

After the big bumps

Upgraded seismic, new QI methods plus the conventional exploration tool box show what to go for in the Persian Gulf

Trond Christoffersen (GGS AS), Katya Krylova (GGS Interica)

Agenda:

- Introduction and politics**
- A quick walk through the sweet-shop**
 - Geophysics**

WHO'S WHO ONE

GGS – Norwegian MC Seismic company.
Acquired, processed and holds the exclusive
licensing rights for PC-2000 (*)

INTERICA – Leading UK data management
company

GGS-Interica – JV managing reprocessing of
PC-2000 and markets the data in co-
operation with GGS.



(*) PC2000, for 15 years the world's largest MC2D seismic survey. 105,000 km covering the entire Iranian PG plus the Sea of Oman

(**) VP Sales and Marketing, GGS-Interica

(***) COO GGS

WHO'S WHO TWO



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(*) President of the USA

(**) President of France

(***) President of Iran

(****) President of Russia

(*****) President of China

(*****) No 5 heir to the Crown of the British Empire

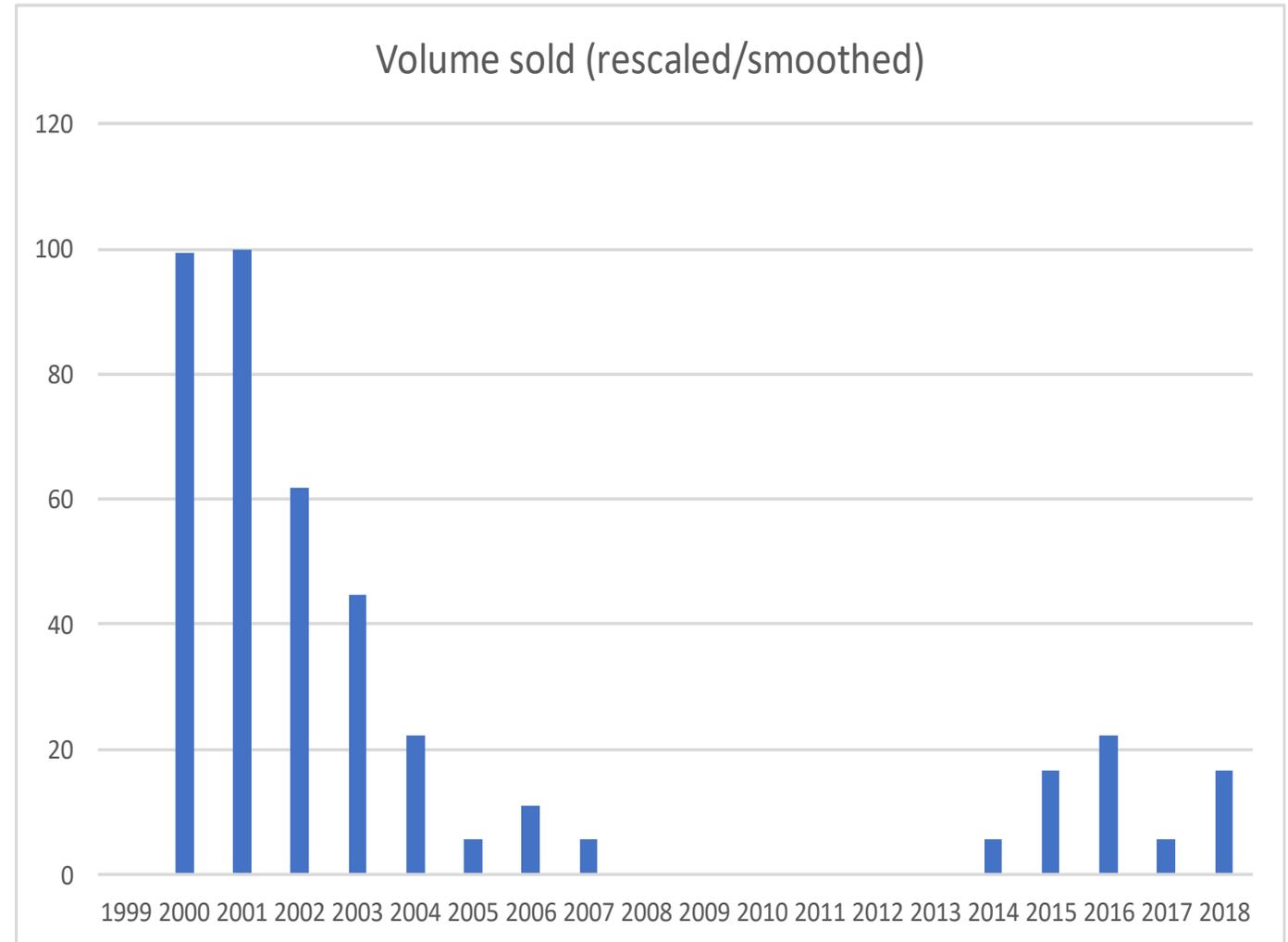
Purchased by 20 oil companies

- 8 Majors
- 10 Independents
- 2 NOCs

Working in Iran is all about long term commitment building trust and relationships

The successes and set-backs can be correlated with international relations (sanctions) and with the E&P terms.

Lessons have been learnt from the limitations of the Buy-Back contracts with the introduction of the IPC.



The USA withdrawal from the Iranian nuclear deal will no doubt stir up the path ahead.

New strict American sanction including secondary sections on non-American companies dealing with Iran.

To be seen:
Europe, Russia and China's response
The effect on Iran
For better or worse?

Not for the faint hearted.
Only for the ones with long term view.

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Total set to pull out of Iran gas deal without sanctions waiver

16 May 2018

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Iran nuclear deal



French energy giant Total is preparing to pull out of a billion dollar gas project in Iran in the face of renewed US sanctions.

Total said it will unwind operations by November unless sanctions are waived.

The Persian Gulf is heavily under-explored as illustrated by the field size distribution. Which has the distribution characteristics of a basin in an immature exploration stage.

Increased reserves will come from:

- Mapping additional reserves in already discovered fields (e.g. additional reservoir layers). Horizontal arrow.
- Making new discoveries. Vertical arrow.

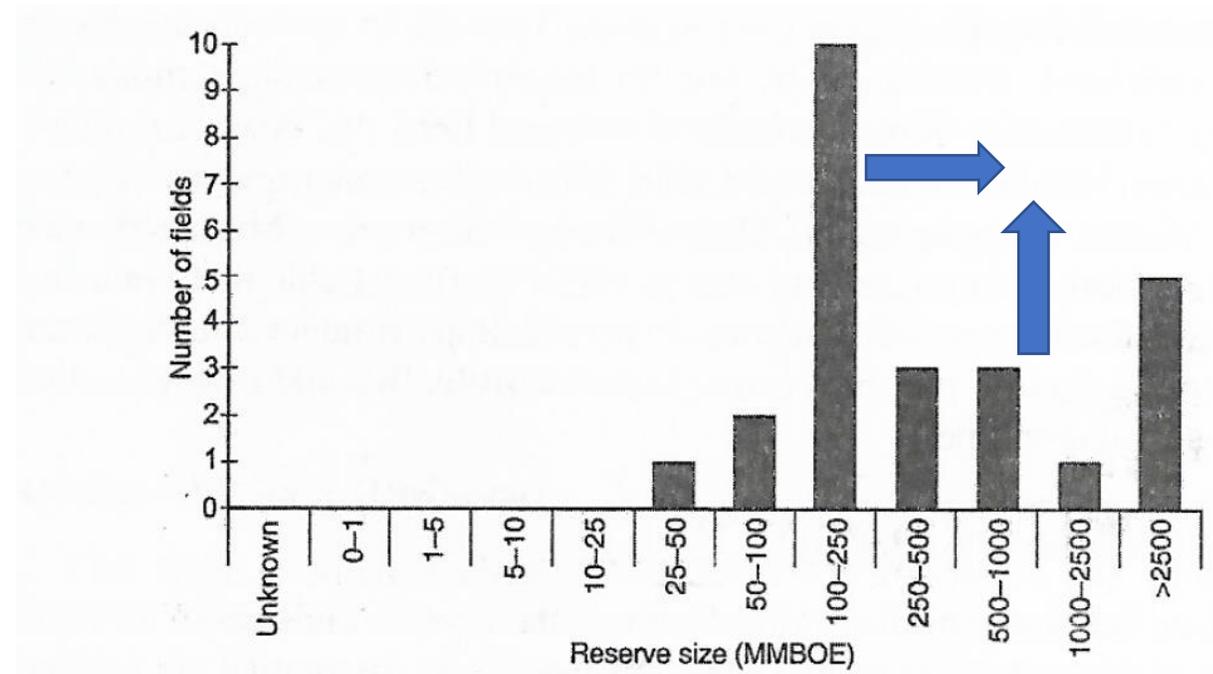


Figure 9-1. The reserves size distribution for Iranian petroleum fields in the Persian Gulf.

Which could lead to one of many possible outcomes.

Original chart from “Petroleum Geology of the Persian Gulf”, Tehran, 2010.

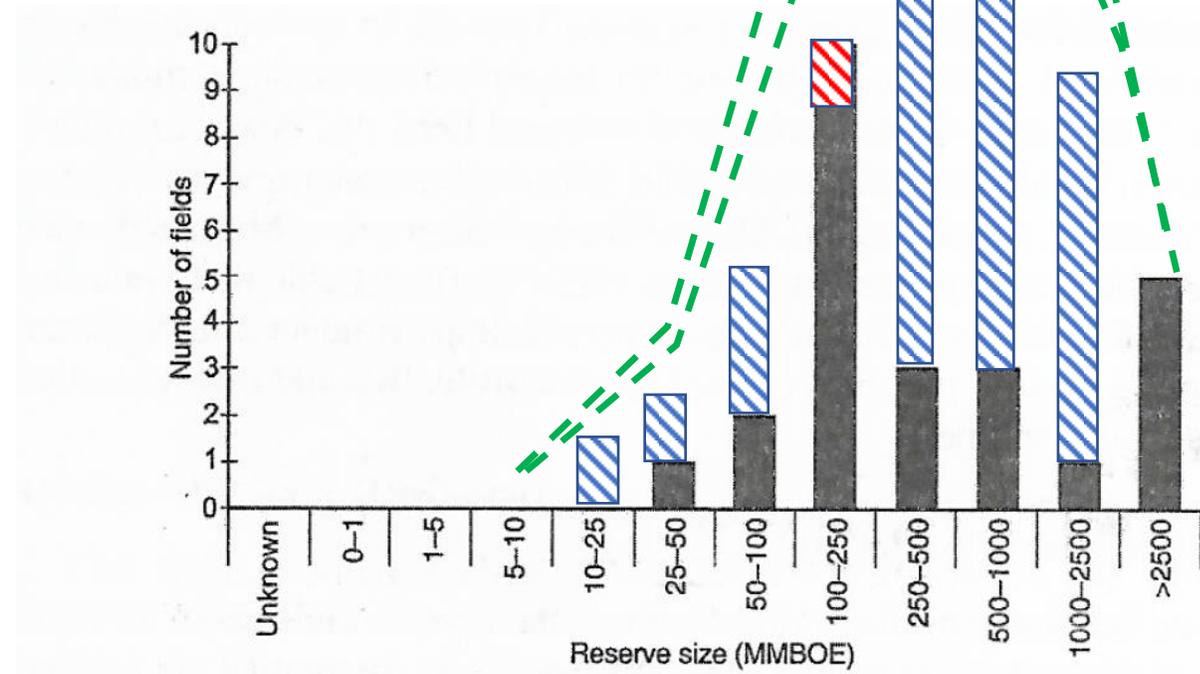
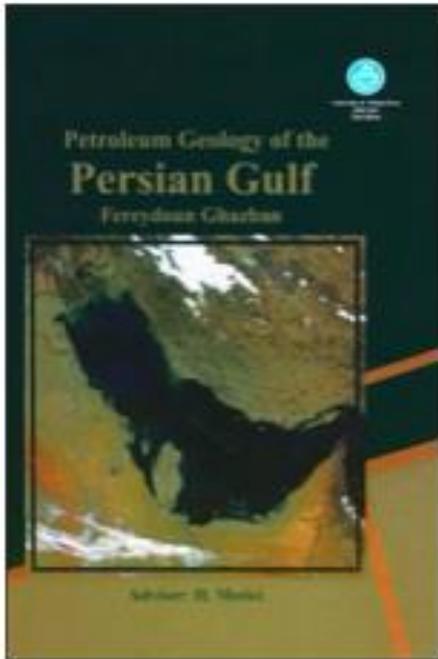
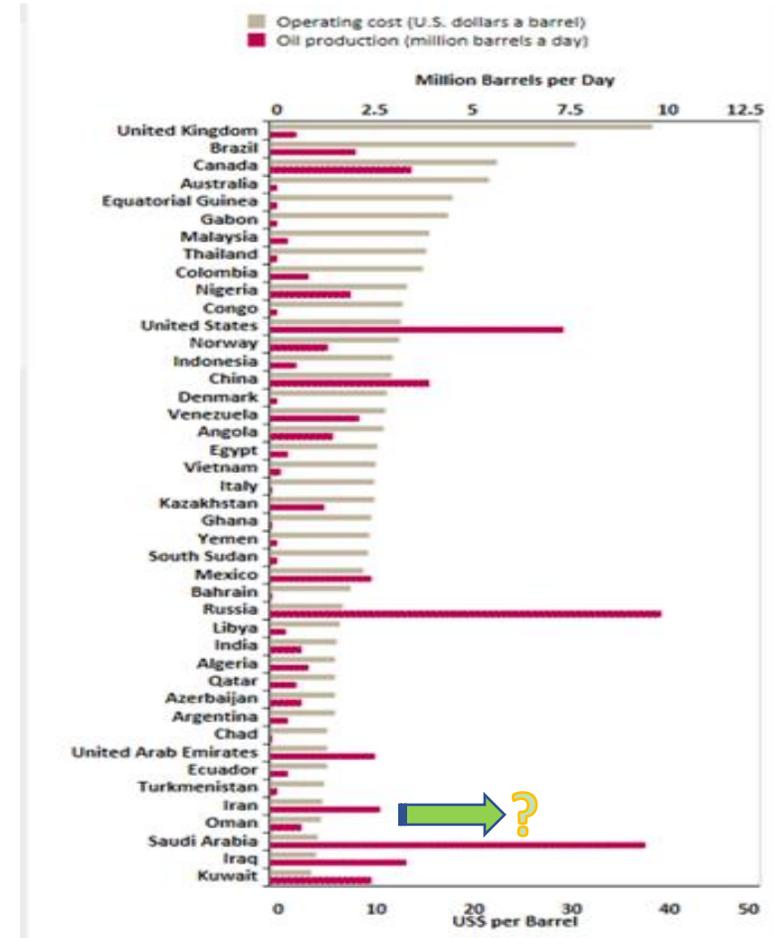


Figure 9-1. The reserves size distribution for Iranian petroleum fields in the Persian Gulf.

- Unique geological attractiveness
- Unique potential to large increase of production at low cost
- Unique possibility of establishing new player relations in the void after sanctions through balanced approach to exploration, development and IOR
- Terms enabling this seems now to be obtainable for win-win solutions (IPC vs Buy-Back)



IPC PROJECTS

Undeveloped and developed proven fields

52 Hydrocarbon Fields (26 packages)							
Oil Fields (29)- STOIP 391 BSTB				Gas Fields (23)- GIIP 255 TSCF			
Green (Undeveloped) Fields (12)		Brown (Developed) Fields (17)		Green (Undeveloped) Fields (21)		Brown (Developed) Fields (2)	
Onshore (9)	Offshore (3)	Onshore (12)	Offshore (5)	Onshore (13)	Offshore (8)	Onshore (2)	Offshore (0)
South Azadegan-Phase2	South Pars Oil Layer	Ahwaz-Bangestan	Foroozan	Halegan, Sefid-Baghoun, Sefid-Zakhor, Day and Aghar	South Pars (Phase 11)	Tang-e-Bijar and Ilam refinery	
Changuleh	Golshan&Ferdowski Oil Field	Mansouri-Bangestan	Soroosh	Khami Reservoirs	Farzad-A		
Darquain-3rd Phase (Bangestan)		Ab-Teymour	Nowrooz	Karun-Bangestan&NGL-1700	Farzad-B		
Susangerd, Jufair, Sepehr, Sohrab, Band-e-Karkheh and Arvand		Aban, Paydar, West-Paydar, Danan, Cheshmekhosh, Dalpari, Naft-Shar, Dehloran and Sumar	Dorood		North Pars		
				Salman Oil Field	Golshan&Ferdowski Gas Field		
					Kish (Phase 2&3)		

IPC PROJECTS

Exploration blocks offered

Sub-Basin/Basin	Block	
CENTRAL IRAN	KAVIR	
MOGHAN	MOGHAN	
PERSIAN GULF	BAMDAD MAHAN PARSA	
KOPE DAGH	SARAKHS DUSTI RAZ	
EASTERN IRAN	SISTAN	
TAYBAD	TAYBAD	
DEZFUL	ZAGROS	ABADAN
LORESTAN		TIMAB ZAHAB
FARS		TUDEJ
CASPIAN SEA	BLOCK 24 BLOCK 26 BLOCK 29 SARDAR -E-JANGAL	

- NIOC offers 18 E&P blocks which enclose six geological basins.
- The offered blocks are mixture of mature plays, high potential and new frontier basins.

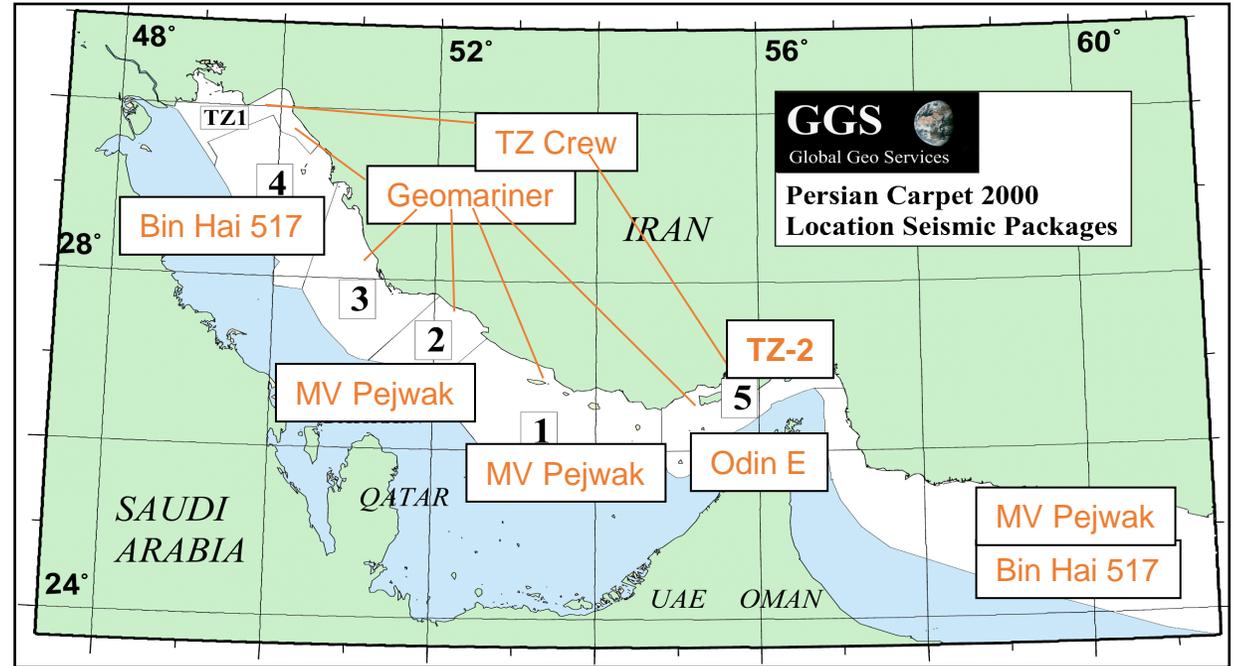


Up to 6 vessels acquiring data

105,000 km collected during a period of more than 2 years (1999-2002)

2km x 2km grid in the Persian Gulf, wider in the Sea of Oman

Truly international crews successfully completing a highly complex operation



TZ CREW BEACH



ODIN



BIN HAI 517



PEJWAK



MV GEOMARINER



TZ CREW TIDAL ZONE
HAI SHI (SHOOTING VESSEL) BIN HAI 504 (MOTHER SHIP)



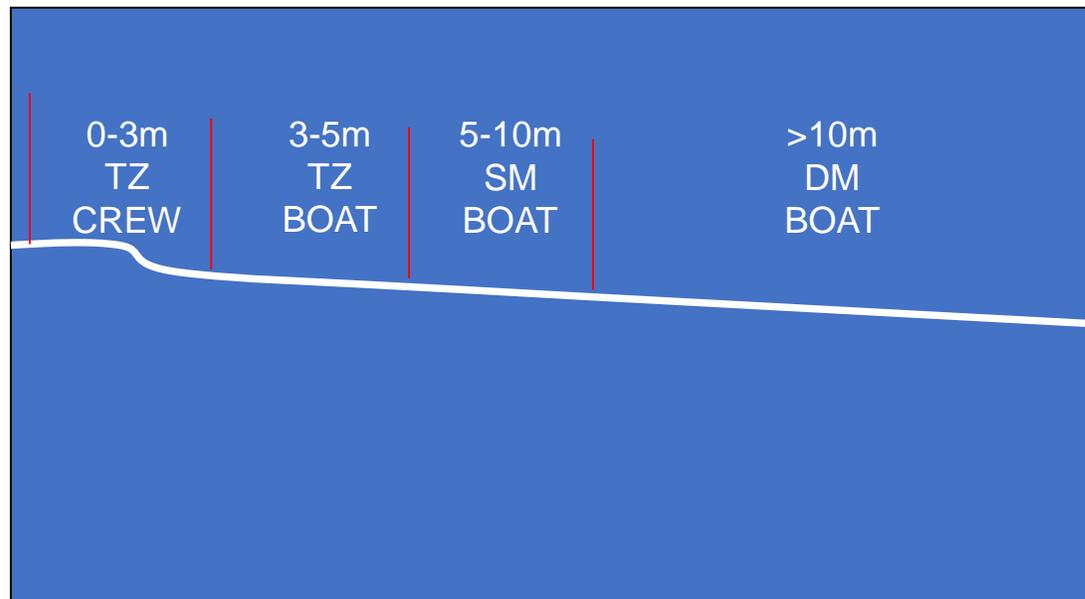
4 DATA COLLECTION METHODS

TZ DYNAMITE

TZ BOAT

SHALLOW MARINE VESSEL

DEEP MARINE VESSEL



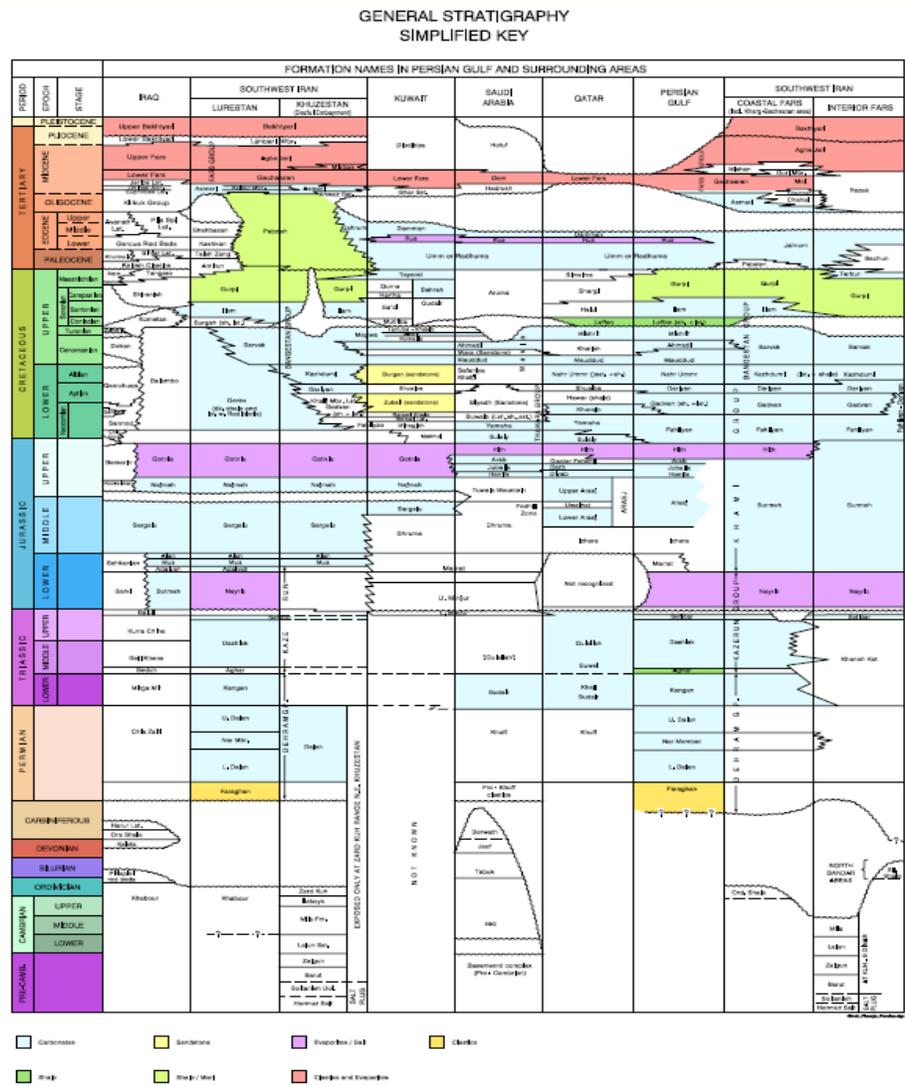
Data Collection Methods

.. what to go for in the Persian Gulf The tour

SIMPLIFIED KEY

Period	Epoch	Formation	Lithology
Tertiary	Mio	Fars	Clastics and Evaporites
		L. Fars	Clastics and Evaporites
		Khang	Clastics and Evaporites
	Oligo	Chahmah Member	Clastics and Evaporites
		Chehel Member	Clastics and Evaporites
Eo - Palaeo	Jahnum(Damman)	Carbonates	
	Rus	Evaporites/Galt	
Cretaceous	Upper	Tayrat	Carbonates
		Tarbour	Carbonates
		Bahra	Carbonates
	Middle	Gurpi	Shale/Marl
		Ilam	Carbonates
		Lafan	Shale
		Sanjak	Carbonates
	Lower	Darjani(Dhuwaba)	Carbonates
		Shuiba	Carbonates
		Zubair	Sandstone
Jurassic	Upper	Qasran	Carbonates
		Rafawi	Carbonates
		Kharabi	Carbonates
	Middle	Khalij Member	Carbonates
		Fahjan	Carbonates
		Yamaha	Carbonates
		Sulay	Carbonates
	Lower	Garau	Carbonates
		Hith	Evaporites/Galt
		Arab A B C D	Evaporites/Galt
Triassic	Upper	Jubaila	Carbonates
		Hanifa	Carbonates
		Dumrah	Carbonates
	Lower	L. Surmeih shale	Shale/Marl
		Daro	Carbonates
		Diyab	Carbonates
		Najmah	Carbonates
Permian	Upper	Darshak	Carbonates
		(Darshak DO)	Carbonates
	Lower	H-Nephrite	Evaporites/Galt
		Bluezone ?	Carbonates
		Gulshah	Shale
Carboniferous	Lower	Sudair	Carbonates
		Kangan	Carbonates
Permian	Lower	Dalan	Carbonates
		Nar Member	Carbonates
Permian	Lower	L. Dalan	Carbonates
		Farafrahan	Clastics
Permian	Lower	Silurian	Clastics

■ Shale ■ Clastics ■ Clastics and Evaporites ■ Shale/Marl
■ Carbonates ■ Sandstone ■ Evaporites/Galt



■ Carbonates ■ Sandstone ■ Evaporites / Galt ■ Clastics
■ Shale ■ Shale / Marl ■ Clastics and Evaporites

Generalized stratigraphy in the PG area

Key to formations

.. what to go for in the Persian Gulf

The tour

SIMPLIFIED KEY

Period	Epoch	Formation	Lithology
Tertiary	Mio	Fars	Clastics and Evaporites
		L. Fars	Clastics and Evaporites
		Kharg	Clastics and Evaporites
		Agha Jabr	Clastics and Evaporites
		Bahariyari	Clastics and Evaporites
	Oligo	Mishan	Clastics and Evaporites
		Guri Member	Clastics and Evaporites
	Eo - Palaeo	Sachsaran	Clastics and Evaporites
		Ghar	Sandstone
		(Ghar-Azhmari)	Sandstone
Cretaceous	Upper	Champeh Member	Clastics and Evaporites
		Chehel Member	Clastics and Evaporites
		Asmari	Carbonates
		Jahrum (Damman)	Carbonates
		Rus	Evaporites/Galt
	Middle	Radhuma	Carbonates
		Pabbeh	Carbonates
		Tayarat	Carbonates
		Tarbour	Carbonates
		Ehara	Carbonates
	Lower	Gurri	Shale/Marl
		Ilan	Carbonates
		Laman	Shale
		Sarvak	Carbonates
		Bangeestan	Carbonates
Jurassic	Upper	Mishrif	Carbonates
		Ahmadi	Carbonates
		Maudud	Carbonates
		Nahr Umm	Carbonates
		Kazhdumi	Carbonates
	Middle	Dair List	Carbonates
		A B C Sand	Sandstone
		Burgan	Sandstone
		Dariyan (Shuaiba)	Carbonates
		Shuaiba	Carbonates
Lower	Zubair	Sandstone	
	Gadvan	Carbonates	
	Ratawi	Carbonates	
	Kharab	Carbonates	
	Khali Member	Carbonates	
Triassic	Upper	Fahliyan	Carbonates
		Yamaha	Carbonates
		Sulbiy	Carbonates
		Garau	Carbonates
		Hith	Evaporites/Galt
	Middle	Gotnia	Evaporites/Galt
		Arab A B C D	Carbonates
		Jubail	Carbonates
		Hanifa	Carbonates
		Burmah	Carbonates
Lower	L. Burmah shale	Shale/Marl	
	Darb	Carbonates	
	Diyab	Carbonates	
	Najmah	Carbonates	
	Dargalu	Carbonates	
Permian	Upper	Aratli	Carbonates
		Mano Member	Carbonates
	Lower	Alan ec.	Carbonates
		Mus	Carbonates
		Adaya ec.	Carbonates
Permian	Upper	Bulmah	Carbonates
		Lithids Bed	Carbonates
	Lower	L.S.G.M.	Carbonates
		Neyriz	Evaporites/Galt
		Dashlak	Carbonates
Triassic	Upper	(Defdar Dol.)	Carbonates
		Hiranyidre	Evaporites/Galt
	Middle	Bluzzone ?	Carbonates
		Gulalah	Carbonates
		Aghar Shale	Shale
Permian	Upper	Sudair	Carbonates
		Kangan	Carbonates
	Lower	Dalan	Carbonates
		Nar Member	Carbonates
		L. Dalan	Carbonates
Permian	Upper	Faraghun	Clastics
		Shuman	Clastics
	Lower		

