

UNCTAD

17th Africa OILGASMINE, Khartoum, 23-26 November 2015

Extractive Industries and Sustainable Job Creation

Investment opportunities in Sudan's hydrocarbon industry

By

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The views expressed are those of the author and do not necessarily reflect
the views of UNCTAD.



Republic of Sudan
Ministry of Petroleum & Gas (MOPG)
Oil Exploration and Production Authority (OEPA)

Investment Opportunities
In Sudan's Hydrocarbon Industry

17th AFRICA
OILGASMINE
TRADE & FINANCE
CONFERENCE AND EXHIBITION
SUDAN 2015

By: Abdalla Ahmed Awadalla



Cubic Globe



Outlines

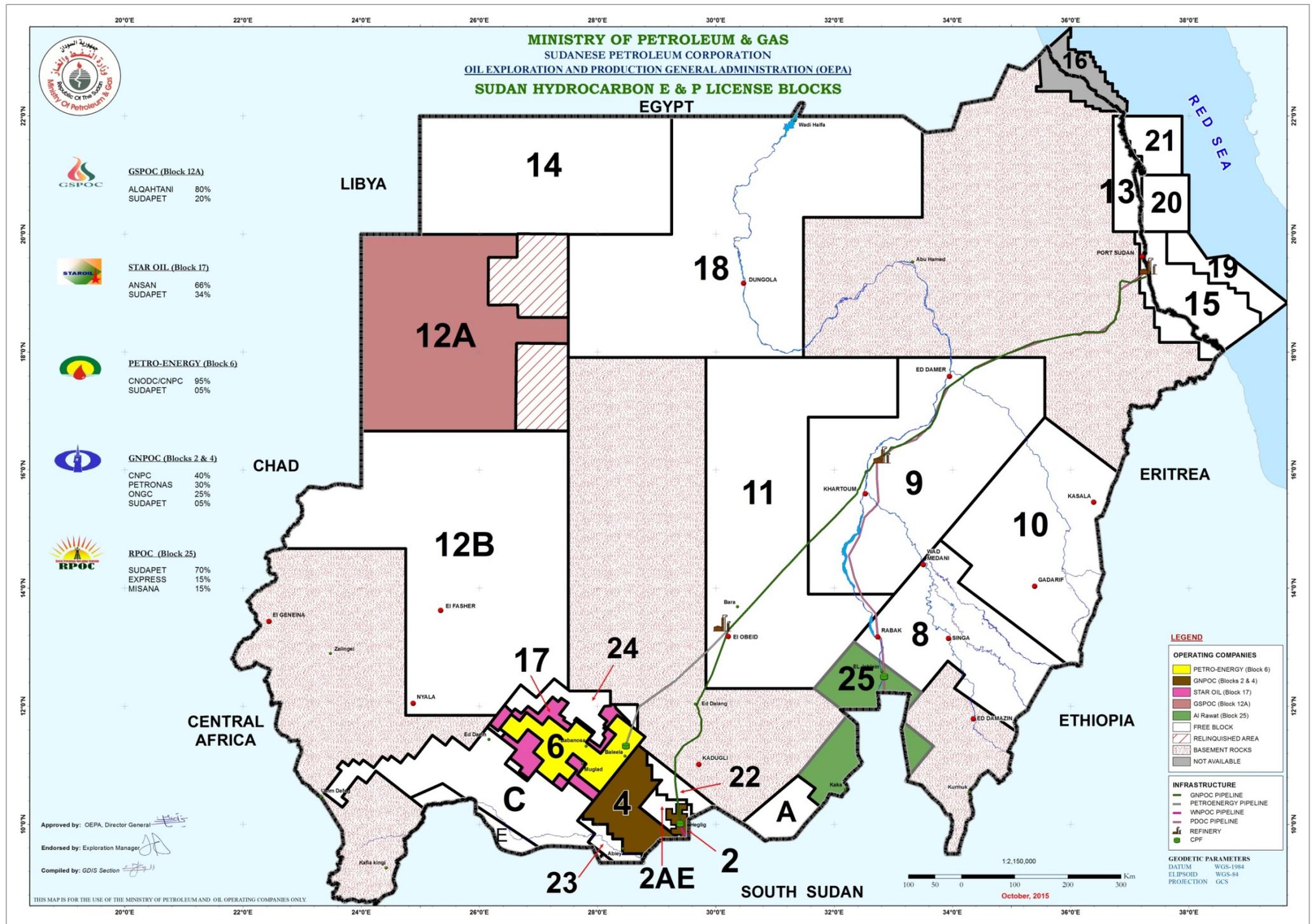
- Introduction
- Data Availability for Each Block
- Block Potentiality & Prospectivity
- Summary for Each Block
- Petroleum Infrastructure
- Conclusions

Introduction

- Oil and Gas Sector is an important extractive sector in Sudan.
- Sudan has a high hydrocarbon potential although the Frontier Basins are considerably under-explored.
- The legal and fiscal regimes are encouraging & flexible.
- The existing infra-structures are reasonably developed.
- **18** free blocks are currently available, 4 of them will be presented.

Introduction (contd.)

Sudan Hydrocarbon Concession Map



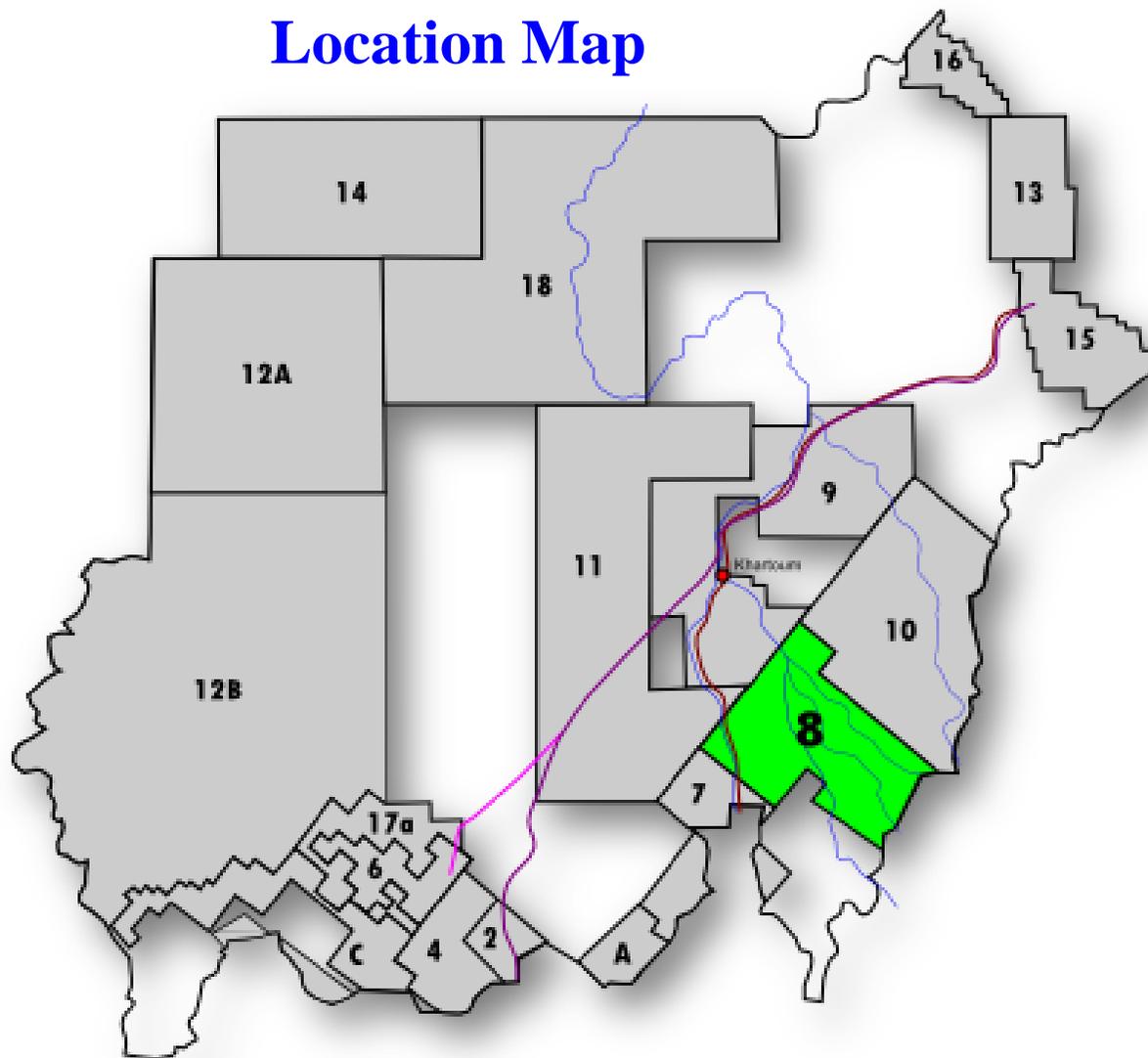
The 18 Free Blocks

Block-8



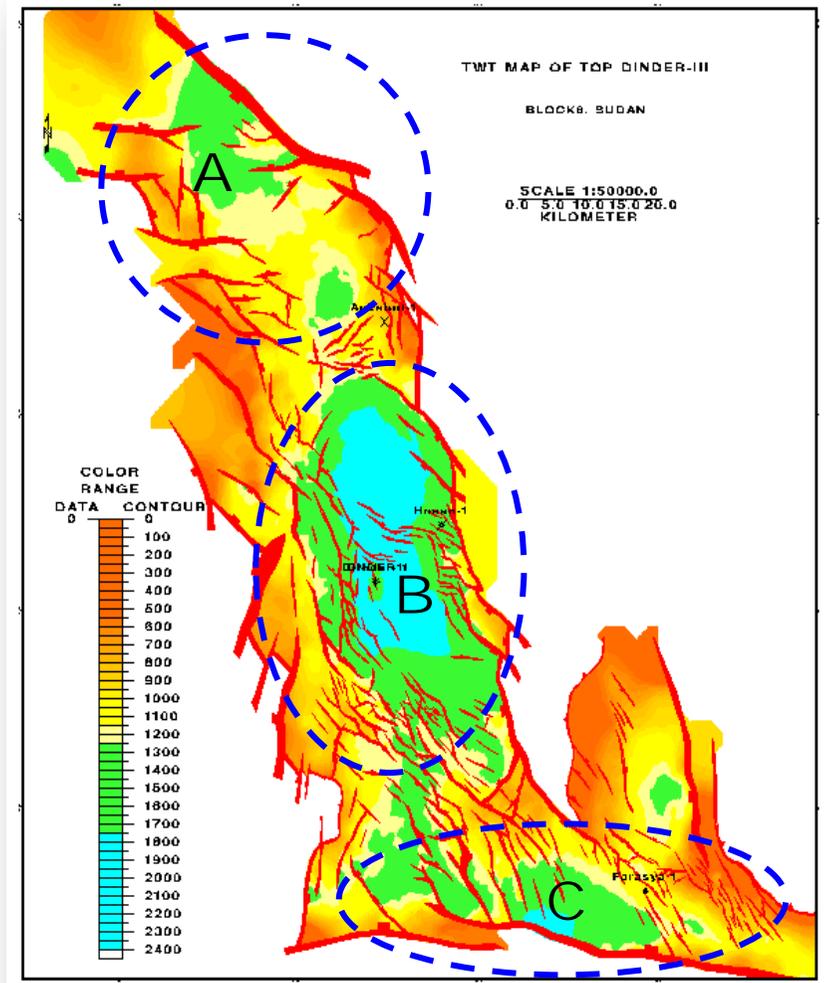
Block-8

Location Map



- Block 8 is 200 km Southeast of Khartoum.
- It covers an area of 60,000 km².
- Block-8 is within the vicinity of Al-Jebalain Export Pipeline and crossed by a variety of transportation networks.

