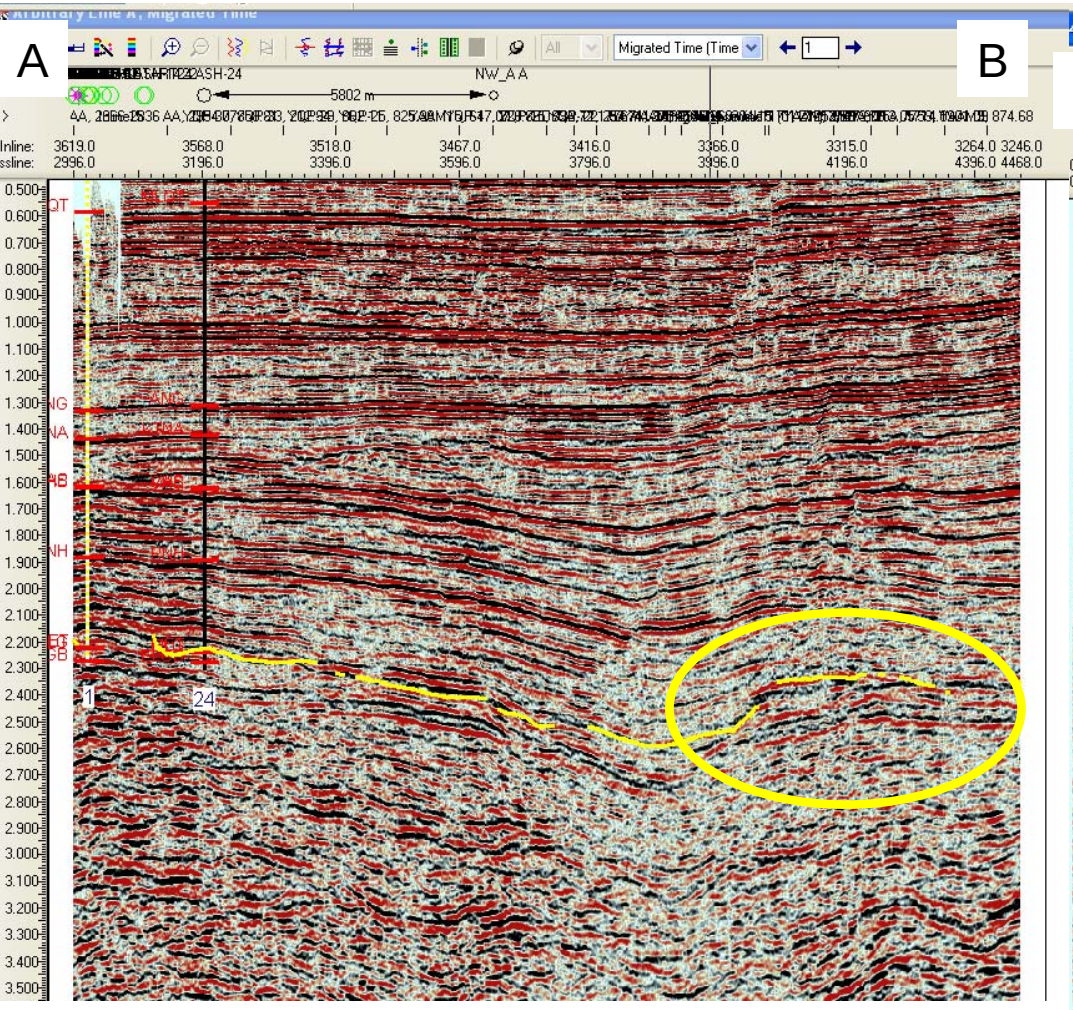


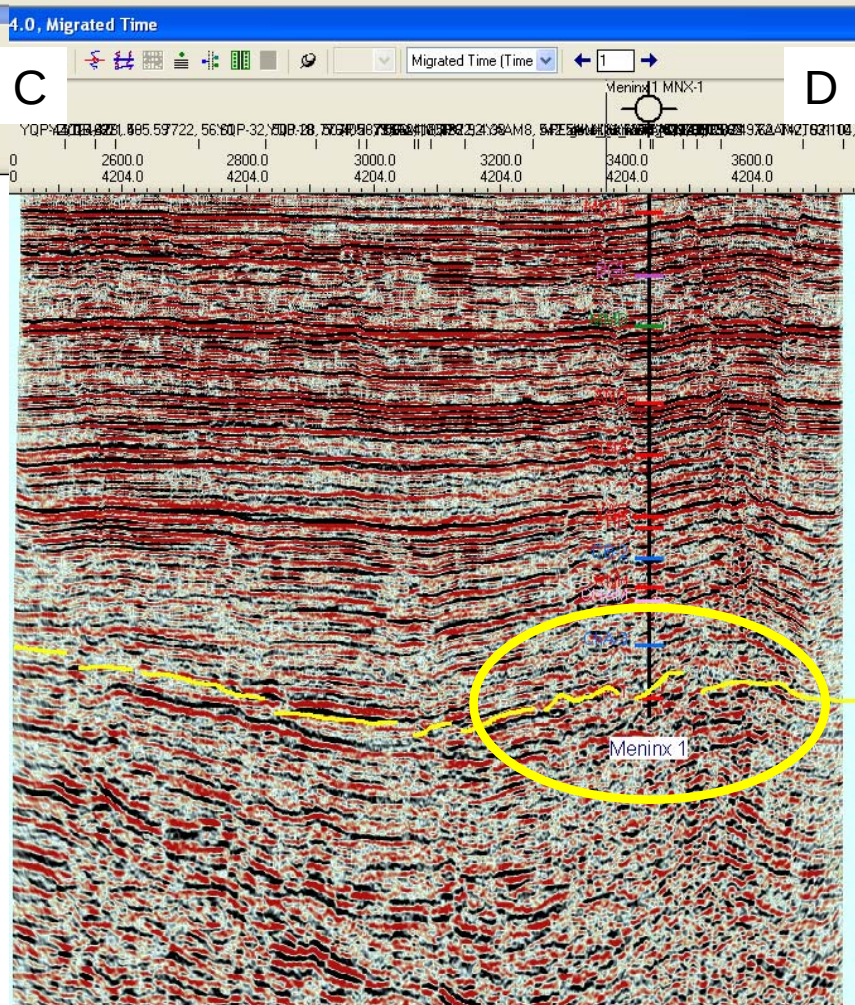


15. Mennix SW

- Favorable structural feature
- Most likely tested by the Mennix 1 well.
- Mennix 1 well did not find the El Garia reservoir