ASM - ASMARI

SAR - SARVAK

KAZ - KAZHDUMI

DAR - DARIYAN

GAD - GADVAN

FAH - FAHLIYAN

SUR - SURMEH

KAN - KANGAN

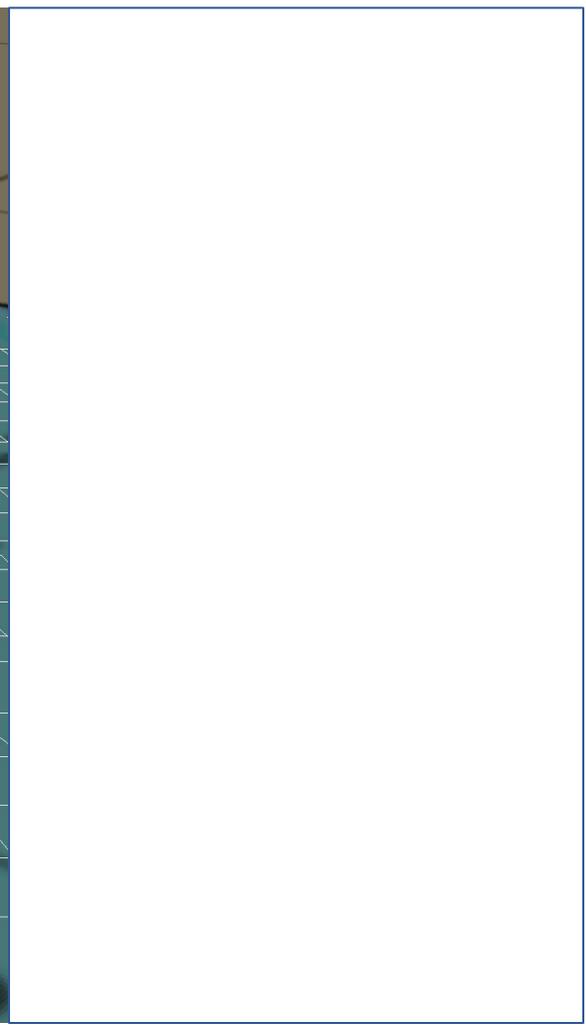
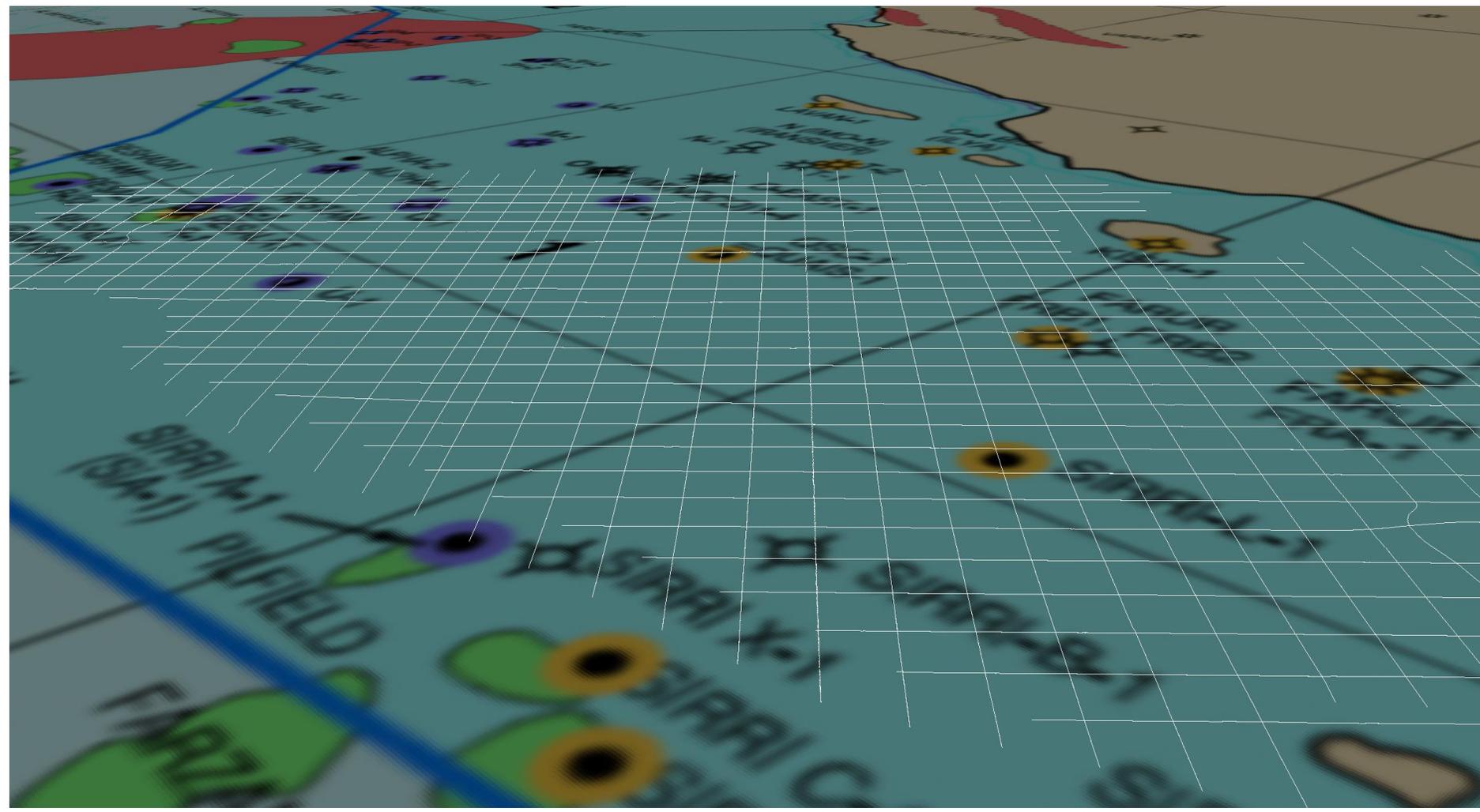
DAL - DALAN



Generalized stratigraphy in the PG area

Key to formations

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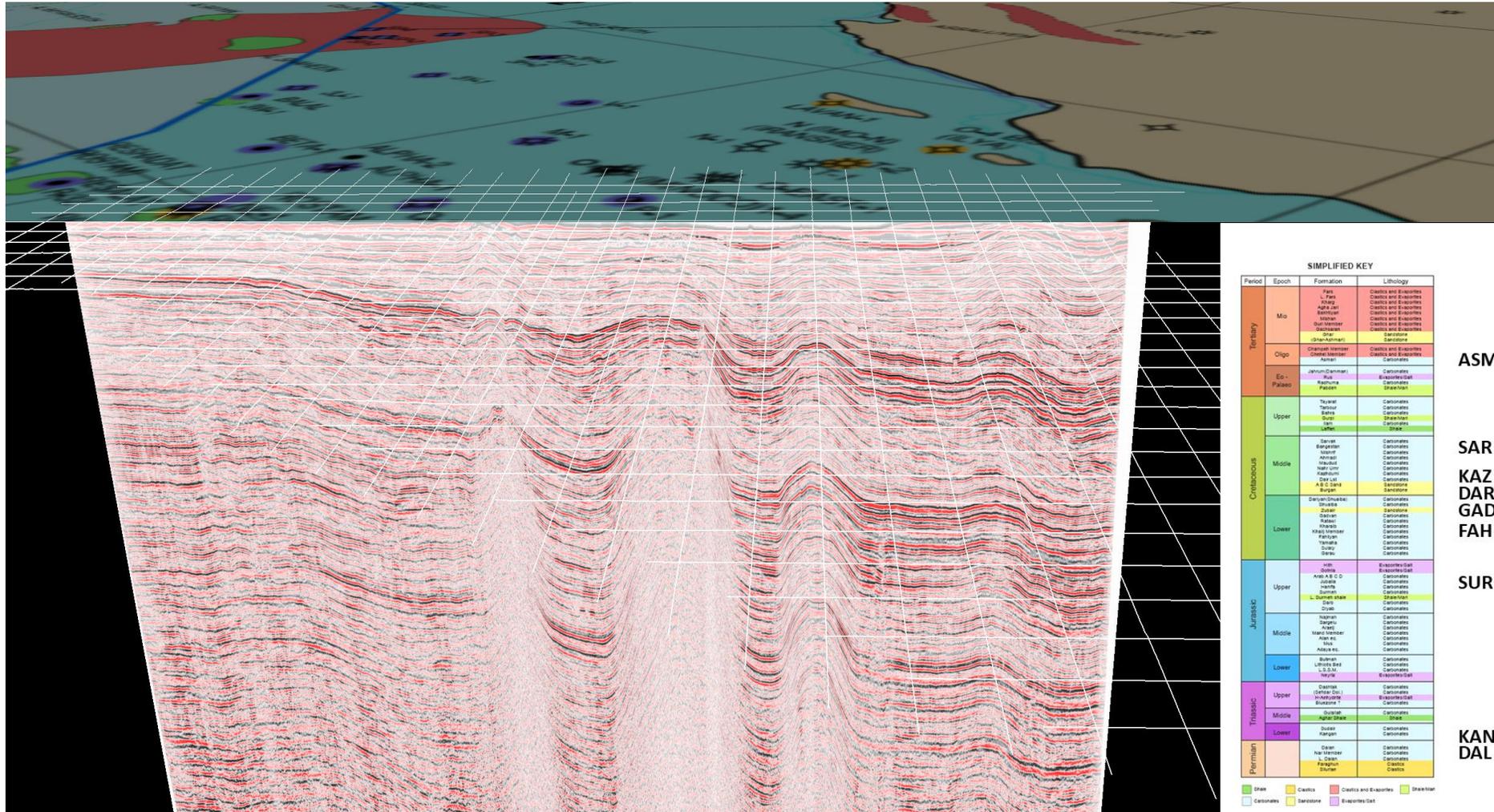
Reshadat



Disc. year	Prod. init. year	Dim. kmxkm	Seismic Data	No. Wells	Formation	API Degrees
1966	1969-72				Sarvak Dariyan Surmeh	20 32 37

Field	STOIP MMBbl	Cumulative Production MMBbl	Current Production MBbl/d	Total Estimated Production MBbl/d
Reshadat	«1-5 BBL»	101 (1980)	« > 100 MBL/d»	To be proposed by contractor

.. what to go for in the Persian Gulf The tour (Central)



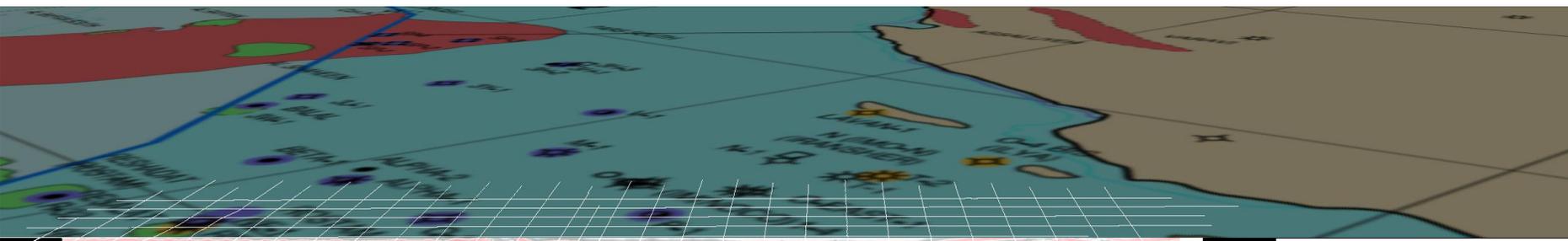
SIMPLIFIED KEY

Period	Epoch	Formation	Lithology
Tertiary	Pliocene	Pass	Clastics and Evaporites
		Avary	Clastics and Evaporites
	Miocene	Alghar	Clastics and Evaporites
		Bahriyat	Clastics and Evaporites
		Moghan	Clastics and Evaporites
Oligocene	Shahkhan	Clastics and Evaporites	
	Shahkhan	Clastics and Evaporites	
	Shahkhan	Clastics and Evaporites	
Eocene-Paleocene	Jahrum/Dammam	Carbonates	
	Rus	Evaporites/Dal	
	Palaeo	Carbonates	
Cretaceous	Upper	Taybar	Carbonates
		Taybar	Carbonates
		Shahkhan	Carbonates
	Middle	Sarraf	Carbonates
		Barghan	Carbonates
		Moghan	Carbonates
		Moghan	Carbonates
	Lower	Moghan	Carbonates
		Moghan	Carbonates
		Moghan	Carbonates
Jurassic	Upper	Shahkhan	Carbonates
		Shahkhan	Carbonates
	Middle	Moghan	Carbonates
		Moghan	Carbonates
		Moghan	Carbonates
	Lower	Moghan	Carbonates
		Moghan	Carbonates
Triassic	Upper	Shahkhan	Carbonates
		Shahkhan	Carbonates
	Lower	Shahkhan	Carbonates
Permian	Upper	Shahkhan	Carbonates
		Shahkhan	Carbonates
	Lower	Shahkhan	Carbonates

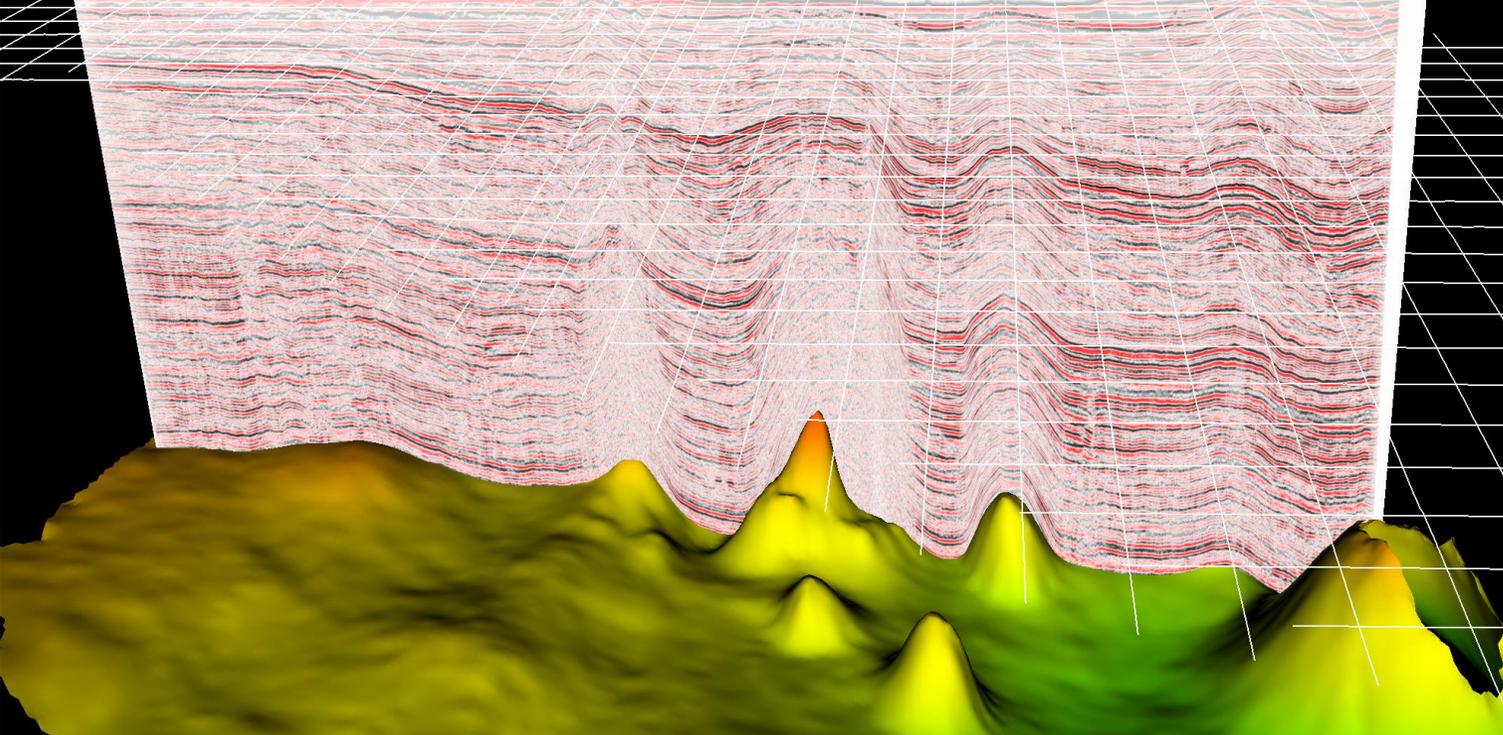
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Shale, Clastics, Carbonates, Evaporites, Sandstone, Evaporites/Dal, Shale/Slit

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Khuff
(Kangan, Dalan below)



SIMPLIFIED KEY

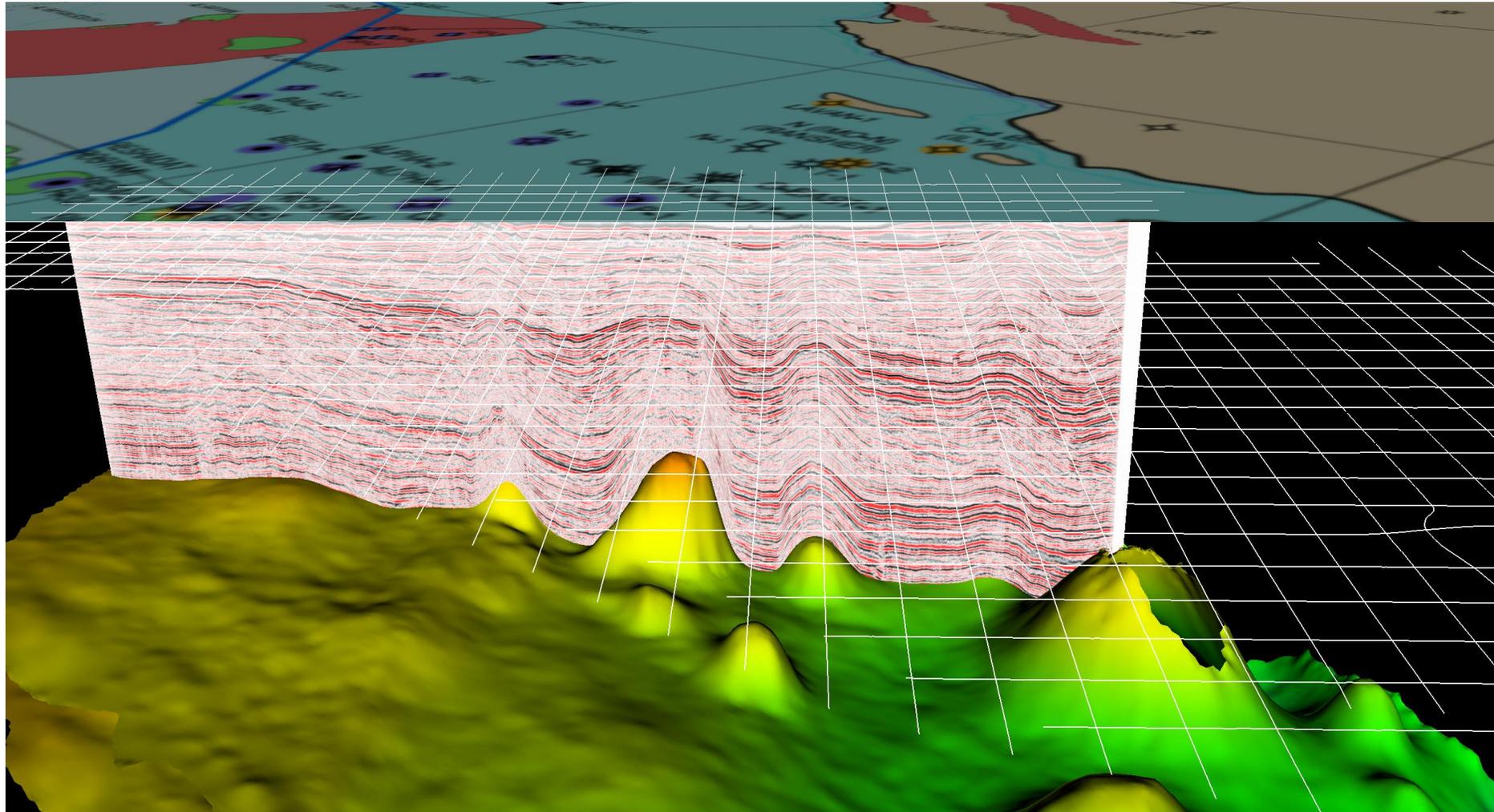
Period	Epoth	Formation	Lithology
Tertiary	Pliocene	Pass	Clastics and Evaporites
		Avary	Clastics and Evaporites
		Alghar	Clastics and Evaporites
	Miocene	Bahriyat	Clastics and Evaporites
		Moghan	Clastics and Evaporites
		Shah-Khman	Clastics and Evaporites
Oligocene	Chahmahk	Clastics and Evaporites	
	Chahmahk	Clastics and Evaporites	
Eocene-Paleocene	Jahrum/Dammam	Carbonates	
	Rus	Evaporites/Dal	
	Palaeon	Carbonates	
Cretaceous	Upper	Taybar	Carbonates
		Taybar	Carbonates
		Shah	Carbonates
	Middle	Sarraf	Carbonates
		Barghan	Carbonates
		Moghan	Carbonates
		Moghan	Carbonates
		High Line	Carbonates
		Moghan	Carbonates
		Dar Laj	Carbonates
A.S.C. Line	Carbonates		
Lower	Barghan	Carbonates	
	Shah	Carbonates	
	Shah	Carbonates	
Jurassic	Upper	Shah	Evaporites/Dal
		Shah	Evaporites/Dal
		Shah	Evaporites/Dal
	Middle	Shah	Carbonates
		Shah	Carbonates
Lower	Shah	Carbonates	
	Shah	Carbonates	
	Shah	Carbonates	
Triassic	Upper	Shah	Carbonates
		Shah	Carbonates
	Middle	Shah	Carbonates
Permian	Lower	Shah	Carbonates
		Shah	Carbonates
	Upper	Shah	Carbonates

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Shah Clastics Clastics and Evaporites Evaporites/Dal
Carbonates Sandstone Evaporites/Dal



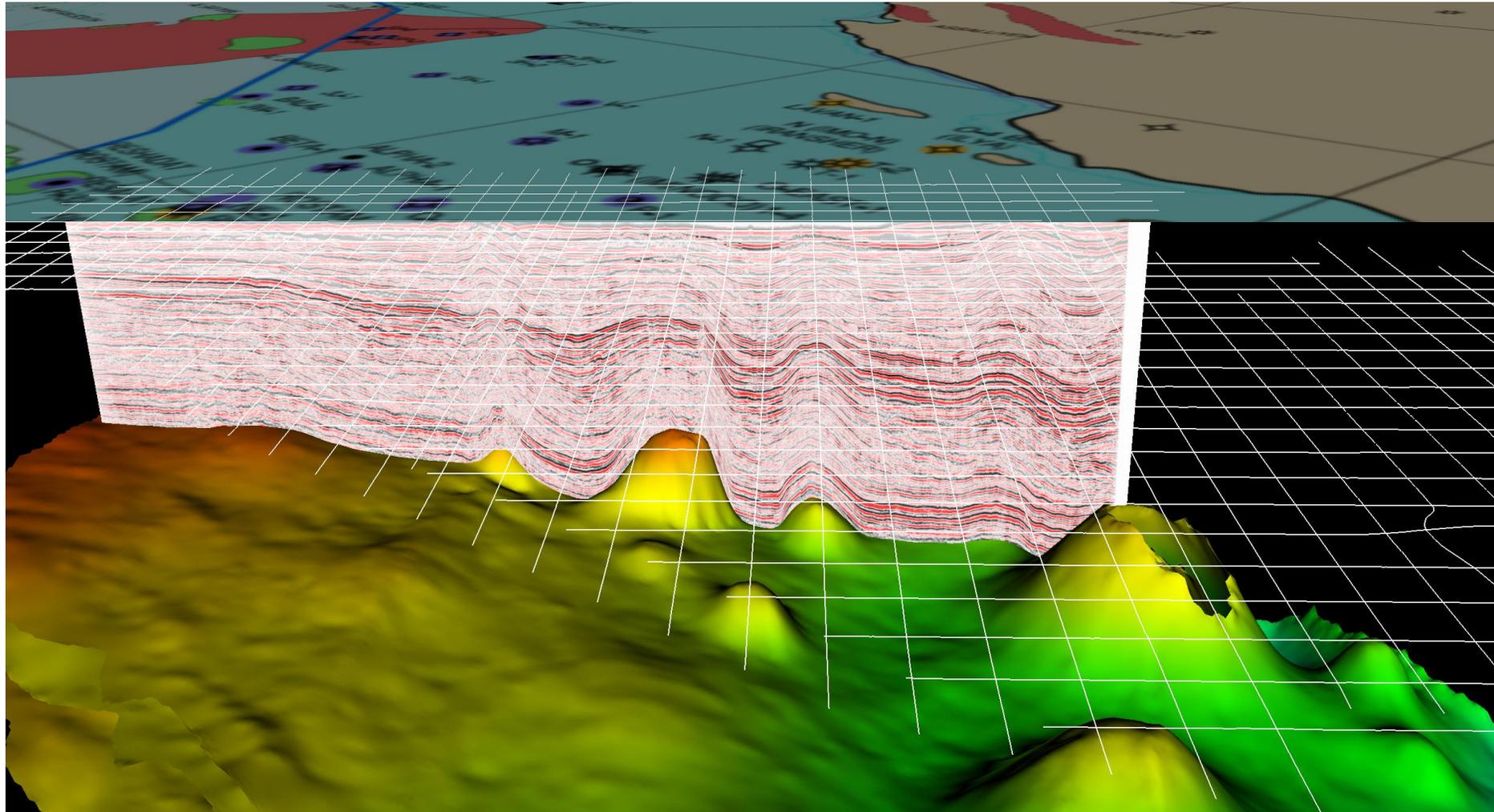
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NT Hith
(Surmeh below)



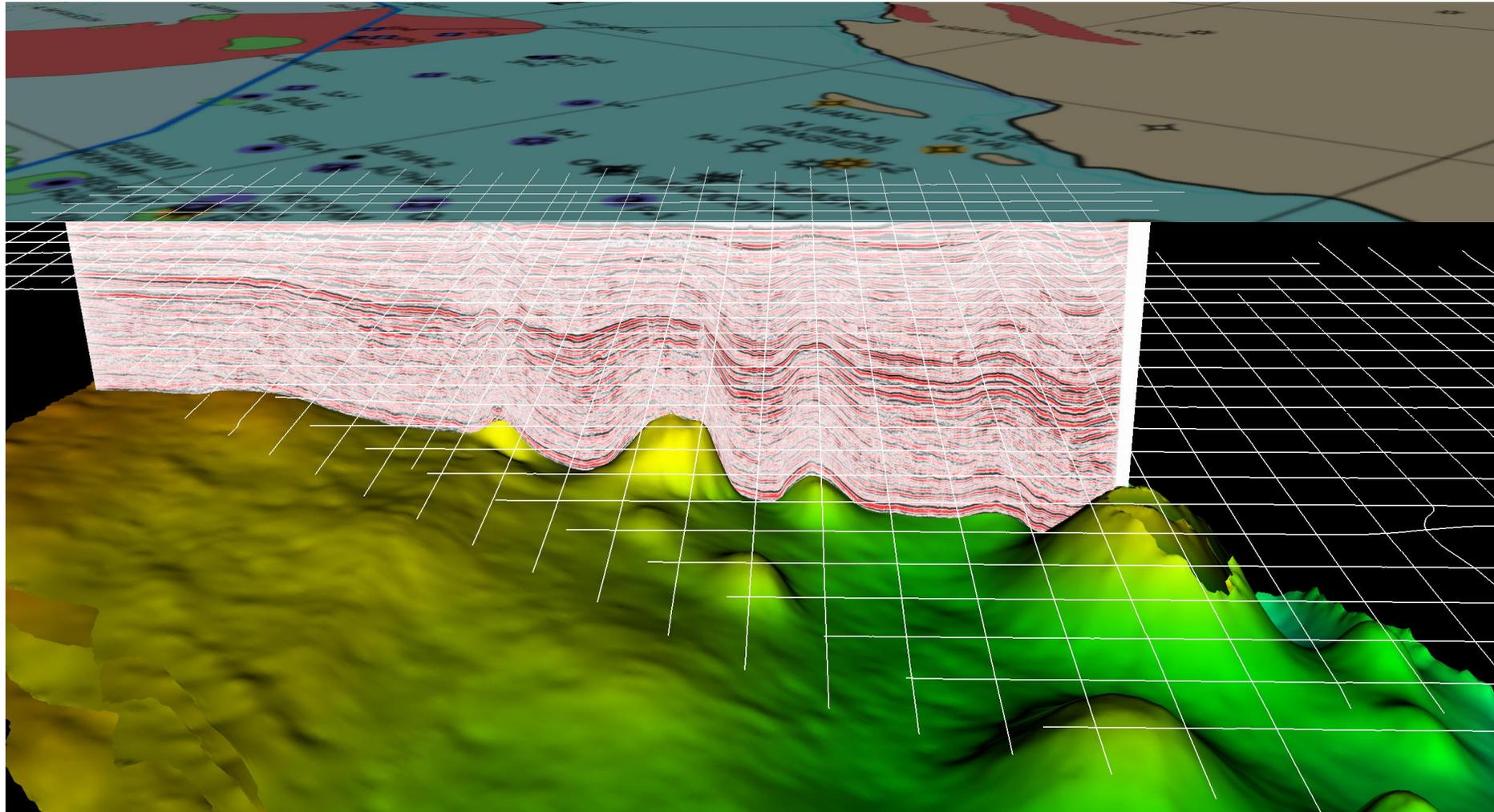
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NT Dariyan
(Dariyan, Gadvan, Fahliyan
below)

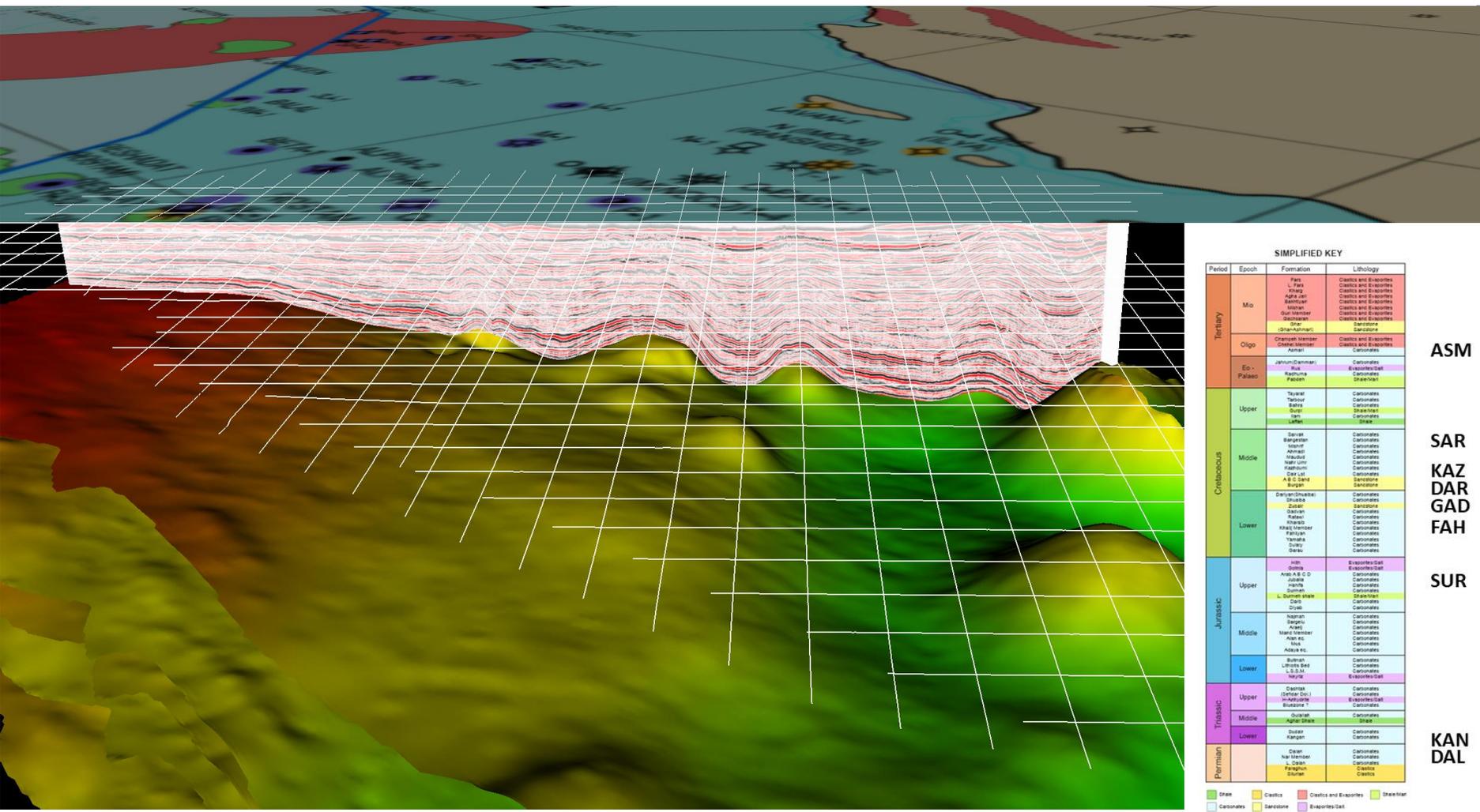


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Turonian UC
(Sarvak below)

.. what to go for in the Persian Gulf The tour (Central)



Oligocene UC
(Asmari just above)

SIMPLIFIED KEY

Period	Epoch	Formation	Lithology
Tertiary	Miocene	Fars	Clastics and Evaporites
		Utaq	Clastics and Evaporites
		Abi	Clastics and Evaporites
		Bahmani	Clastics and Evaporites
		Qasbi Member	Clastics and Evaporites
	Oligocene	Cheragh Member	Clastics and Evaporites
		Asmari	Clastics and Evaporites
	Eocene-Paleocene	Jabrud (Asmari)	Carbonates
		Ras	Evaporites/Gas
		Maqun	Carbonates
Cretaceous	Upper	Tajaki	Carbonates
		Tarbur	Carbonates
		Salma	Carbonates
		Yam	Evaporites/Gas
		Yam	Carbonates
	Middle	Sarab	Carbonates
		Bargestan	Carbonates
		Amadi	Carbonates
		Mahudi	Carbonates
		Nahr Umr	Carbonates
Lower	Das	Carbonates	
	A. S. C. Das	Carbonates	
	Buzg	Carbonates	
	Darvazeh	Carbonates	
	Shabab	Carbonates	
Jurassic	Upper	Yah	Evaporites/Gas
		Jahra	Carbonates
		Amir A B C D	Carbonates
		Amir	Carbonates
		Sumar	Carbonates
	Middle	L. Dornak	Carbonates
		Das	Carbonates
		Das	Carbonates
		Napash	Carbonates
		Amir	Carbonates
Lower	Amir	Carbonates	
	Amir	Carbonates	
Triassic	Upper	Darvazeh	Carbonates
		Das	Carbonates
	Middle	Amir	Carbonates
		Amir	Carbonates
		Amir	Carbonates
Permian	Upper	Amir	Carbonates
		Amir	Carbonates
	Lower	Amir	Carbonates
		Amir	Carbonates
		Amir	Carbonates

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KAN
DAL

■ shale
■ Clastics
■ Clastics and Evaporites
■ Carbonates
■ Sandstone
■ Evaporites/Gas
■ shale/hill



Kish gas field, in Kish island, is located about 30 Km. east of Lavan island. 13 wells were drilled in the field up to now, but they have not been completed due to the lack of equipment, hence no production.



