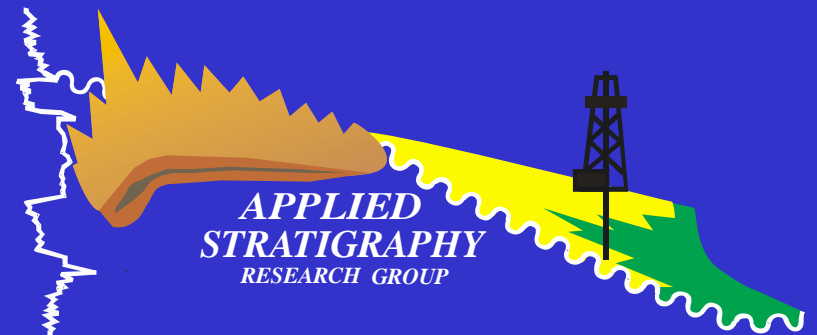


# Well log study and stratigraphic correlation of the Cantuar Formation and adjacent strata, SW Saskatchewan

Shaohua Li

Charles M. Henderson

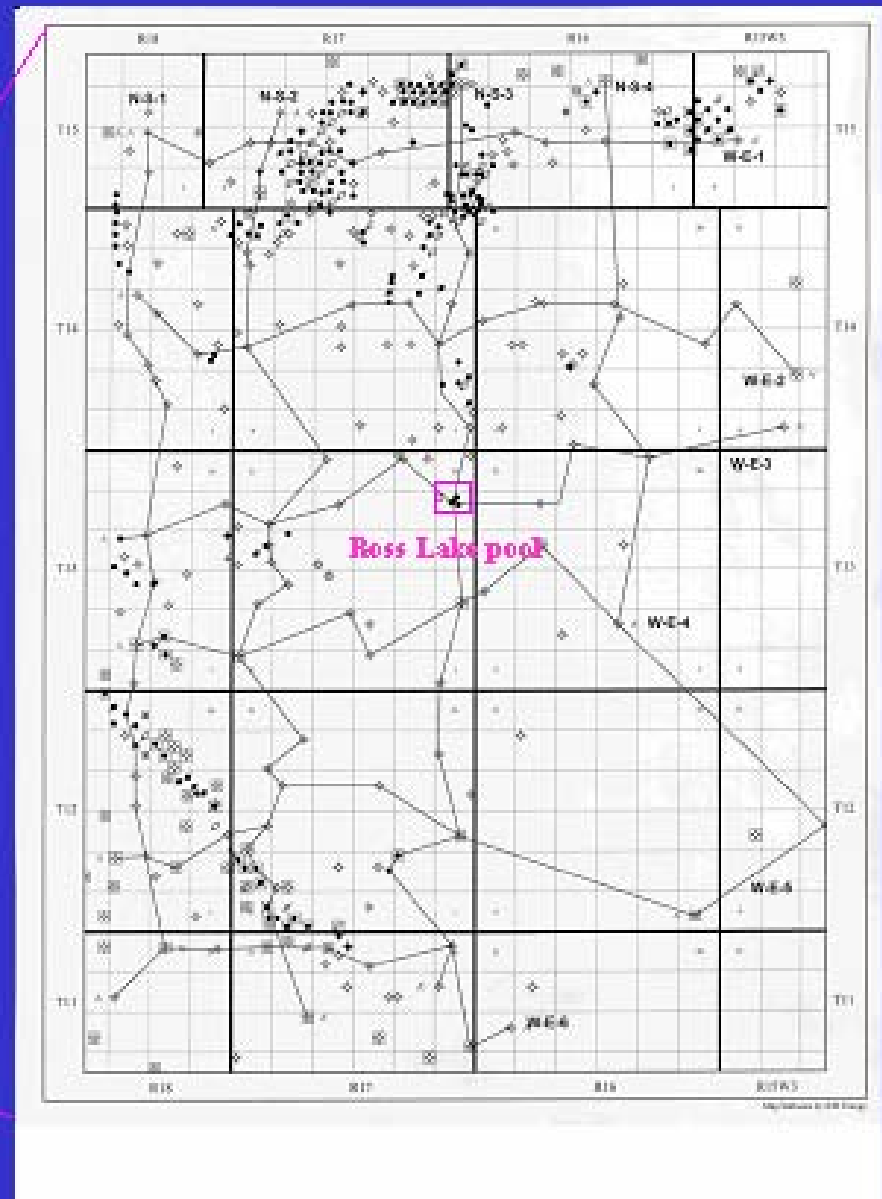
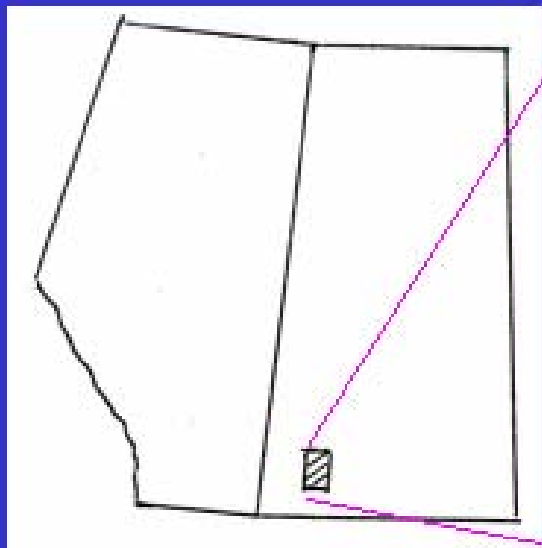
Robert R. Stewart