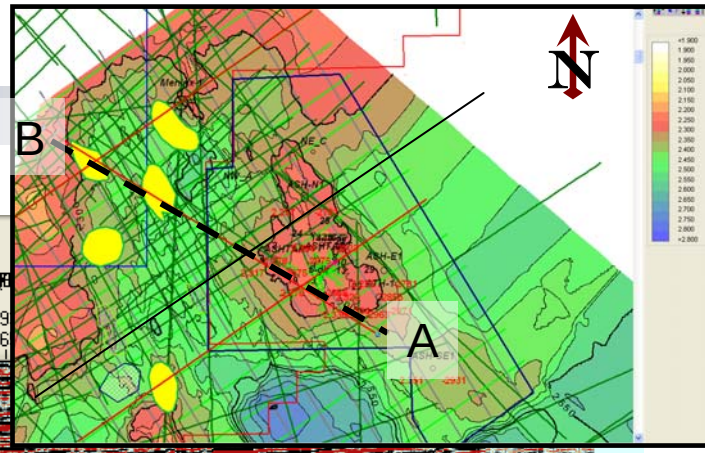


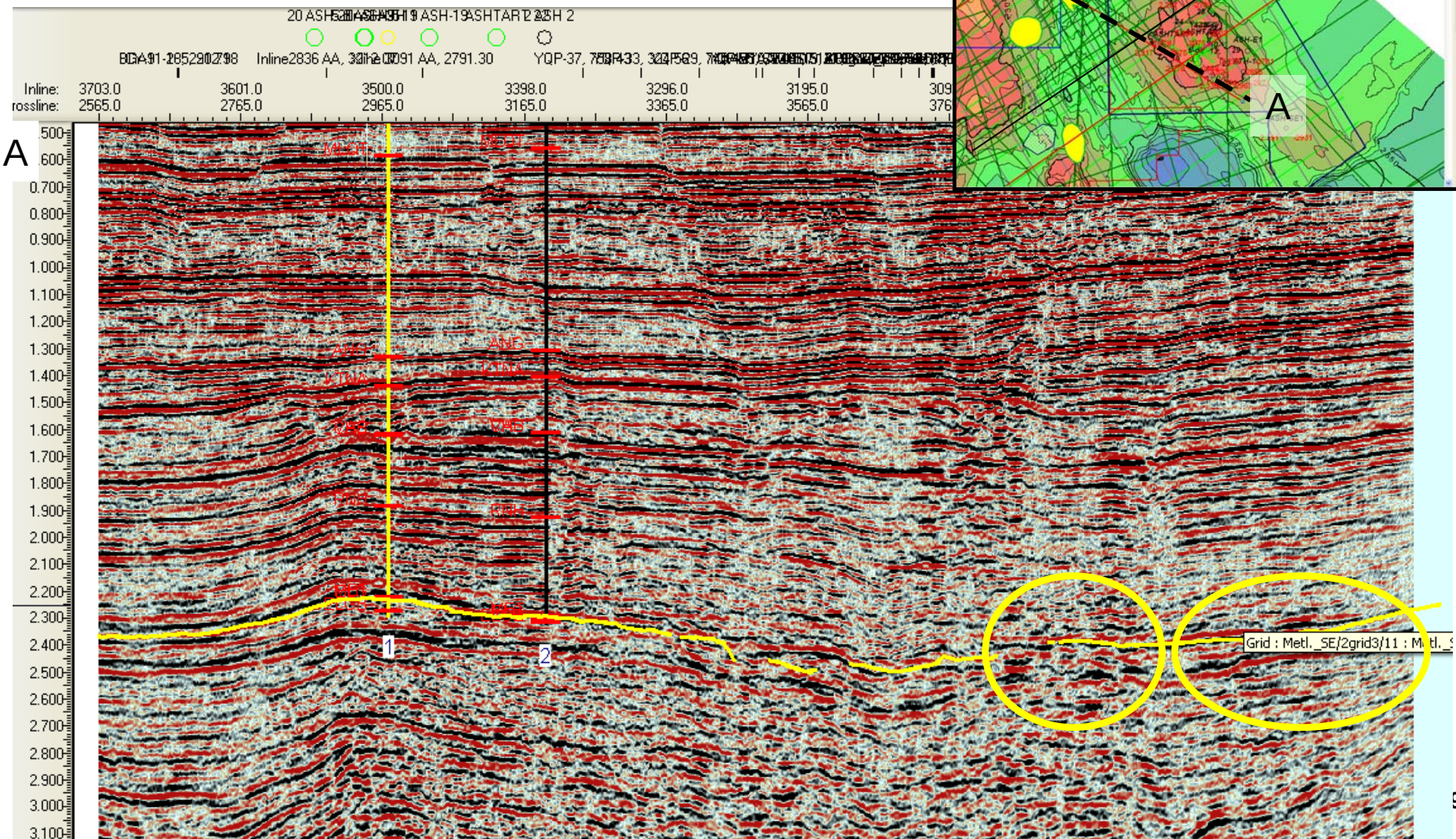




16, 17, & 18. Sidi Selam East (I and II) and West

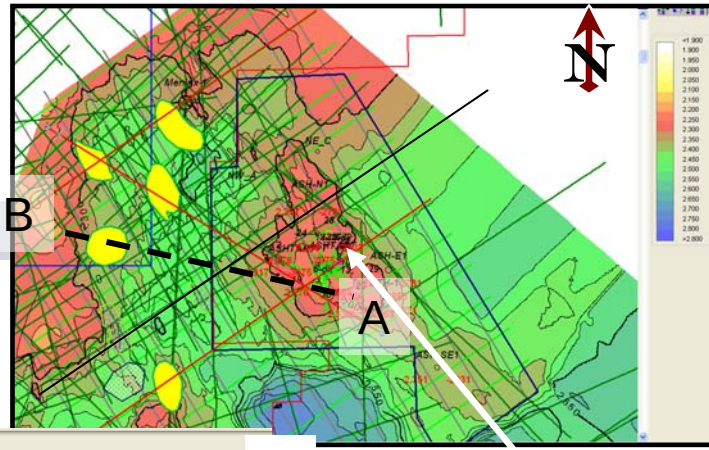
- Stratigraphically lower than the OWC in the Ashtart field
- Mennix-1 well did not find the El Garia reservoir