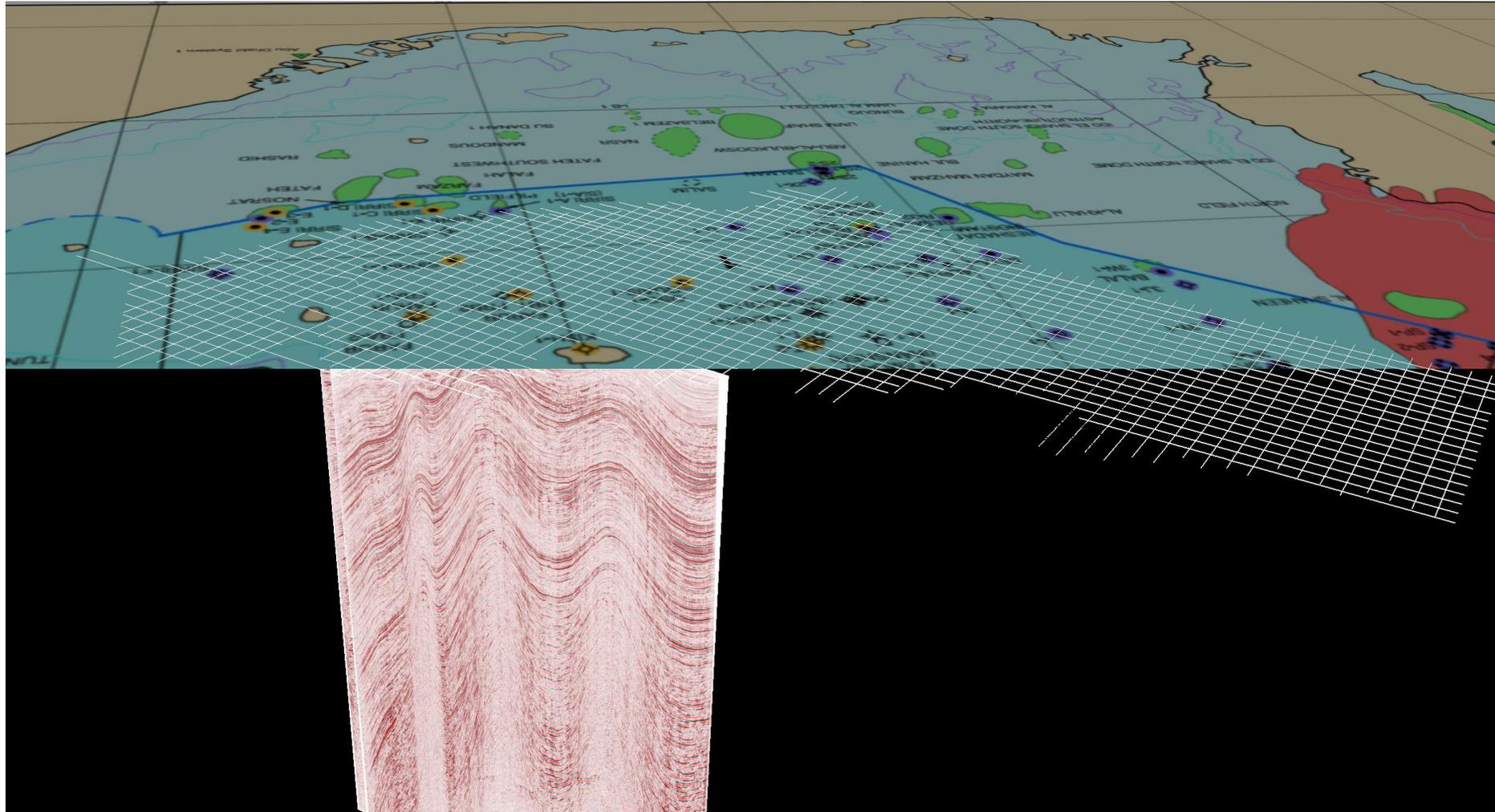
Disc. year	Prod. init. year	Dim. kmxkm	Seismic Data	No. Wells	Formation	CGR STB/MMSCF	H2S ppm
2003	N/A	32x25	2D	13	Kangan/Dalan	4.2-11.3	70-200

Field	OGIP	Cumulative Production (Up to now)	Current Production	Planned Production
	10 ⁹ SCF	10 ⁹ SCF	10 ⁶ SCF/d	10 ⁶ SCF/d
Kish	55000	0	0	3000

Kish Gas

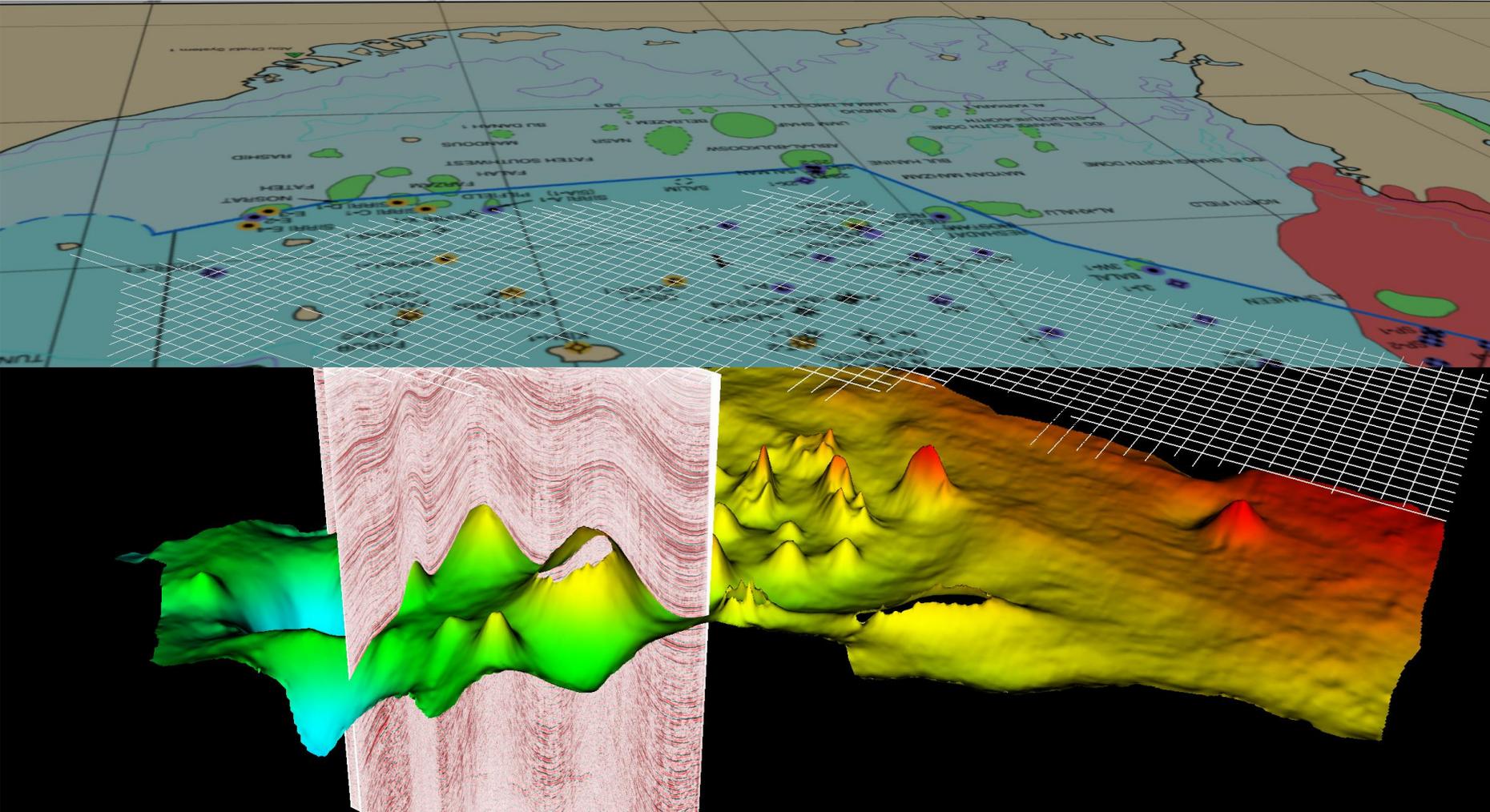


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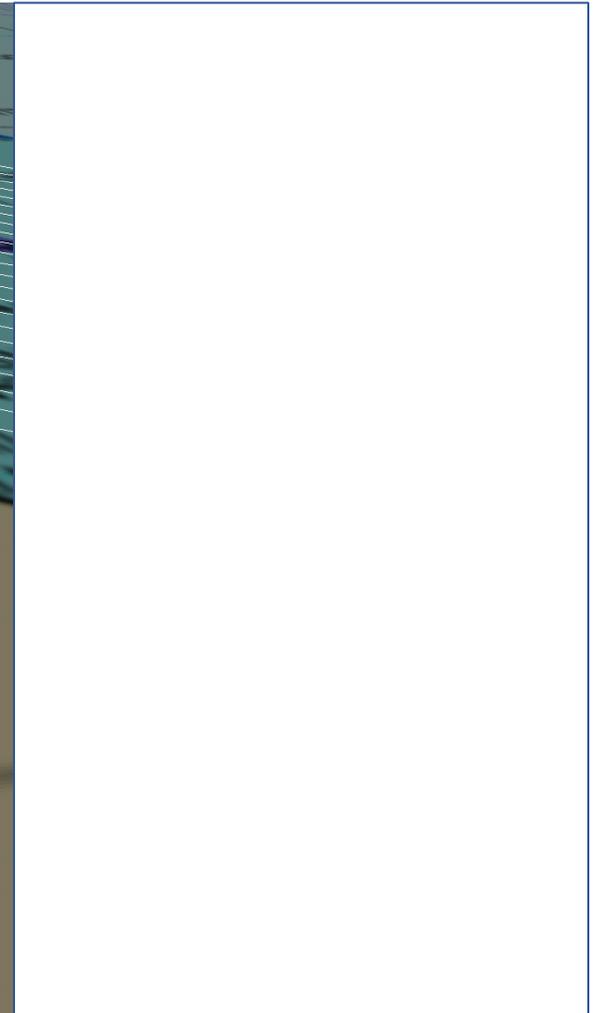
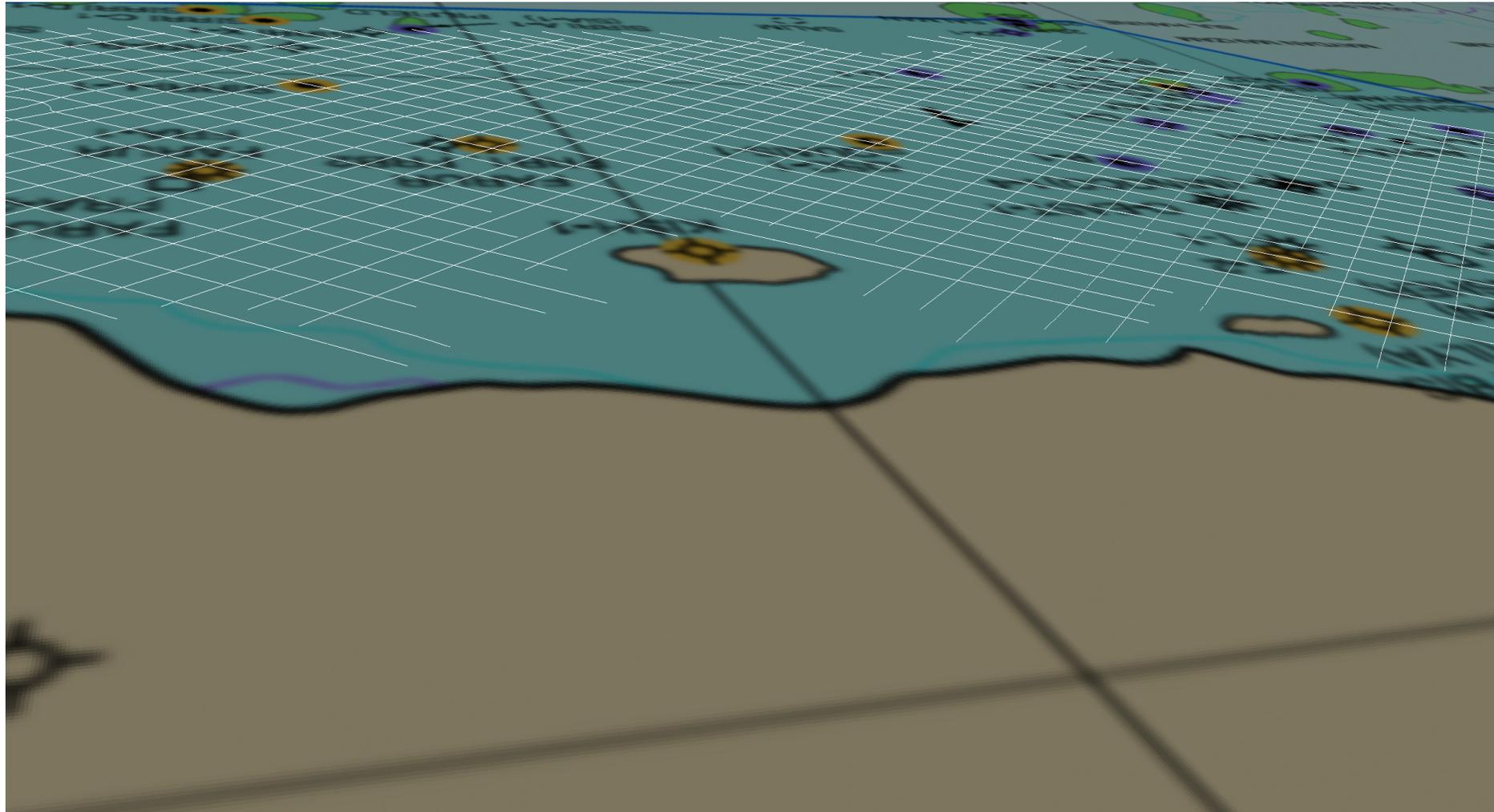


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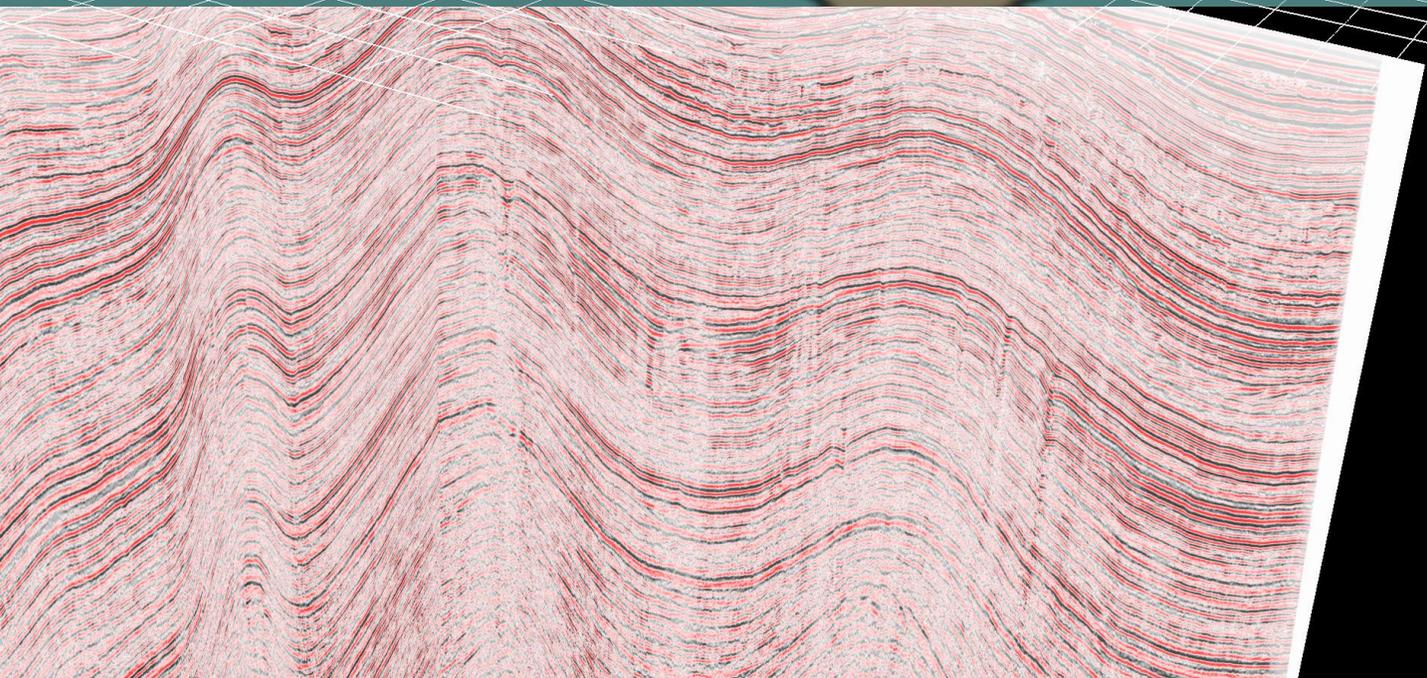
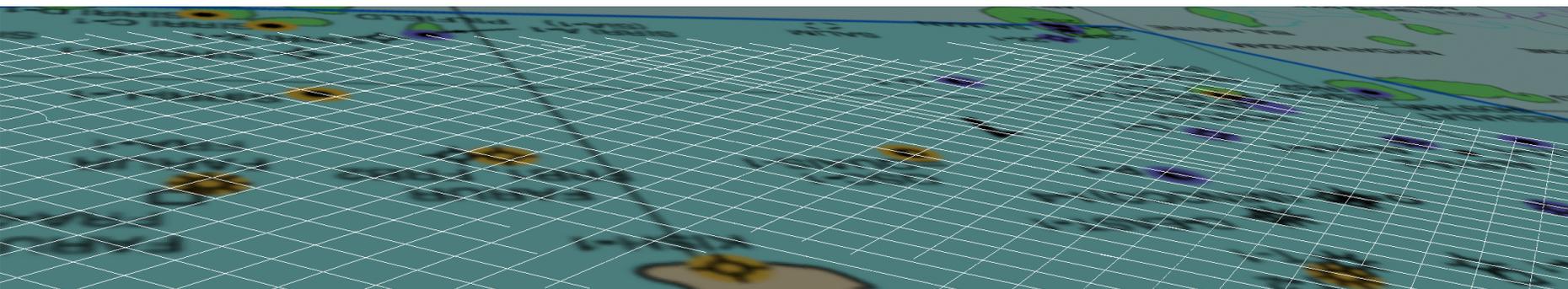


NT Khuff
(Kangan, Dalan below)

.. what to go for in the Persian Gulf The tour (Central)



.. what to go for in the Persian Gulf The tour (Central)



Period	Eon	Formation	Lithology
Tertiary	Mi	Fah	Clastics and Evaporites
		Avaz	Clastics and Evaporites
		Bandar	Clastics and Evaporites
Oligo	Chahmahal	Clastics and Evaporites	
	Chahmahal	Clastics and Evaporites	
Eo-Paleo	Jahrom-Damman	Carbonates	
	Bus	Evaporites/Dal	
Cretaceous	Upper	Rayah	Carbonates
		Band	Carbonates
		Lafan	Shale
	Middle	Sarvak	Carbonates
		Bandar	Carbonates
		Bandar	Carbonates
Lower	Bandar	Carbonates	
	Bandar	Carbonates	
	Bandar	Carbonates	
Jurassic	Upper	Bandar	Carbonates
		Bandar	Carbonates
		Bandar	Carbonates
	Middle	Bandar	Carbonates
		Bandar	Carbonates
		Bandar	Carbonates
Lower	Bandar	Carbonates	
	Bandar	Carbonates	
	Bandar	Carbonates	
Triassic	Upper	Bandar	Carbonates
		Bandar	Carbonates
		Bandar	Carbonates
Permian	Lower	Bandar	Carbonates
		Bandar	Carbonates
		Bandar	Carbonates

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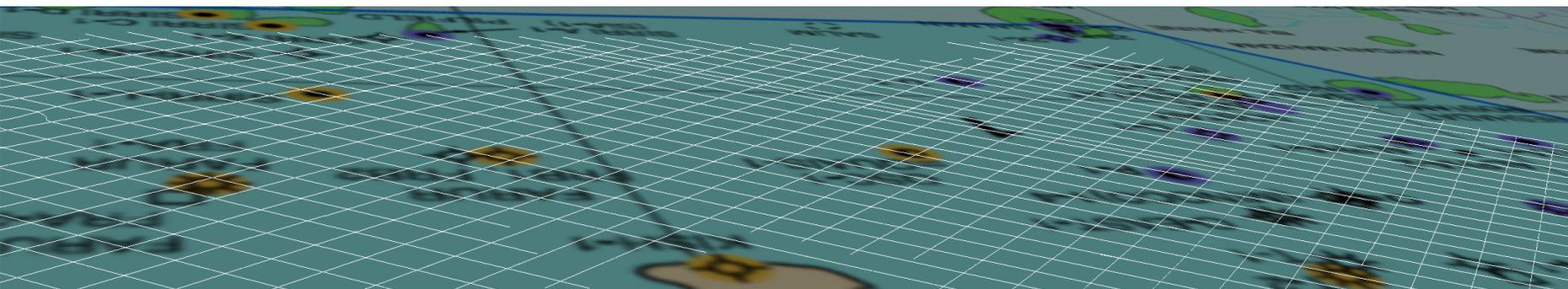
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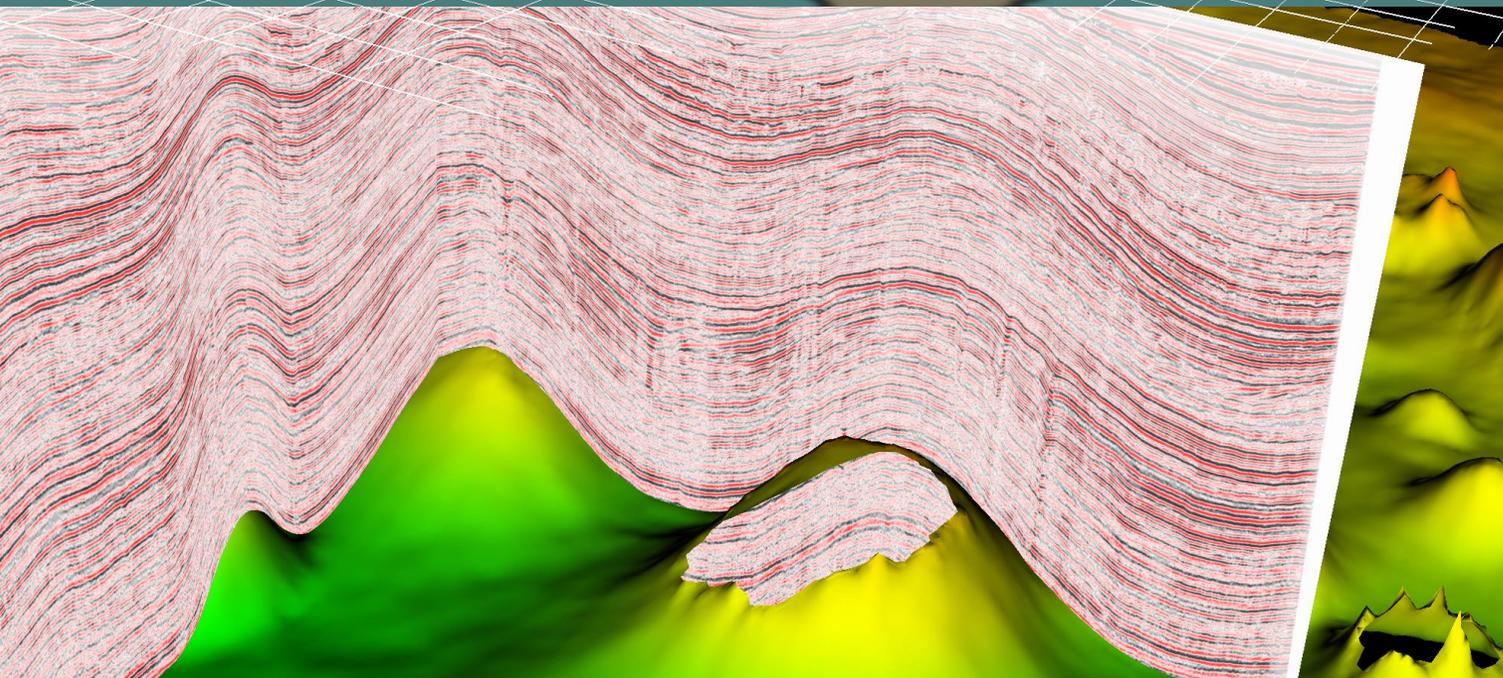
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.. what to go for in the Persian Gulf The tour (Central)



NT Khuff
(Kangan, Dalan below)

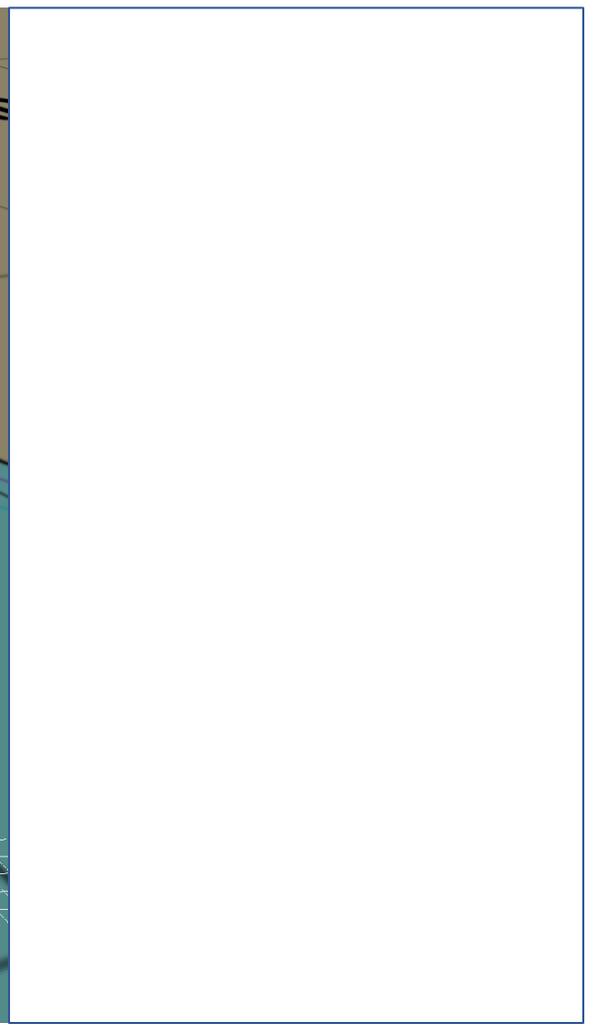
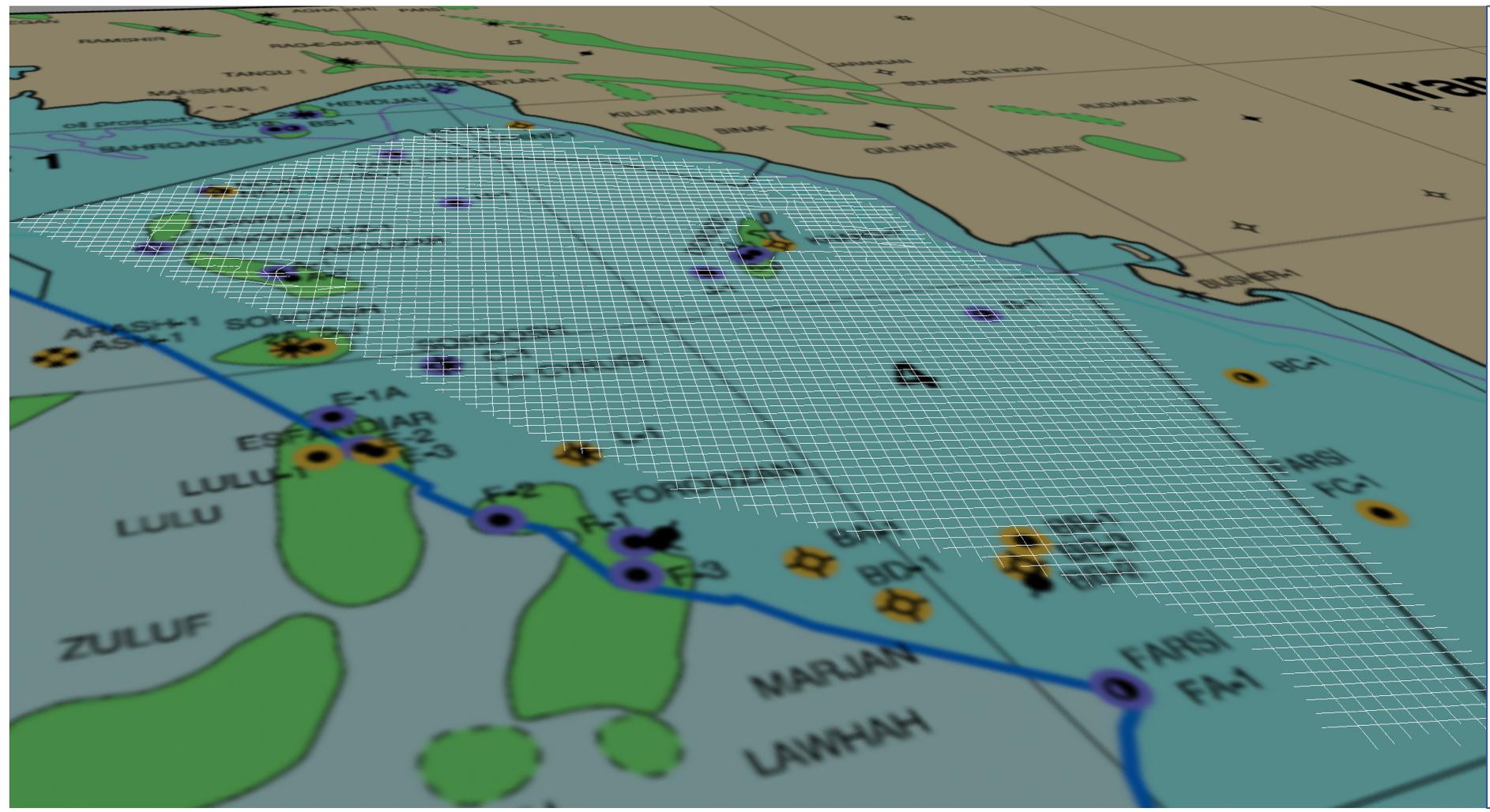