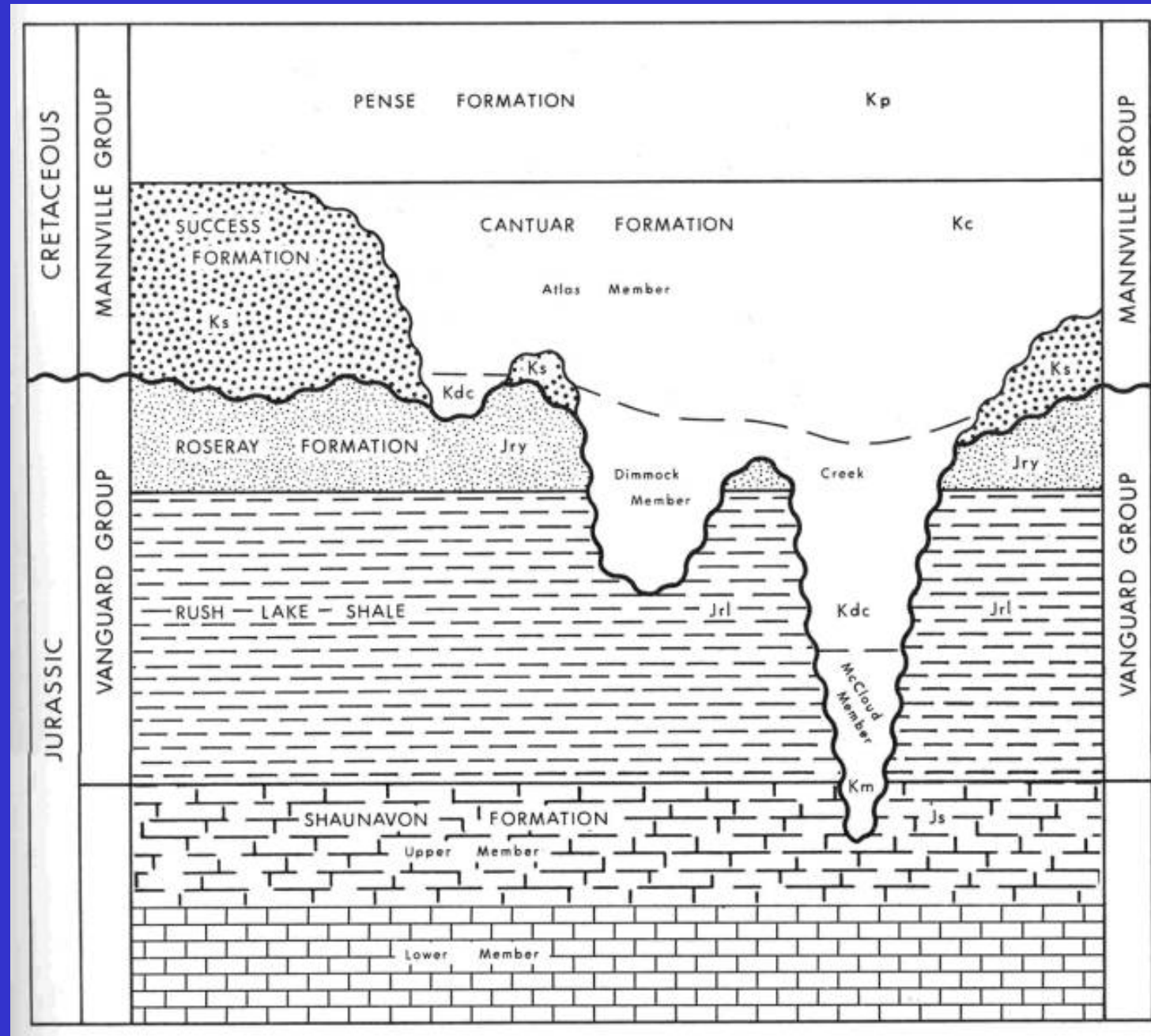
# Outline

- **INTRODUCTION**
- **TECTONIC SETTING**
- **STRATIGRAPHIC HISTORY**
- **LOG CHARACTERS**
- **STRATIGRAPHIC CORRELATION**
- **ISOPACH MAPS AND STRUCTURE MAP**
- **ROSS LAKE POOL**
- **CONCLUSIONS**

## Study area



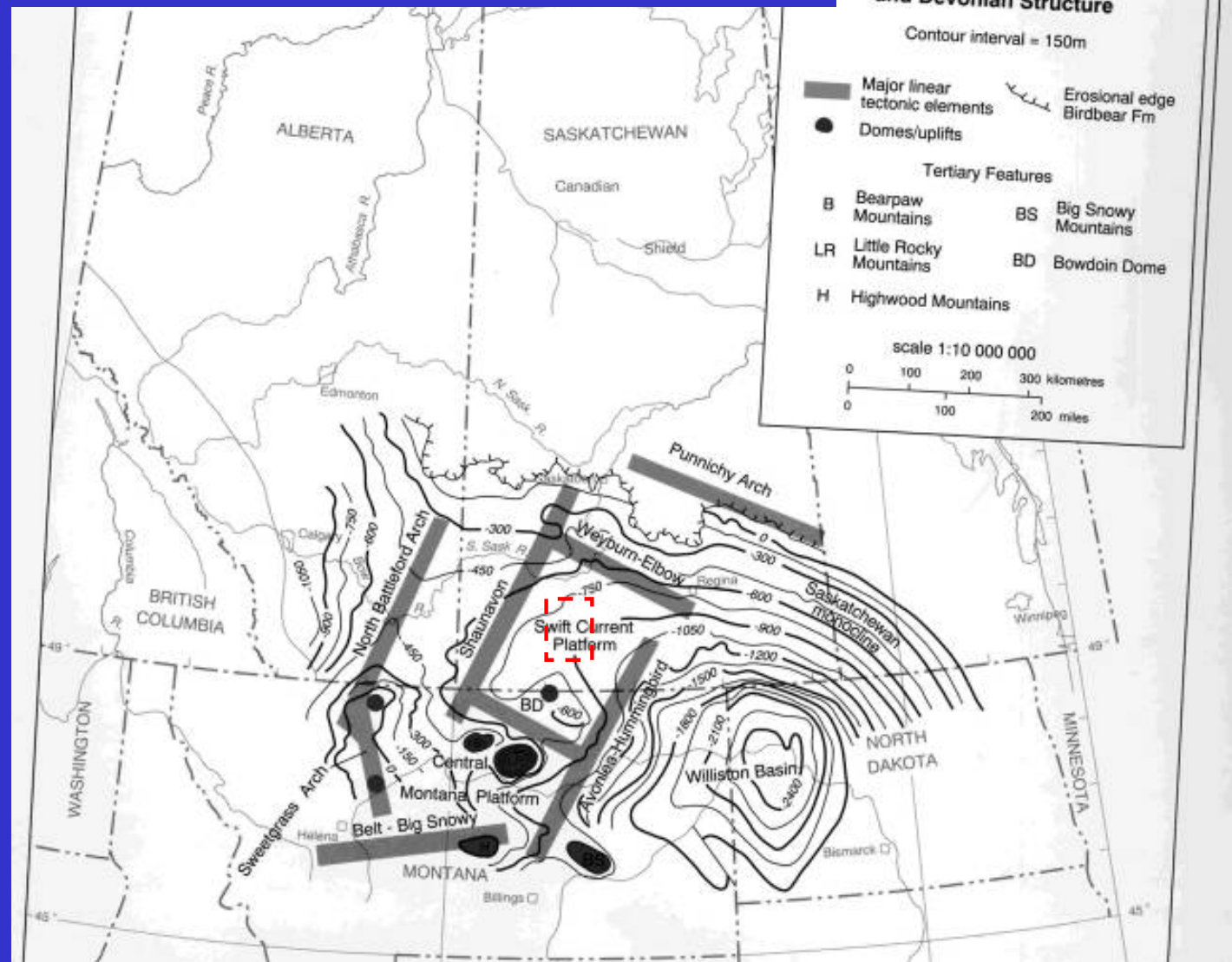
## Stratigraphic Nomenclature



A) From Christopher, 1974 .