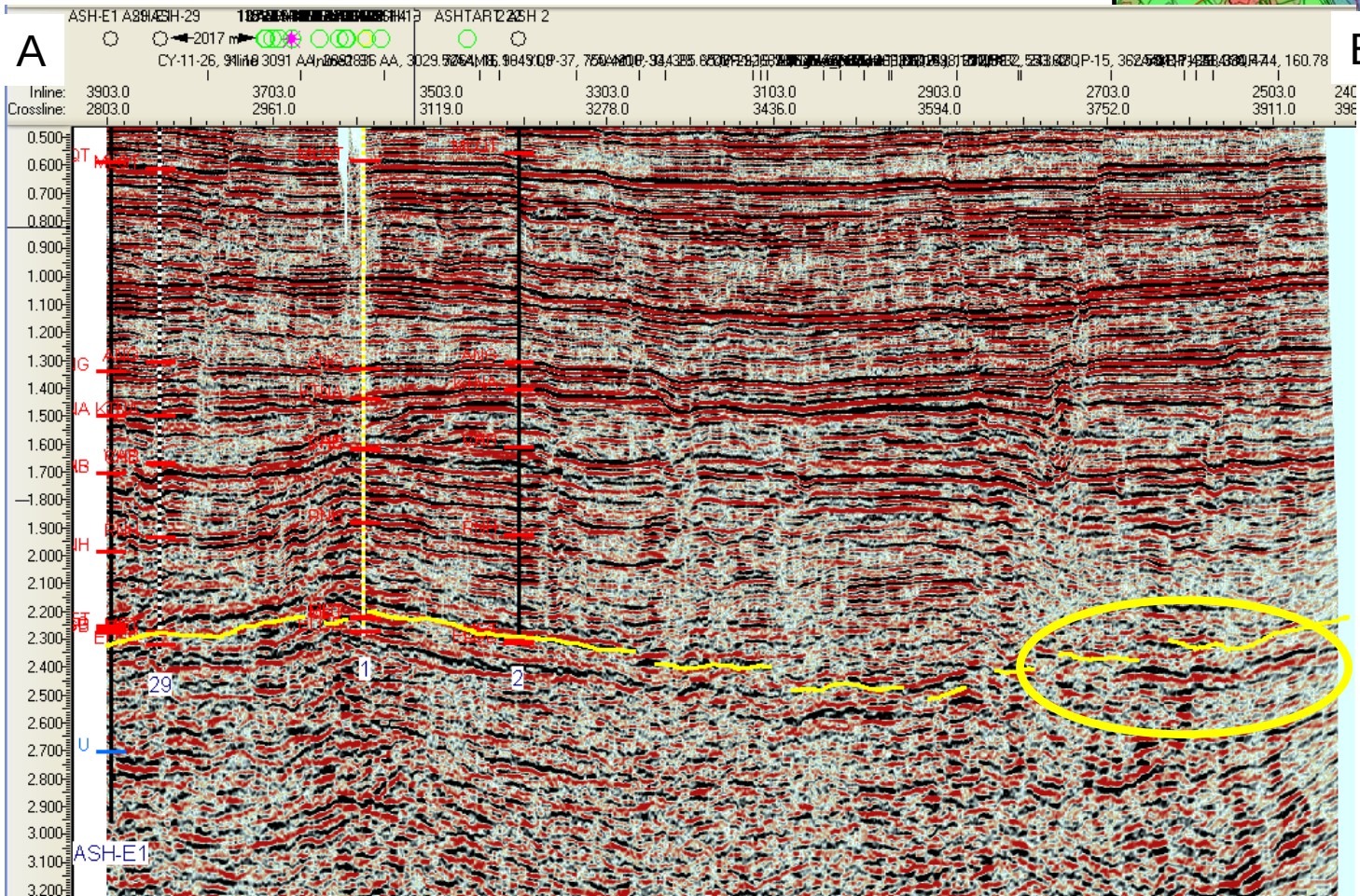


19 & 20. Tarf El Ma

•As in the other satellites, the question remains if the reservoir exists and if timing was appropriate to allow charge in this structure.



Ashtart Field



EXTENSION AREA
2D Area Review

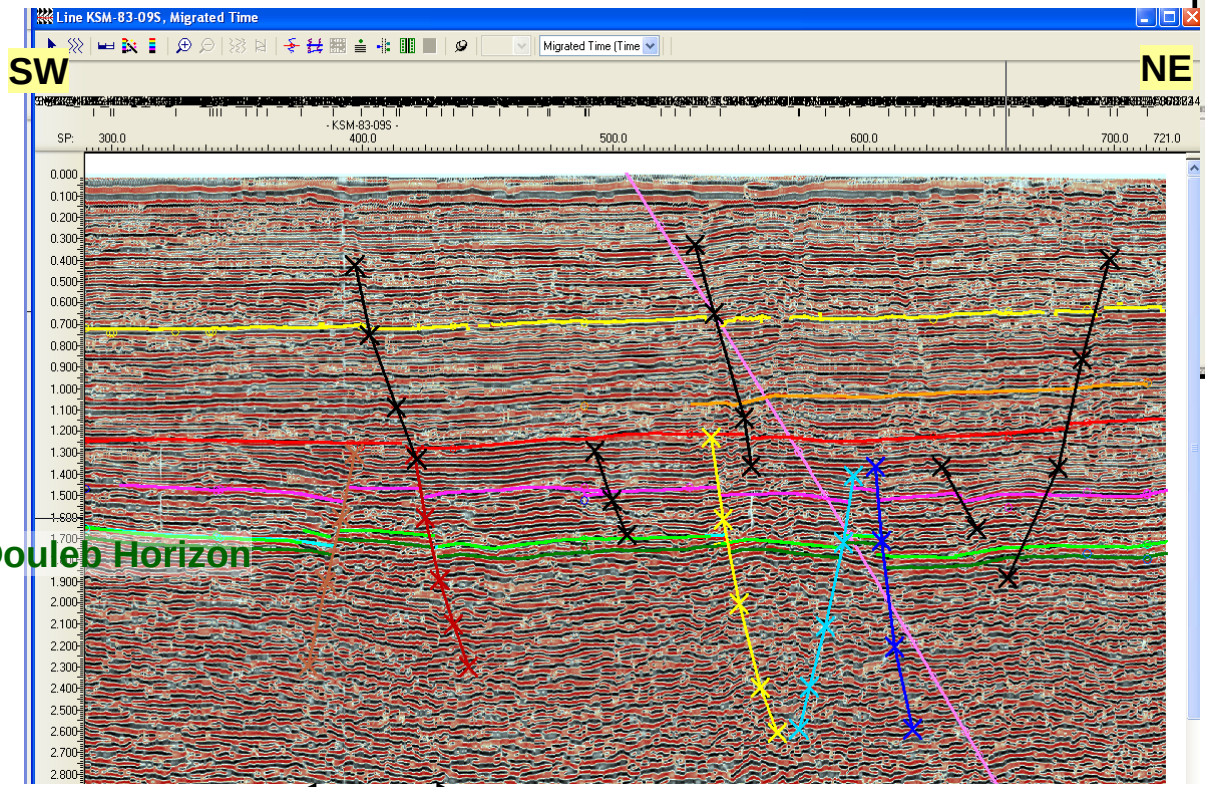
Prospect	#	Reservoir	APEX Area (acres)
Salloum South	**21**	**Douleb/Bireno**	**791**
Thyna	**22**	**Douleb/Bireno**	**680**
Thyna South	**23**	**Douleb/Bireno**	**1046**

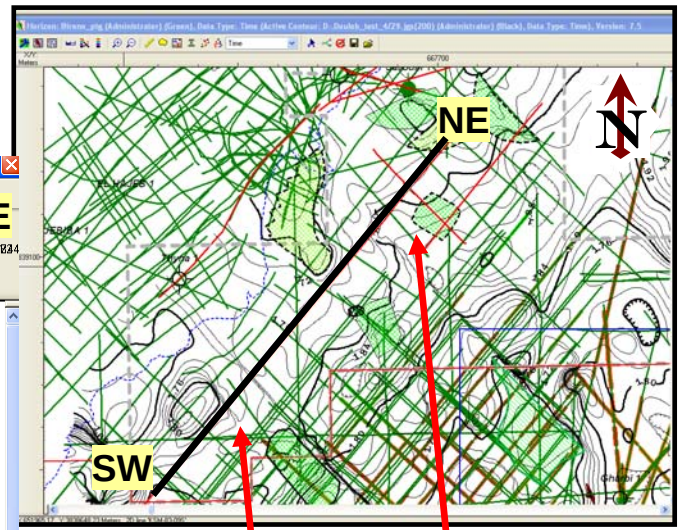
EXTENSION AREA
General Observation

- Area of limited 2D data
- There is a Douleb time map, with no corresponding Horizon Data. The Bireno horizon is picked in a few 2D lines
- Leads are mapped as being structurally separated from dry holes that are updip in a regional sense
- Current mapping is inadequate
- New 3D seismic data currently in processing covers the Salloum South lead and should increase understanding and confidence in this area