Period	Eon	Formation	Lithology
Tertiary	Eo-	Fast	Clastics and Evaporites
		Avary	Clastics and Evaporites
	Mi-	Alga-Jer	Clastics and Evaporites
		Baharjaf	Clastics and Evaporites
	Oligo-	Shah-Khangan	Clastics and Evaporites
		Shah-Khangan	Carbonates
Eo-Paleo-	Chahmah-Sander	Clastics and Evaporites	
	Chahmah-Sander	Clastics and Evaporites	
	Kam	Carbonates	
Cretaceous	Upper	Jahrum-Dannan	Carbonates
		Rus	Evaporites/Dal
	Lower	Palasa	Carbonates
Cretaceous	Upper	Tayraf	Carbonates
		Tayraf	Carbonates
		Bar	Carbonates
		Yah	Carbonates
	Middle	Sarvak	Carbonates
		Bargahan	Carbonates
		Alamut	Carbonates
		Masjed	Carbonates
	Lower	Nahr-Lure	Carbonates
		Khadem	Carbonates
		Dal-Lal	Carbonates
		M.S. Lure	Carbonates
Jurassic	Upper	Baran-Shekar	Carbonates
		Shakila	Carbonates
		Zafar	Carbonates
		Dastan	Carbonates
	Lower	Rafsanjani	Carbonates
		Khal-Khender	Carbonates
		Farsan	Carbonates
		Taybars	Carbonates
Triassic	Upper	Shakila	Carbonates
		Shakila	Carbonates
	Middle	Qasbi	Carbonates
		Shakila	Carbonates
	Lower	Qasbi	Carbonates
		Shakila	Carbonates
Permian	Upper	Dalan	Carbonates
		Nah-Mensher	Carbonates
	Lower	Dalan	Carbonates
		Nah-Mensher	Carbonates

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.. what to go for in the Persian Gulf The tour (North)

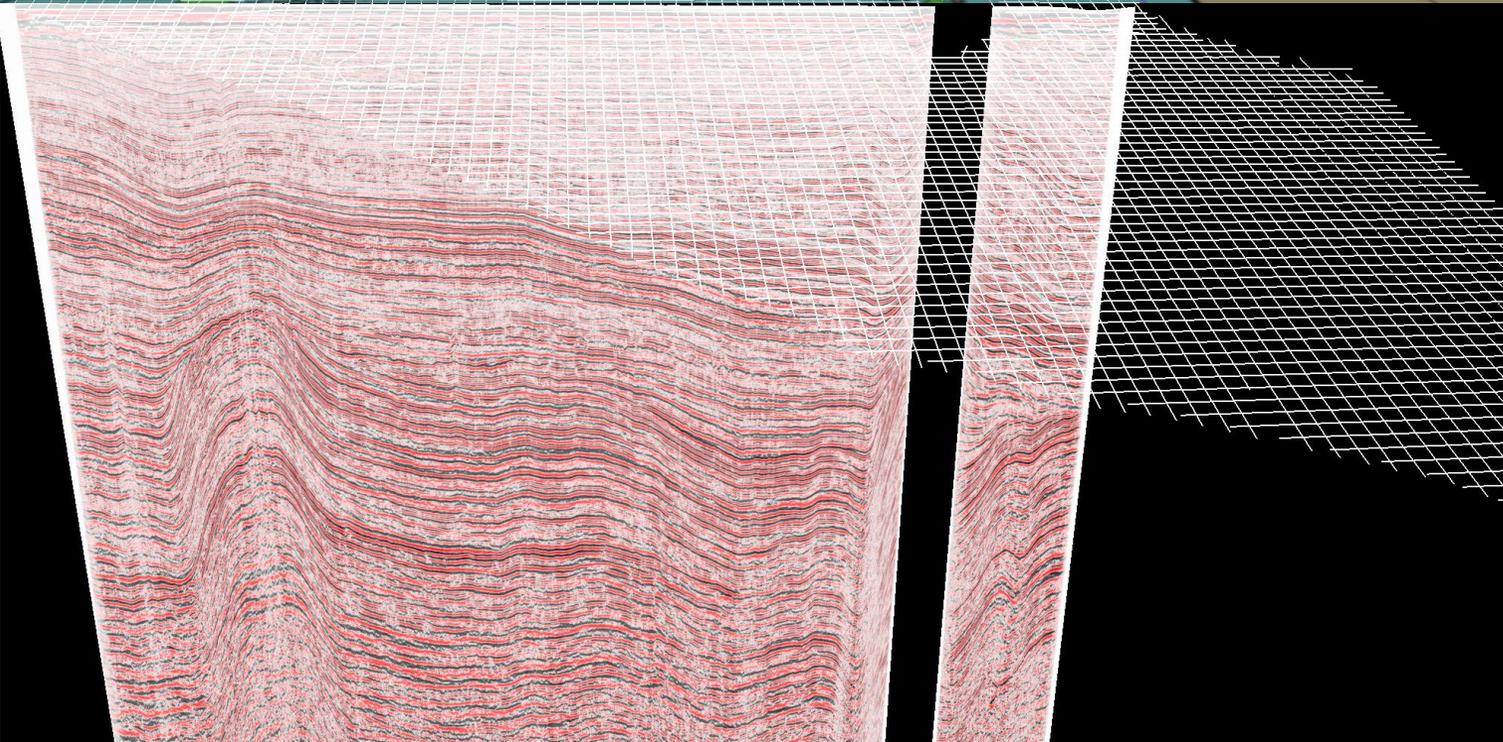
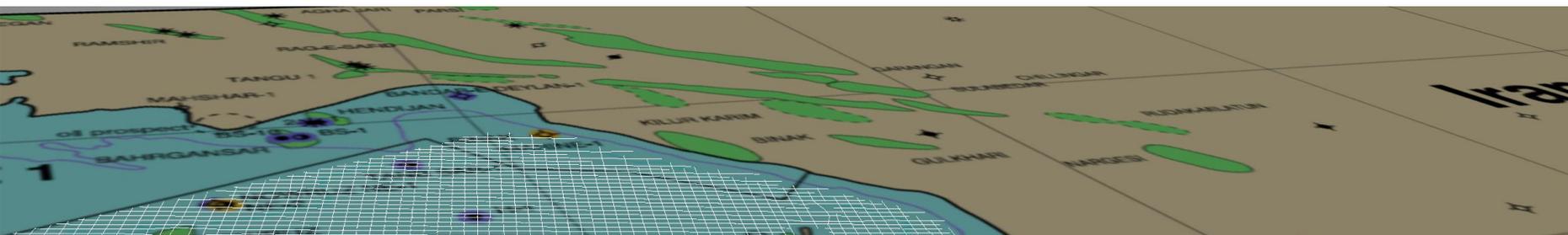


Nowrooz



Disc.	Prod. init.	Dim.	Seismic Data	No. Wells	Formation	API
year	year	kmxkm				Degrees
1966	1971	20x5	3D	35 (21 Prod.)	Burgan Khalij Shoeyba Yamama	20.5 18 20 30
Field	STOIP	Cumulative Production		Current Production	Total Estimated Production	
	MMBbl	MMBbl		MBbl/d	MMBbl/d	
Norooz	4201	276		28	To be proposed by contractor	

.. what to go for in the Persian Gulf The tour (North)

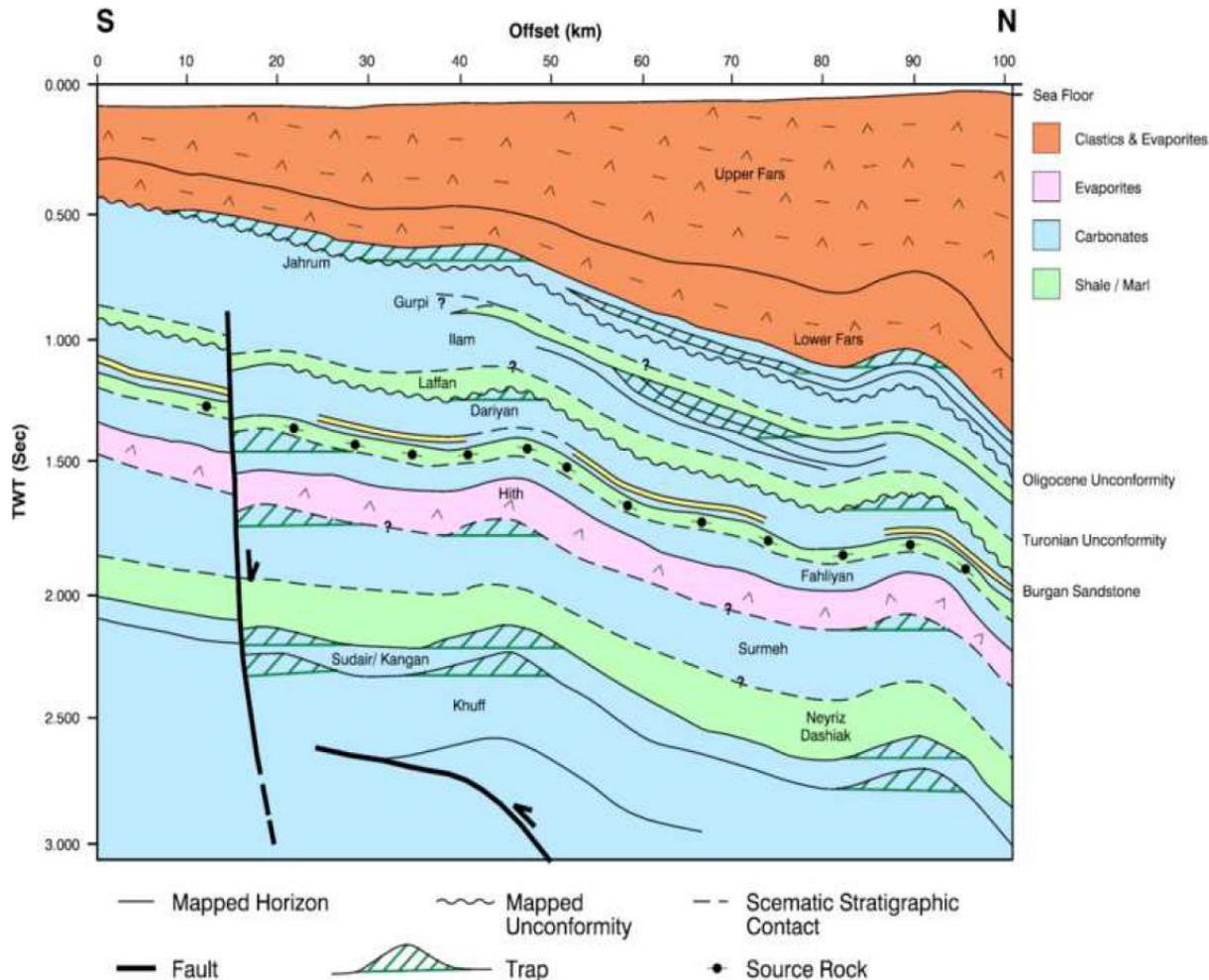


SIMPLIFIED KEY

Period	Epoch	Formation	Lithology
Tertiary	Eocon	Pass	Clastics and Evaporites
		Arzang	Clastics and Evaporites
		Agah-Jari	Clastics and Evaporites
		Bahariyat	Clastics and Evaporites
		Moghan	Clastics and Evaporites
	Miocene	Sar-e-Bander	Clastics and Evaporites
		Shah-Kharami	Sandstone
		Chah-Khambor	Clastics and Evaporites
		Chah-Khambor	Clastics and Evaporites
		Kerman	Carbonates
Oligocene	Jahrom-Damman	Carbonates	
	Rus	Evaporites/Salt	
	Palawan	Carbonates	
Cretaceous	Upper	Tharab	Carbonates
		Tharab	Carbonates
		Bahis	Carbonates
		Shak	Carbonates
		Lafan	Shale
	Middle	Sar-e-Bander	Carbonates
		Moghan	Carbonates
		Moghan	Carbonates
		High-Low	Carbonates
		Moghan	Carbonates
Lower	Das-Lal	Carbonates	
	M.S. Lane	Sandstone	
	Bugan	Carbonates	
	Dar-e-Shahr	Carbonates	
	Shak	Carbonates	
Jurassic	Upper	Das-Lal	Evaporites/Salt
		Das-Lal	Evaporites/Salt
		Das-Lal	Carbonates
		Das-Lal	Carbonates
		Das-Lal	Carbonates
	Middle	Das-Lal	Carbonates
		Das-Lal	Carbonates
Lower	Das-Lal	Carbonates	
	Das-Lal	Carbonates	
Triassic	Upper	Das-Lal	Carbonates
		Das-Lal	Carbonates
		Das-Lal	Carbonates
	Middle	Das-Lal	Carbonates
		Das-Lal	Carbonates
Lower	Das-Lal	Carbonates	
	Das-Lal	Carbonates	
Permian	Lower	Das-Lal	Carbonates
		Das-Lal	Carbonates

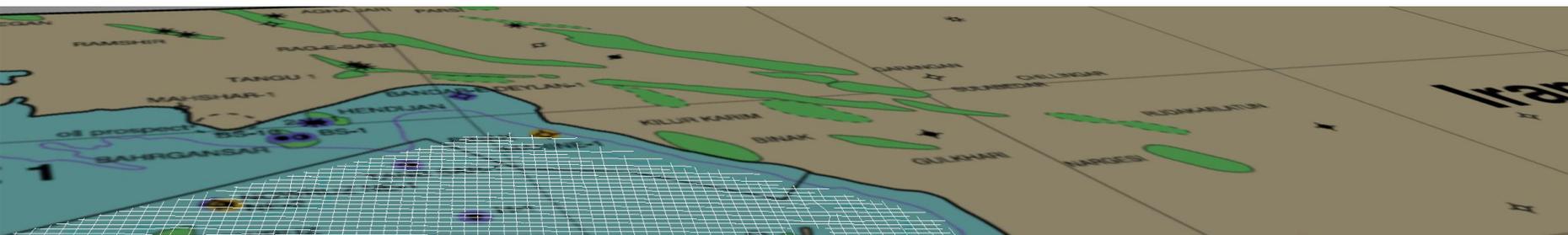
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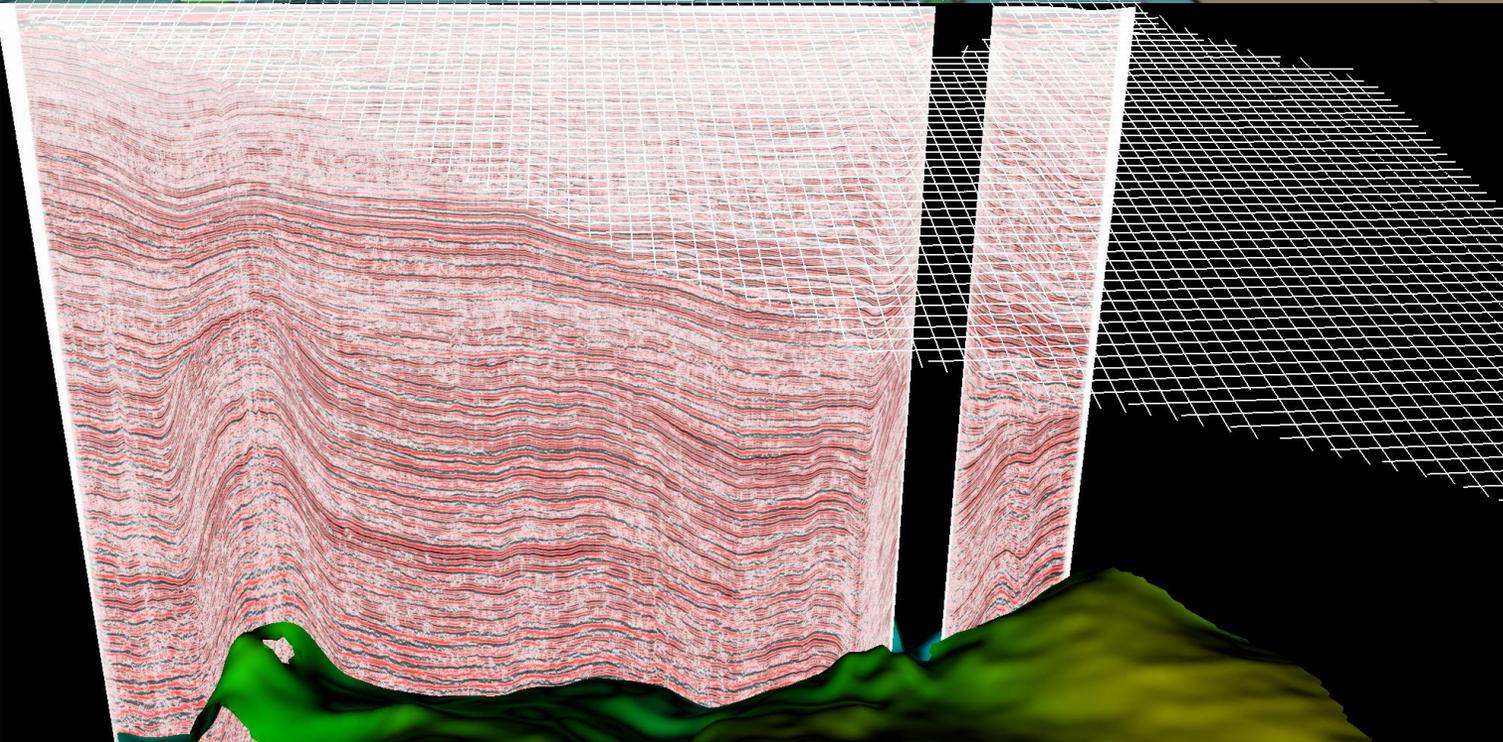


- Post-Turonian Unconformity (pre-Gurpi Shale)
 - Pinch-out plays of the Asmari Fm. on structural highs. The structural highs define mostly four-way dip closures, but the trap might be situated on the flank of structural culmination.
 - Bedding structure of prograding Jahrum Fm. offers possibility for stratigraphic traps.
- Turonian Unconformity – Base Cretaceous (Top Hith Evaporite)
 - Few structural closures on salt domes.
 - Additional potential when accounting for fault closure.
- Jurassic and older
 - As above

.. what to go for in the Persian Gulf The tour (North)



NT Sudair
(Kangan, Dalam below)



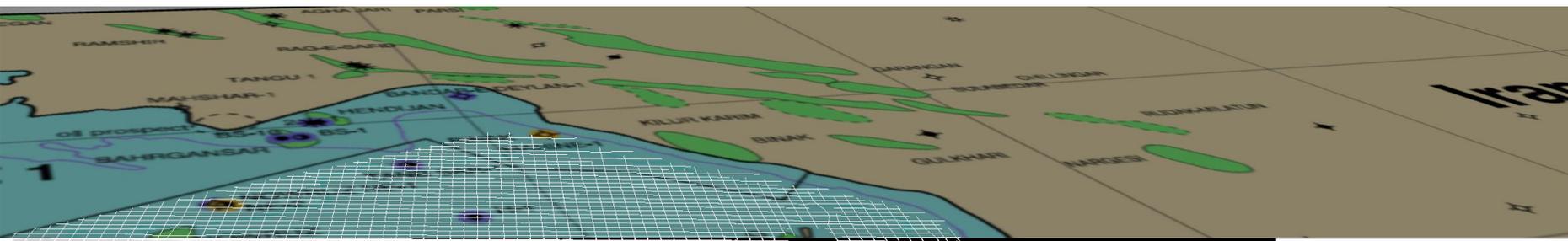
SIMPLIFIED KEY

Period	Epoch	Formation	Lithology
Tertiary	Pliocene	Pass	Clastics and Evaporites
		Avary	Clastics and Evaporites
		Alghar	Clastics and Evaporites
		Bahriyat	Clastics and Evaporites
		Mozan	Clastics and Evaporites
	Oligocene	Sar Manshar	Clastics and Evaporites
		Shahkhan	Sandstone
	Eocene-Paleocene	Chahkhan	Clastics and Evaporites
		Chahkhan	Clastics and Evaporites
		Chahkhan	Clastics and Evaporites
Cretaceous	Upper	Jahrom (Dammam)	Carbonates
		Rus	Evaporites/Dal
		Madina	Carbonates
		Pasiran	Shale/Sand
		Yazal	Carbonates
	Middle	Tajour	Carbonates
		Badra	Carbonates
		Shahkhan	Carbonates
		Shahkhan	Carbonates
		Shahkhan	Carbonates
Lower	Sarjan	Carbonates	
	Kangiran	Carbonates	
	Mozan	Carbonates	
	Mozan	Carbonates	
	Mozan	Carbonates	
Jurassic	Upper	Dammam (Dammam)	Carbonates
		Shahkhan	Carbonates
	Middle	Shahkhan	Carbonates
		Shahkhan	Carbonates
Lower	Shahkhan	Carbonates	
	Shahkhan	Carbonates	
Triassic	Upper	Shahkhan	Carbonates
		Shahkhan	Carbonates
		Shahkhan	Carbonates
Permian	Lower	Shahkhan	Carbonates
		Shahkhan	Carbonates
		Shahkhan	Carbonates

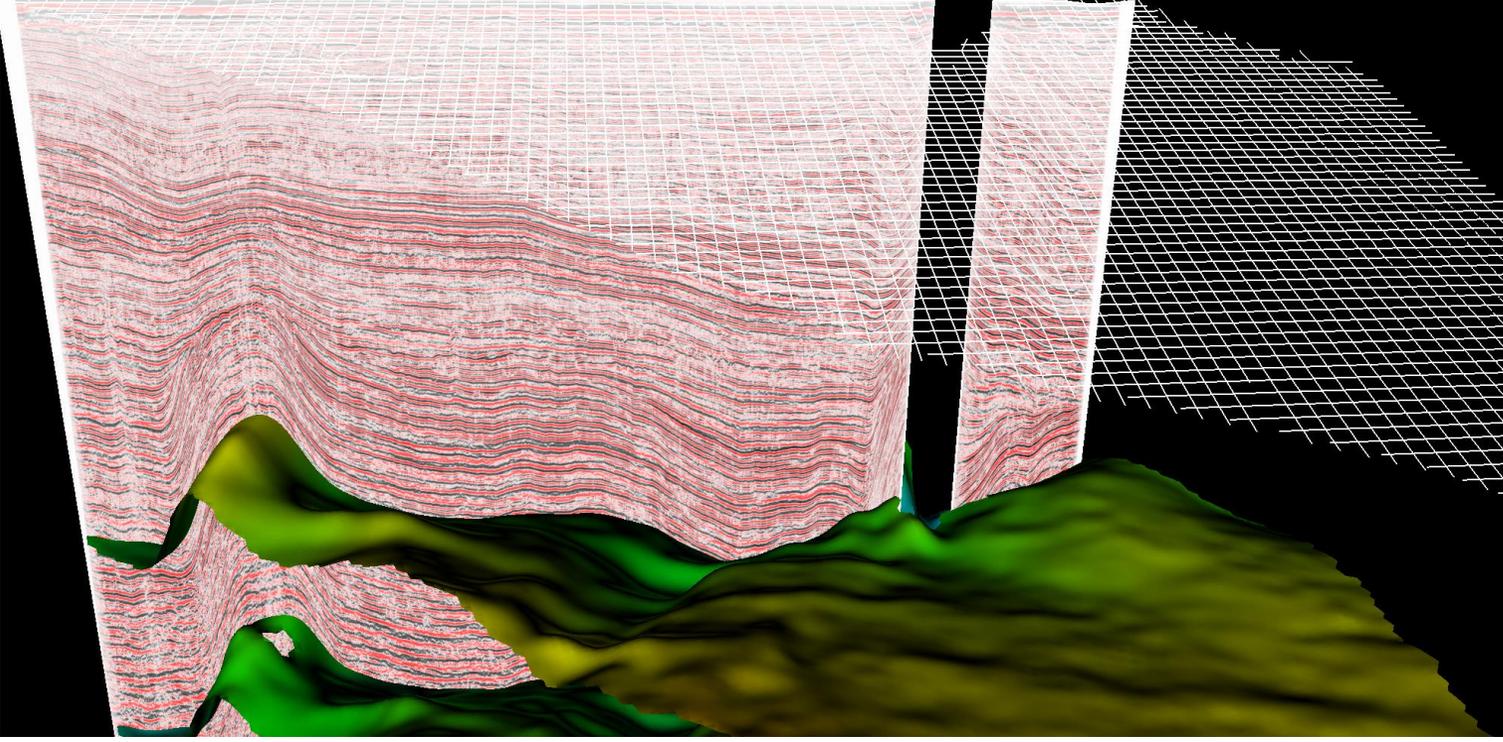
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■ Sandstone ■ Clastics ■ Clastics and Evaporites ■ Shale/Sand
■ Carbonates ■ Sandstone ■ Evaporites/Dal

.. what to go for in the Persian Gulf The tour (North)



NT Hith
(Surmeh below)



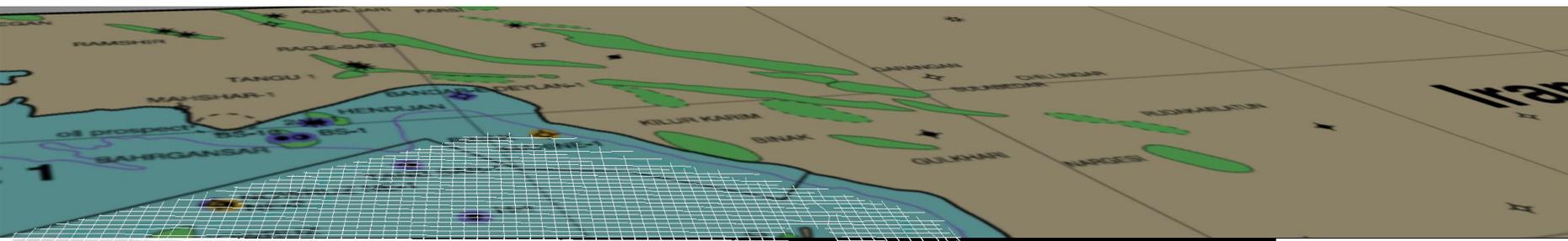
SIMPLIFIED KEY

Period	Epoth	Formation	Lithology
Tertiary	Eooc	Pass	Clastic and Evaporites
		Arang	Clastic and Evaporites
	Mo	Agah Jay	Clastic and Evaporites
		Bahariyat	Clastic and Evaporites
	Oligo	Moghan	Clastic and Evaporites
		Sar-e-Bander	Clastic and Evaporites
		Dezful	Clastic and Evaporites
		Shah-Khraman	Sandstone
	Eo-Paleo	Chahmah-Lensher	Clastic and Evaporites
		Chahmah-Lensher	Clastic and Evaporites
Kerman		Carbonates	
Cretaceous	Upper	Jahrom-Damman	Carbonates
		Rus	Evaporites/Salt
	Middle	Mahana	Carbonates
		Passen	Sandstone
		Yazui	Carbonates
	Lower	Yazui	Carbonates
		Yazui	Carbonates
Jurassic	Upper	Sar-e-Bander	Carbonates
		Yazui	Carbonates
	Middle	Moghan	Carbonates
		Moghan	Carbonates
		Moghan	Carbonates
	Lower	Moghan	Carbonates
		Moghan	Carbonates
Triassic	Upper	Moghan	Carbonates
		Moghan	Carbonates
	Lower	Moghan	Carbonates
		Moghan	Carbonates
		Moghan	Carbonates
Permian	Upper	Moghan	Carbonates
		Moghan	Carbonates
	Lower	Moghan	Carbonates
		Moghan	Carbonates
		Moghan	Carbonates

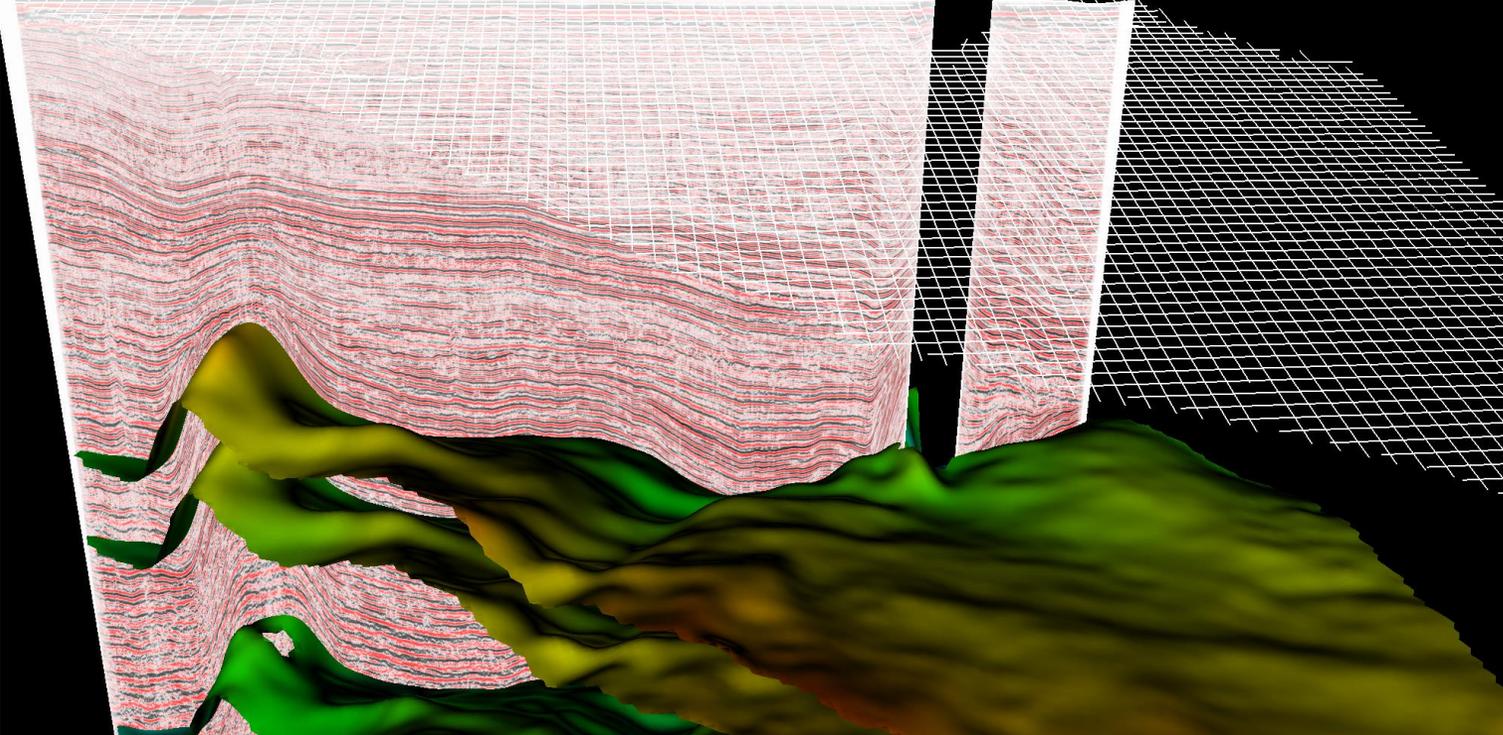
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.. what to go for in the Persian Gulf The tour (North)



NT Dariyan
(Dariyan, Gadvan, Fahliyan below)



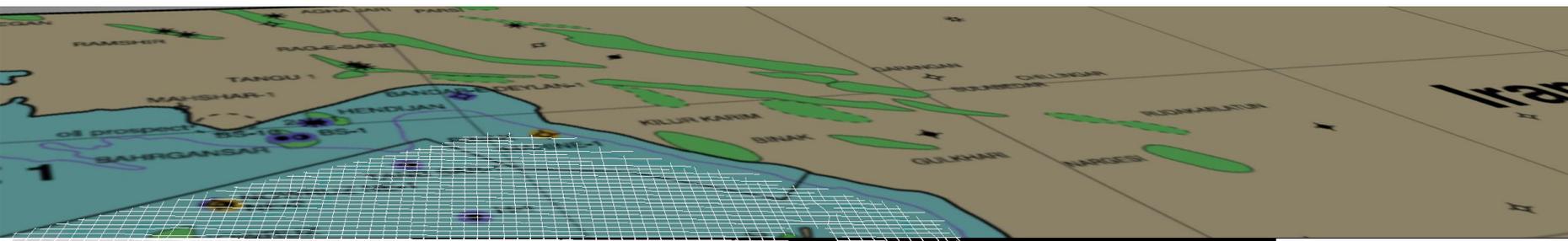
SIMPLIFIED KEY

Period	Eonon	Formation	Lithology
Tertiary	Plioc	Pass	Clastics and Evaporites
		Avary	Clastics and Evaporites
	Mio	Agah-Jay	Clastics and Evaporites
		Bahriyat	Clastics and Evaporites
	Oligo	Moghan	Clastics and Evaporites
		Sar-i-Bander	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
		Shah-Khraman	Sandstone
		Chahkhalan	Clastics and Evaporites
		Chahkhalan	Clastics and Evaporites
Cretaceous	Eo-Paleo	Yakouh-Danman	Carbonates
		Rus	Evaporites/Salt
	Upper	Madina	Carbonates
		Passan	Shale/Silt
	Middle	Yazal	Carbonates
		Yazal	Carbonates
		Bahs	Carbonates
		Shah	Carbonates
		Lafan	Shale
		Sar-i-K	Carbonates
Barghan		Carbonates	
Mahvel		Carbonates	
Lower	Shahrak	Carbonates	
	Shahrak	Carbonates	
Jurassic	Upper	Shahrak	Carbonates
		Shahrak	Carbonates
	Middle	Shahrak	Carbonates
		Shahrak	Carbonates
	Lower	Shahrak	Carbonates
		Shahrak	Carbonates
Triassic	Upper	Shahrak	Carbonates
		Shahrak	Carbonates
	Middle	Shahrak	Carbonates
		Shahrak	Carbonates
	Lower	Shahrak	Carbonates
		Shahrak	Carbonates
Permian	Lower	Shahrak	Carbonates
		Shahrak	Carbonates

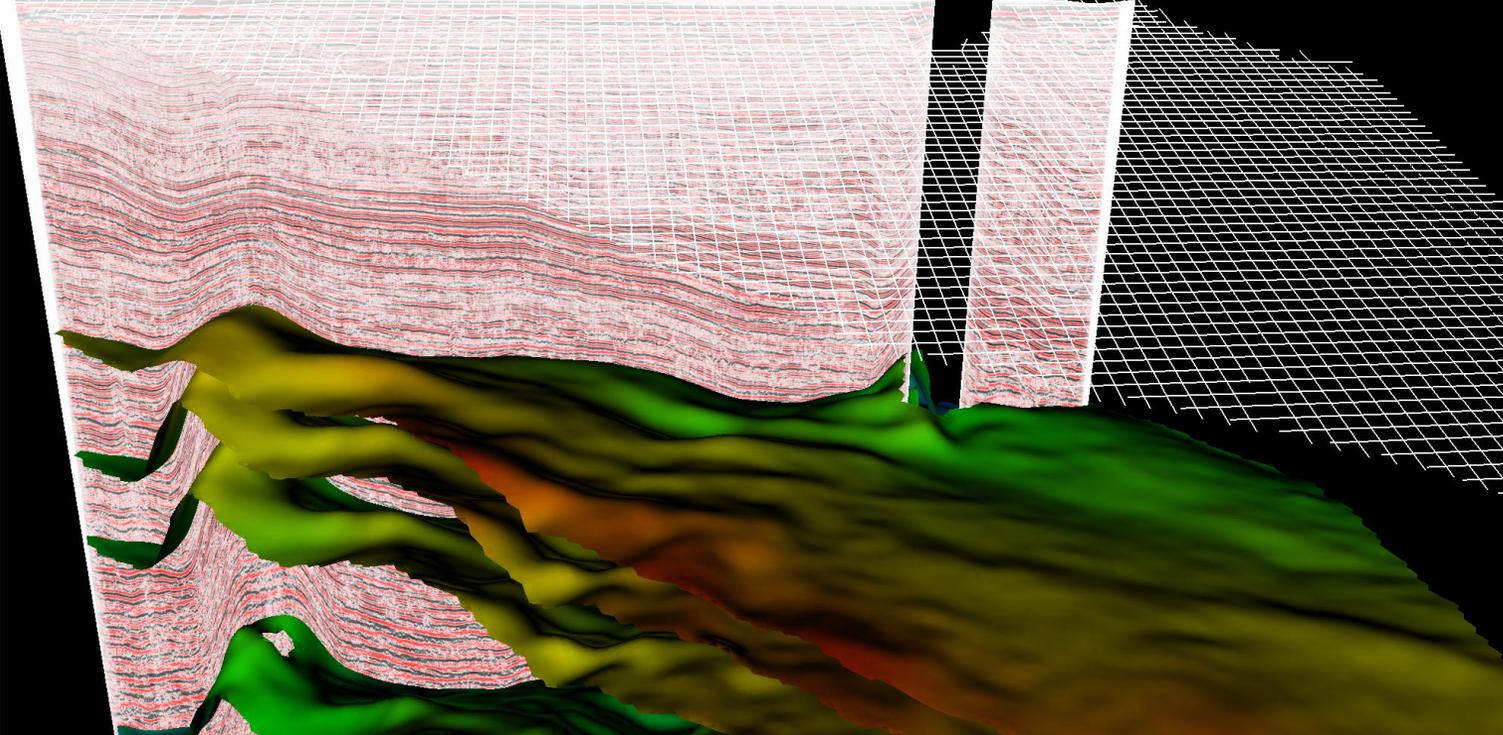
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Legend for lithology: Shale, Carbonates, Sandstone, Evaporites/Salt, Clastics, Clastics and Evaporites, Shale/Silt.