# Tectonic Setting

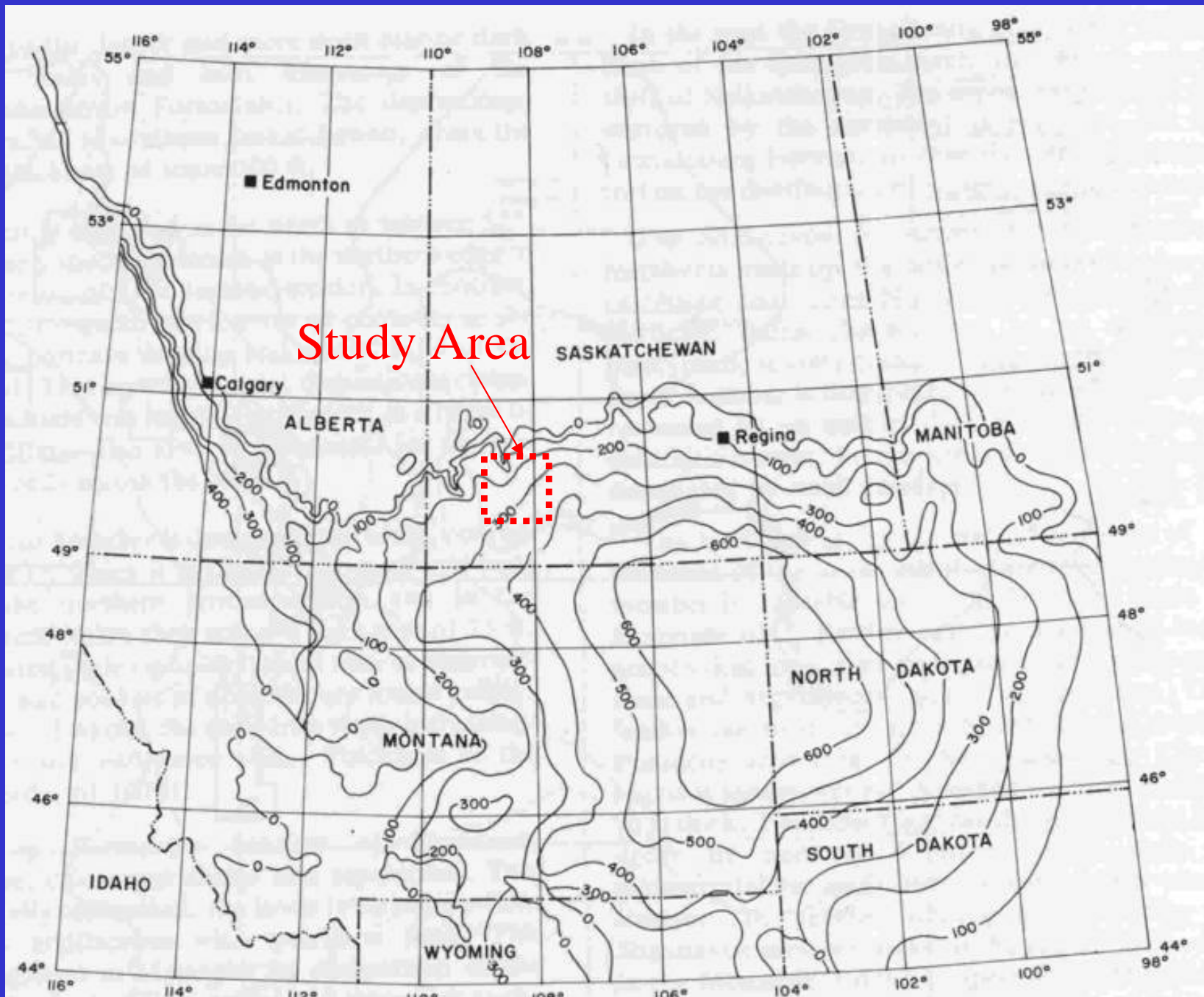
Structural features in southwestern Saskatchewan and surrounding area  
(Kent and Christopher, 1994)



# Stratigraphic History

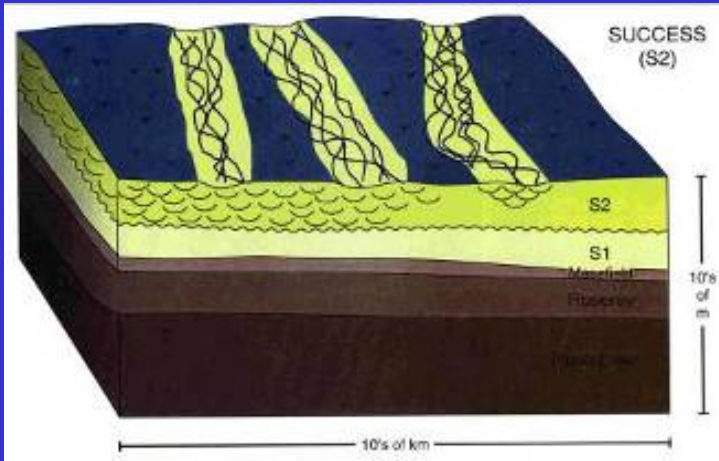
Isopach map of the Upper Jurassic

(From Peterson, 1972 and Springer et al., 1964)

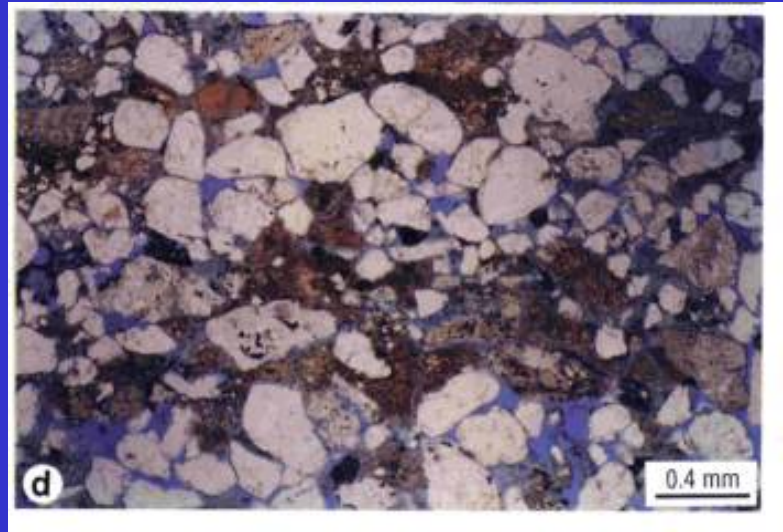
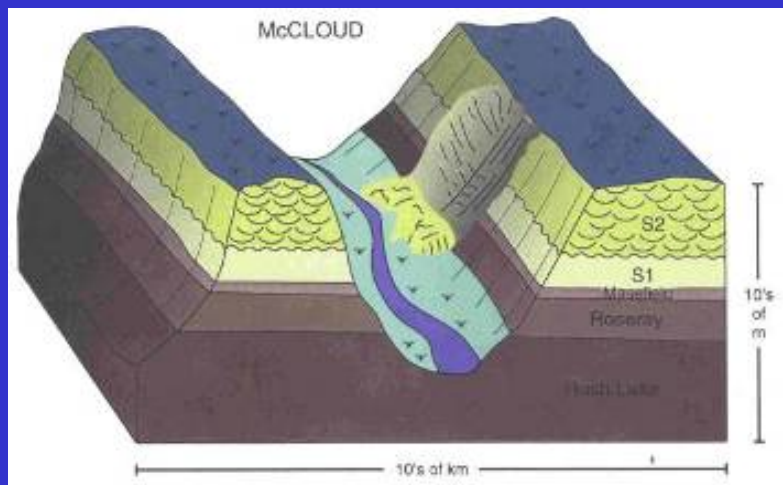