Three Sub-basins



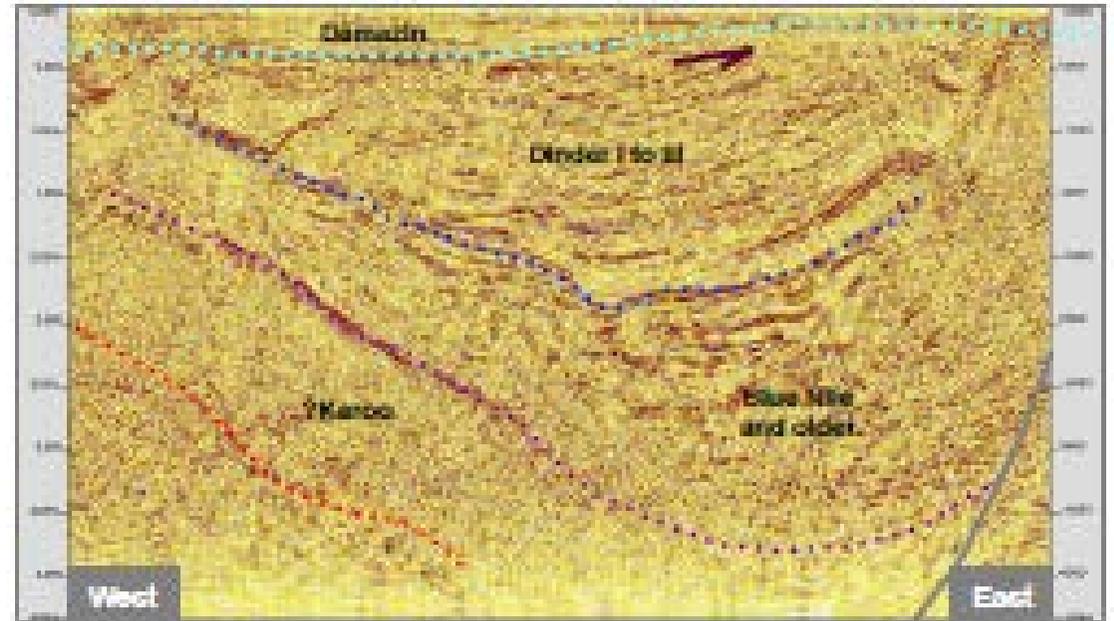
- Block-8 covered Blue Nile Basin of Sudan.
- It consist of three main Sub-basins.

Block-8

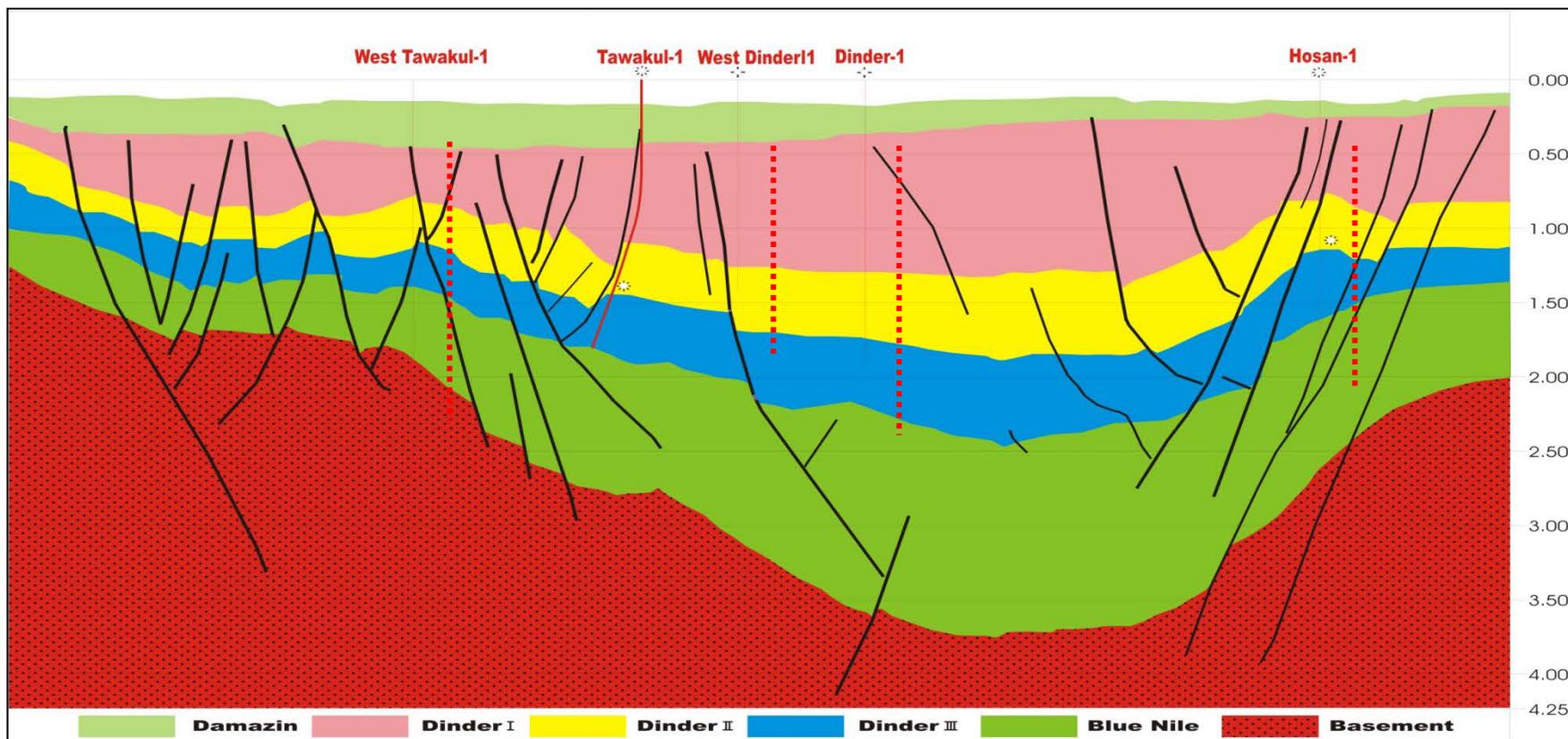
Available Data

- Gravity and Magnetic Data.
- 7523 km of 2D Seismic data.
- 11 wells (3 Discoveries).
- 9 G&G Studies.