.. what to go for in the Persian Gulf The tour (North)



Turonian UC
(Sarvak below)



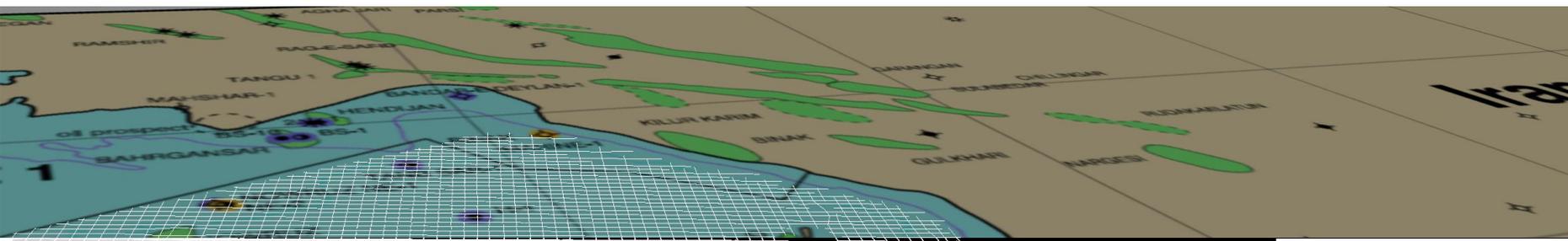
SIMPLIFIED KEY

Period	Eonon	Formation	Lithology
Tertiary	Plioc	Pass	Clastics and Evaporites
		Arang	Clastics and Evaporites
	Mio	Agah Jay	Clastics and Evaporites
		Bahariyat	Clastics and Evaporites
		Moghan	Clastics and Evaporites
	Oligo	Sarvak	Clastics and Evaporites
		Shah-Kharami	Sandstone
	Eo-Paleo	Chahmahal	Clastics and Evaporites
		Chahmahal	Clastics and Evaporites
		Kerman	Carbonates
Cretaceous	Upper	Jahrom-Damman	Carbonates
		Rus	Evaporites/Salt
	Middle	Kapona	Carbonates
		Passen	Shale/Sand
		Yazui	Carbonates
Jurassic	Upper	Yazui	Carbonates
		Yazui	Carbonates
	Middle	Sarvak	Carbonates
		Bargahan	Carbonates
		Moghan	Carbonates
		Moghan	Carbonates
		Moghan	Carbonates
Lower	High Lure	Carbonates	
	Kapona	Carbonates	
	Das Lari	Carbonates	
	M.S.C. Lure	Sandstone	
	Bugan	Carbonates	
Triassic	Upper	Darab (Shahak)	Carbonates
		Shahak	Carbonates
	Middle	Shahak	Carbonates
		Shahak	Carbonates
Lower	Shahak	Carbonates	
	Shahak	Carbonates	
Permian	Upper	Shahak	Carbonates
		Shahak	Carbonates
	Lower	Shahak	Carbonates
		Shahak	Carbonates
		Shahak	Carbonates

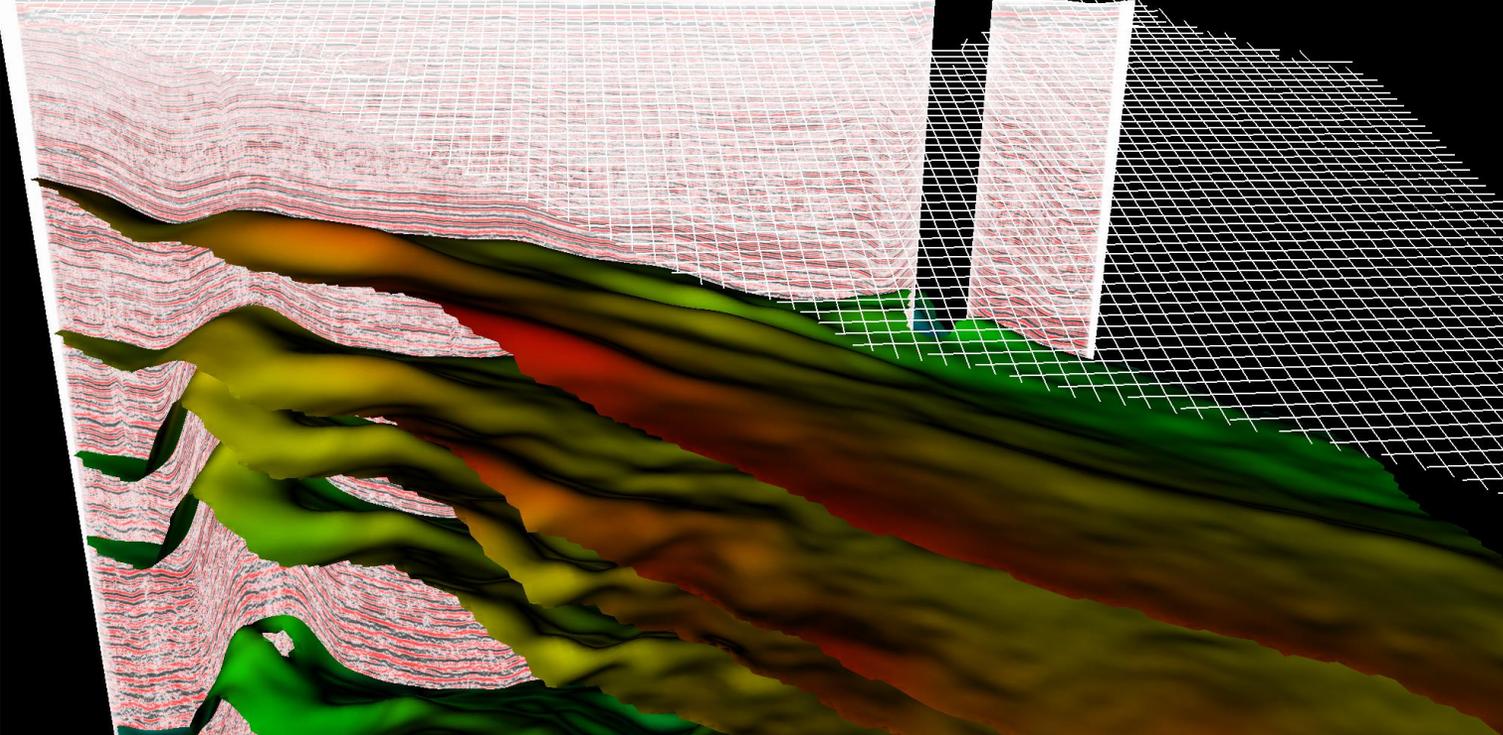
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Oligocene UC
(Asmari just above)



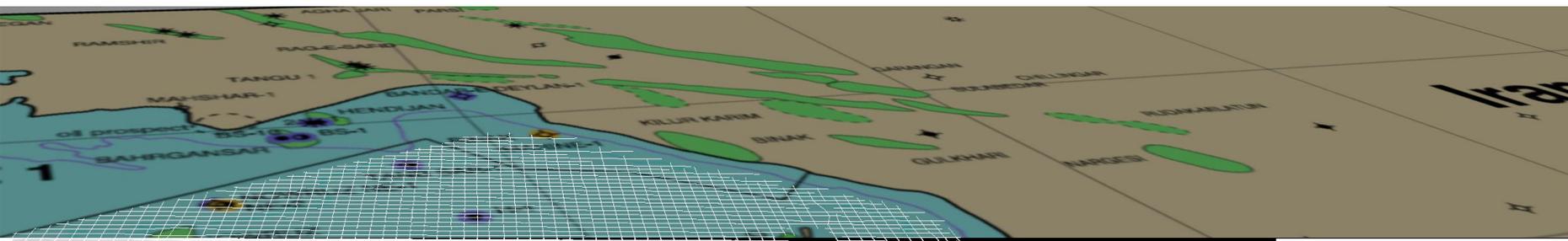
SIMPLIFIED KEY

Period	Epoth	Formation	Lithology
Tertiary	Eo- Mioc	Pass	Clastics and Evaporites
		Arang	Clastics and Evaporites
		Agah-Jari	Clastics and Evaporites
		Bahariyat	Clastics and Evaporites
		Moghan	Clastics and Evaporites
	Oligo	Shah-Khambani	Clastics and Evaporites
		Chahmahdi	Sandstone
	Eo- Pliocen	Chahmahdi	Clastics and Evaporites
		Chahmahdi	Clastics and Evaporites
		Chahmahdi	Clastics and Evaporites
Cretaceous	Upper	Jahrom-Damman	Carbonates
		Rus	Evaporites/Salt
		Nahma	Carbonates
		Passen	Shale/Silt
		Passen	Shale/Silt
	Middle	Yazui	Carbonates
		Yazui	Carbonates
	Lower	Sarvak	Carbonates
		Bangestan	Carbonates
		Moghan	Carbonates
		Moghan	Carbonates
		Moghan	Carbonates
Jurassic	Upper	Abi	Evaporites/Salt
		Abi	Evaporites/Salt
		Abi	Evaporites/Salt
	Middle	Yazui	Carbonates
		Yazui	Carbonates
Lower	Yazui	Carbonates	
	Yazui	Carbonates	
Triassic	Upper	Yazui	Carbonates
		Yazui	Carbonates
		Yazui	Carbonates
	Middle	Yazui	Carbonates
		Yazui	Carbonates
Lower	Yazui	Carbonates	
	Yazui	Carbonates	
Permian	Upper	Yazui	Carbonates
		Yazui	Carbonates
		Yazui	Carbonates
	Middle	Yazui	Carbonates
		Yazui	Carbonates
Lower	Yazui	Carbonates	
	Yazui	Carbonates	

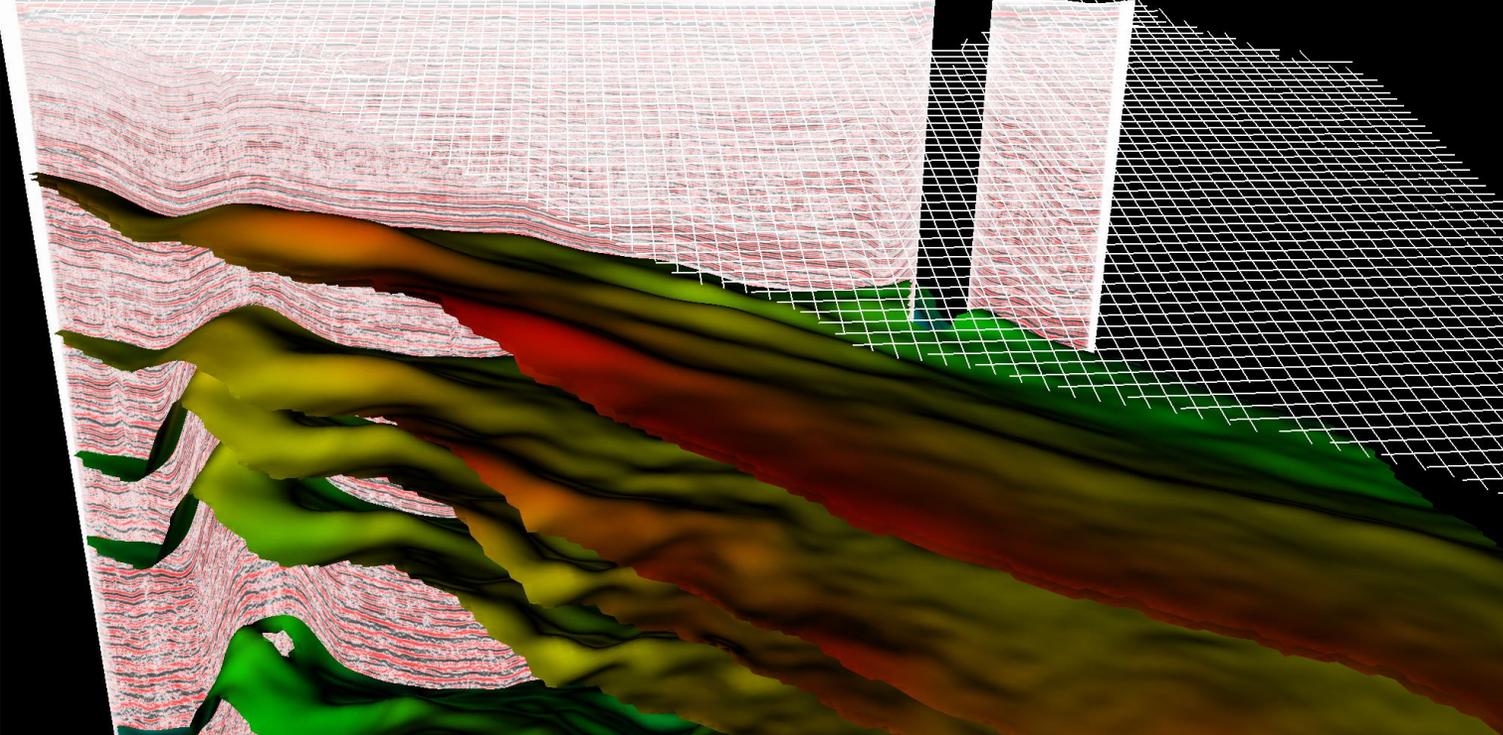
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Asmari



SIMPLIFIED KEY

Period	Eonon	Formation	Lithology
Tertiary	Eocon	Pass	Clastics and Evaporites
		Arang	Clastics and Evaporites
	Mo	Agah-Jari	Clastics and Evaporites
		Bahariyat	Clastics and Evaporites
	Oligo	Shahkhan	Clastics and Evaporites
		Shahkhan	Sandstone
Eo-Paleo	Chahkhan	Clastics and Evaporites	
	Chahkhan	Clastics and Evaporites	
	Chahkhan	Clastics	
Cretaceous	Upper	Jahrom-Damman	Carbonates
		Rus	Evaporites/Dal
		Palawan	Carbonates
	Middle	Yazal	Carbonates
		Yazal	Carbonates
		Bahri	Carbonates
		Yazal	Carbonates
		Yazal	Carbonates
		Yazal	Shale
	Lower	Sarvak	Carbonates
		Kangaroo	Carbonates
		Yazal	Carbonates
Jurassic	Upper	Sarvak	Carbonates
		Yazal	Carbonates
		Yazal	Carbonates
	Middle	Yazal	Carbonates
		Yazal	Carbonates
		Yazal	Carbonates
Lower	Yazal	Carbonates	
	Yazal	Carbonates	
	Yazal	Carbonates	
Triassic	Upper	Yazal	Carbonates
		Yazal	Carbonates
		Yazal	Carbonates
	Middle	Yazal	Carbonates
		Yazal	Carbonates
		Yazal	Carbonates
Permian	Lower	Yazal	Carbonates
		Yazal	Carbonates
		Yazal	Carbonates

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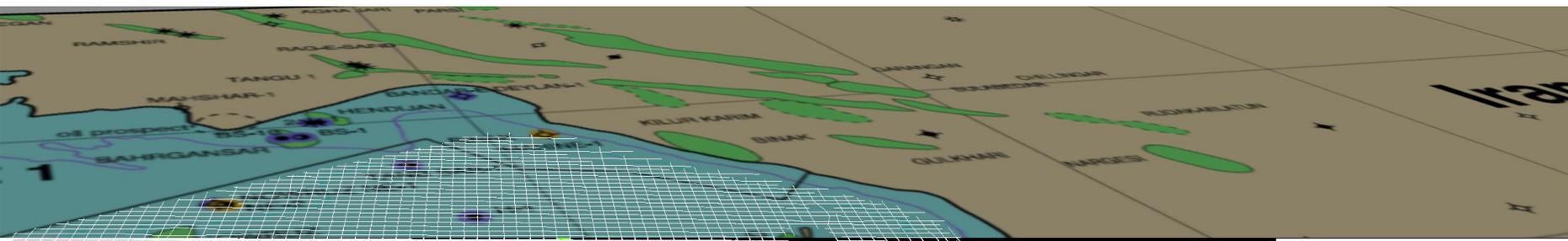
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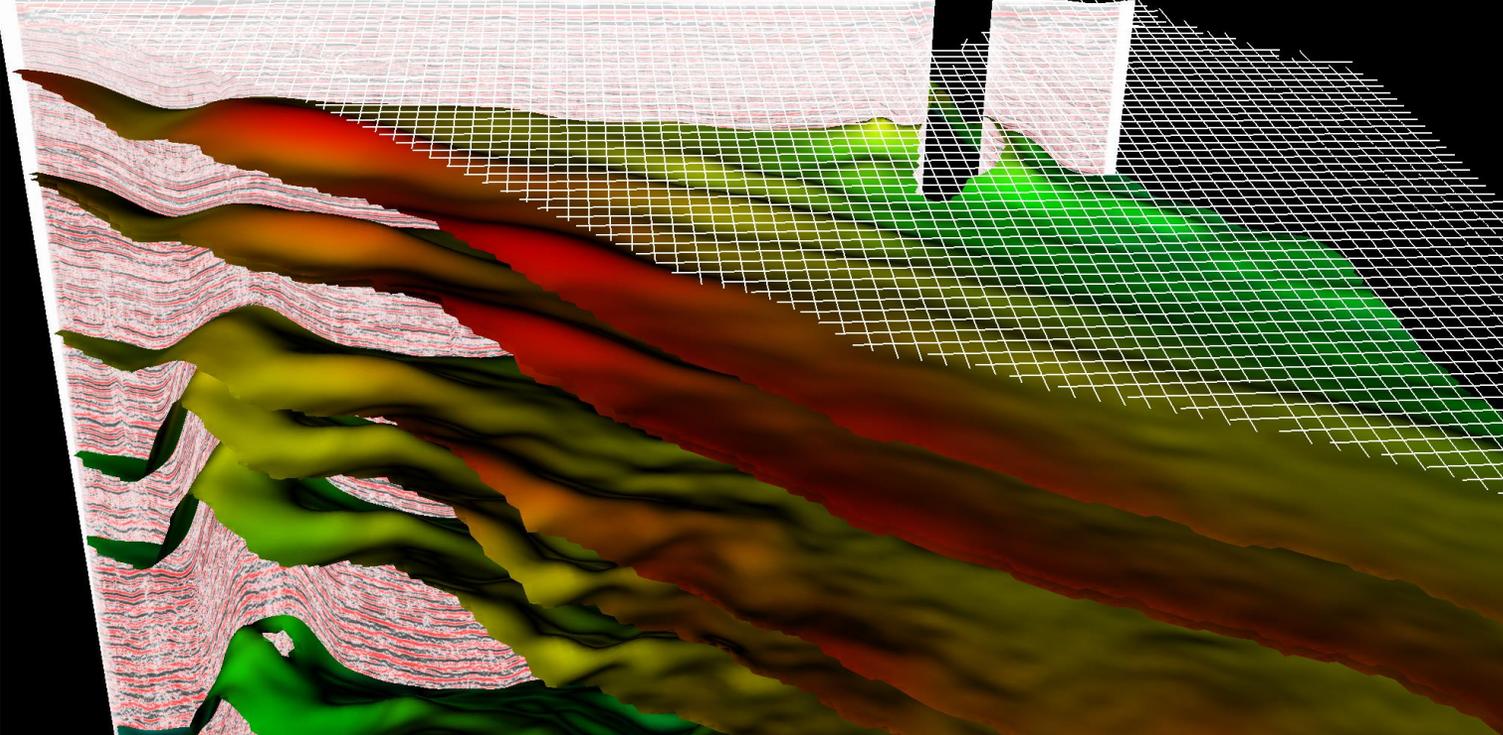
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.. what to go for in the Persian Gulf The tour (North)



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SIMPLIFIED KEY

Period	Eonon	Formation	Lithology	
Tertiary	Eoan	Pass	Clastics and Evaporites	
		Avary	Clastics and Evaporites	
	Mo	Agah-Jay	Clastics and Evaporites	
		Bahariyat	Clastics and Evaporites	
		Shah-Khamban	Clastics and Evaporites	
	Oligo	Shah-Khamban	Sandstone	
		Shah-Khamban	Sandstone	
	Eo-Paleo	Chah-Khamban	Clastics and Evaporites	
		Chah-Khamban	Clastics and Evaporites	
		Chah-Khamban	Clastics and Evaporites	
Cretaceous	Upper	Jahm-Damman	Carbonates	
		Rus	Evaporites/Salt	
		Palasa	Carbonates	
	Middle	Tharwat	Carbonates	
		Tharwat	Carbonates	
		Bahis	Carbonates	
		Shah	Carbonates	
		Lafan	Shale	
		Lower	Sarvak	Carbonates
			Kangaroo	Carbonates
Shah	Carbonates			
Jurassic	Upper	Shah	Carbonates	
		Avah	Carbonates	
		Avah	Carbonates	
	Middle	Avah	Carbonates	
		Avah	Carbonates	
		Avah	Carbonates	
		Avah	Carbonates	
	Lower	Avah	Carbonates	
		Avah	Carbonates	
		Avah	Carbonates	
Triassic	Upper	Avah	Carbonates	
		Avah	Carbonates	
	Lower	Avah	Carbonates	
		Avah	Carbonates	
		Avah	Carbonates	
Permian	Upper	Avah	Carbonates	
		Avah	Carbonates	
	Lower	Avah	Carbonates	
		Avah	Carbonates	
		Avah	Carbonates	

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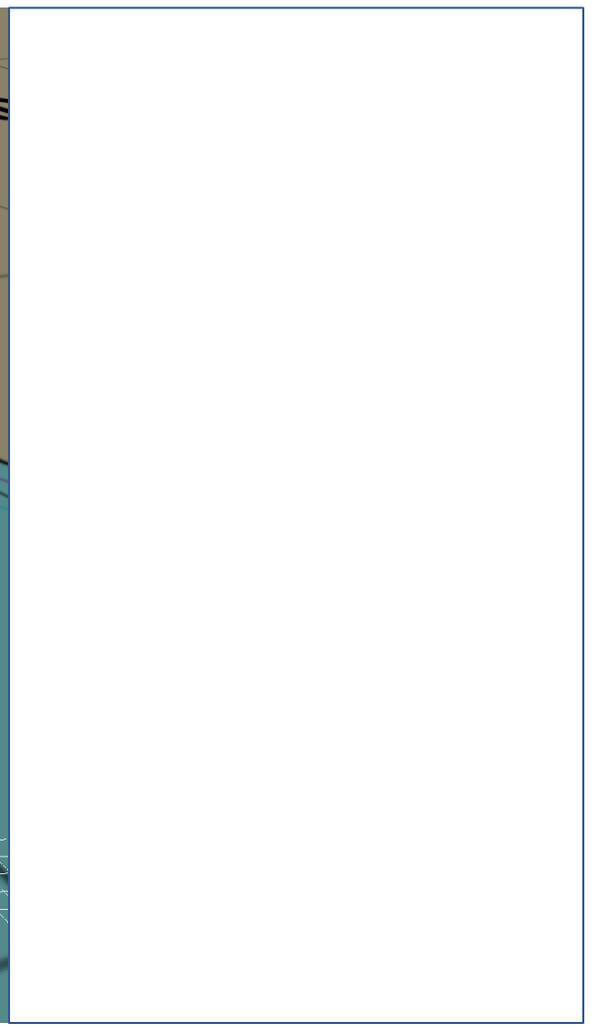
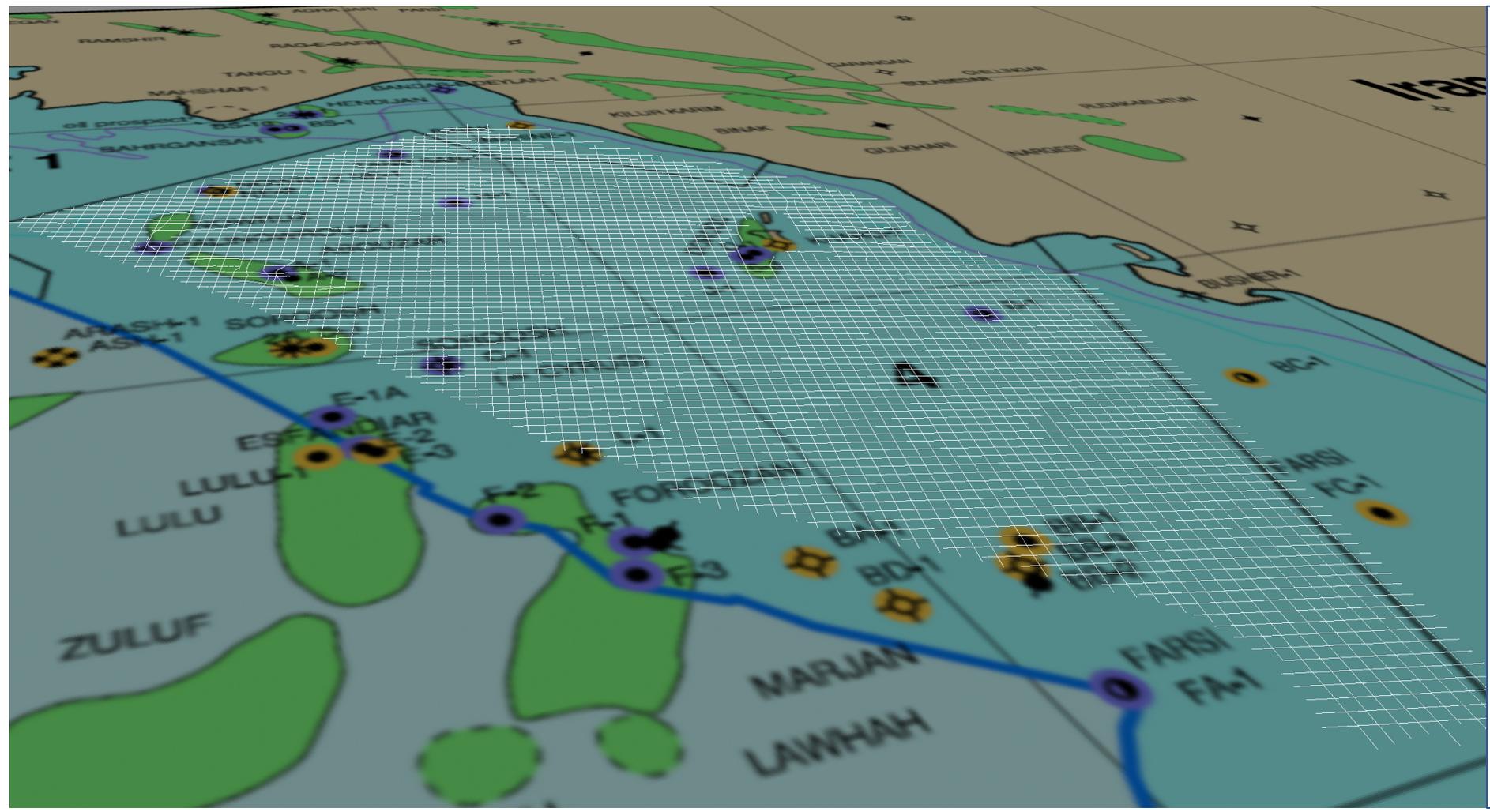
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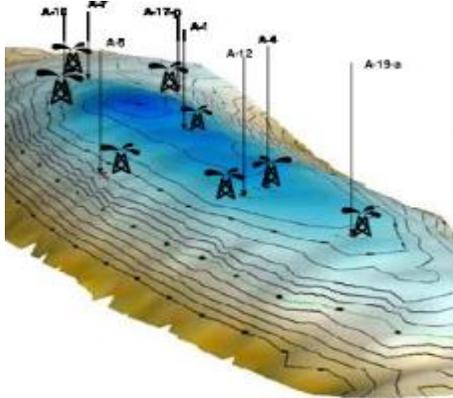
Dorood



Disc.	Prod. init.	Dim.	Seismic Data	No. Wells	Formation	API
year	year	kmxkm				Degrees
1961	1964	25x5	3D	88 (47 Prod.)	Asmari Surmeh Yamama Manifa	23 29.5 35 31

Field	STOIP	Cumulative Production	Current Production	Total Estimated Production
	MMBbl	MMBbl	MBbl/d	MBbl/d
Dorood	11007	1764	69	To be proposed by contractor