# Stratigraphic History

## Success Formation

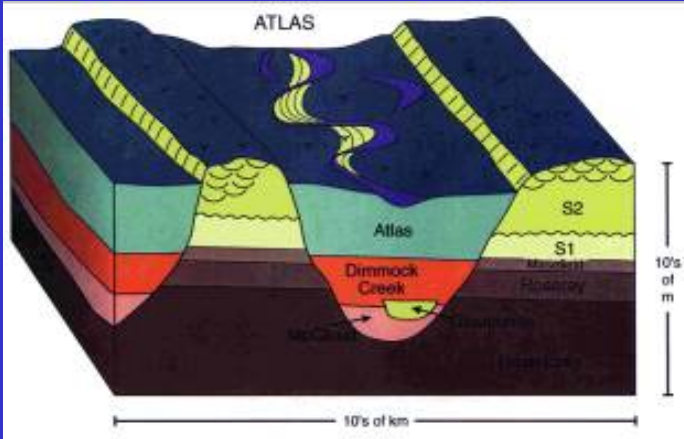


## McCloud Member

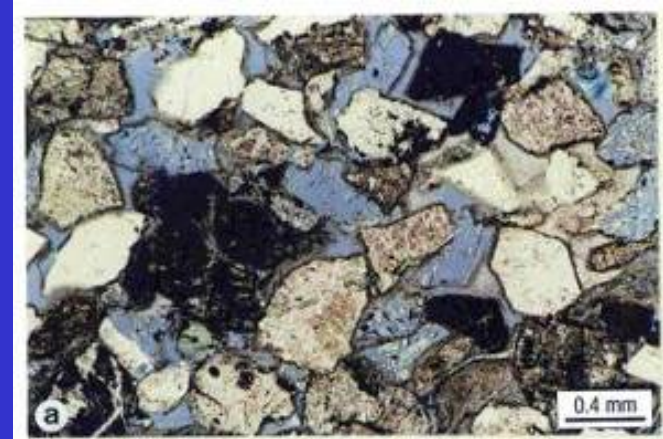


# Stratigraphic History

## Dimmock Creek Member



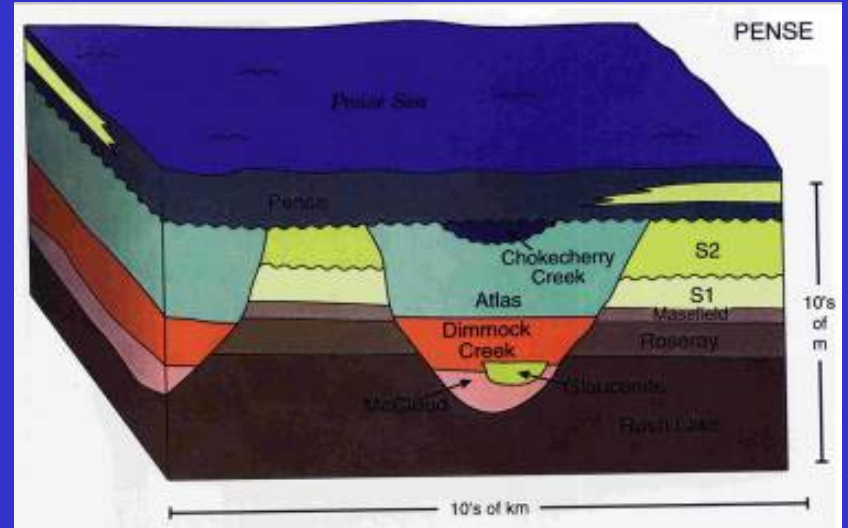
## Atlas Member





# Stratigraphic History

## Pense Formation



Top



Bottom

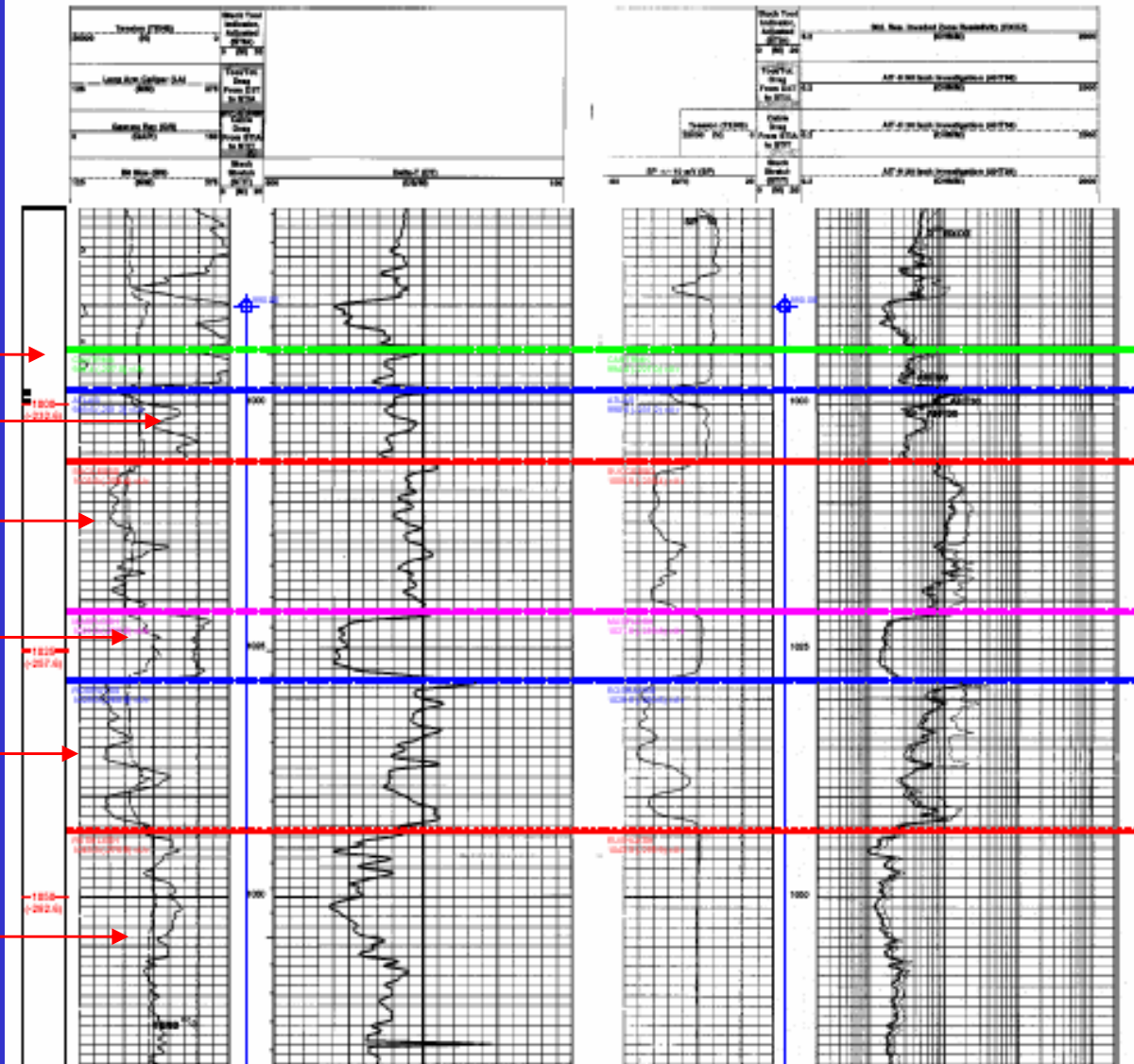
Pense  
Contact  
Atlas



# Log Characters

31/02-18-015-15W3/0

KB: 767.4 m RR: 1997-10-30  
TD: 1155.0 m ProdForm: CANTR  
Mode: Prod Fluid: Oil  
FCE SEWARD N 2-18-15