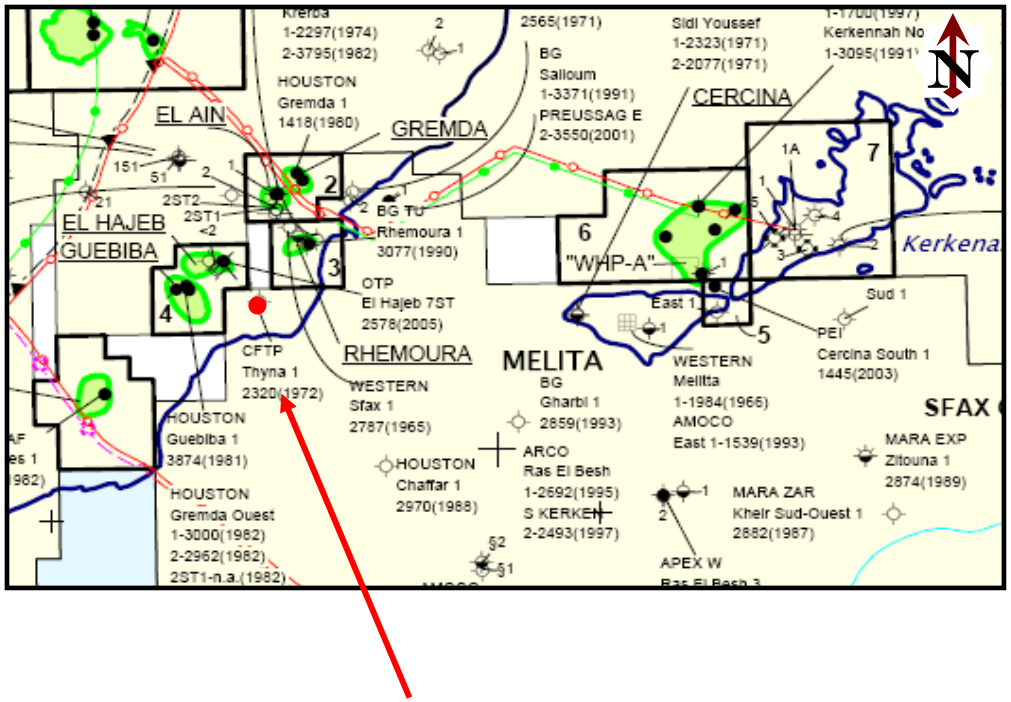
21. Salloum South

- Not well defined lead; limited data
- Structurally separated and lower than the Salloum Discovery
- Expected to be within the coverage area of the new 3D seismic survey