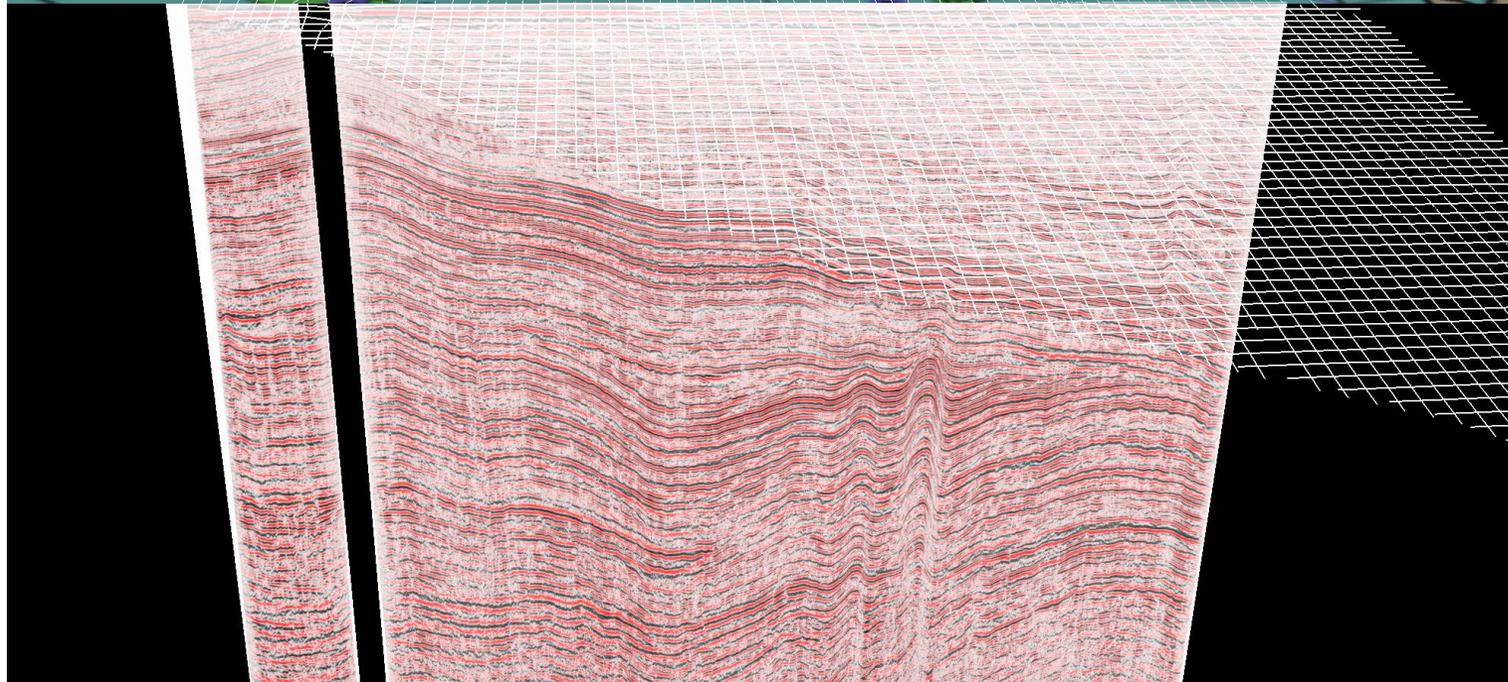
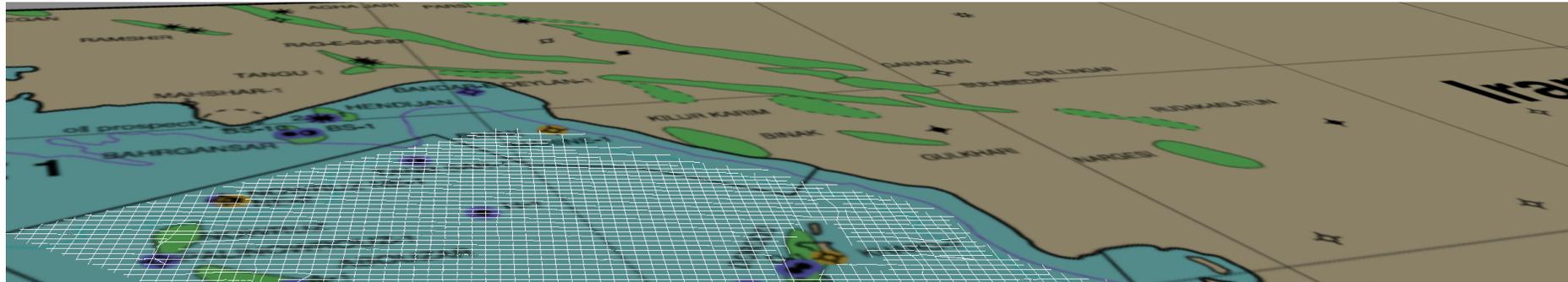
Aboozar



Disc. year	Prod. init. year	Dim. kmxkm	Seismic Data	No. Wells	Formation	API Degrees
1959	1976	1976			Asmari sand Plus undev Asmari Carb Azadegan Sand	20-28

Field	STOIP MMBbl	Cumulative Production MMBbl	Current Production MBbl/d	Total Estimated Production MBbl/d
Aboozar	> 1 BBL		« > 100 MBL/d »	To be proposed by contractor

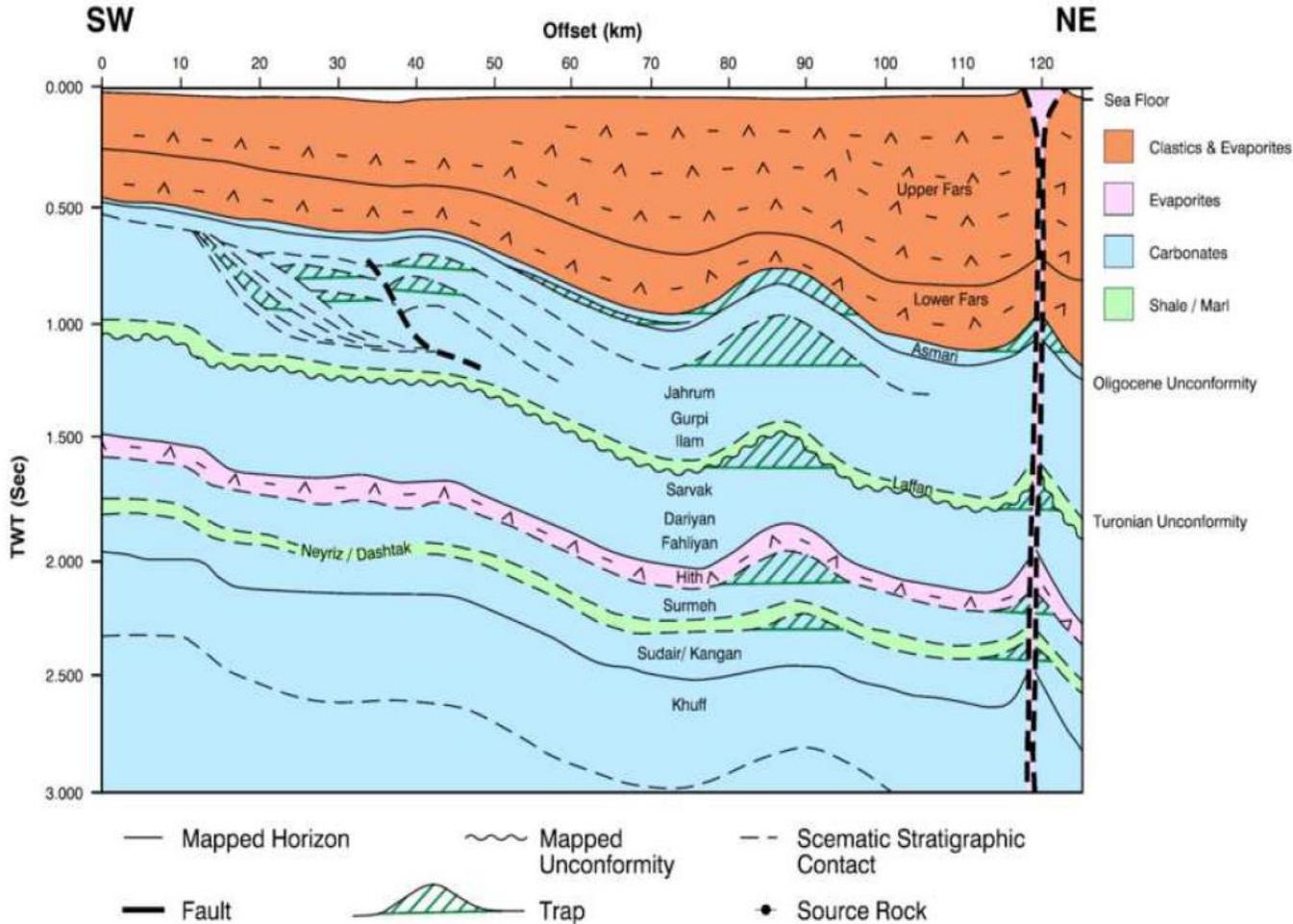
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Period	Eon	Formation	Lithology
Tertiary	Eoan	Faz	Clastics and Evaporites
		Avaz	Clastics and Evaporites
	Mio	Agah-Jar	Clastics and Evaporites
		Bahariyeh	Clastics and Evaporites
		Shar	Clastics and Evaporites
	Oligo	Chahkhan	Clastics and Evaporites
		(Shah-Khman)	Sandstone
	Eo-Paleo	Chahkhan Member	Clastics and Evaporites
		Chahkhan Member	Clastics and Evaporites
		Ham	Carbonates
Cretaceous	Upper	Jahrom/Chahman	Carbonates
		Rus	Evaporites/Salt
		Mahana	Carbonates
Cretaceous	Upper	Passen	Shale/Sand
		Tharal	Carbonates
		Tharal	Carbonates
	Middle	Barak	Carbonates
		Barghan	Carbonates
		Mahvel	Carbonates
Lower	Dasht-e-Khast	Carbonates	
	Dasht-e-Khast	Carbonates	
	Dasht-e-Khast	Carbonates	
Jurassic	Upper	Dasht-e-Khast	Carbonates
		Dasht-e-Khast	Carbonates
		Dasht-e-Khast	Carbonates
	Middle	Dasht-e-Khast	Carbonates
		Dasht-e-Khast	Carbonates
		Dasht-e-Khast	Carbonates
		Dasht-e-Khast	Carbonates
	Lower	Dasht-e-Khast	Carbonates
		Dasht-e-Khast	Carbonates
		Dasht-e-Khast	Carbonates
Triassic	Upper	Dasht-e-Khast	Carbonates
		Dasht-e-Khast	Carbonates
		Dasht-e-Khast	Carbonates
Permian	Lower	Dasht-e-Khast	Carbonates
		Dasht-e-Khast	Carbonates
		Dasht-e-Khast	Carbonates

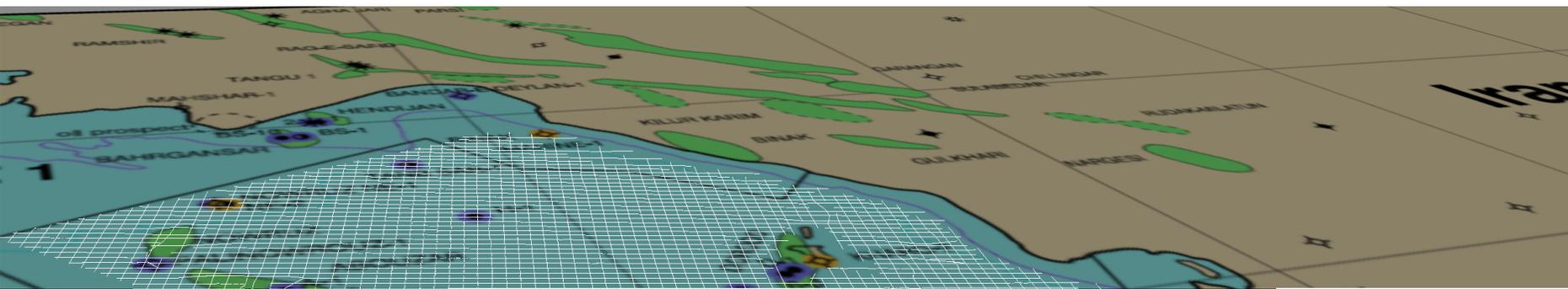
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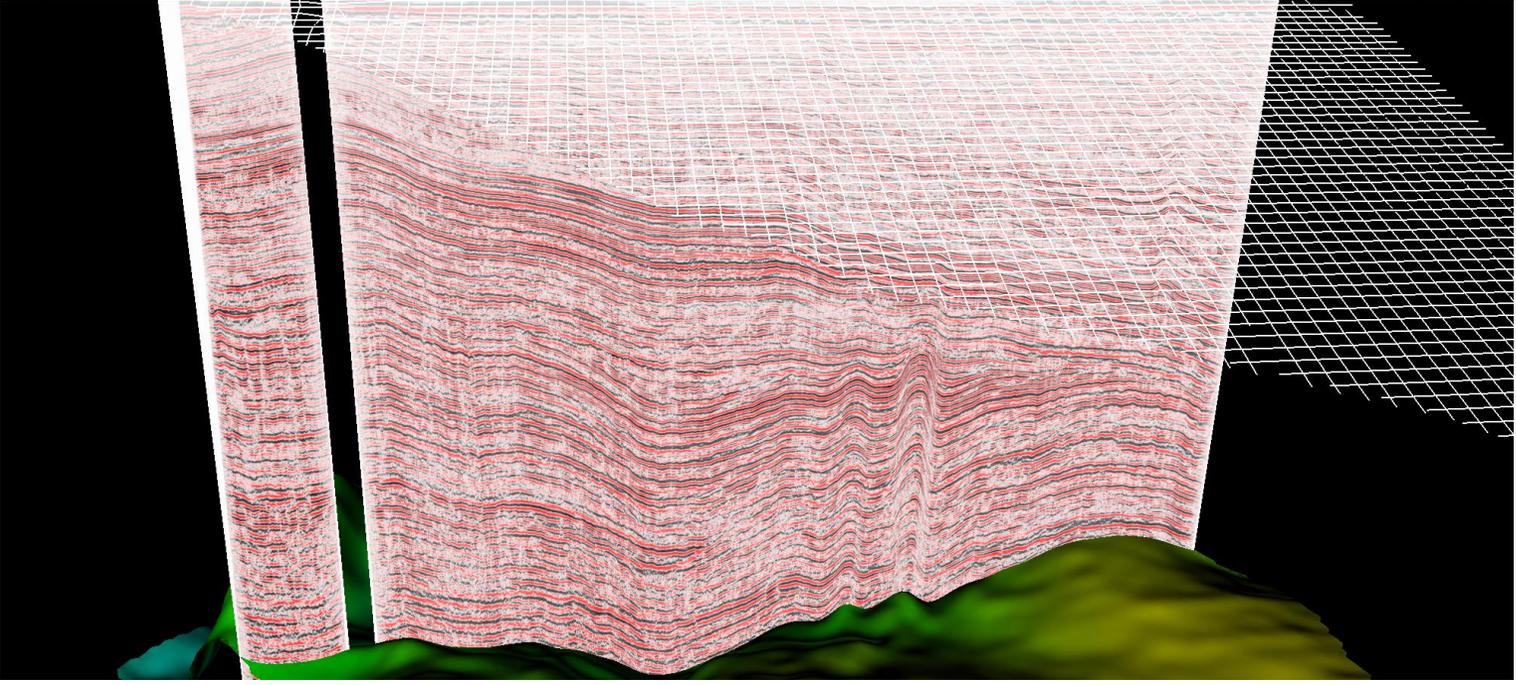


- Post-Turonian Unconformity (pre-Gurpi Shale)
 - Pinch-out plays of the Asmari Fm. were encountered only in the northeast of the block.
 - Bedding structure of prograding Jahrum Fm. offers possibility for stratigraphic traps. In addition can slumping lead to closures within this formation.
- Turonian Unconformity – Base Cretaceous (Top Hith Evaporite)
 - Several structural closures on salt domes.
 - Additional potential when accounting closure against salt stock.
 - Some of the larger Salt structures which have been drilled close to its crest still offer opportunities at the flanks.
- Jurassic and older
 - As above

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NT Sudair
(Kangan, Dalam below)

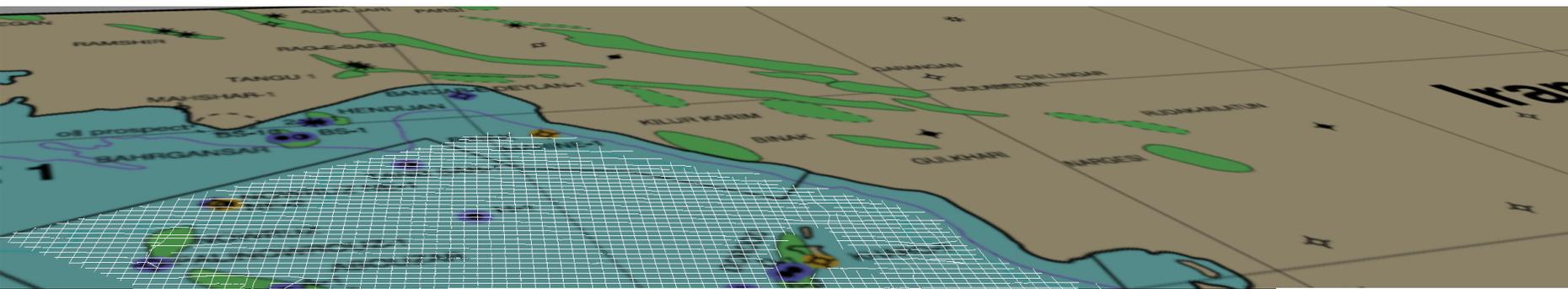


Period	Epoth	Formation	Lithology
Tertiary	Pli	Faz	Clastics and Evaporites
		Avary	Clastics and Evaporites
	Mio	Agah Jar	Clastics and Evaporites
		Bahariyeh	Clastics and Evaporites
	Oligo	Moghan	Clastics and Evaporites
		Sar Hamdan	Clastics and Evaporites
		Chahmah	Clastics and Evaporites
		Shah Khatami	Sandstone
		Chahmah Hammar	Clastics and Evaporites
		Chahmah Hammar	Clastics and Evaporites
Eo-Paleo	Jahrum/Damman	Carbonates	
	Rus	Evaporites/Salt	
	Mahina/Pasien	Carbonates	
Cretaceous	Upper	Tayran	Carbonates
		Tayran	Carbonates
		Bahra	Carbonates
		Shah	Carbonates
	Middle	Sarraf	Carbonates
		Bangestan	Carbonates
		Mahvel	Carbonates
		Mahvel	Carbonates
		Mahvel Lower	Carbonates
		Mahvel	Carbonates
Lower	Dasht	Carbonates	
	Dasht	Carbonates	
	M.S. Lake	Carbonates	
	Bugan	Carbonates	
	Dasht (lower)	Carbonates	
	Dasht	Carbonates	
Jurassic	Upper	Ab	Evaporites/Salt
		Dasht	Evaporites/Salt
		Abu A.S.C	Carbonates
		Jahra	Carbonates
	Middle	L. Bahra	Carbonates
		Dasht	Carbonates
		Dasht	Carbonates
		Dasht	Carbonates
Lower	Dasht	Carbonates	
	Dasht	Carbonates	
	Dasht	Carbonates	
	Dasht	Carbonates	
Triassic	Upper	Dashtak	Carbonates
		Dashtak	Carbonates
	Middle	Agah Jar	Shale
Permian	Lower	Dasht	Carbonates
		Kangan	Carbonates
		Dasht	Carbonates

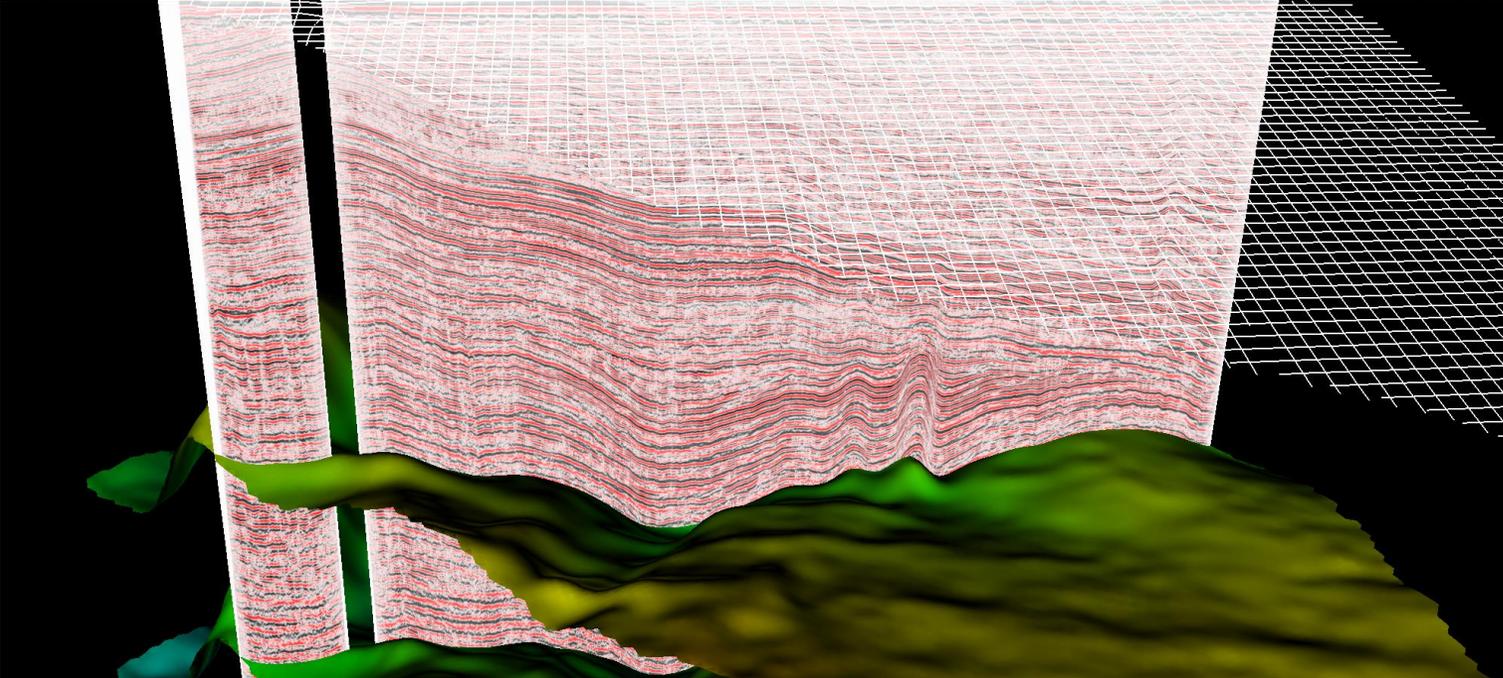
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NT Hith
(Surmeh below)

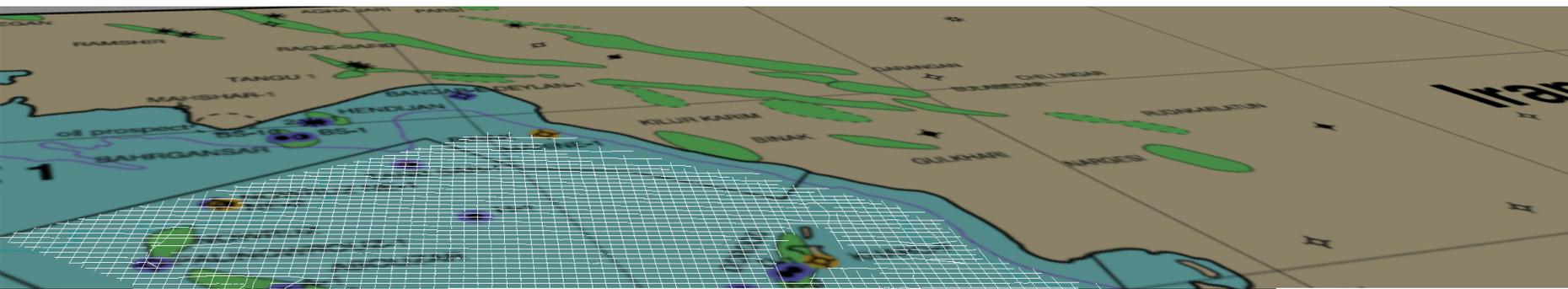


Period	Epoth	Formation	Lithology
Tertiary	Pli	Pass	Clastic and Evaporites
		Avarg	Clastic and Evaporites
	Mio	Agah-Jar	Clastic and Evaporites
		Bahariyeh	Clastic and Evaporites
	Oligo	Moghan	Clastic and Evaporites
		Sar Hamdan	Clastic and Evaporites
		Chahmahal	Clastic and Evaporites
		Shah-Khman	Sandstone
		Chahmahal	Clastic and Evaporites
		Chahmahal	Clastic and Evaporites
Cretaceous	Eo-Paleo	Jahrom-Damman	Carbonates
		Rus	Evaporites/Salt
		Passen	Carbonates
	Upper	Thayal	Carbonates
		Thayal	Carbonates
		Shah	Carbonates
		Shah	Shale
	Middle	Sarraf	Carbonates
		Barghan	Carbonates
		Mahvel	Carbonates
Mahvel		Carbonates	
Mahvel		Carbonates	
Mahvel		Carbonates	
Lower	Dasht-e-Sayeh	Carbonates	
	Shah	Carbonates	
	Shah	Carbonates	
	Shah	Carbonates	
Jurassic	Upper	Shah	Evaporites/Salt
		Shah	Carbonates
		Shah	Carbonates
	Middle	Shah	Carbonates
		Shah	Carbonates
		Shah	Carbonates
Lower	Shah	Carbonates	
	Shah	Carbonates	
	Shah	Carbonates	
Triassic	Upper	Shah	Carbonates
		Shah	Evaporites/Salt
	Middle	Shah	Shale
Permian	Lower	Shah	Carbonates
		Shah	Carbonates
	Upper	Shah	Carbonates

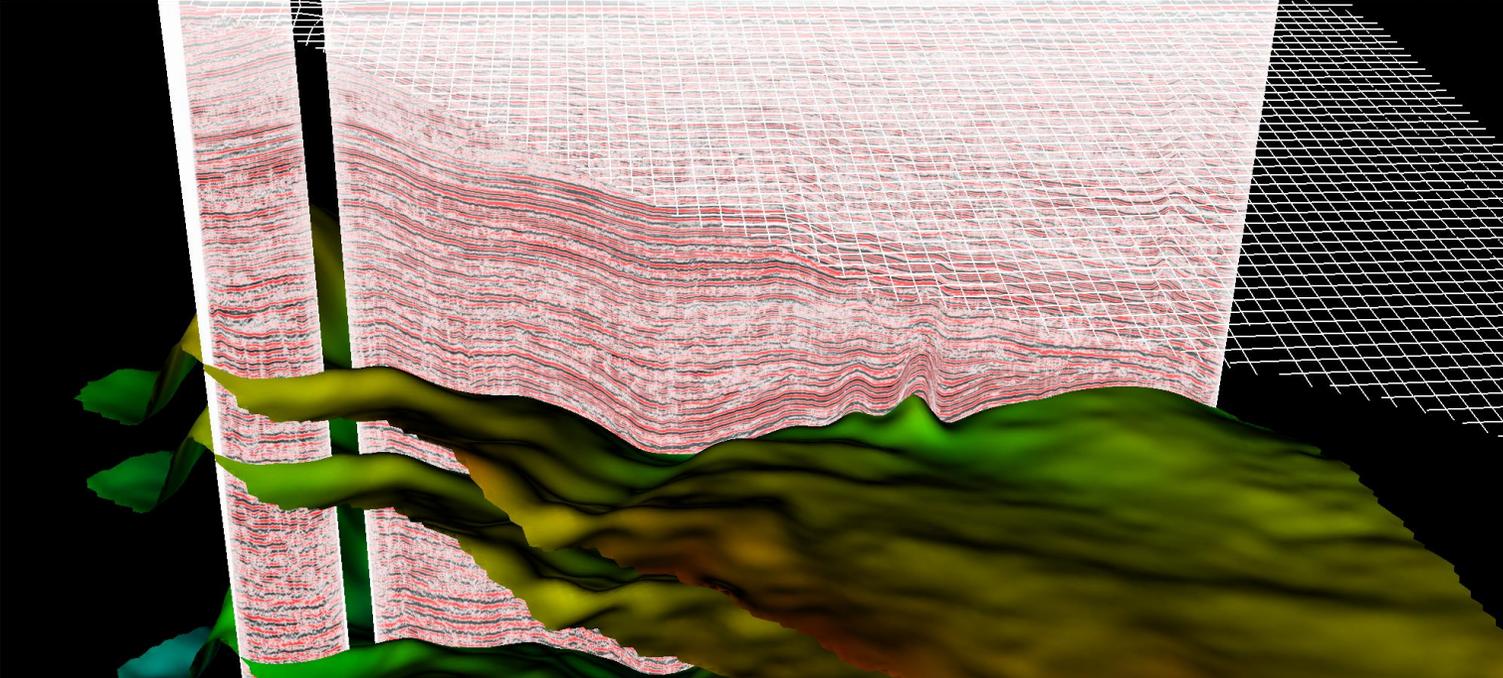
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NT Dariyan
(Dariyan, Gadvan, Fahliyan below)

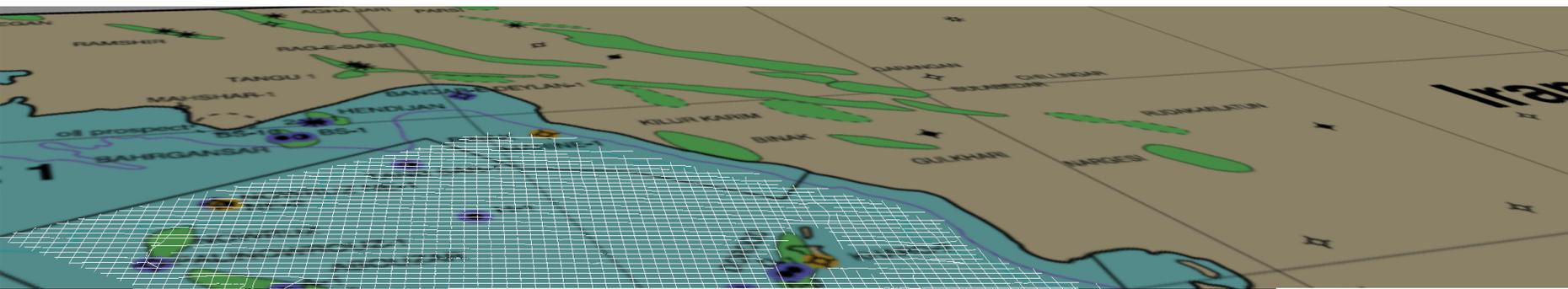


Period	Eon	Formation	Lithology
Tertiary	Pliocene	Fazl	Clastics and Evaporites
		Avarg	Clastics and Evaporites
	Miocene	Agah-Jari	Clastics and Evaporites
		Bahariyeh	Clastics and Evaporites
	Oligocene	Qasr Namdar	Clastics and Evaporites
		Chahmahal	Clastics and Evaporites
Eocene-Paleocene	Chahmahal	Clastics and Evaporites	
	Chahmahal	Clastics and Evaporites	
	Chahmahal	Clastics and Evaporites	
	Chahmahal	Clastics and Evaporites	
Cretaceous	Upper	Taybar	Carbonates
		Taybar	Carbonates
		Taybar	Carbonates
	Middle	Sarvak	Carbonates
		Bangestan	Carbonates
		Mahvel	Carbonates
	Lower	Mahvel	Carbonates
		Mahvel	Carbonates
Jurassic	Upper	Abi-Dhabi	Evaporites/Dal
		Abi-Dhabi	Evaporites/Dal
		Abi-Dhabi	Evaporites/Dal
	Middle	Agah-Jari	Carbonates
		Agah-Jari	Carbonates
		Agah-Jari	Carbonates
Lower	Agah-Jari	Carbonates	
	Agah-Jari	Carbonates	
	Agah-Jari	Carbonates	
Triassic	Upper	Agah-Jari	Carbonates
		Agah-Jari	Carbonates
		Agah-Jari	Carbonates
Permian	Lower	Agah-Jari	Carbonates
		Agah-Jari	Carbonates
		Agah-Jari	Carbonates