Seismic Section

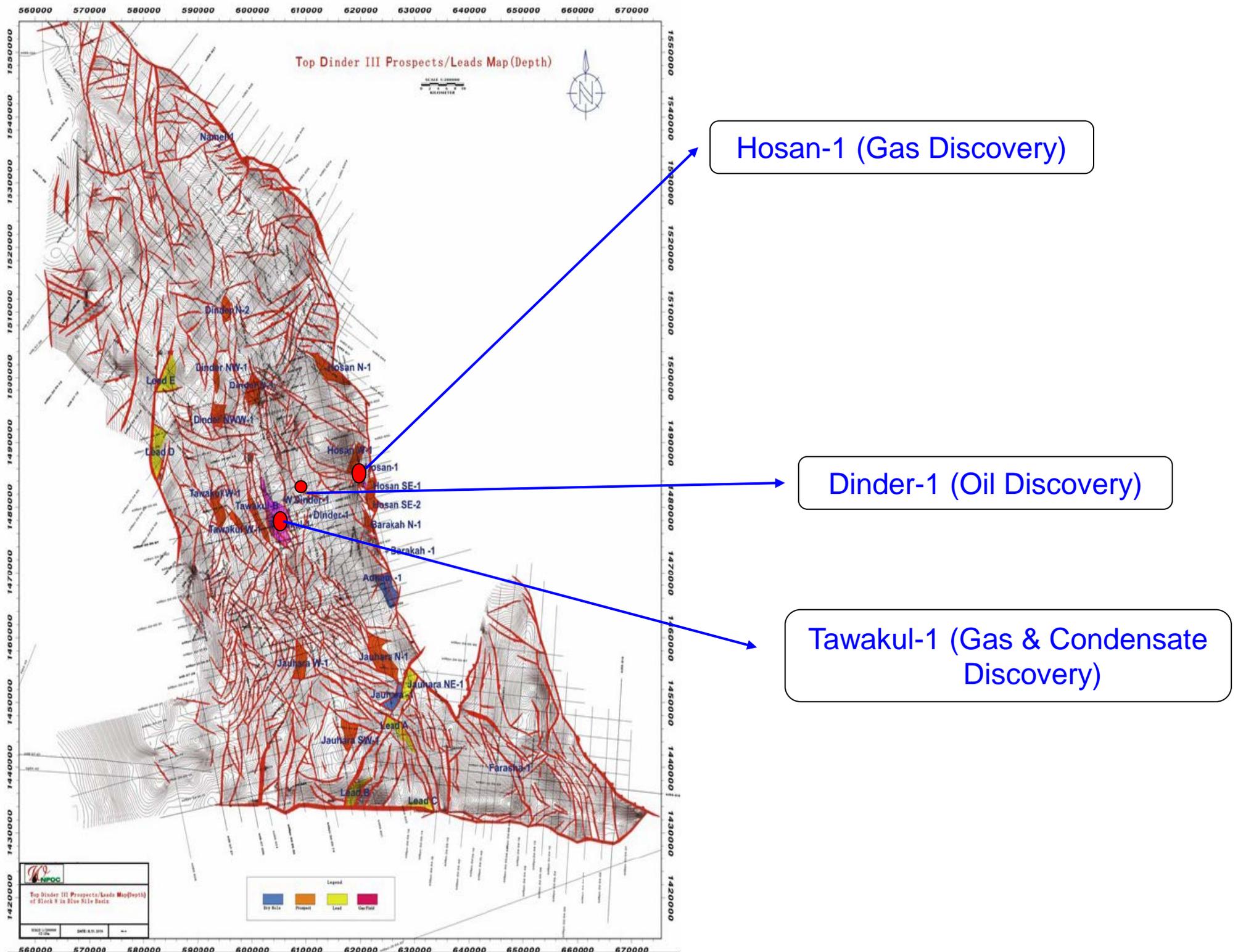


Geological Section



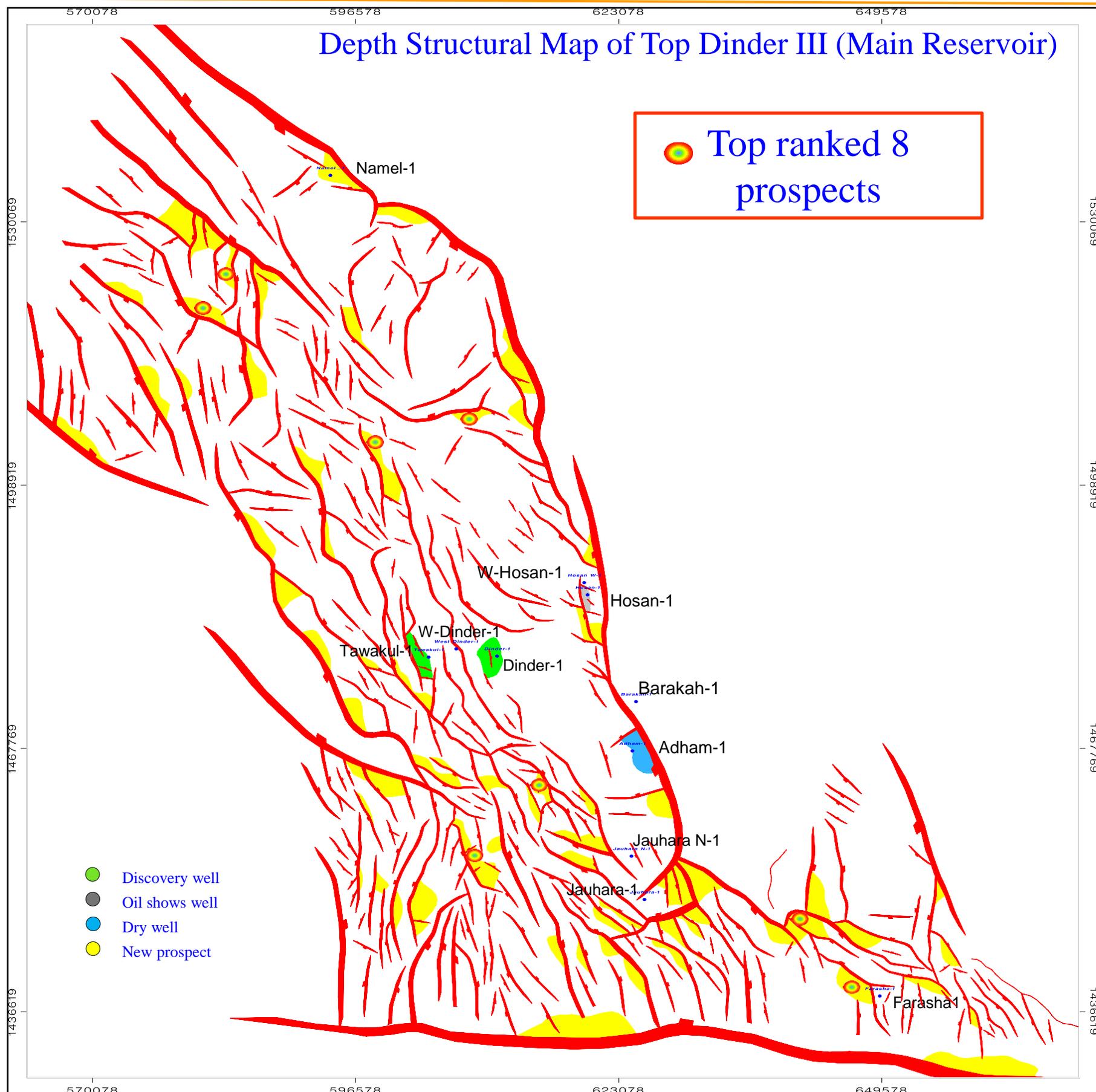
Block-8 Potentiality & Prospectivity

Location of the three Discoveries





Block-8 Potentiality & Prospectivity



Block-8

Summary

- The Blue Nile Basin has a proven petroleum system.
- Gas, Condensate & Oil have been discovered.
- 3 Discoveries (Tawakul-1, Hosan-1 & Dinder-1) out of 11.
- Most of the drilled wells encountered good hydrocarbon shows.
- More than 100,000ppm gas readings encountered during the drilling operations (shale gas).
- Most of the drilled wells are off structures.

Block-15

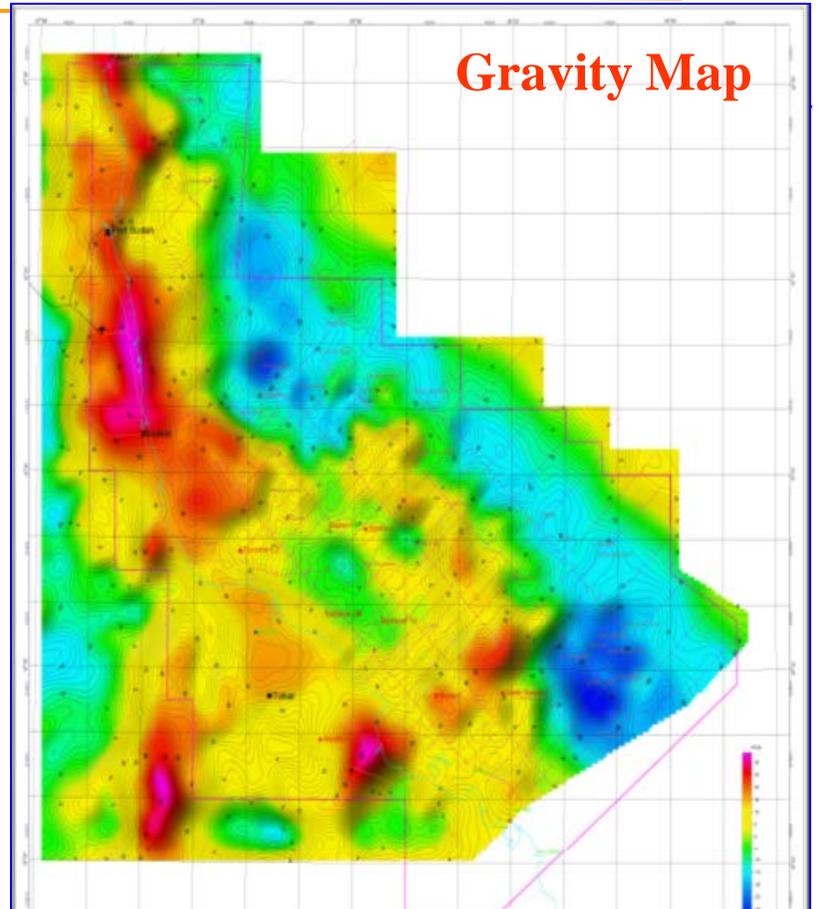


Block-15

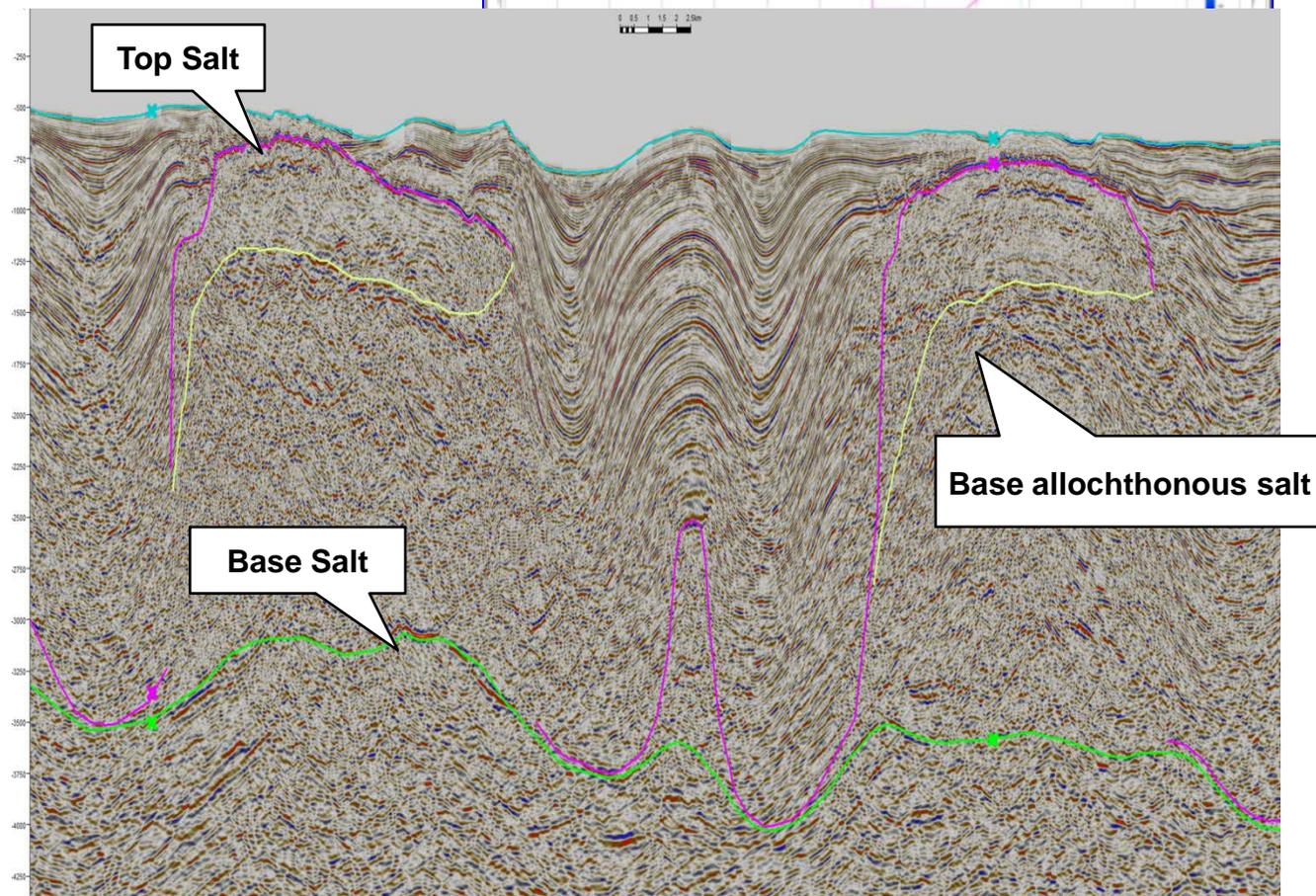
Available Data

- Gravity and Magnetic Data.
- 9152 km of 2D Seismic data.
- 11 wells (2 Discoveries).
- 4 G&G Studies.
- 2 Geological Surveys.