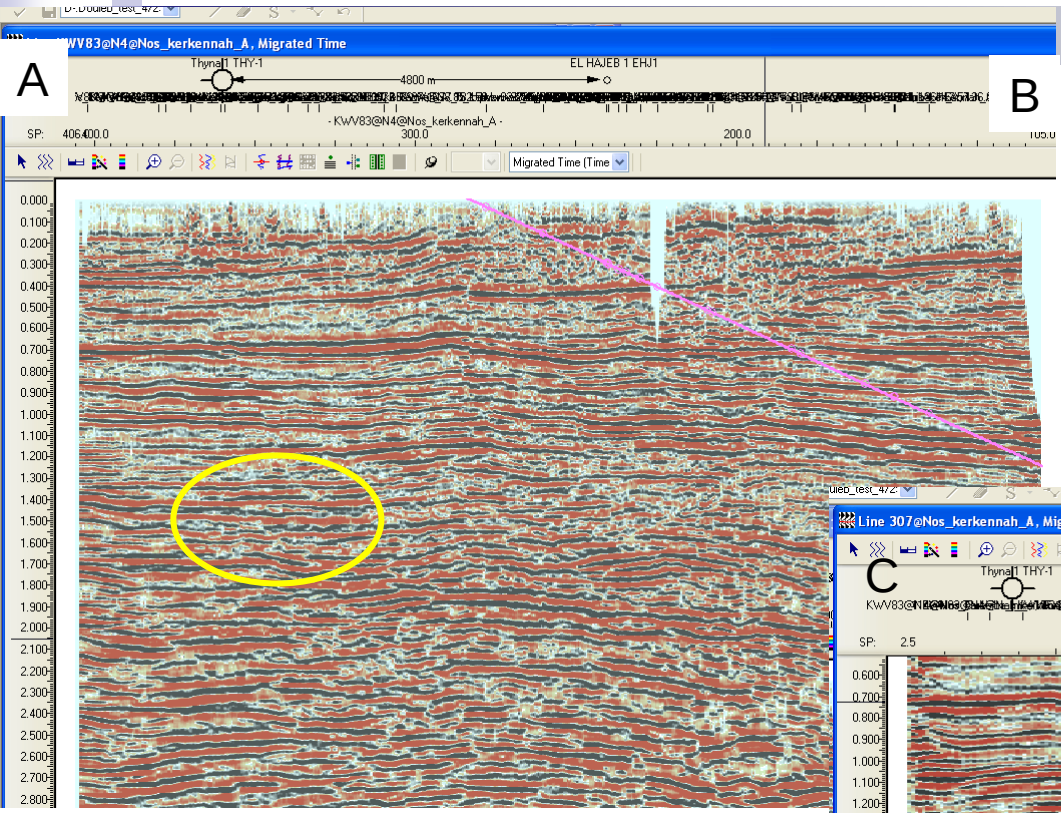
22. Thyna

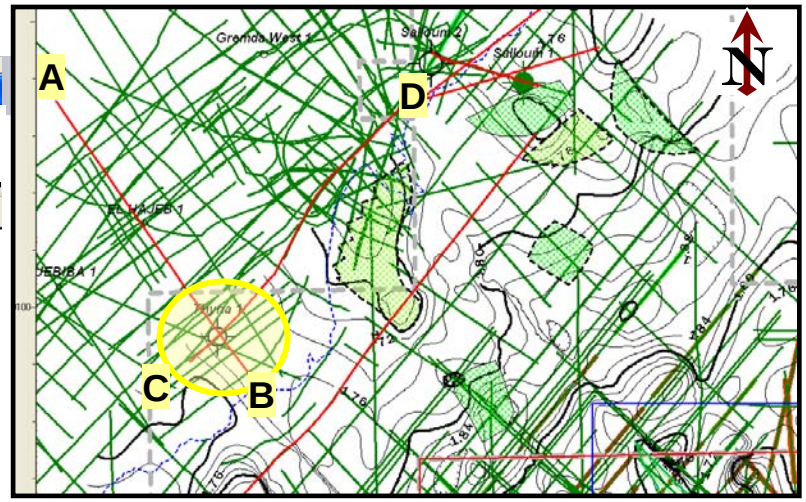


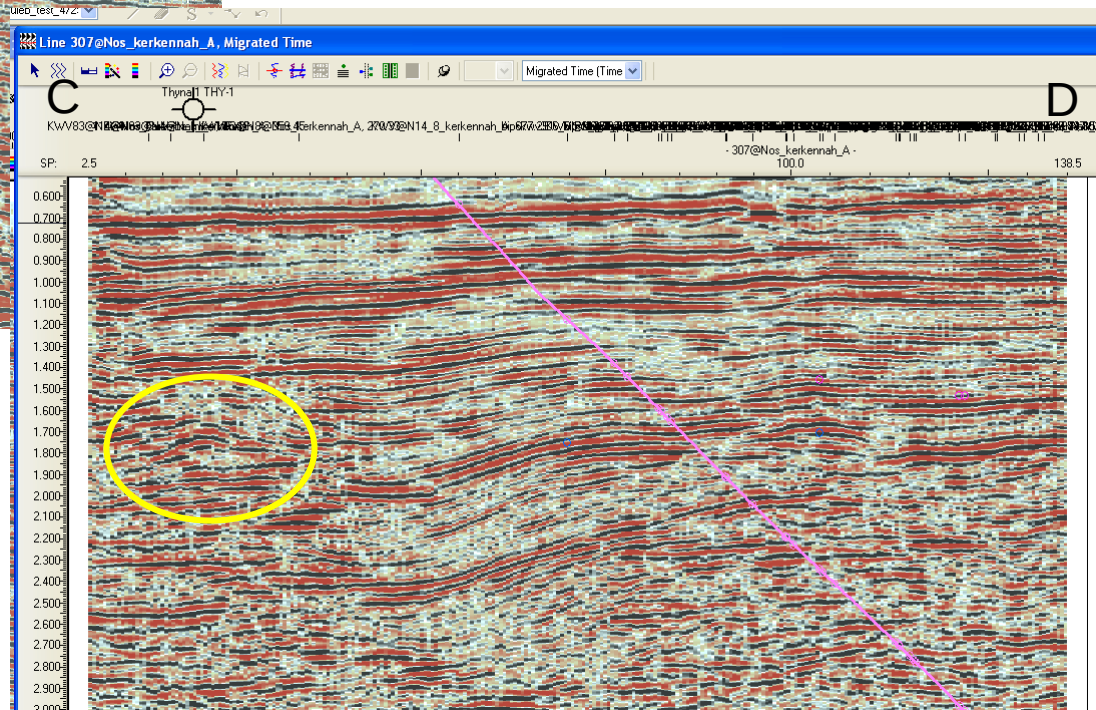
Thyna-1 Well was drill in 1972 to a total depth of 2320m.
The well is reported to be not deep enough to see the Bireno formation.

22. Thyna

- Located S-SE of El Hajeb 1 and Guebiba 1 locations
- No interpretation (horizons, maps) or surrounding well information is provided for this lead