Cantuar Marker

Atlas Member

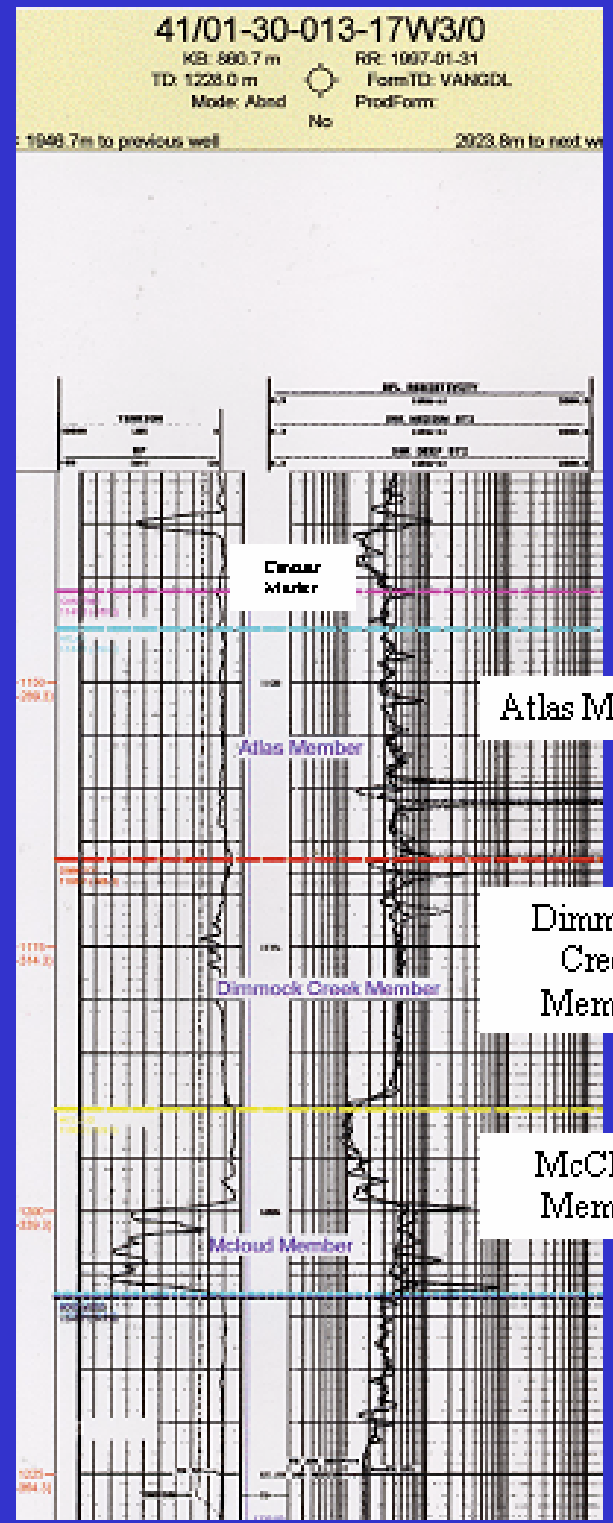
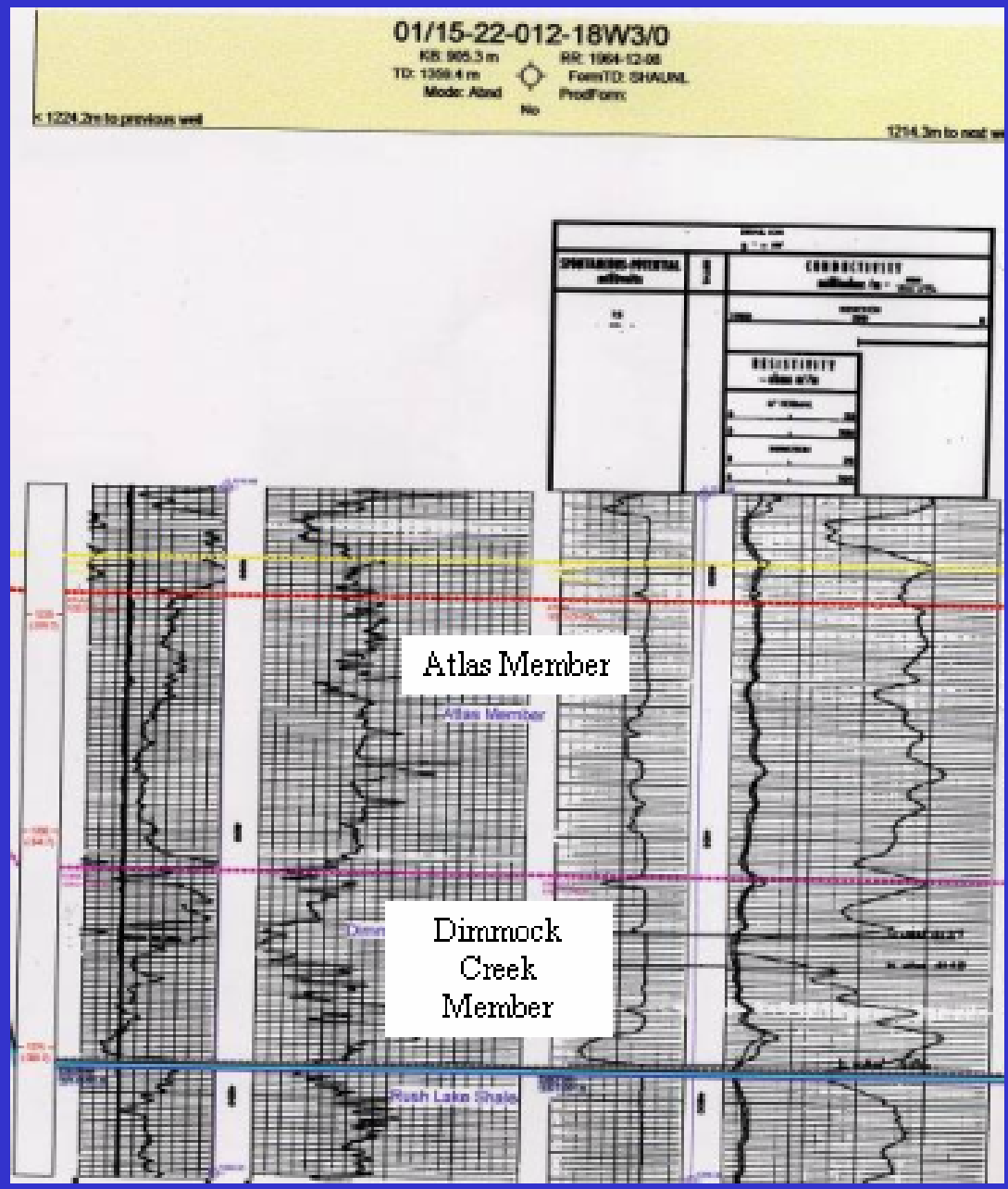
Success Formation