Gravity Map

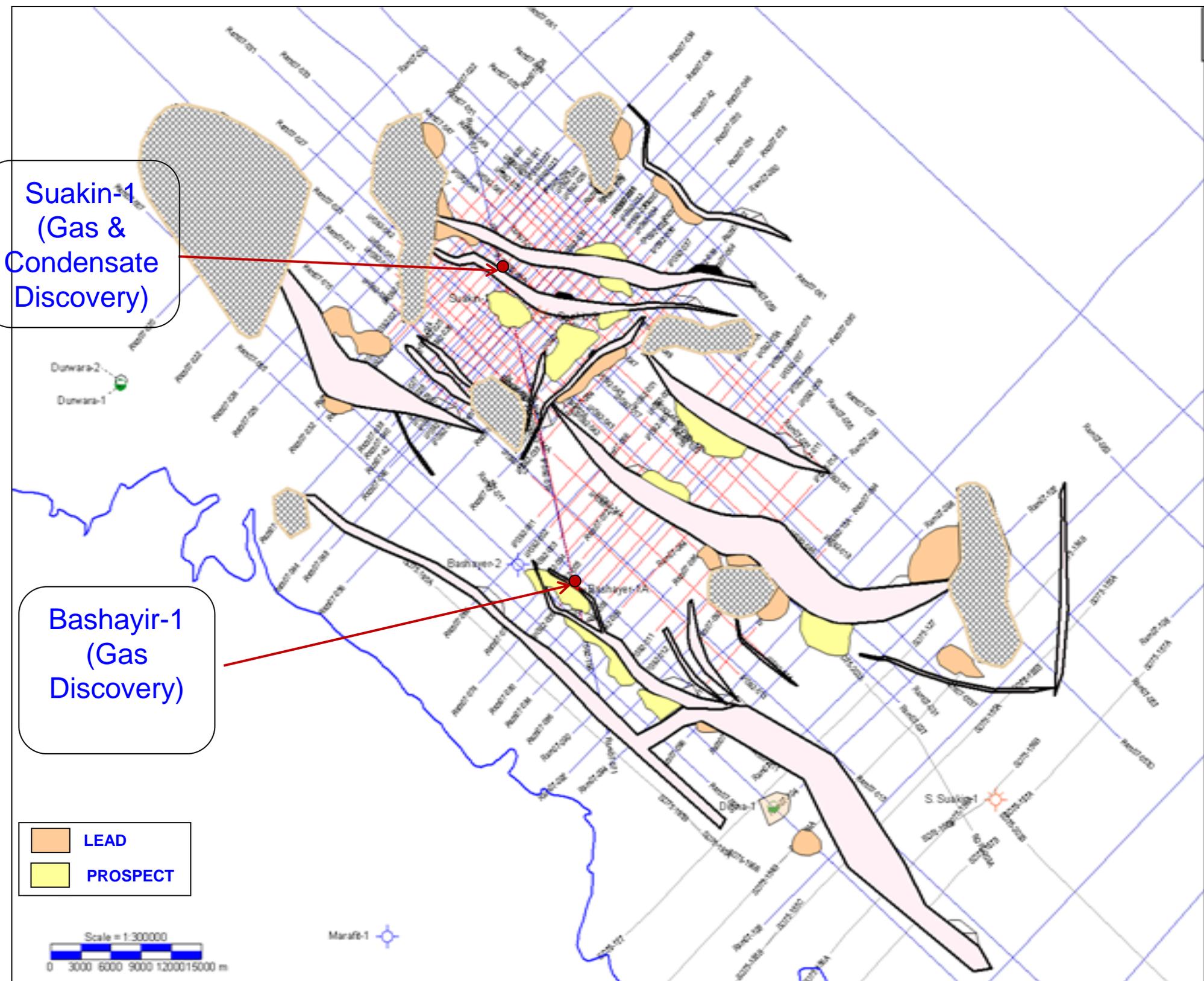


Seismic Section



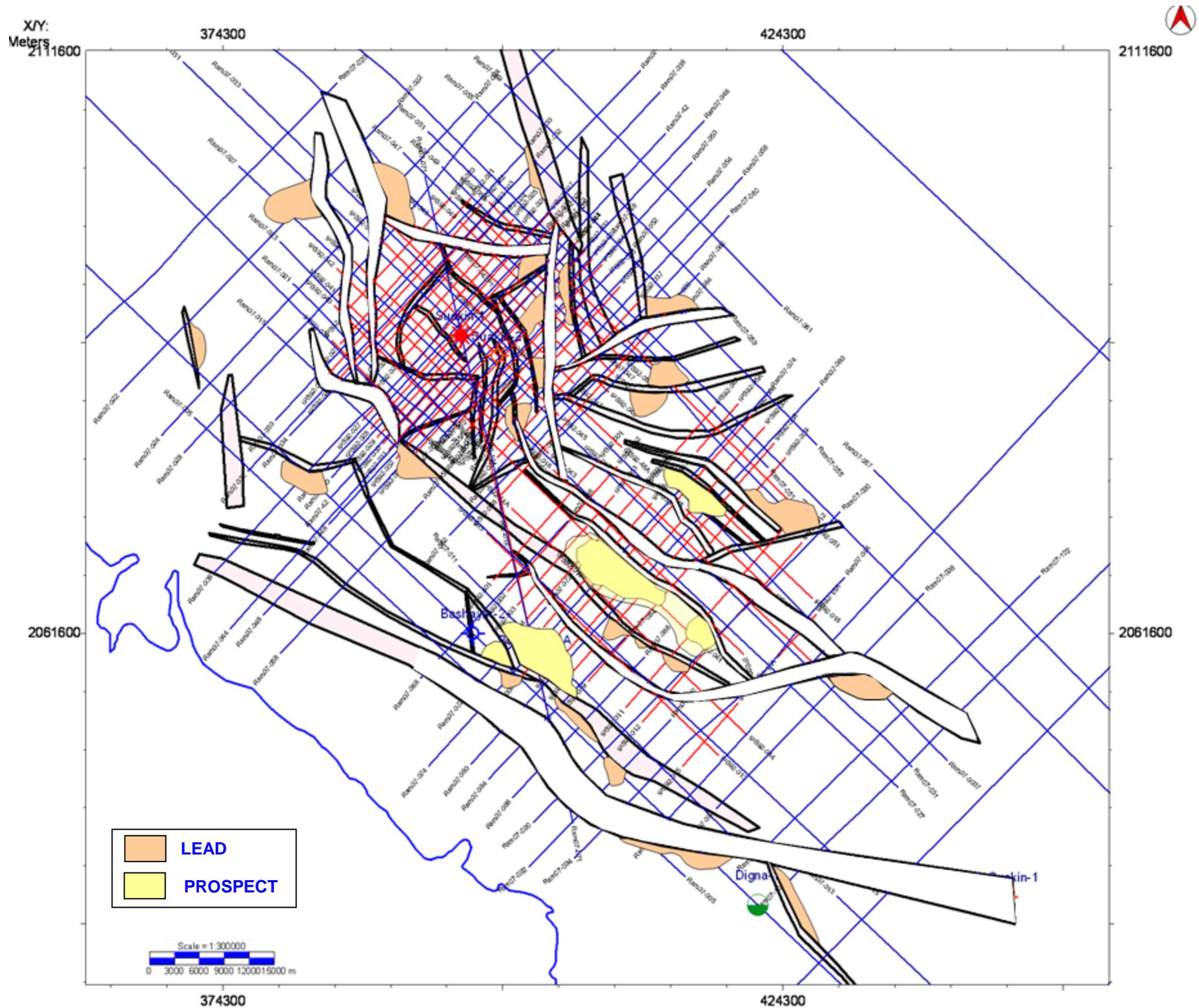
Block-15 Potentiality & Prospectivity

Post-Salt Prospectivity Map (11 Prospects & 15 Leads)



Block-15 Potentiality & Prospectivity

Pre-salt Prospectivity Map (5 Prospects & 22 Leads)