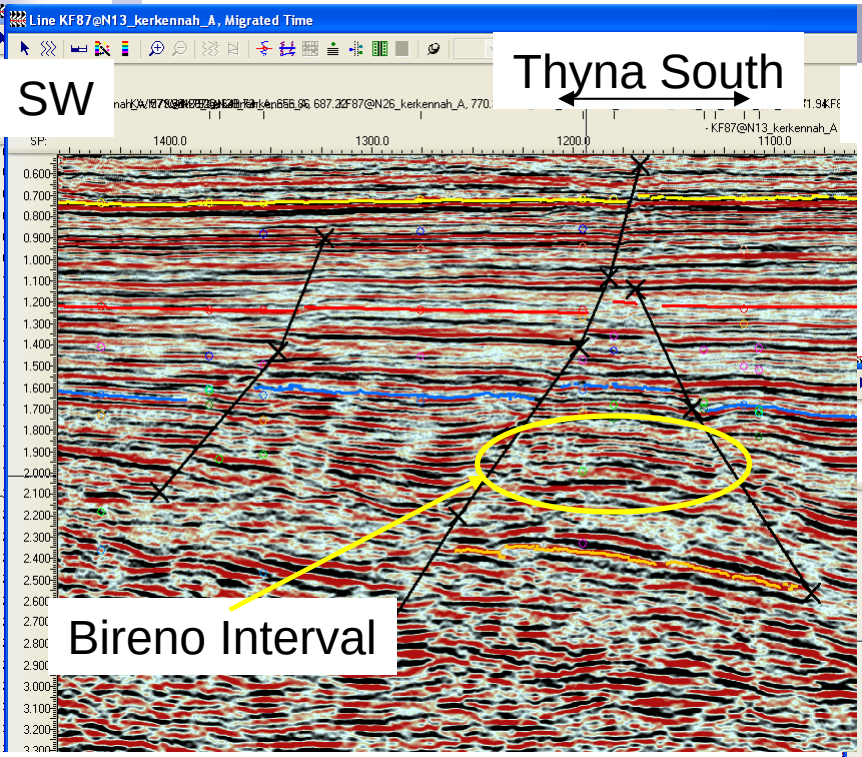


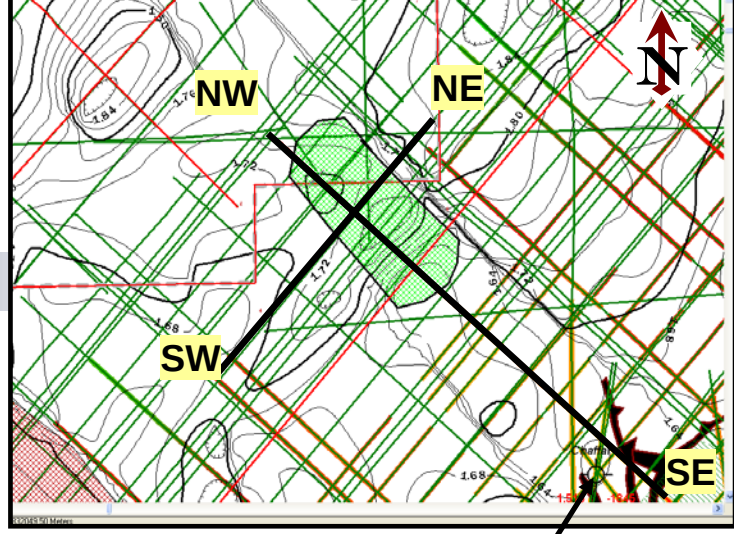


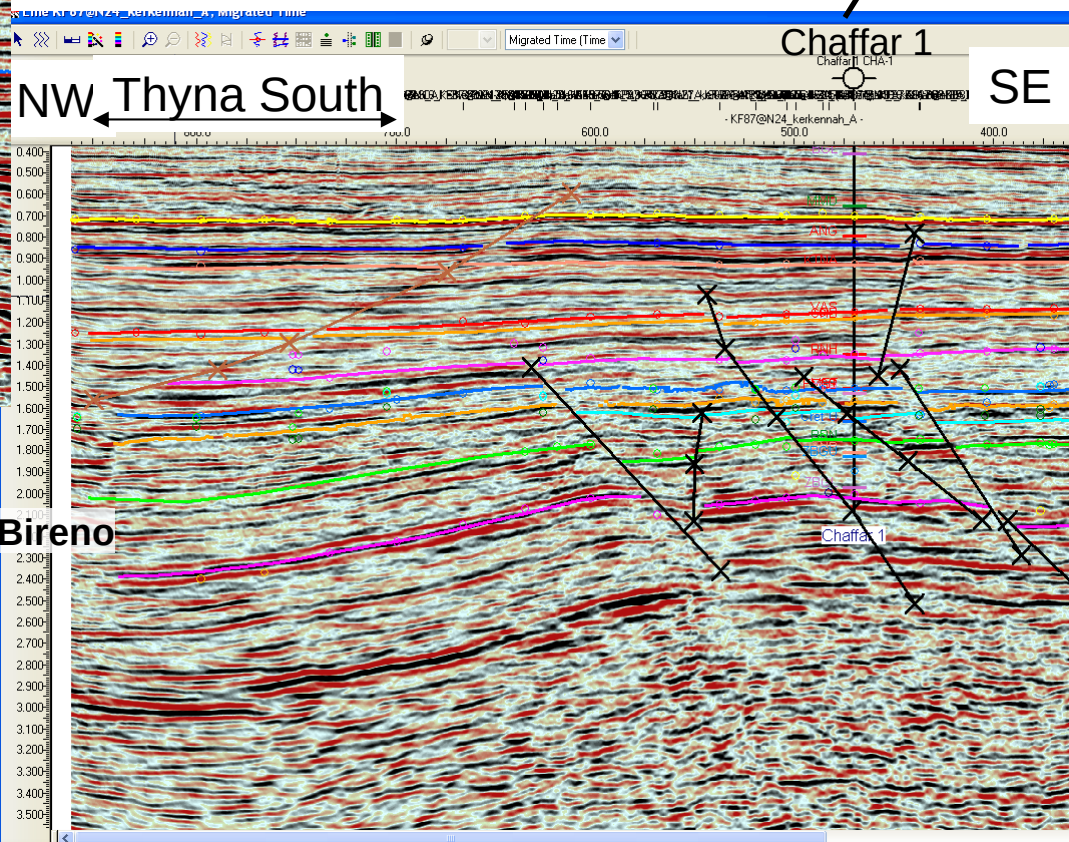


23. Thyna South

- Pop-up/Horst structure; climbing to the SE
- Located NW and shown structurally separated and lower than the Thyna 1 dry hole







ANADARKO Southern 2D Area Review

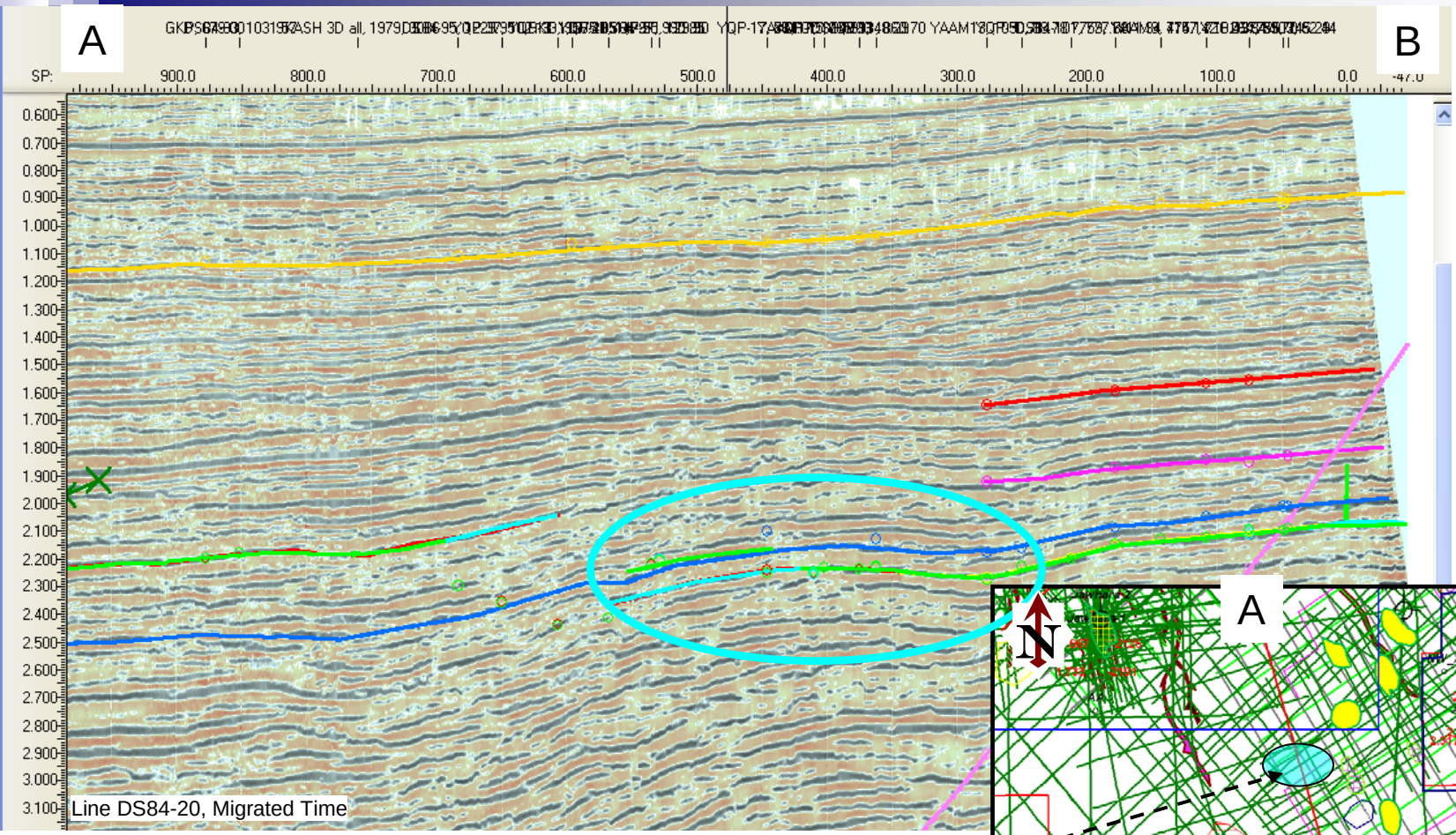
Prospect	#	Reservoir	APEX Area (acres)
Ashtart West	**24**	**El Garia**	**5906**
Pinchout	**25**	**El Garia**	**7592**