Masefield Shale

Roseray Formation

Rush Lake Shale

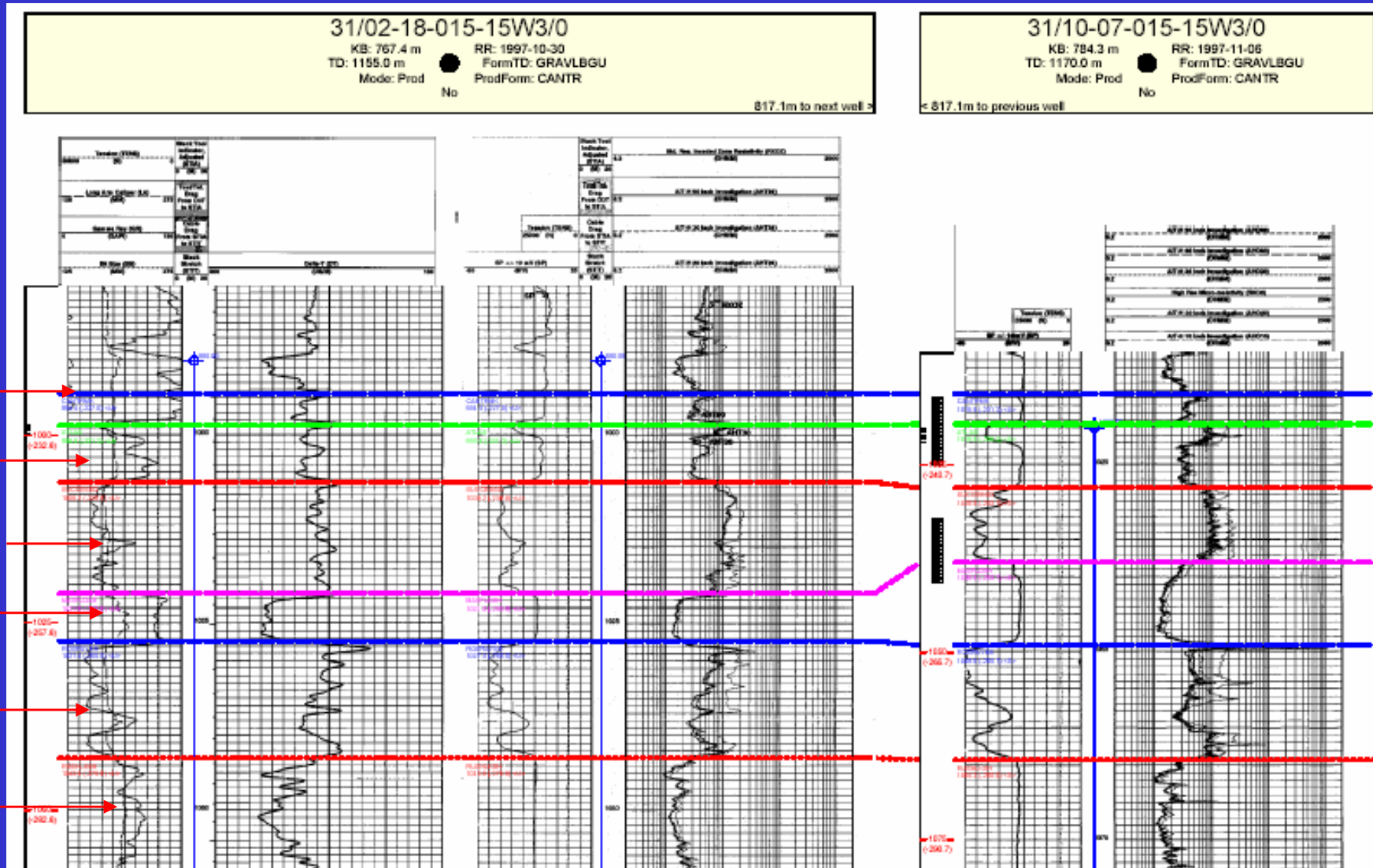
# Log Characters



# Stratigraphic Correlation

❖ Marker beds

❖ Unit association correlation

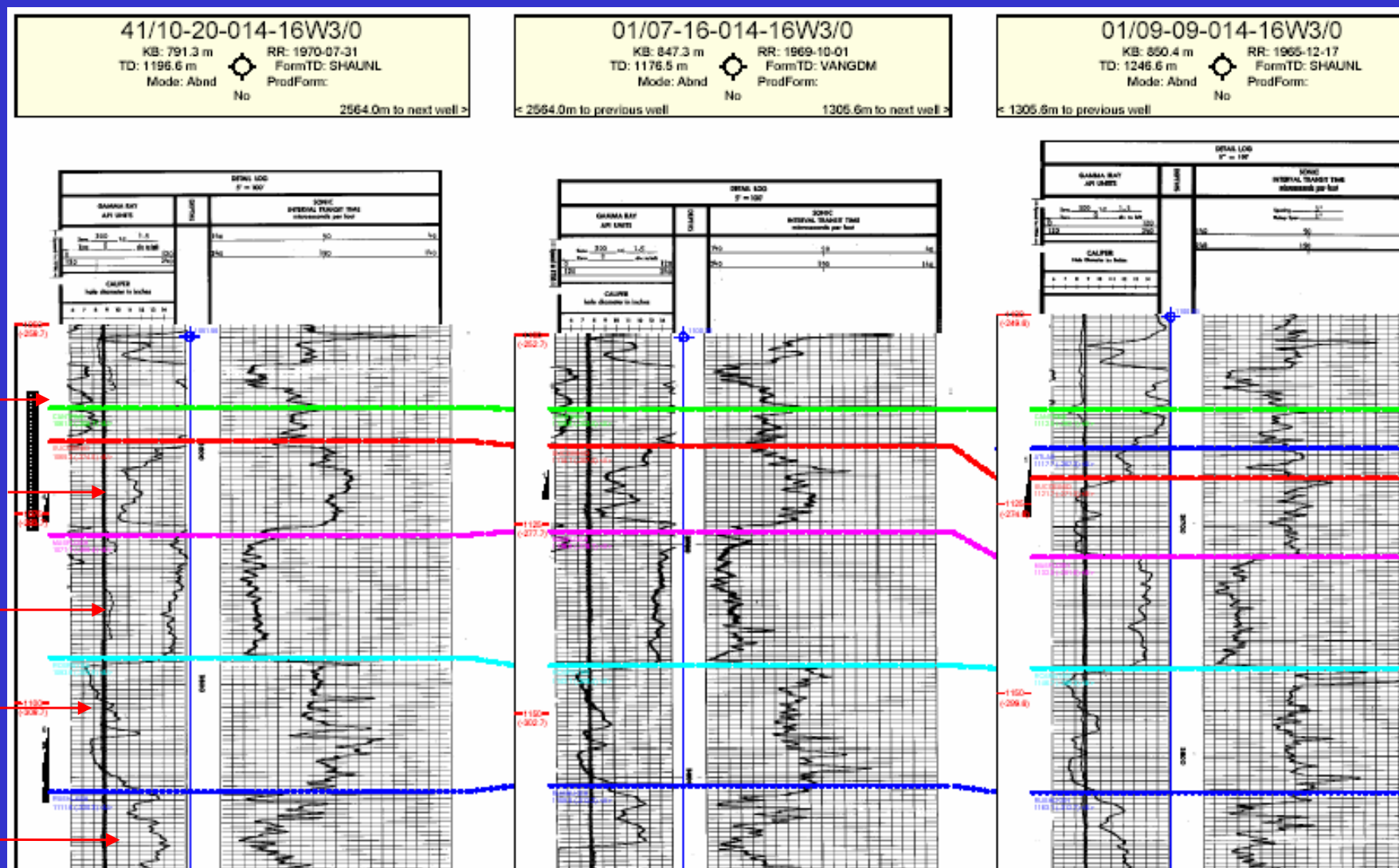


Cantuar Marker  
Atlas Member  
Success Formation  
Masefield Shale  
Rosera Formation  
Rush Lake Shale