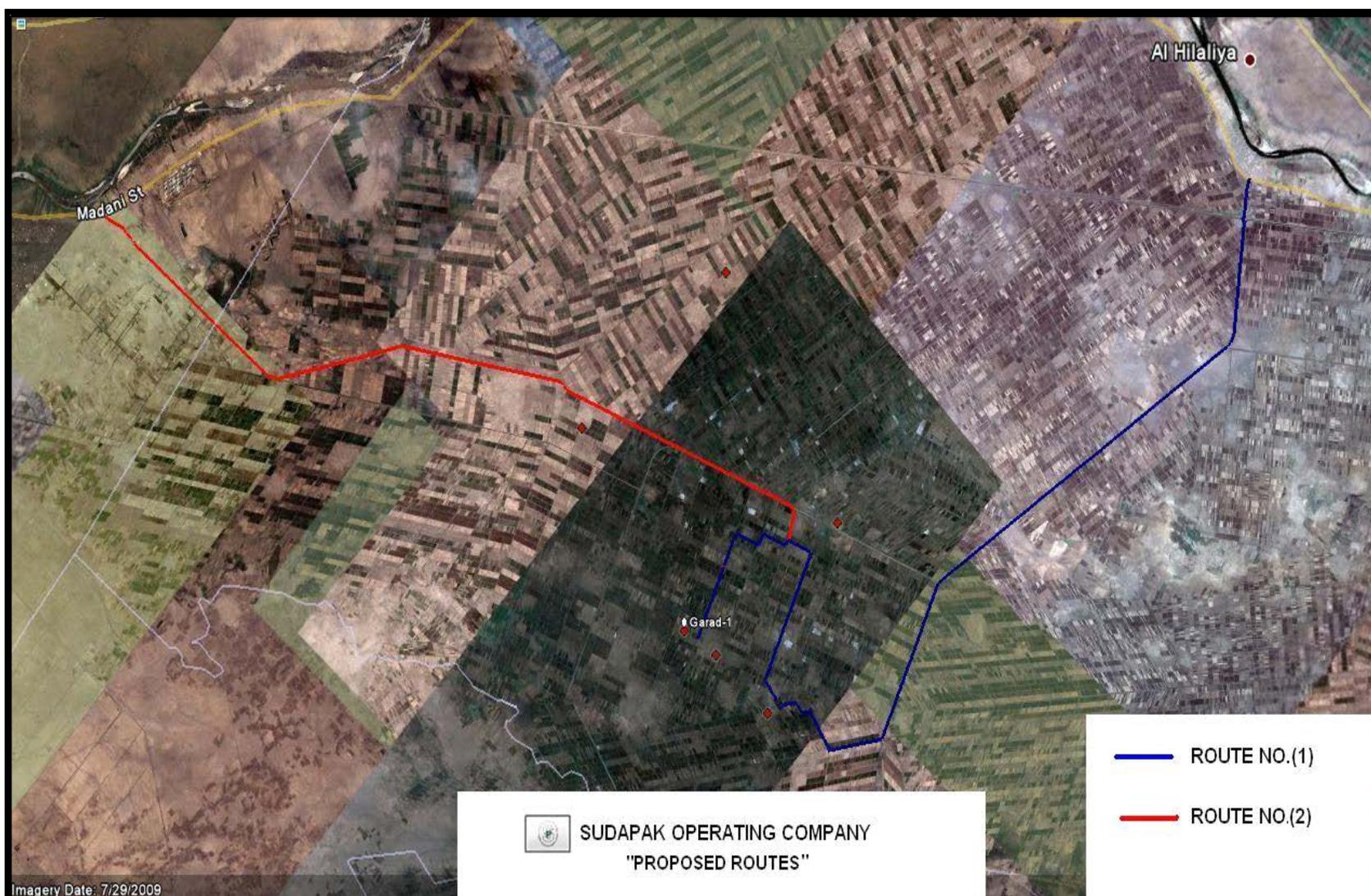


Block-15

Summary

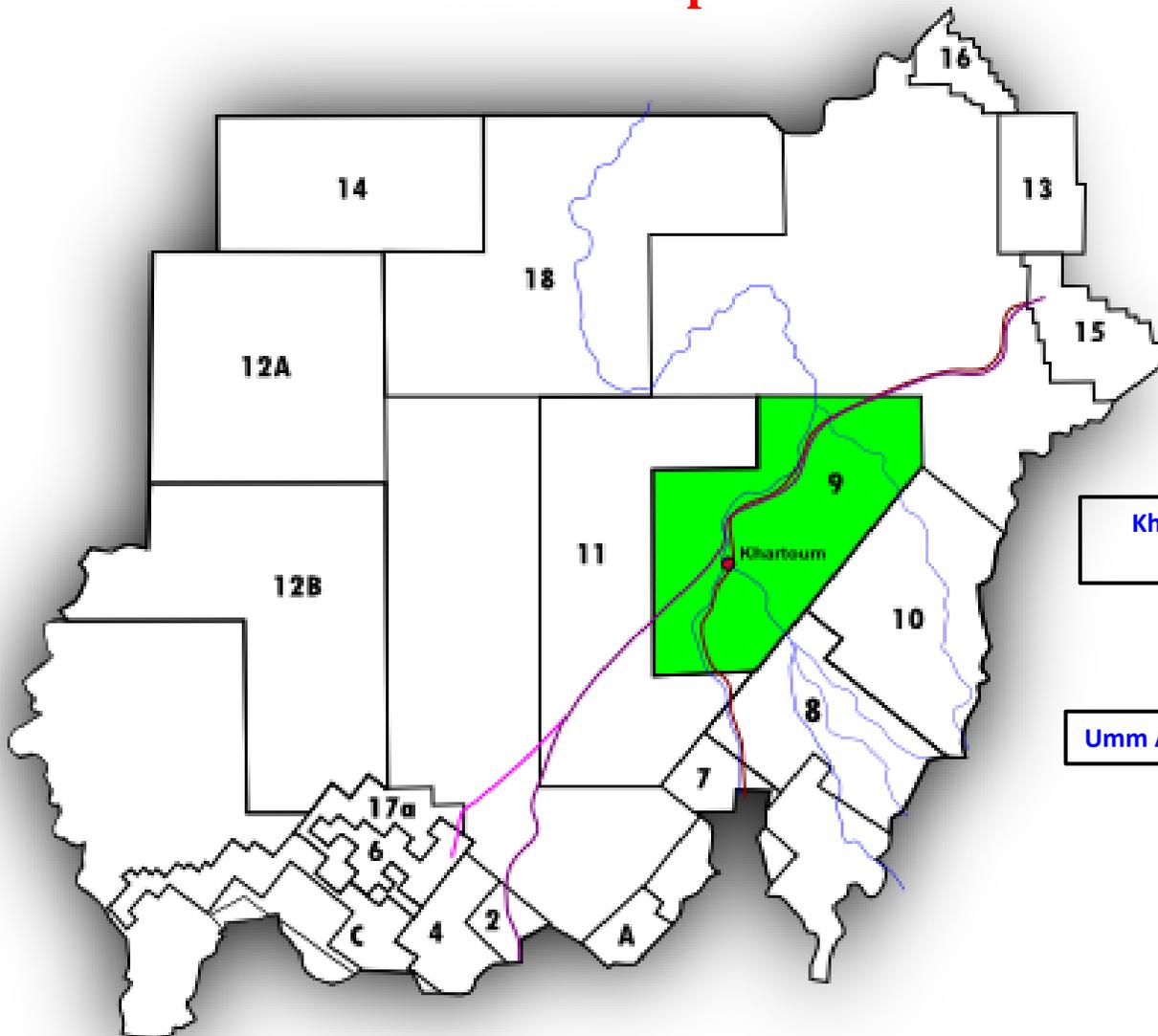
- The basin is considered as proven petroleum system with gas and condensate discoveries.
- The carbonates reservoirs are possible to be found at the pre- salt due to presence of 400m of carbonates at Digna-1 well.
- Block-15 is considered as a shallow water depth basin.
- Block-15 is not the only offshore block in Sudan.

Block-9

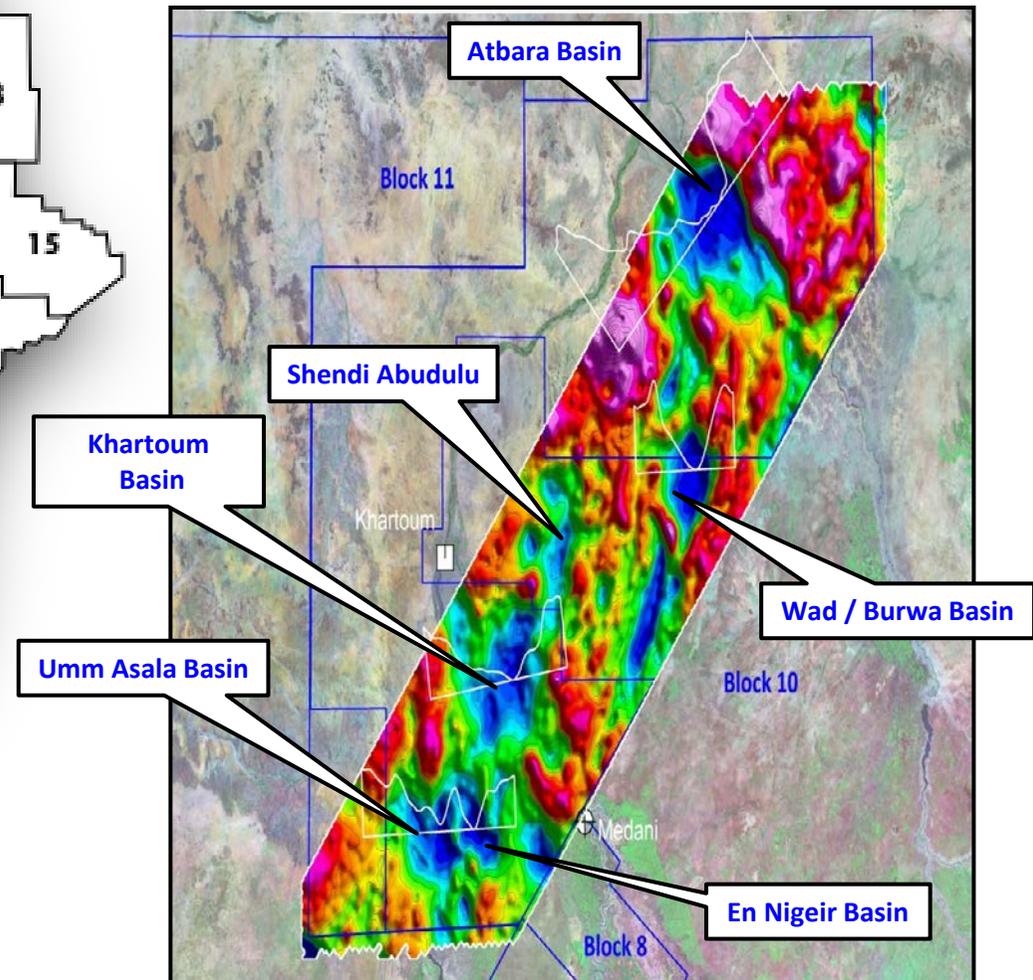


Block-9

Location Map



**Gravity & Magnetic Map
(6 Sub-Basins)**



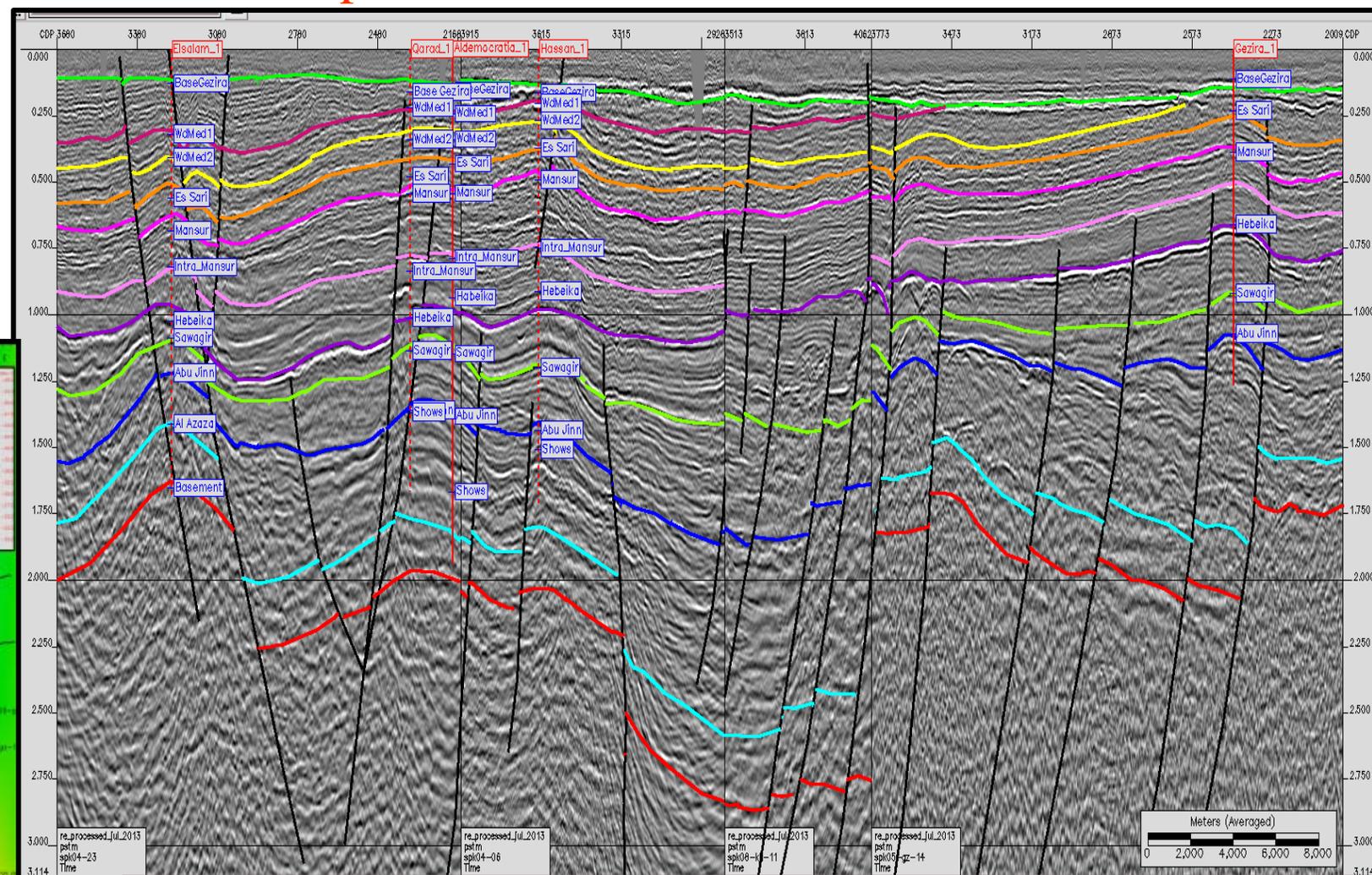
- Block-9 is located in the central part of Sudan, about 1000 km far from port Sudan (Marine Terminal).
- It covers an area of 123,000 km² .
- It surrounded by many infrastructures & crossed by all pipelines.

Available Data

- High Resolution Airborne Gravity, Magnetic & Magneto Telluric (MT) Surveys.
- 7,400 Km of 2D Seismic data.
- 8 Wells.
- 1 G&G Study.