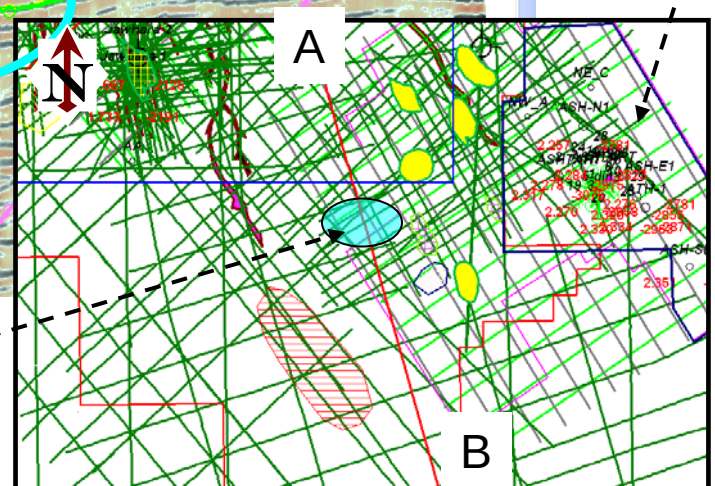
ANADARKO SOUTHERN
General Observations

- **Based mostly on 2D data**
- **There are good indications for both leads in the 2D seismic data**
- **Additional mapping is necessary to properly define the areal extent of the features**
- **Similar issues with the Satellite leads**
  - There are no producing wells in the flanks of the Ashtart field.
  - Is the reservoir there?
  - Is the timing there?

24. Ashtart West

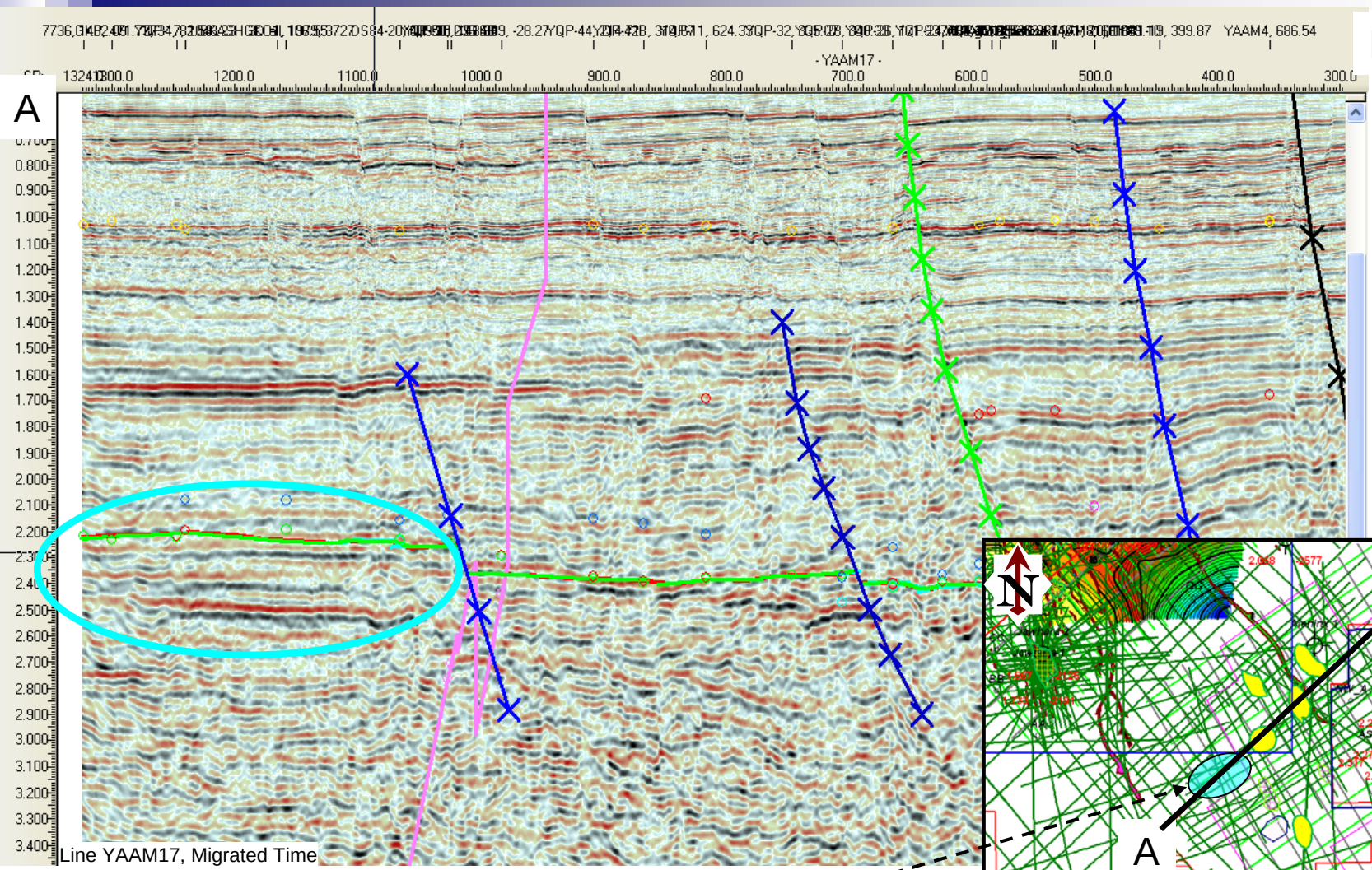
- At the edge of the 3D data.
- Down-dip from the Ashtart Field
- Anticlinal feature is seen in the 2D seismic; better in the N-S direction