# Stratigraphic Correlation

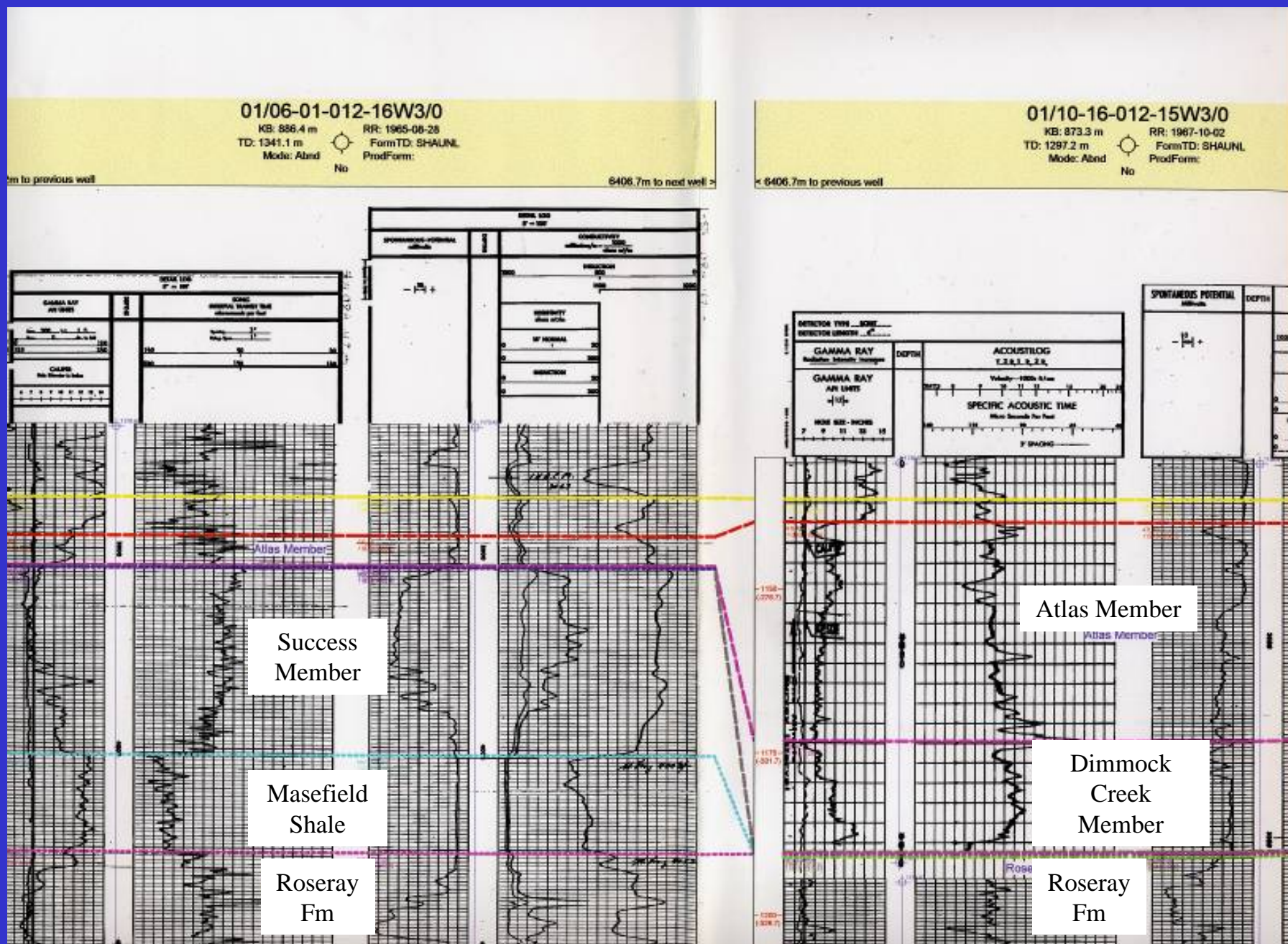
❖ Consider the general depositional environment