Composite Seismic Traverse between 5 Wells

Cross Section



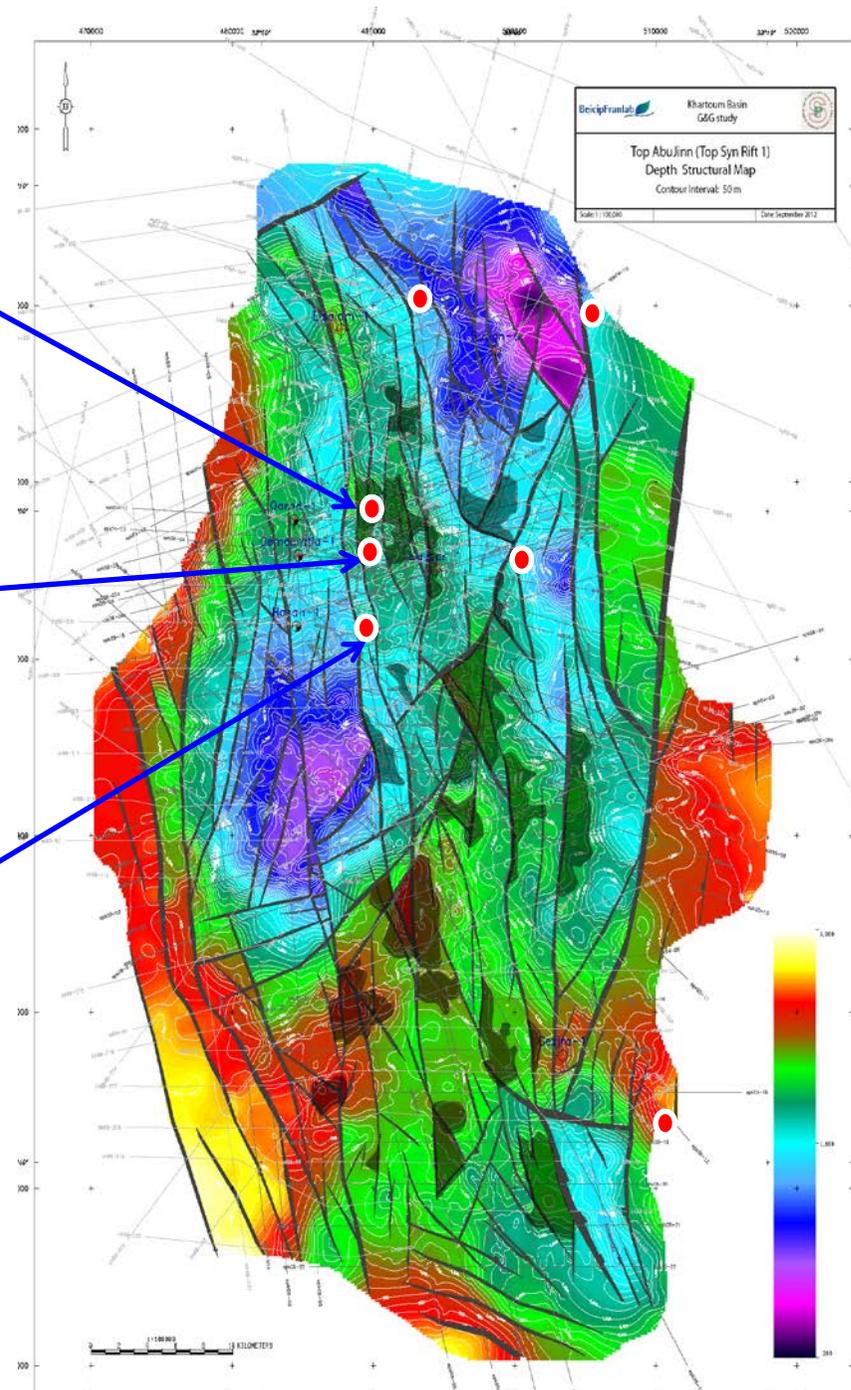
Block-9 Potentiality & Prospectivity

Location of the three Discoveries

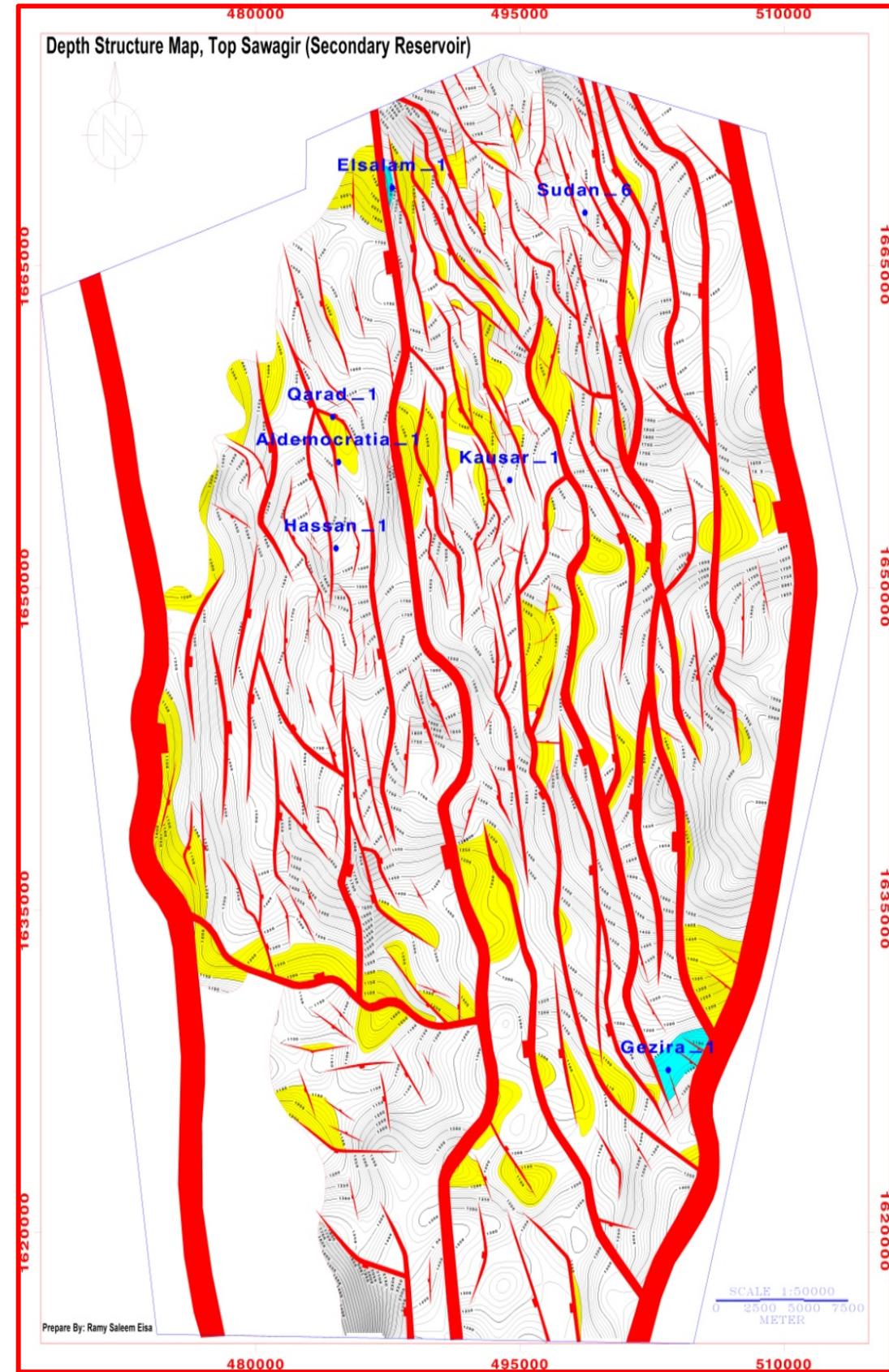
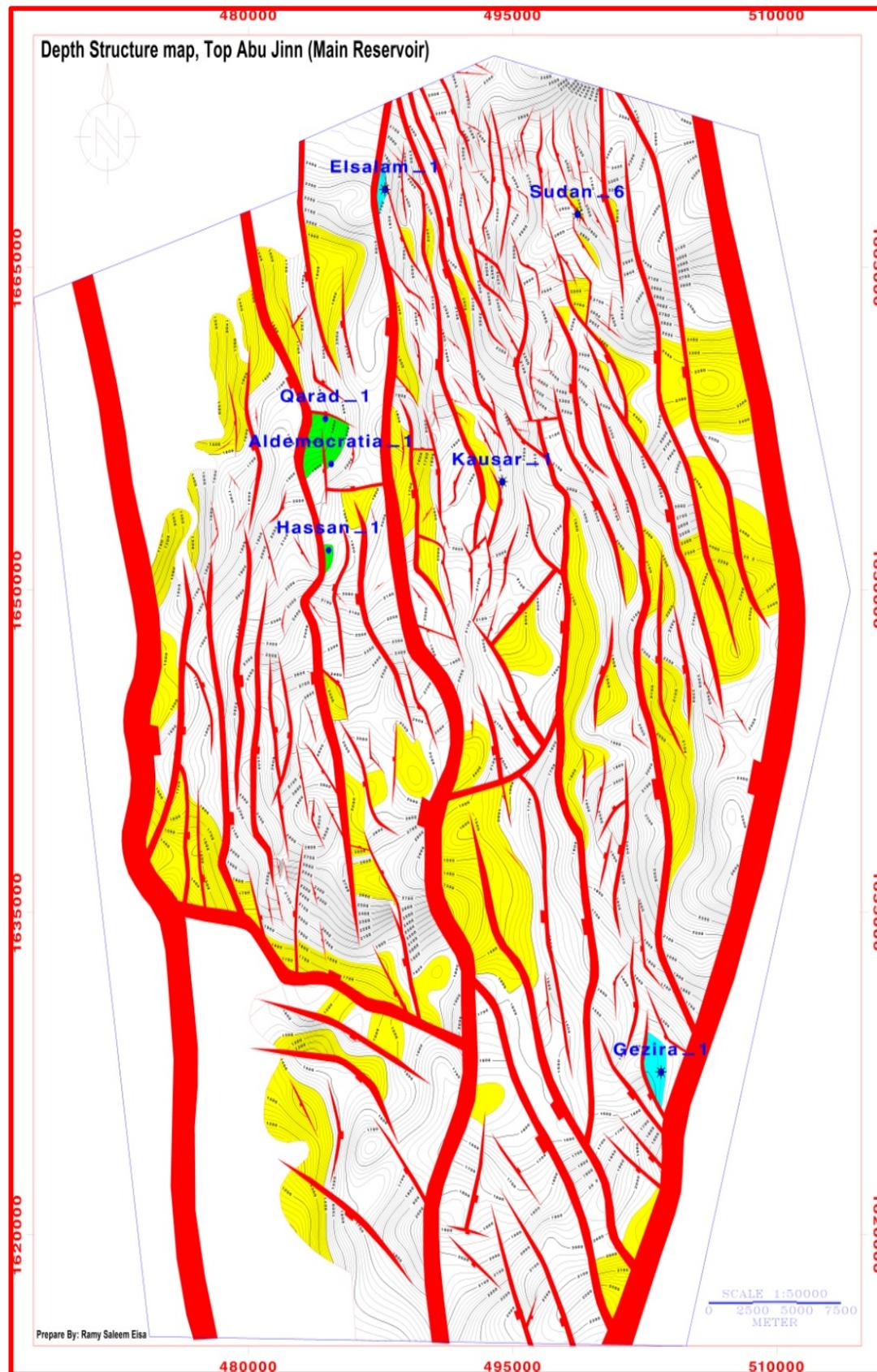
Garad-1
(very good oil shows)

Al-Democratia-1
(Oil Discovery)

Hassan-1
(Oil Discovery)



Block-9 Potentiality & Prospectivity (34 Leads)