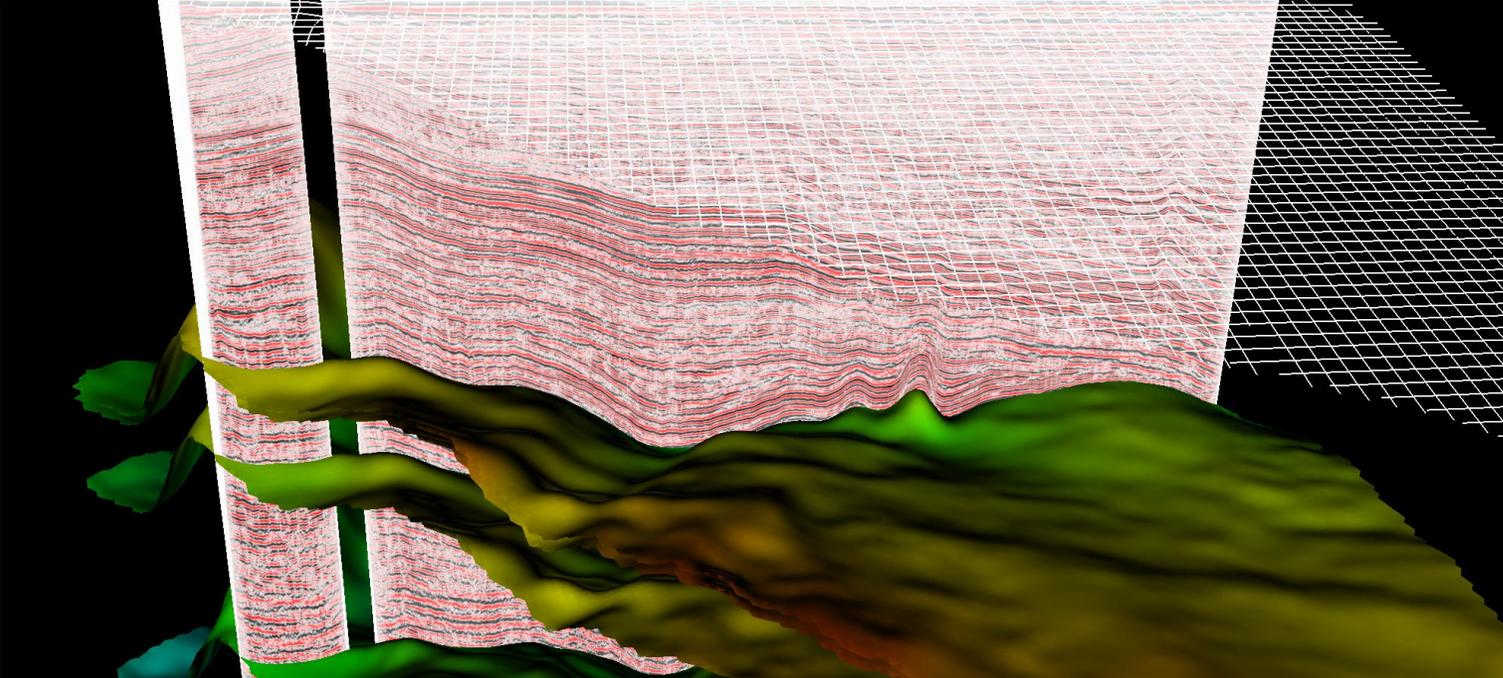
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NT Burgan
(Burgan below, Kazhdumi
(Nam Uhr) just above)



Period	Eon	Formation	Lithology
Tertiary	Eoan	Faz	Clastics and Evaporites
		Avarg	Clastics and Evaporites
	Mio	Agah Jar	Clastics and Evaporites
		Bahriyar	Clastics and Evaporites
	Oligo	Moghan	Clastics and Evaporites
		Sar Hamdan	Clastics and Evaporites
		Chahmah	Clastics and Evaporites
		Shah Khatami	Sandstone
		Chahmah Lower	Clastics and Evaporites
		Chahmah Upper	Clastics and Evaporites
Eo-Paleo	Jahrom/Damman	Carbonates	
	Rus	Evaporites/Salt	
	Mahina	Carbonates	
Cretaceous	Upper	Thayal	Carbonates
		Thayal	Carbonates
		Bafra	Carbonates
		Agah	Carbonates
	Middle	Sar	Carbonates
		Sar	Carbonates
Lower	Sar	Carbonates	
	Sar	Carbonates	
Jurassic	Upper	Sh	Evaporites/Salt
		Sh	Evaporites/Salt
		Sh	Evaporites/Salt
	Middle	Sh	Carbonates
		Sh	Carbonates
		Sh	Carbonates
Lower	Sh	Carbonates	
	Sh	Carbonates	
	Sh	Carbonates	
Triassic	Upper	Sh	Carbonates
		Sh	Carbonates
		Sh	Carbonates
Permian	Lower	Sh	Carbonates
		Sh	Carbonates
		Sh	Carbonates

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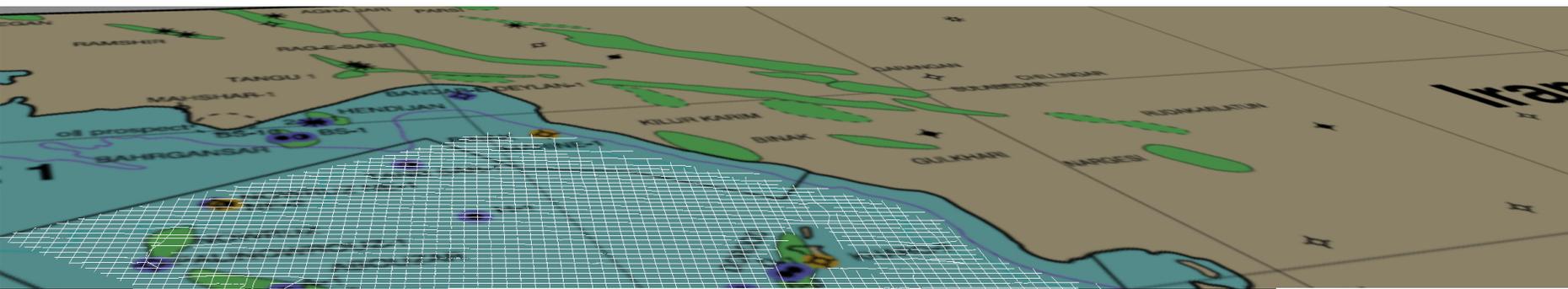
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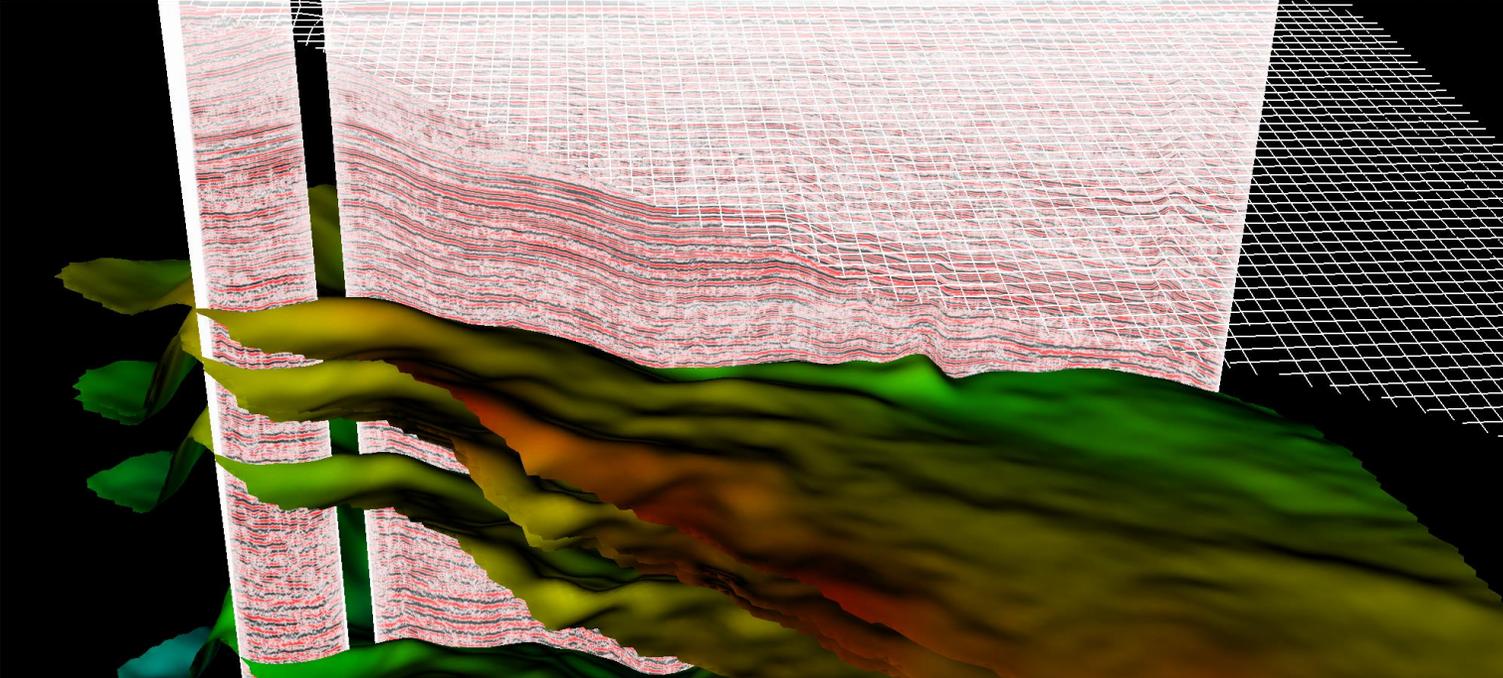
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Turonian UC
(Sarvak below)

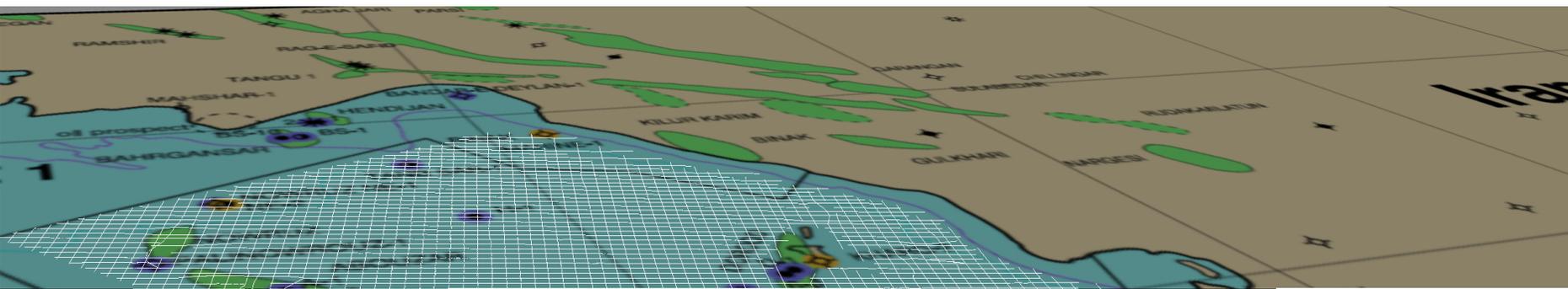


Period	Eon	Formation	Lithology
Tertiary	Eoan	Fazl	Clastics and Evaporites
		Avary	Clastics and Evaporites
	Mio	Agah-Jari	Clastics and Evaporites
		Bahariyeh	Clastics and Evaporites
	Oligo	Qasr Namdar	Clastics and Evaporites
		Chahmahal	Clastics and Evaporites
		Shah-Kahmani	Sandstone
		Chahmahal	Clastics and Evaporites
		Chahmahal	Clastics and Evaporites
		Chahmahal	Clastics and Evaporites
Cretaceous	Eo-Paleo	Jahrom-Damman	Carbonates
		Rus	Evaporites/Salt
		Pasana	Carbonates
	Upper	Taybar	Carbonates
		Taybar	Carbonates
		Barak	Carbonates
		Shah	Carbonates
Lower	Sarvak	Carbonates	
	Bangestan	Carbonates	
	Mahvel	Carbonates	
Jurassic	Upper	Shah	Evaporites/Salt
		Shah	Evaporites/Salt
		Shah	Evaporites/Salt
	Middle	Shah	Carbonates
		Shah	Carbonates
Lower	Shah	Carbonates	
	Shah	Carbonates	
	Shah	Carbonates	
Triassic	Upper	Shah	Carbonates
		Shah	Carbonates
	Lower	Shah	Carbonates
Permian	Upper	Shah	Carbonates
		Shah	Carbonates
	Lower	Shah	Carbonates

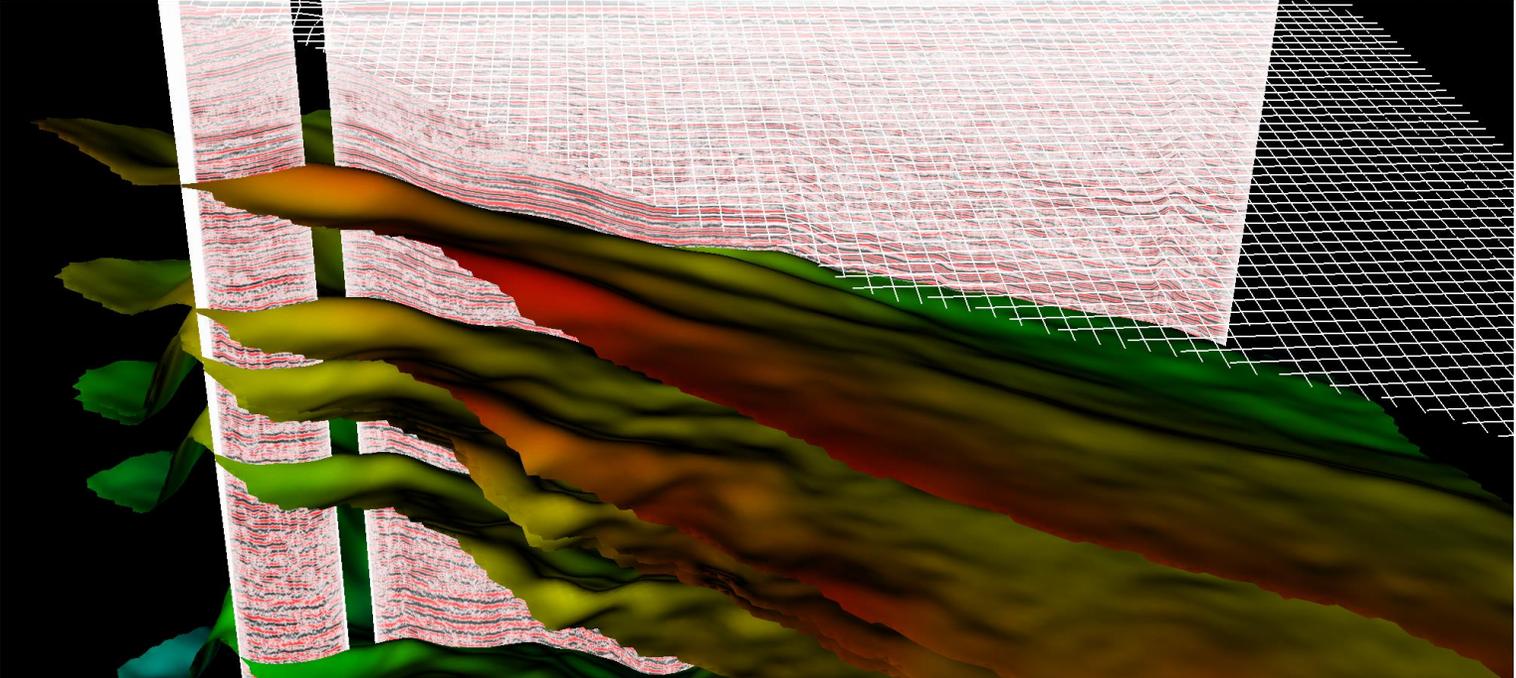
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Oligocene UC
(Asmari just above)

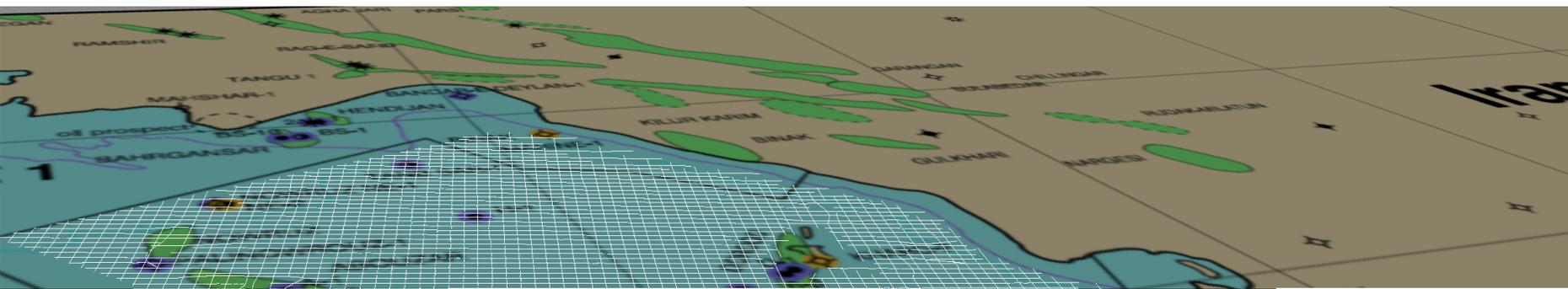


Period	Epoth	Formation	Lithology
Tertiary	Pli	Fazl	Clastics and Evaporites
		Avary	Clastics and Evaporites
	Mio	Agah-Jar	Clastics and Evaporites
		Bahariyeh	Clastics and Evaporites
	Oligo	Shahr	Clastics and Evaporites
		Qasr Namdar	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
Cretaceous	Eo-Paleo	Jahrom-Damman	Carbonates
		Rus	Evaporites/Dal
	Upper	Mahina	Carbonates
		Passen	Shale/Sand
		Tharal	Carbonates
		Tharal	Carbonates
		Barah	Carbonates
Jurassic	Upper	Sarvak	Carbonates
		Bangestan	Carbonates
	Middle	Mahvel	Carbonates
		Mahvel	Carbonates
Permian	Upper	Asmari	Evaporites/Dal
		Asmari	Evaporites/Dal
	Lower	Asmari	Evaporites/Dal
		Asmari	Evaporites/Dal

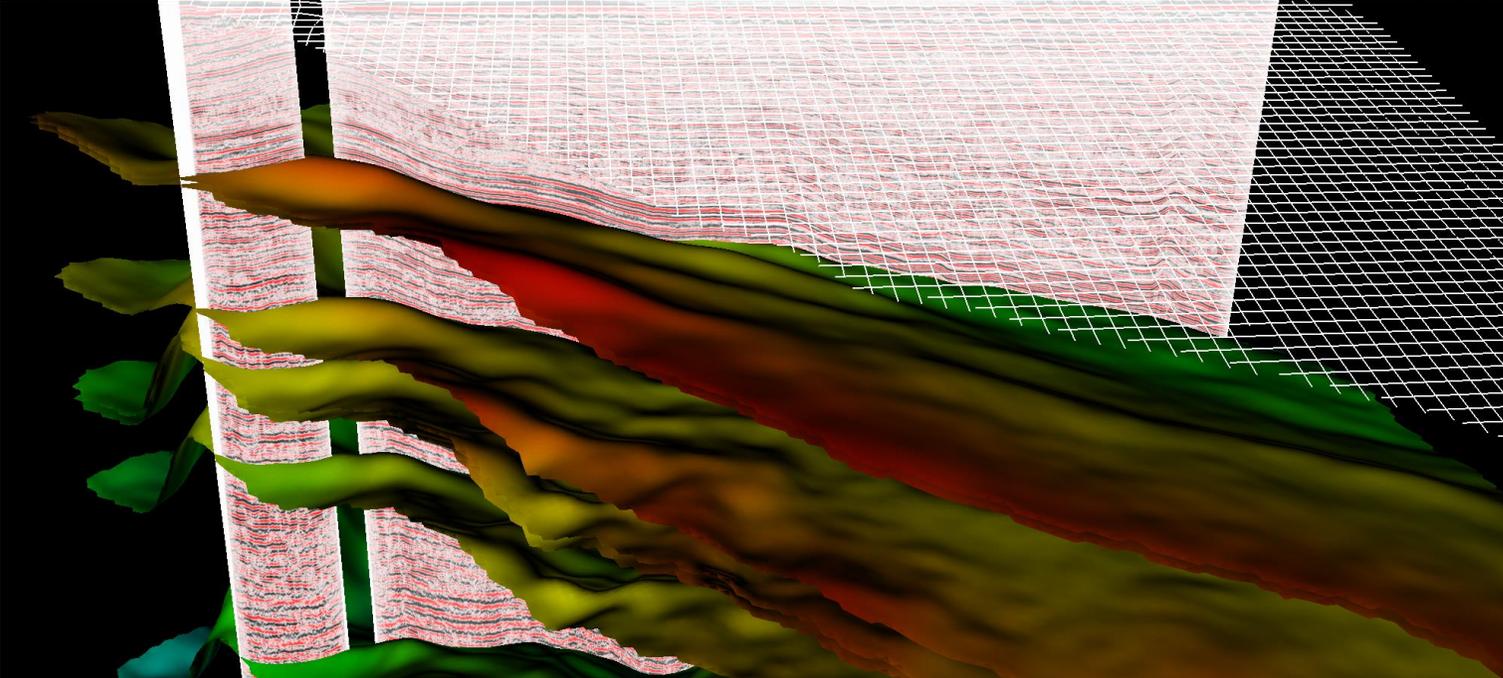
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Asmari



Period	Eon	Formation	Lithology
Tertiary	Eo-	Pass	Clastics and Evaporites
		Avary	Clastics and Evaporites
	Mio	Agah-Jar	Clastics and Evaporites
		Bahariyeh	Clastics and Evaporites
	Oligo	Moghan	Clastics and Evaporites
		Qasr Namdar	Clastics and Evaporites
		Chahmahal	Clastics and Evaporites
		Shir	Sandstone
		(Shah-Khman)	Sandstone
		Chahmahal (lower)	Clastics and Evaporites
Eo-Paleo	Chahmahal (upper)	Clastics and Evaporites	
	Yamud-Damman	Carbonates	
	Rus	Evaporites/Salt	
Cretaceous	Upper	Madina	Carbonates
		Passen	Carbonates
	Middle	Thayal	Carbonates
		Thayal	Carbonates
		Baris	Carbonates
		Yamud	Carbonates
	Lower	Shir	Carbonates
		Lafan	Shale
		Sarvak	Carbonates
		Bangestan	Carbonates
Jurassic	Upper	Mahvel	Carbonates
		Mahvel	Carbonates
	Middle	Mahvel (lower)	Carbonates
		Mahvel	Carbonates
	Lower	Dasi Lari	Carbonates
		M.S. Lari	Carbonates
		Bugan	Sandstone
		Darwin (lower)	Carbonates
		Shakka	Carbonates
		Zohar	Carbonates
Triassic	Upper	Am	Evaporites/Salt
		Shakka	Evaporites/Salt
	Middle	Amir A.S.C.	Carbonates
		Judria	Carbonates
	Lower	Yamud	Carbonates
		L. Shahr-e-Nak	Shale
Permian	Upper	Shir	Carbonates
		Dashtak	Carbonates
Middle	Shahr-e-Nak (lower)	Evaporites/Salt	
	Shahr-e-Nak (upper)	Carbonates	
Lower	Dashtak	Carbonates	
	Agah-Jar (lower)	Shale	
Carboniferous	Upper	Dashtak	Carbonates
		Agah-Jar (upper)	Shale
Lower	Dashtak	Carbonates	
	Agah-Jar (lower)	Shale	

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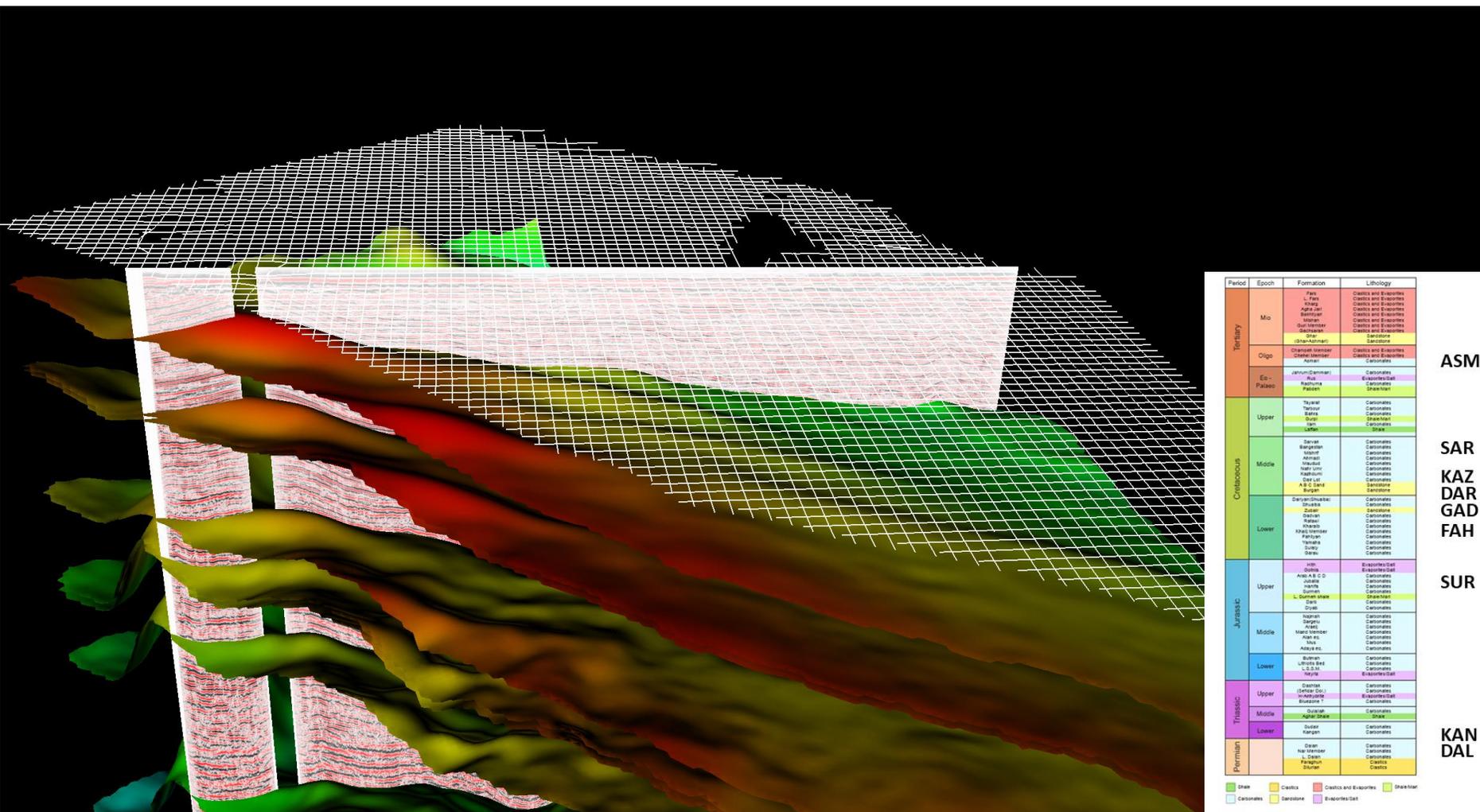
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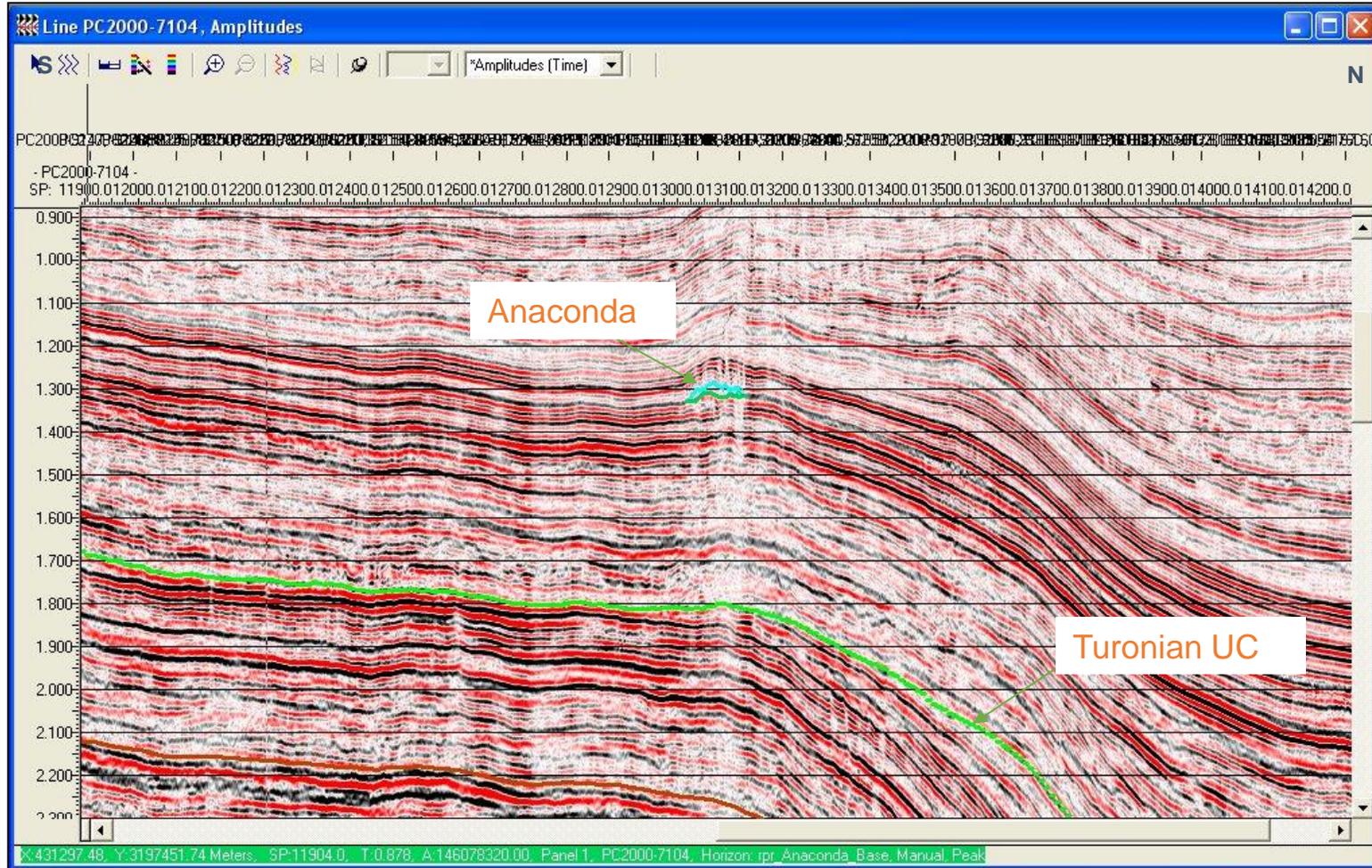


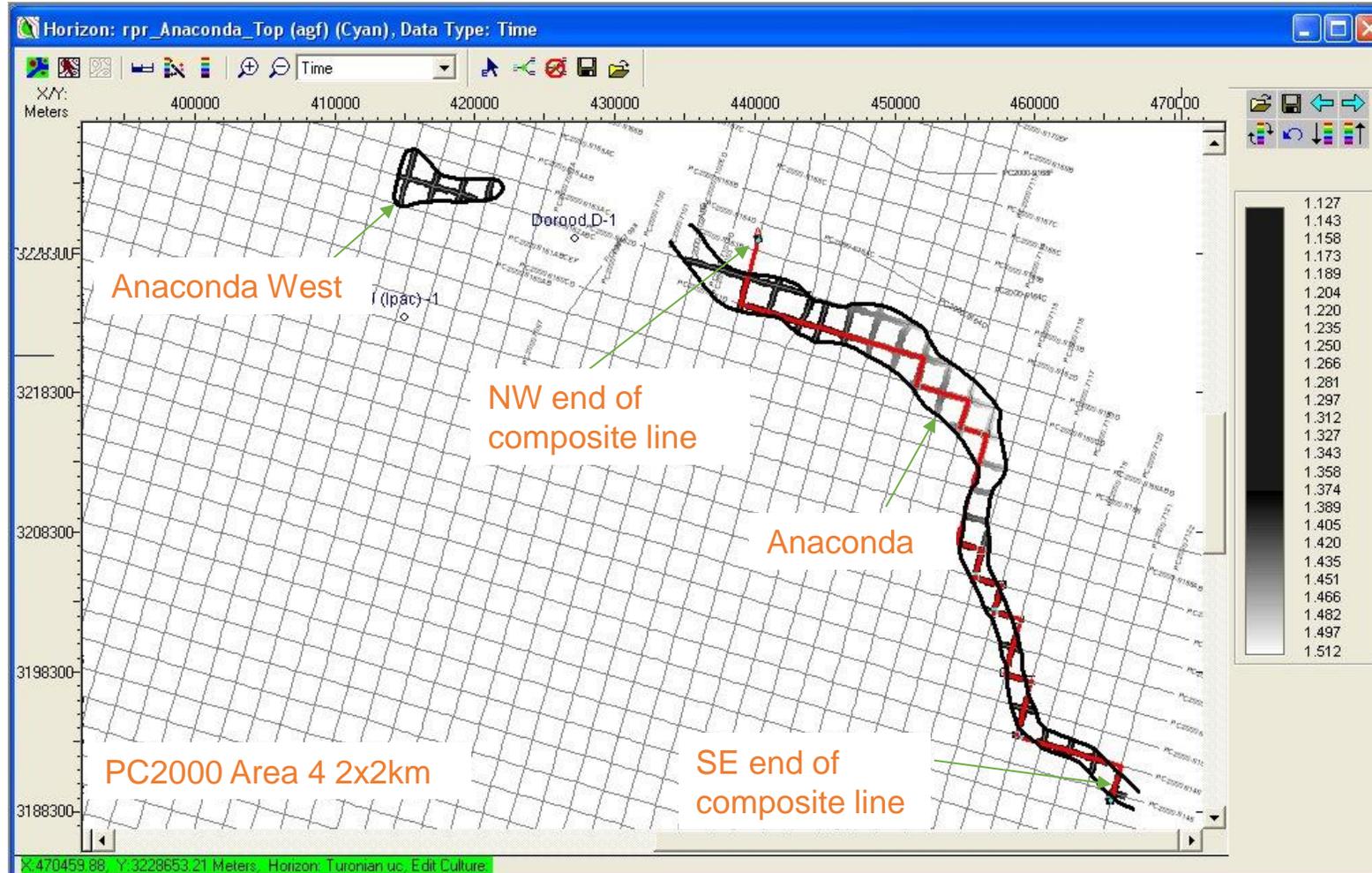
Intra Lower Fars

Period	Epoth	Formation	Lithology
Tertiary	Pliocene	Fars	Clastics and Evaporites
		Avaz	Clastics and Evaporites
		Agah-Jari	Clastics and Evaporites
		Bahariyat	Clastics and Evaporites
		Moghan	Clastics and Evaporites
	Oligocene	Sar Hamdan	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
	Eocene-Paleocene	Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
Cretaceous	Upper	Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
	Middle	Sarvak	Clastics and Evaporites
		Kangas	Clastics and Evaporites
		Moghan	Clastics and Evaporites
		Moghan	Clastics and Evaporites
		Moghan	Clastics and Evaporites
	Lower	Moghan	Clastics and Evaporites
		Moghan	Clastics and Evaporites
		Moghan	Clastics and Evaporites
		Moghan	Clastics and Evaporites
		Moghan	Clastics and Evaporites
Jurassic	Upper	Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
	Middle	Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
Lower	Shahrak	Clastics and Evaporites	
	Shahrak	Clastics and Evaporites	
Triassic	Upper	Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
	Middle	Shahrak	Clastics and Evaporites
Permian	Lower	Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites
		Shahrak	Clastics and Evaporites