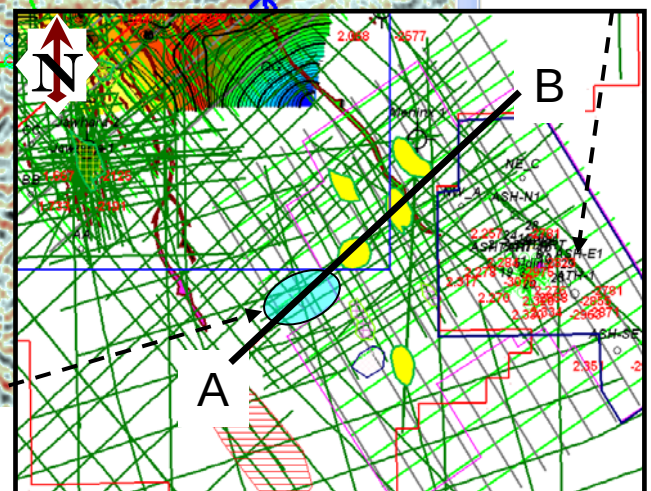




24. Ashtart West

•Not as evident roll in the SW-NE direction to define the 4-way closure



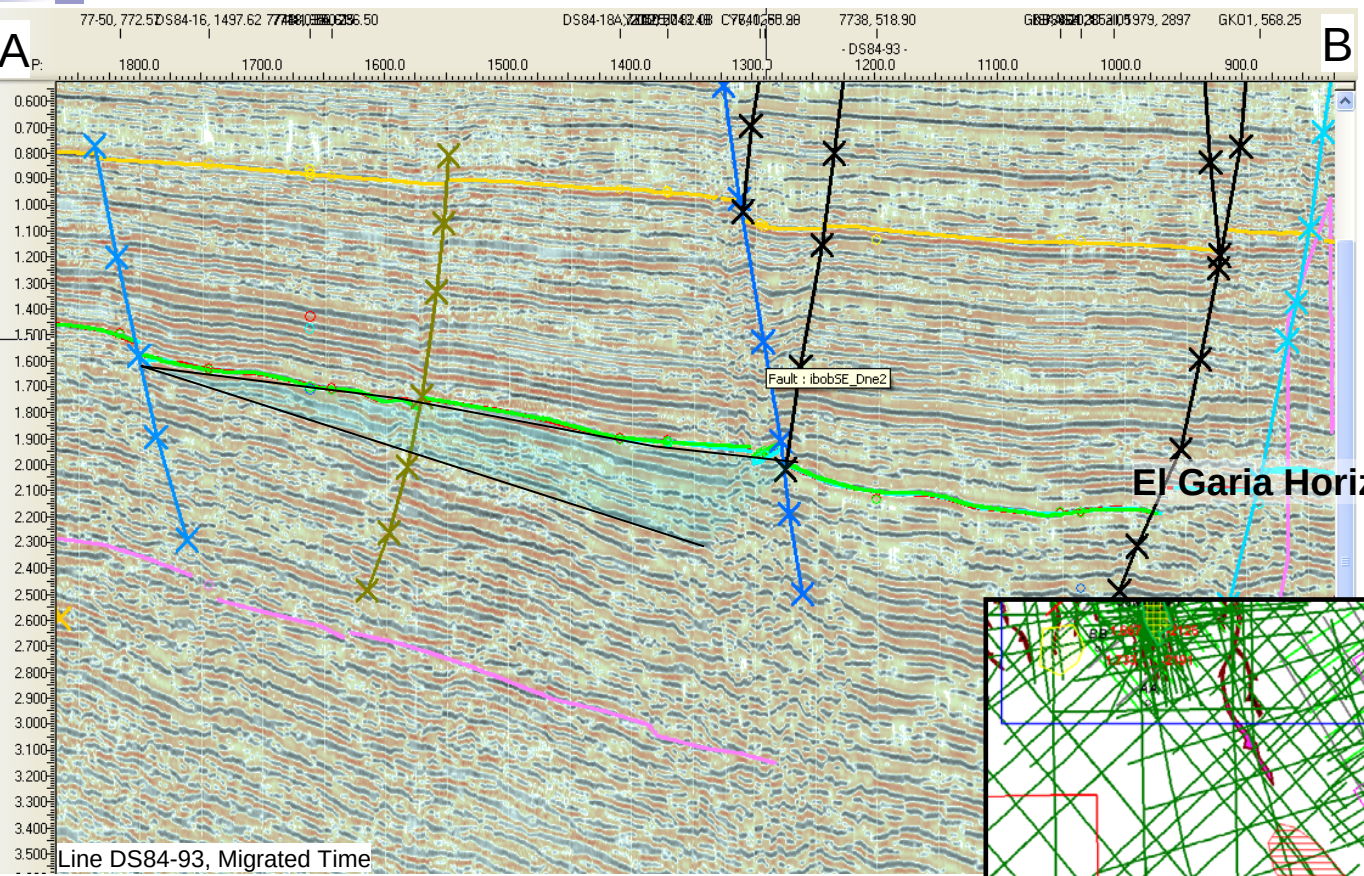


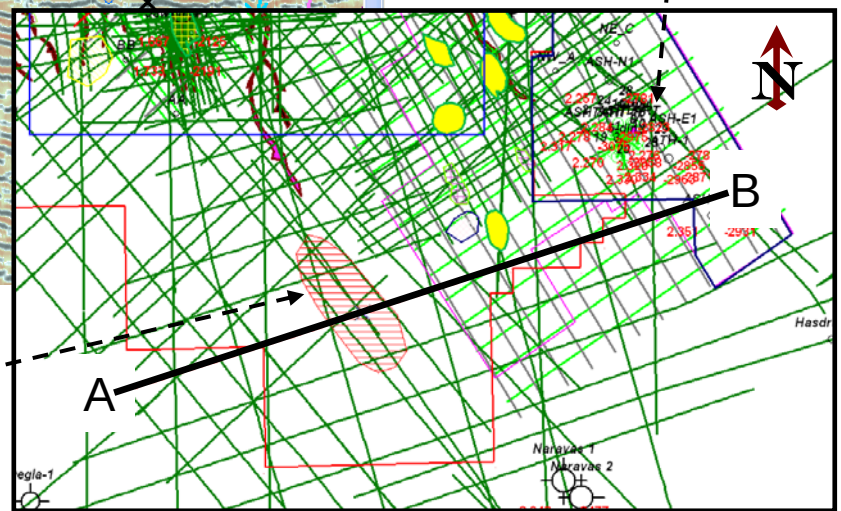
Ashtart field

Prospect Outline

25. Pinchout

- The Metloui pinch-out is clearly imaged in 2D seismic data
- There are no maps to illustrate the areal extent of the feature
- Reservoir quality, trap definition, and timing are considerable risk factors for this prospect





Sfax Offshore Permit

Petrophysical Review

Petrophysics Sfax Offshore APEx

- Petrophysics done on a random sample of wells to check APEx log interpretation
- Rw chosen by client checked and confirmed by GCA by the use of Pickett Plots
- Cutoffs used by GCA for the sums and averages are the same as used by the client: PHIE>.08, VCL<.4, and Sw<.6

Petrophysics
APEx

- Same log analysis method used by APEx and GCA, Archie
- Reasonable results found between APEx sums and averages and GCA sums and averages

Sfax Offshore Permit

Summation

Jawahara Valuation

The Jaw1 and Jaw1 NE areas have been valued based on maps provided by APEx and the results of the Jaw-1 and 2 wells

- **General Assumptions**
  - Cost
    - Vertical well US$14MM
    - Horizontal well US$ 18 MM
    - Injection well US$ 12 MM
  - Most likely case will use water flooding for maximum recovery
    - Annual decline rate 19.5 %
    - Recovery Factor of 25% in most likely case
  - Economic cut off
    - 50 bopd in vertical wells
    - 100 bopd in horizontal wells
    - Injection wells will run at 5000 bwpd

Jawahara Development Cases

The following table defines the minimum, most likely, and maximum cases for the the Jaw-1 discovery area

Case	Wells			OOIP MM stb	RF %	EUR MMstb
	Vertical	Horizontal	Injectors			
Minimum	5	0	0	58	15	8.7
Most Likely	2	6	4	135	25	33.8
Maximum	2	9	6	211	30	63.3
Well Cost			**Initial Rate bopd**	min	most likely	maximum
Horizontal	US$18MM		Horizontal	3000	3000	3200
Vertical	US$14MM		Vertical	1450	1450	1500
Injection	US$12 MM		Injection	5000 bwpd/well		

NPV valuation with sensitivities

NPV base case uses $63/bbl

Case	NPV10 US$MM	NPV15 US$MM	Sensitivities NPV10		Oil Price Sensitivity NPV10 US$MM		
			+20% CAPEX	+20% OPEX	$50	$70	$80
Minimum	8	3	-8	-14	-32	31	65
Most Likely	199	144	185	181	121	236	289
Maximum	337	233	323	321	235	391	467