Block-9

Summary

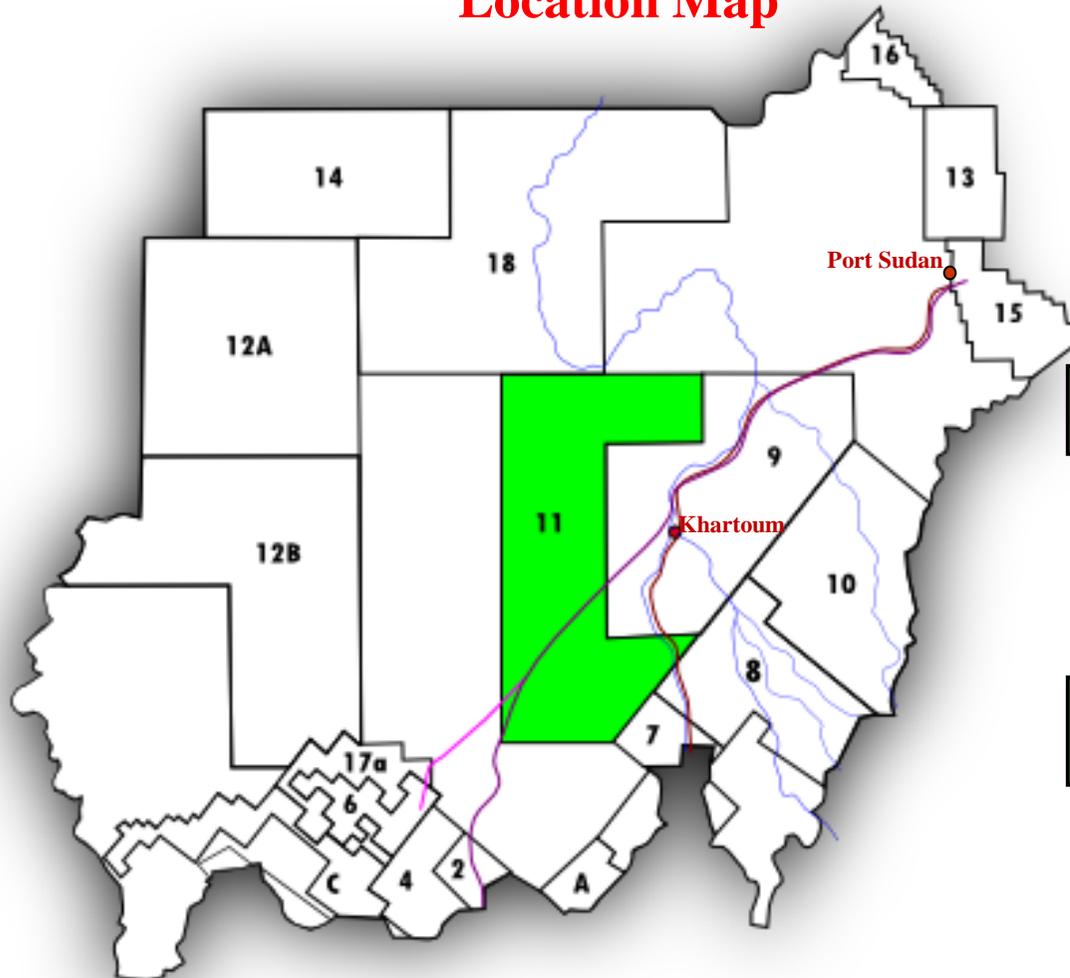
- The basin is considered as proven petroleum system with oil discoveries.
- Most of the wells have Hydrocarbon shows.
- The three Discoveries were in the same sub-basin.
- Three sub-basins branched out from Khartoum basin (Democratia , Sudan-6 and Gezira).

Block-11

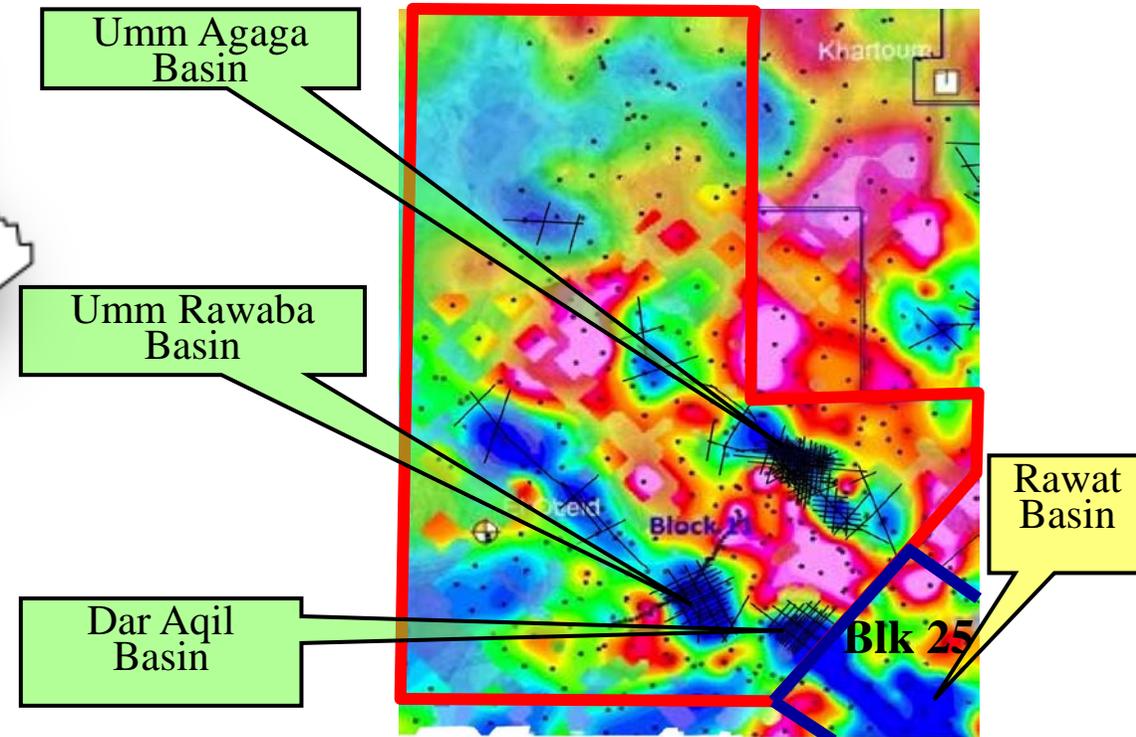


Block-11

Location Map



Gravity Map



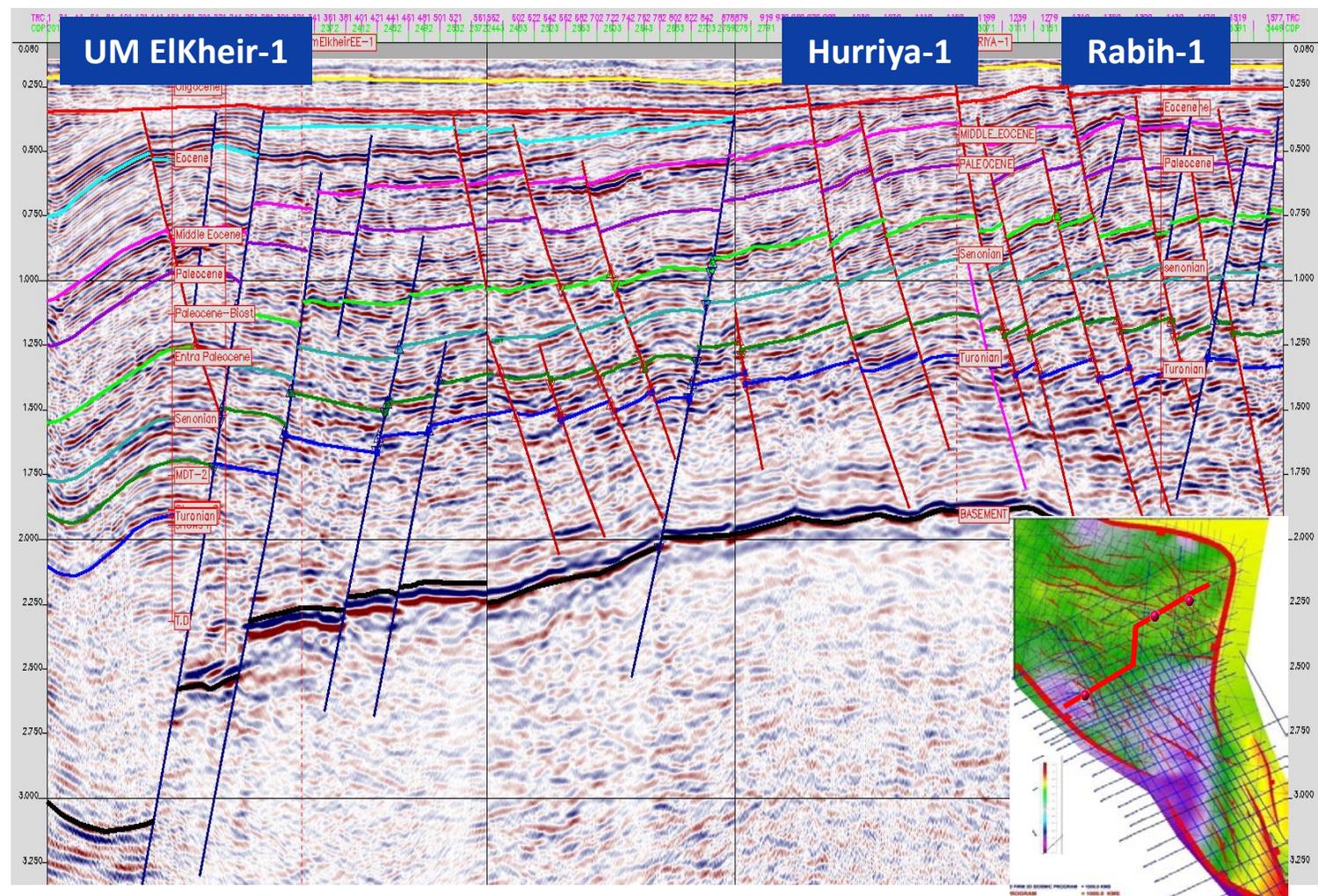
- **Block -11 is located in the central part of Sudan, about 1200 km far from Port Sudan (Marine Terminal).**
- **It covers an area of 125,000 km².**
- **It surrounded by many infrastructures & crossed by all pipelines.**

Block-11

Available Data

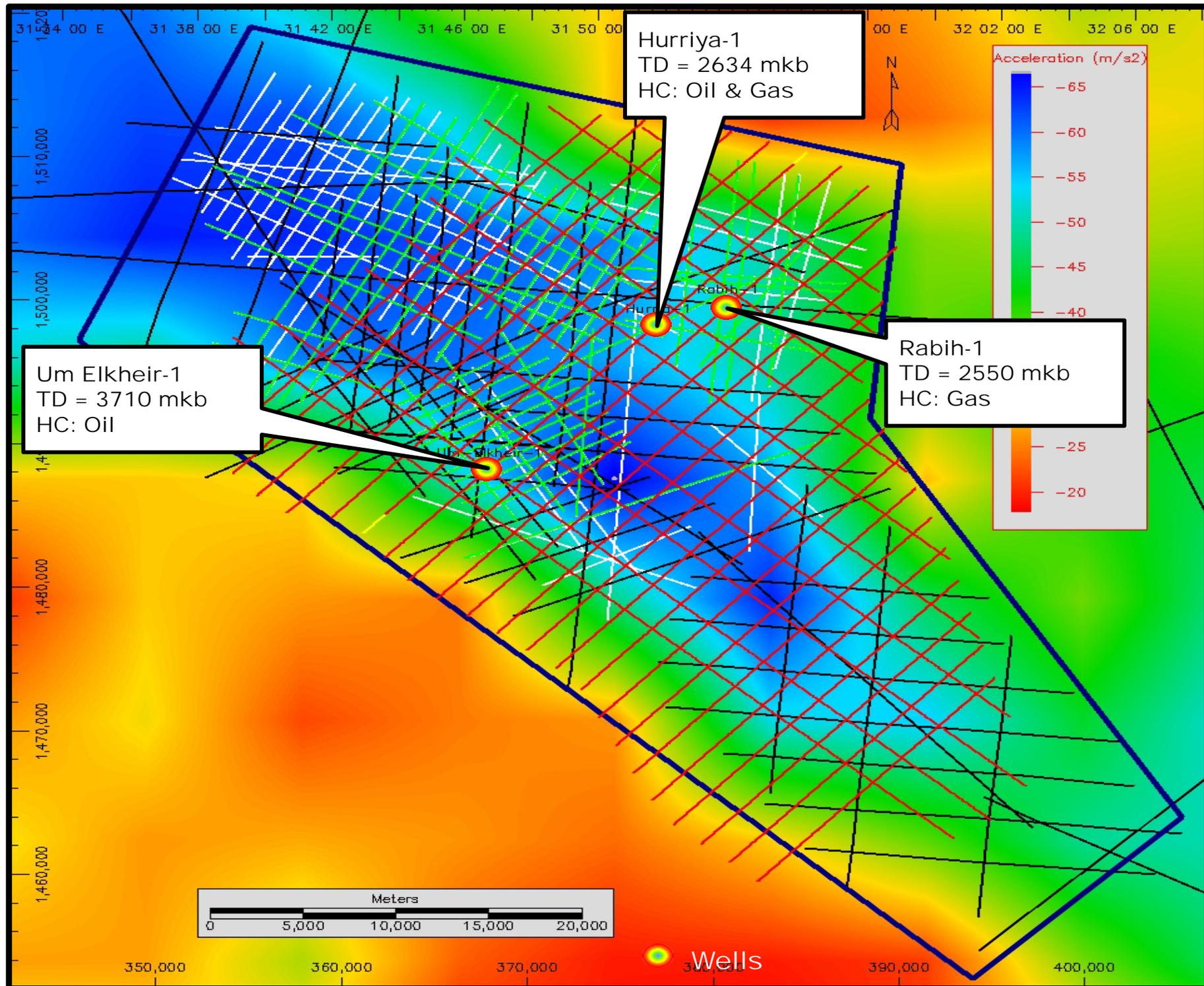
- High Resolution Airborne Gravity & Magnetic Data.
- 4693 km of 2D Seismic data.
- 5 wells.
- 1 G & G Study.