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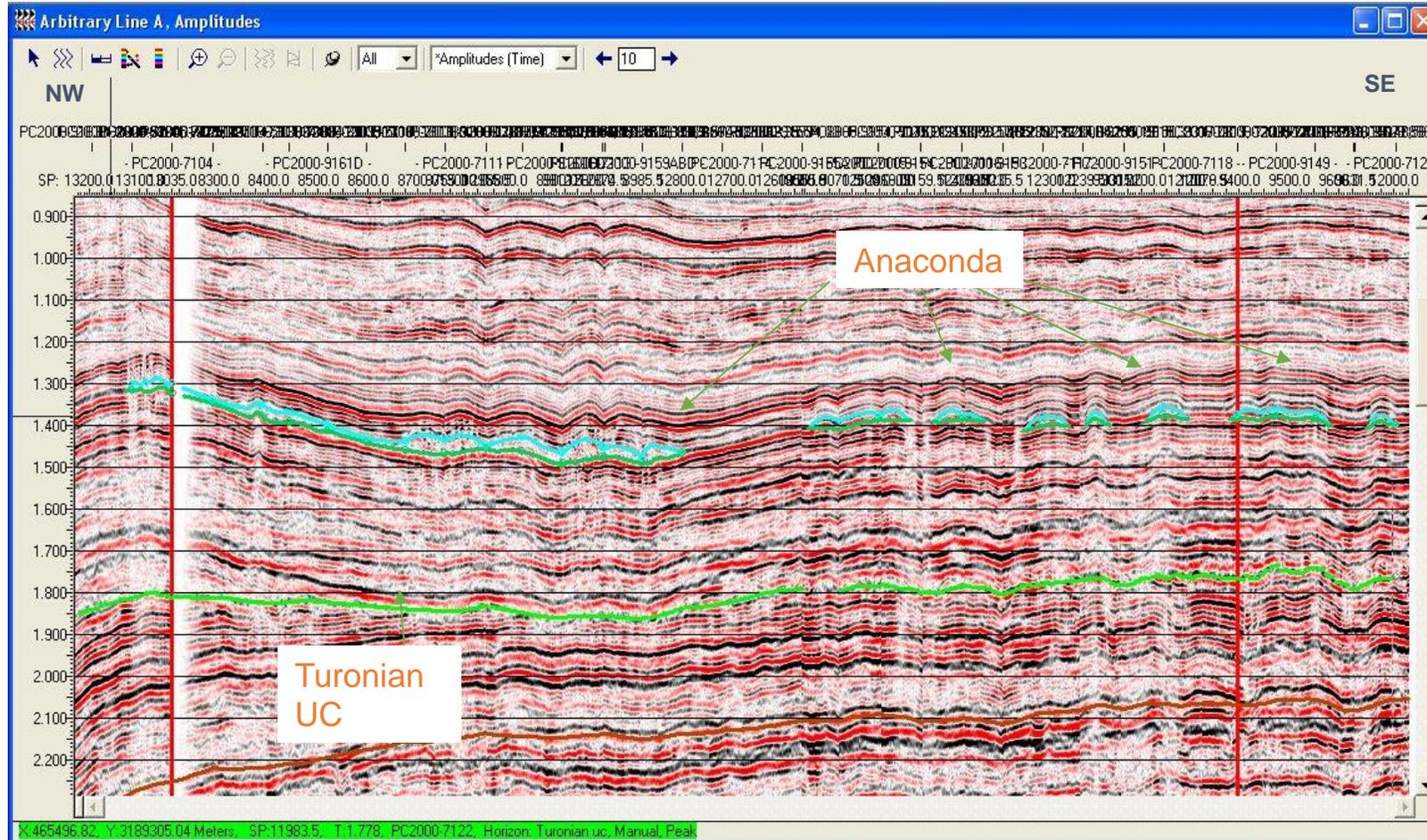




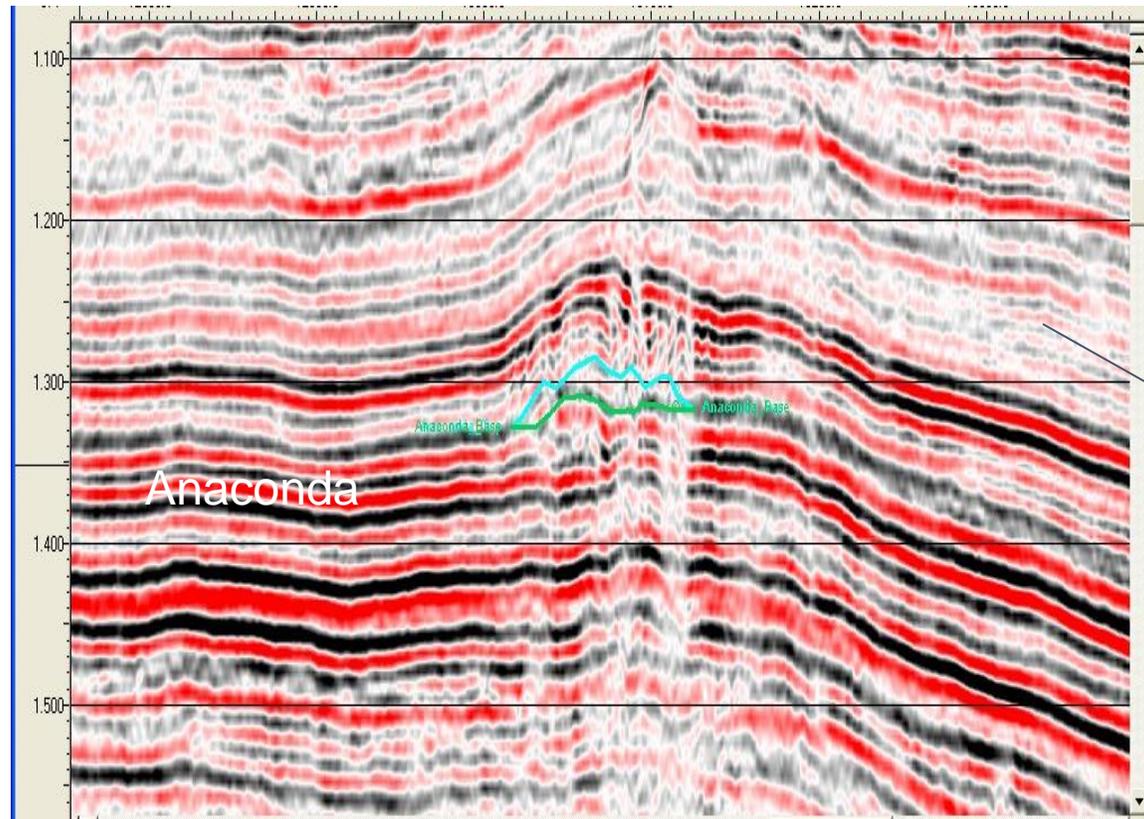


Path of composite line shown in red (see next slide)

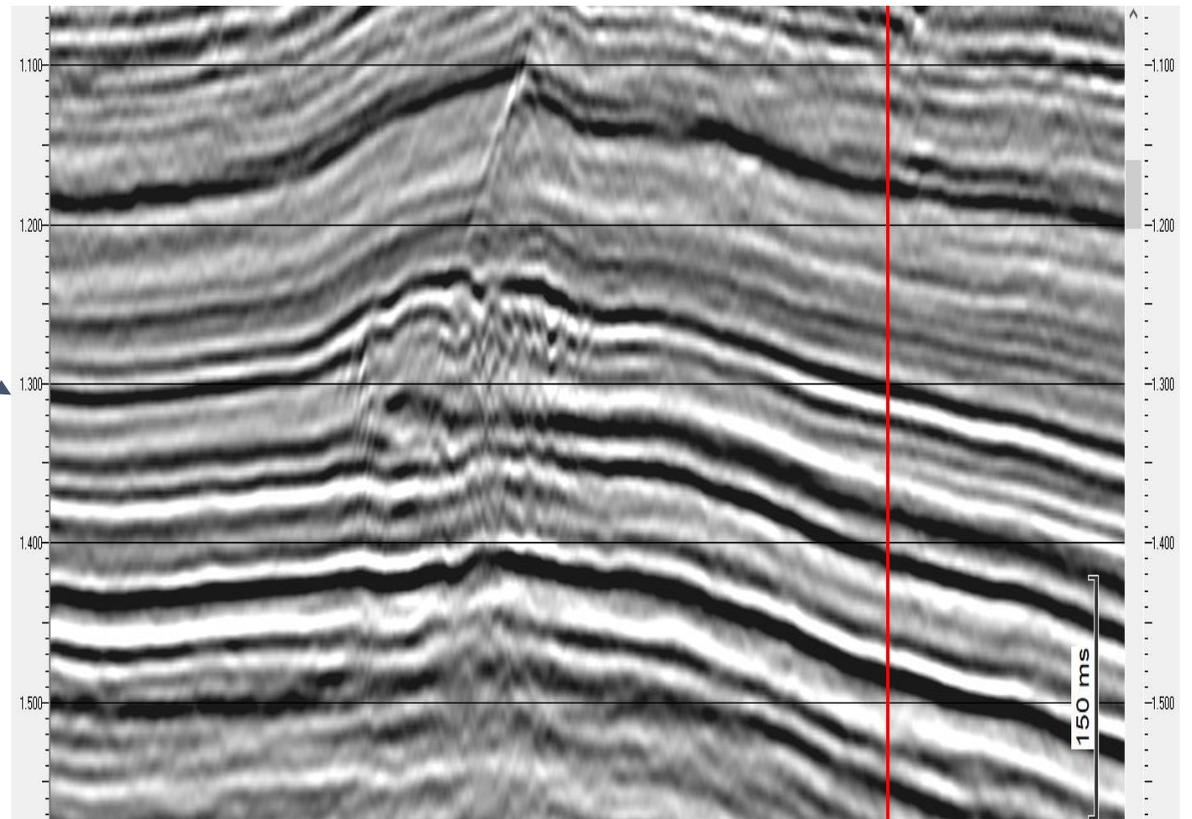
Anaconda



Composite line



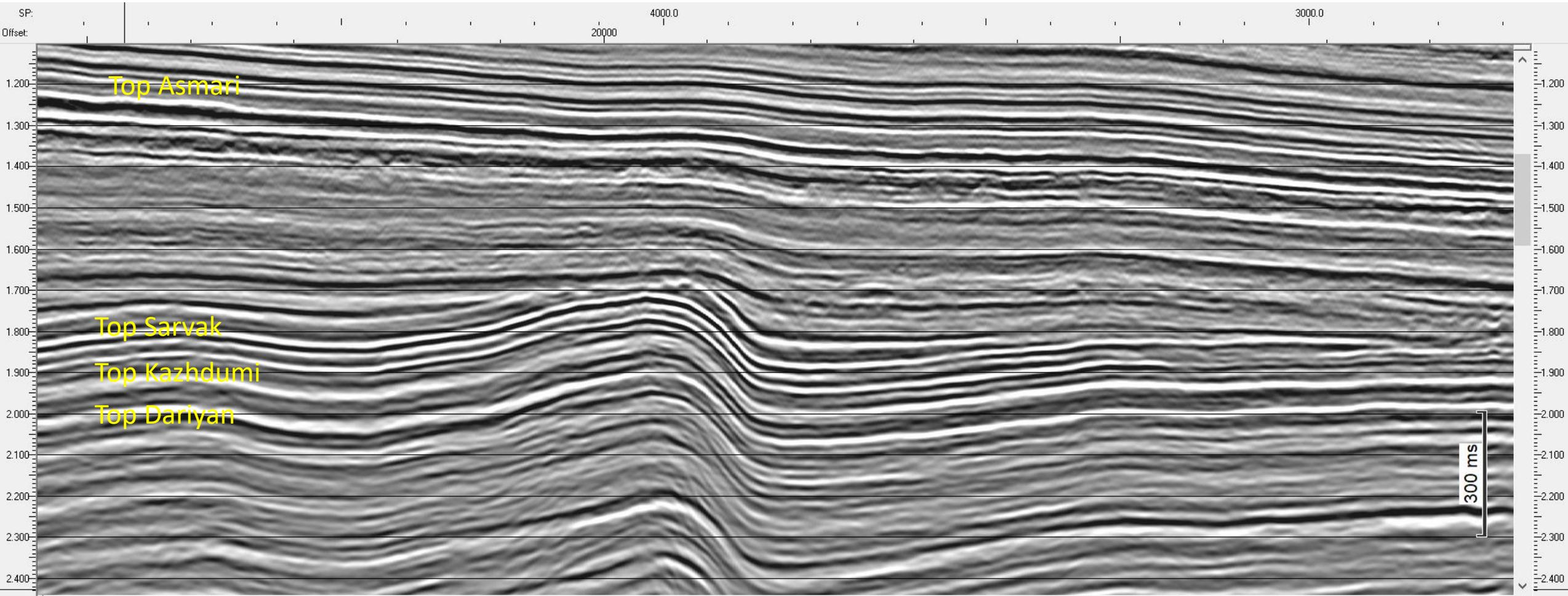
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Anaconda

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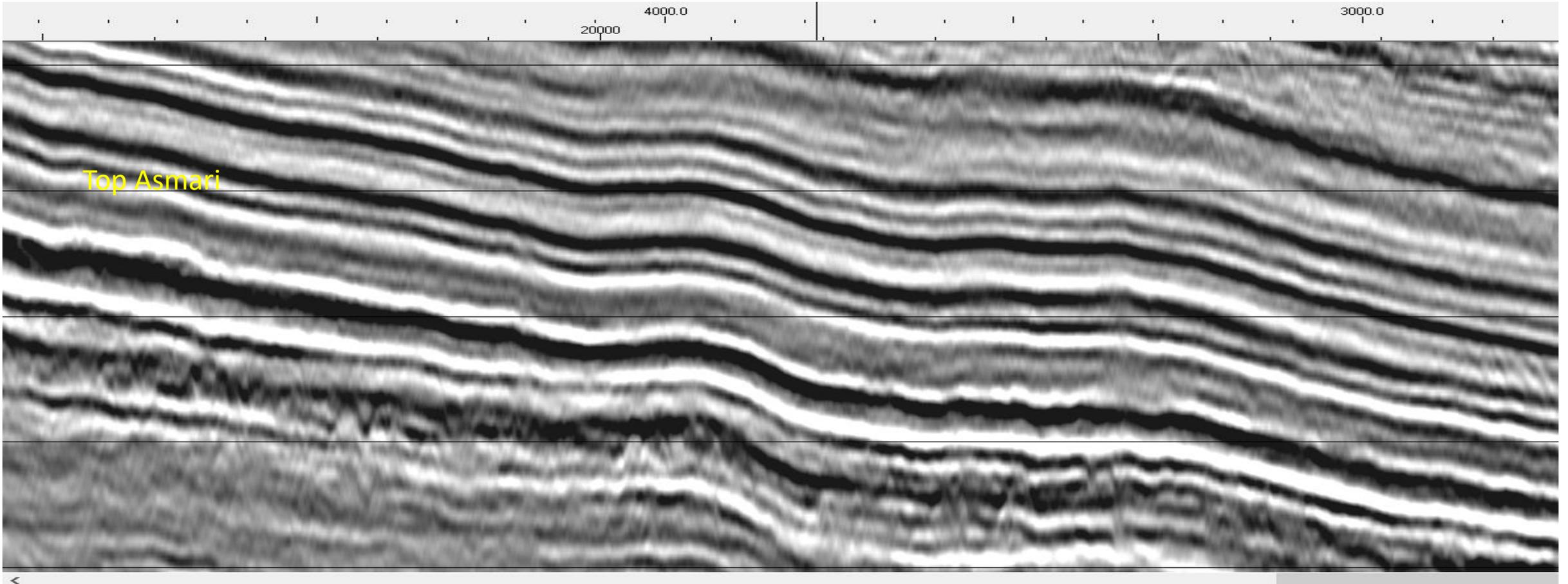
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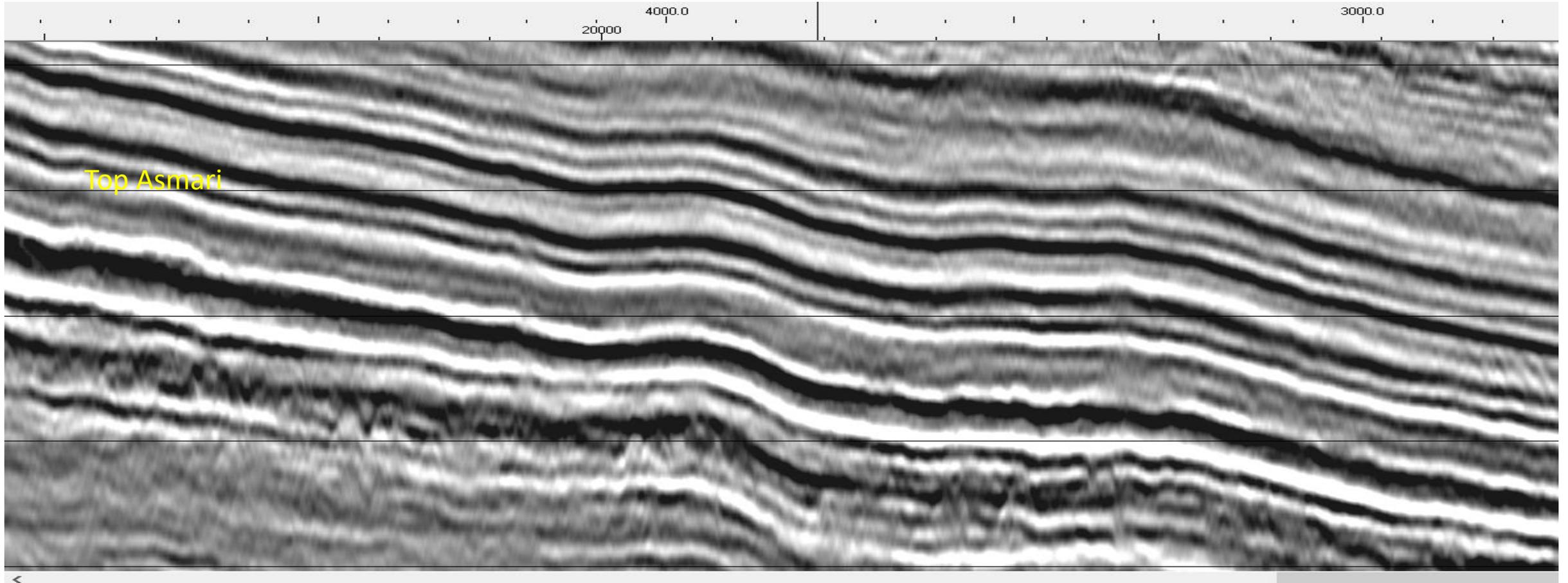
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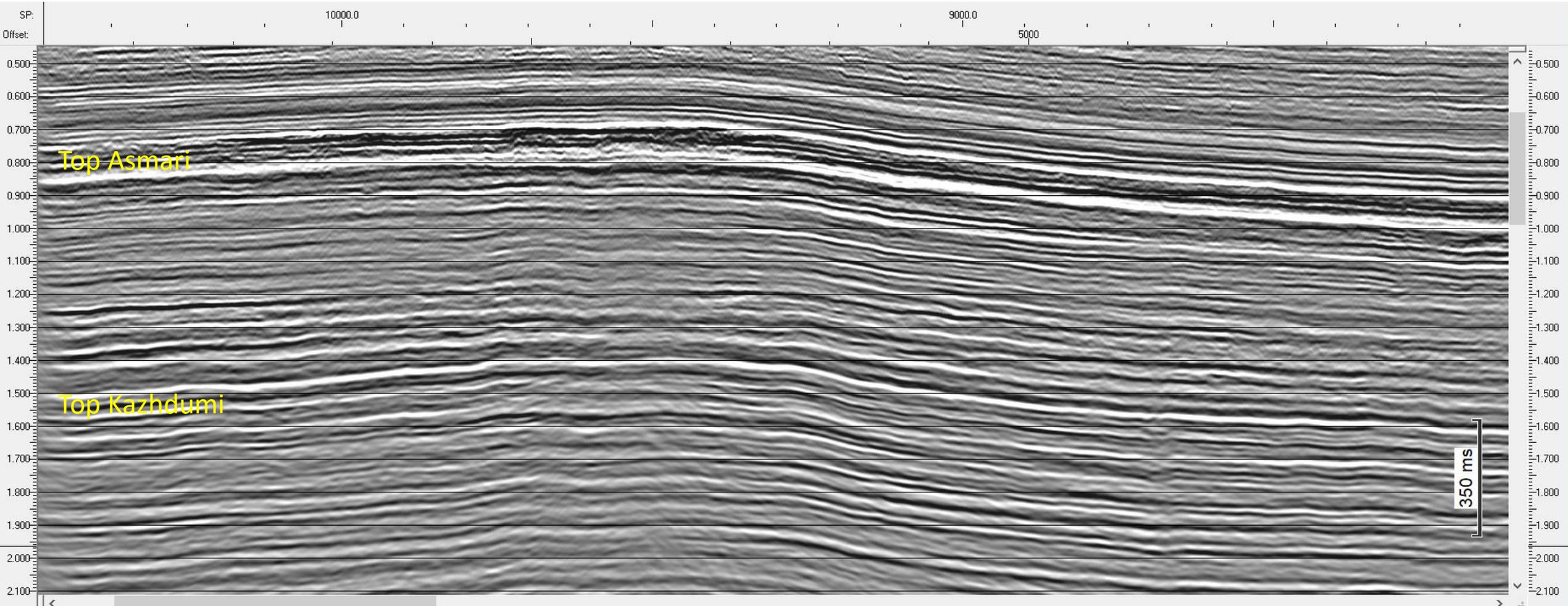


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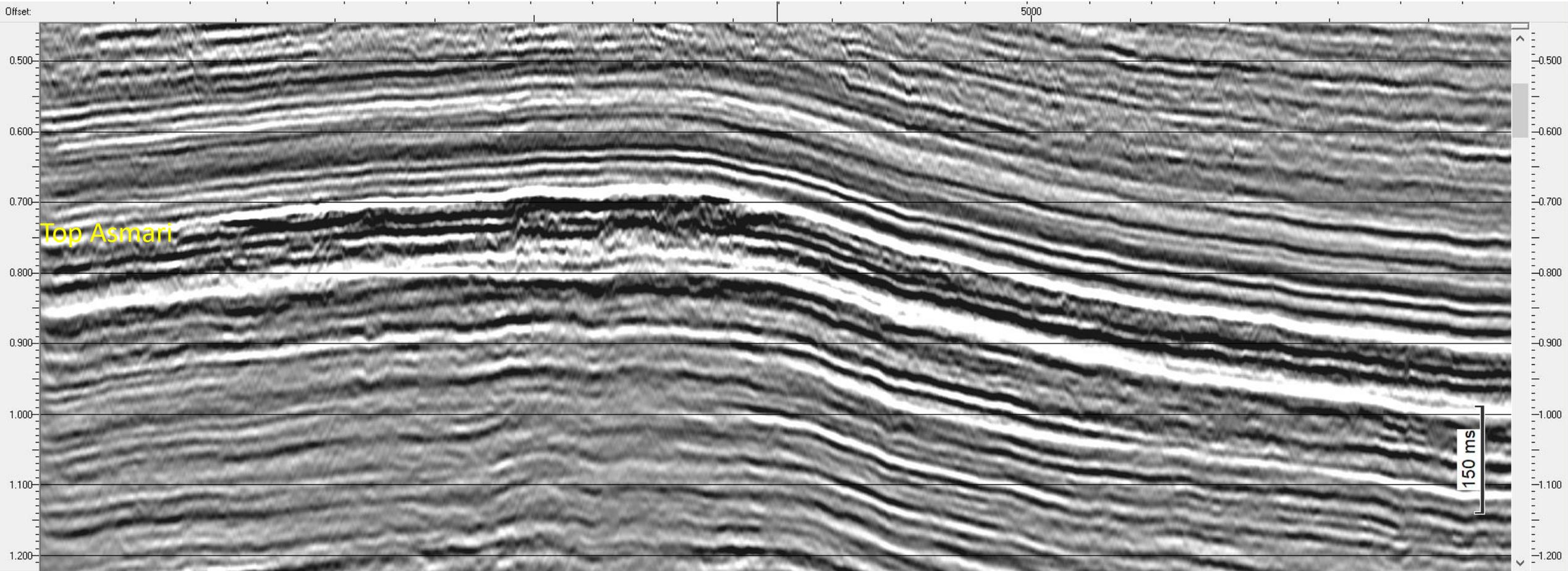
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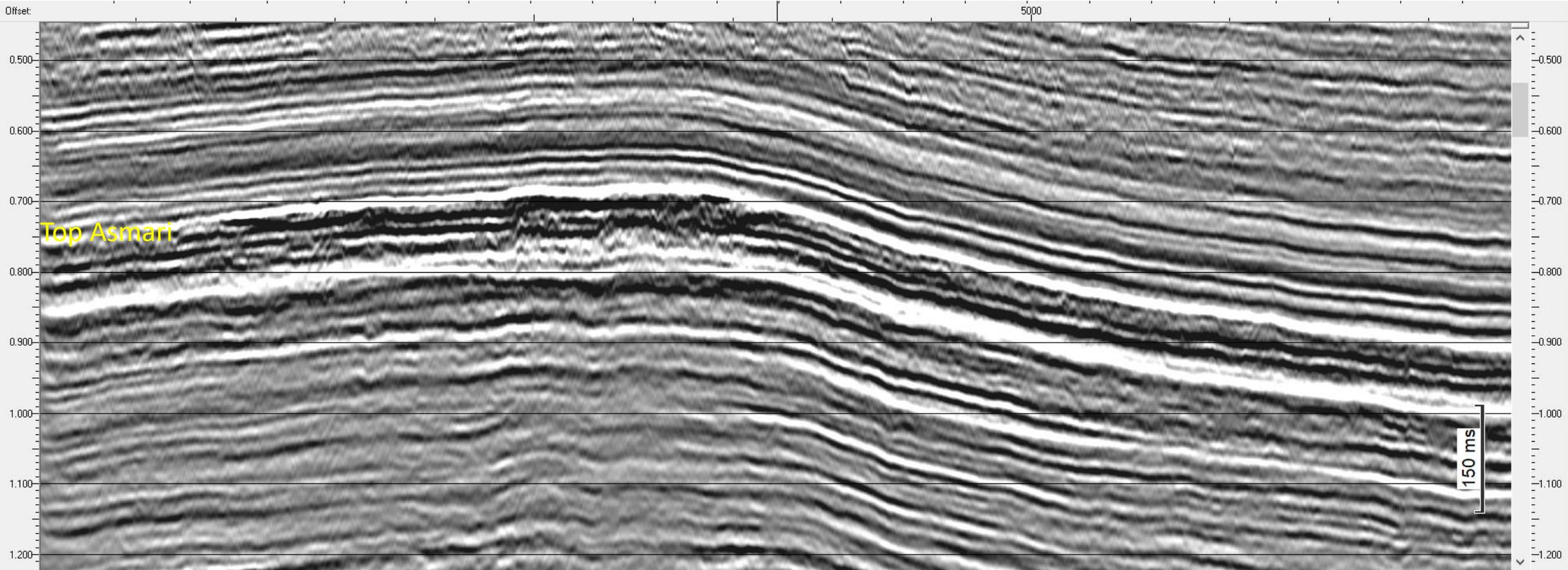
Aboozar Line 9158BBCD Repro



Aboozar Line 9158BBCD Repro



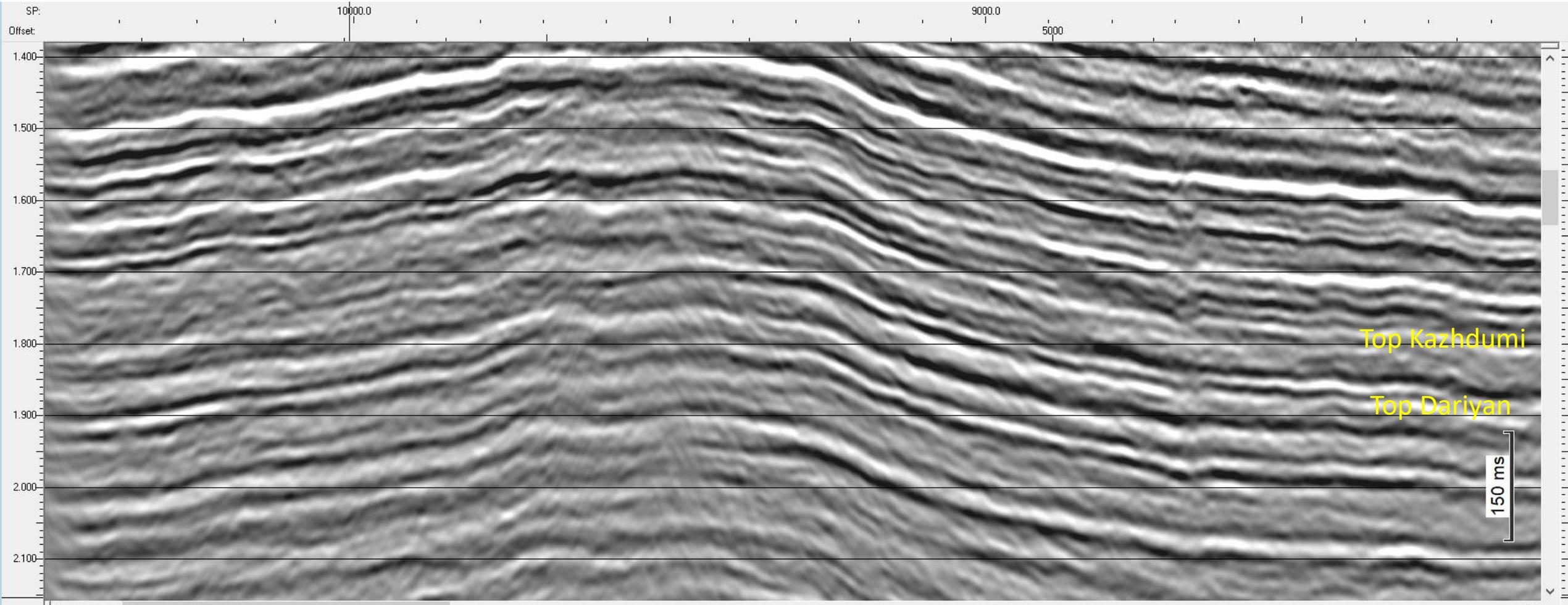
Aboozar Line 9158BBCD Repro





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Aboozar Line 9158BBCD Repro





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Aboozar Line 9158BBCD Repro