Regional Section Through Um El Kheir-1, Hurriya-1 and Rabih-1 wells



Block-11 Potentiality & Prospectivity

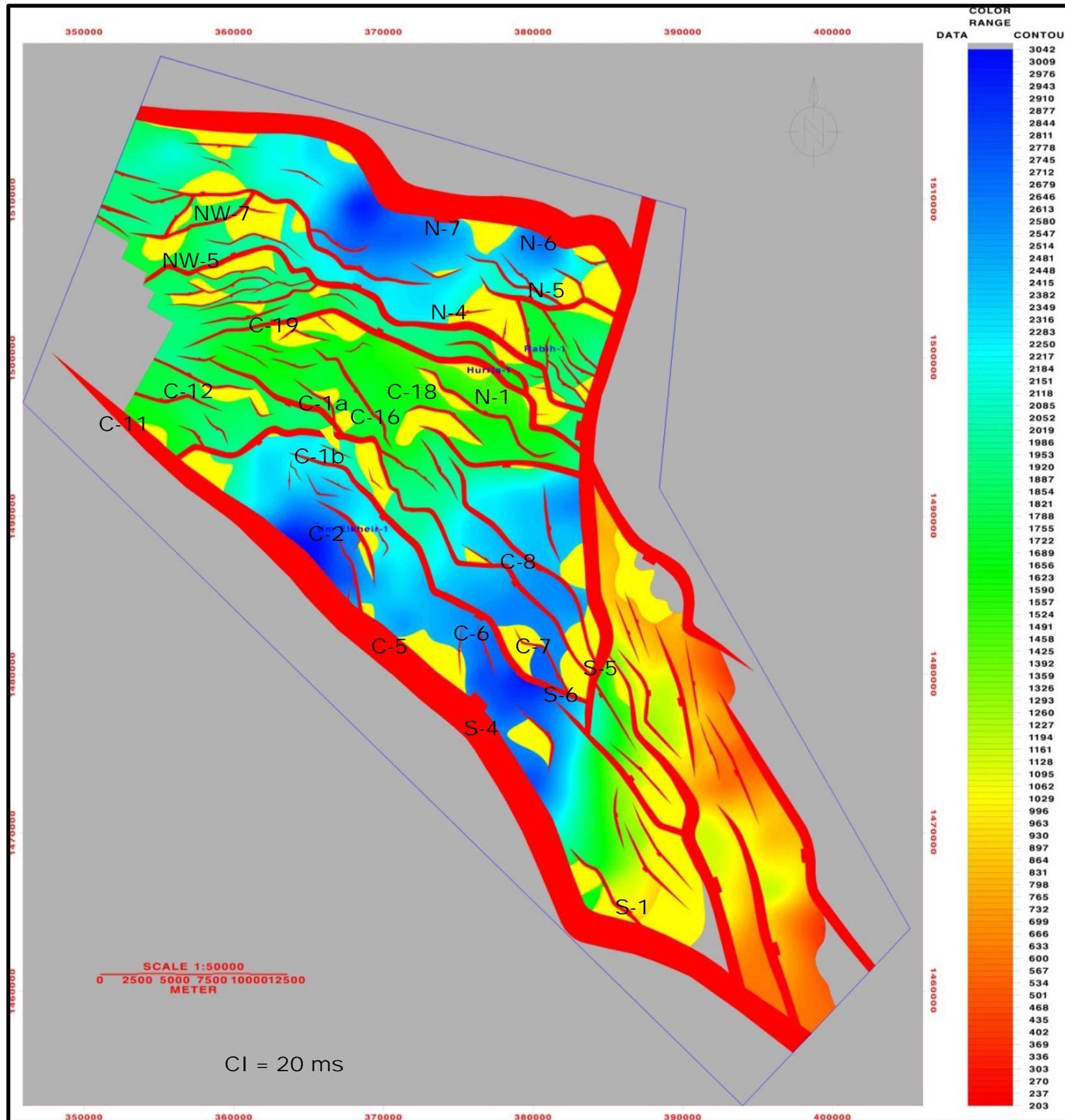
Location of the three Discoveries





Block-11 Potentiality & Prospectivity

Depth Structure Map, Top Primary Reservoir (6 leads & 17 prospects)



Block-11

Summary

- Proved hydrocarbon petroleum system.
- Um Agaga Basin is the most potential one among block-11 sub-basins.
- Most of the wells have Hydrocarbon shows.
- Some wells are off structure.

Petroleum Infrastructure



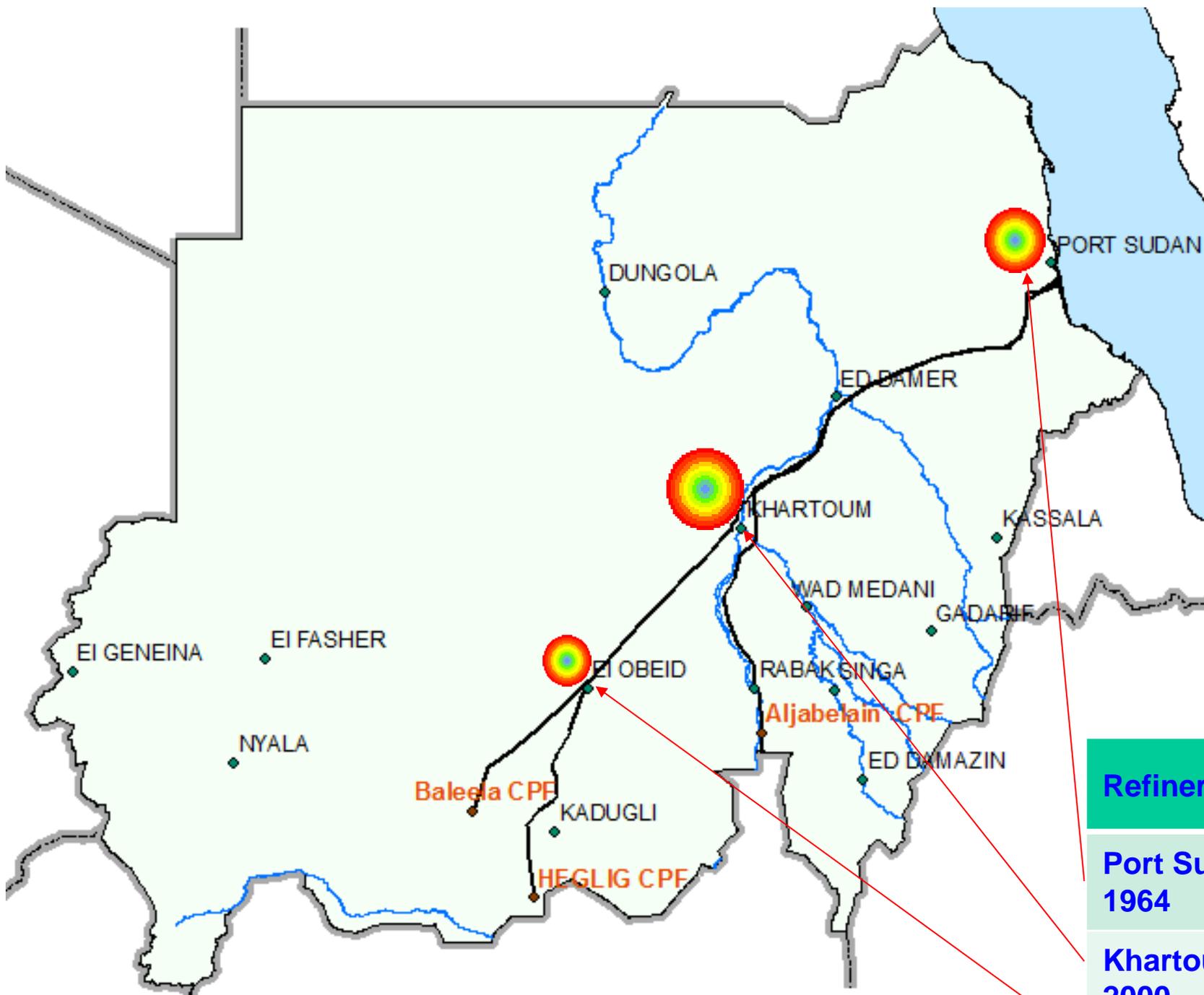
Crude Pipelines

Pipeline	Length (km)	Diameter (inch)	Capacity (bbl/d)
Aljabelain - Marine Terminal	1131	32	500,000
El Fula - KRC	720	24	200,000
Heglig - Marine Terminal	1505	28	450,000

Central Processing Facilities (CPFs)

1. Heglig CPF : 350 bbl/d
2. Jabelain CPF : 300 bbl/d
3. Baleela CPF : 200 bbl/d

Petroleum Infrastructure (Contd.)



Refineries

Refineries	Capacity (bbl/d)
Port Sudan Refinery-1964	25,000
Khartoum Refinery-2000	100,000
Obaid Refinery-1996	15,000

Petroleum Infrastructure (Contd.)

Equipment & Facilities

- Seismic Crews: 7
- Drilling Rigs: 24
- Work-Over Rigs: 25
- Processing Centers, Labs, Data Information Center, and Training Centers.



Conclusions

- Currently, the Ministry of Petroleum & Gas offering **18** free blocks.
- Promotion Package is available for each Block
- MOPG is promoting these Free Blocks in addition to some Oilfield Services, if manage to award all or some of these blocks or bring some services providers then it will:
 - ✓ Add more to the extractive industries.
 - ✓ Contribute to the Community Development (CD) in area around the block.
 - ✓ Create more Job Vacancies to the local labours.



Thank You!



Promotion Website

www.mop.gov.sd/promotion