On the interfluves



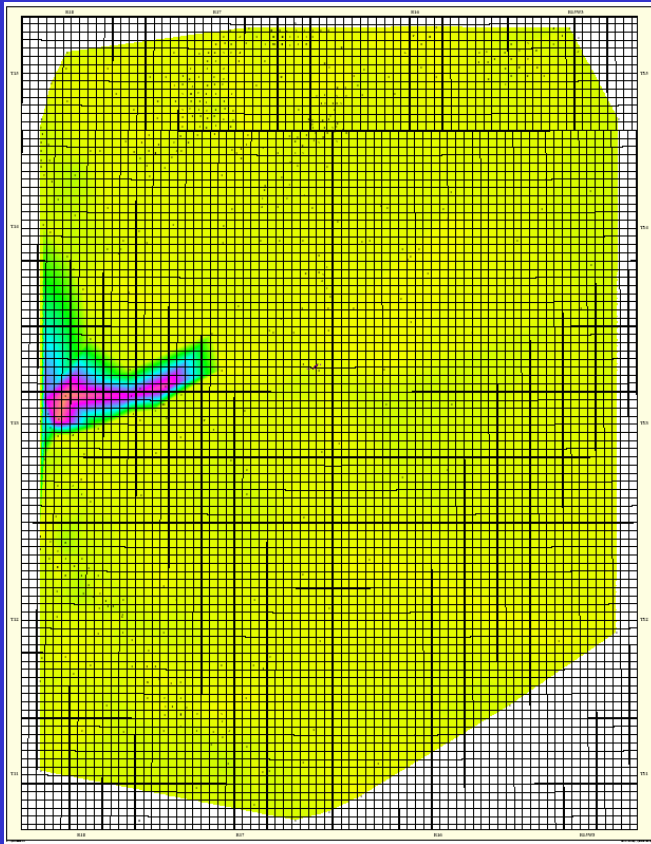
# Stratigraphic Correlation

## ❖ Interfluve--Valley

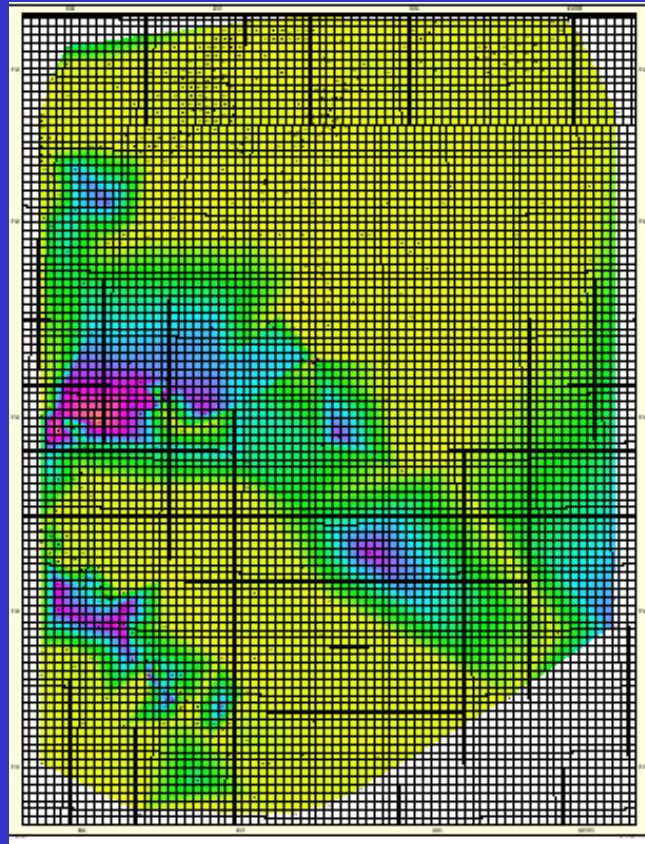


# Isopach maps

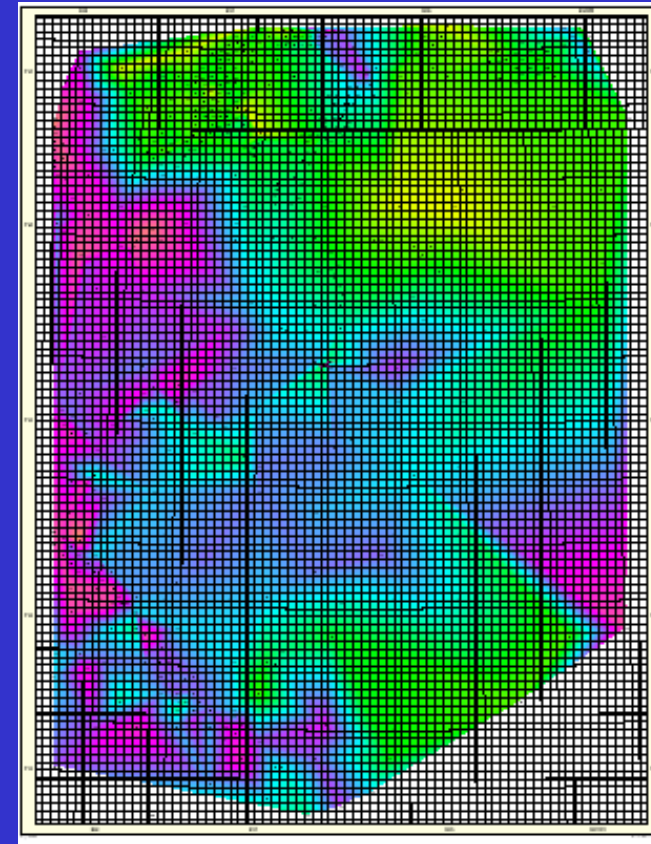
❖ McCloud Member



❖ Dimmock Creek Member

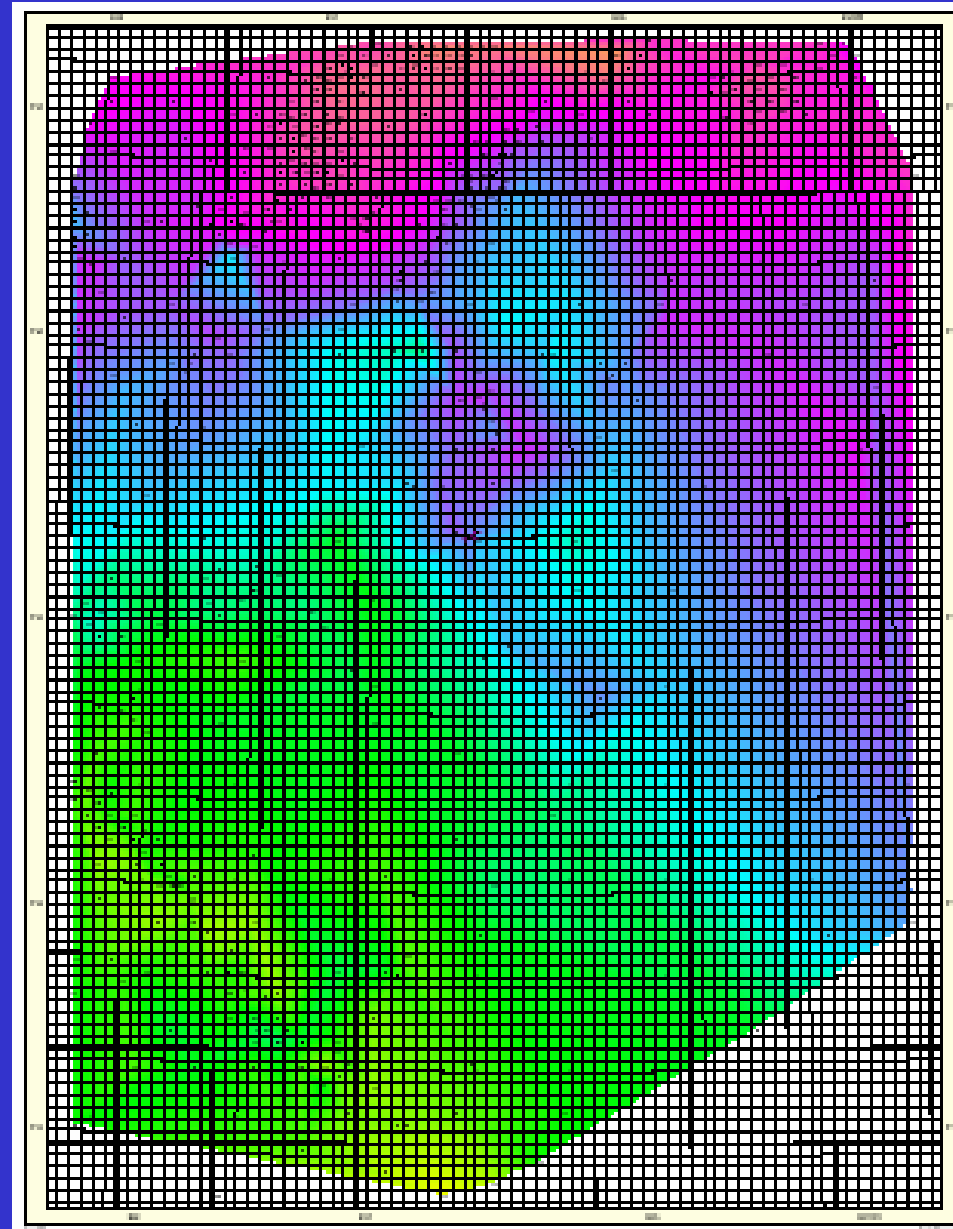


❖ Atlas Member



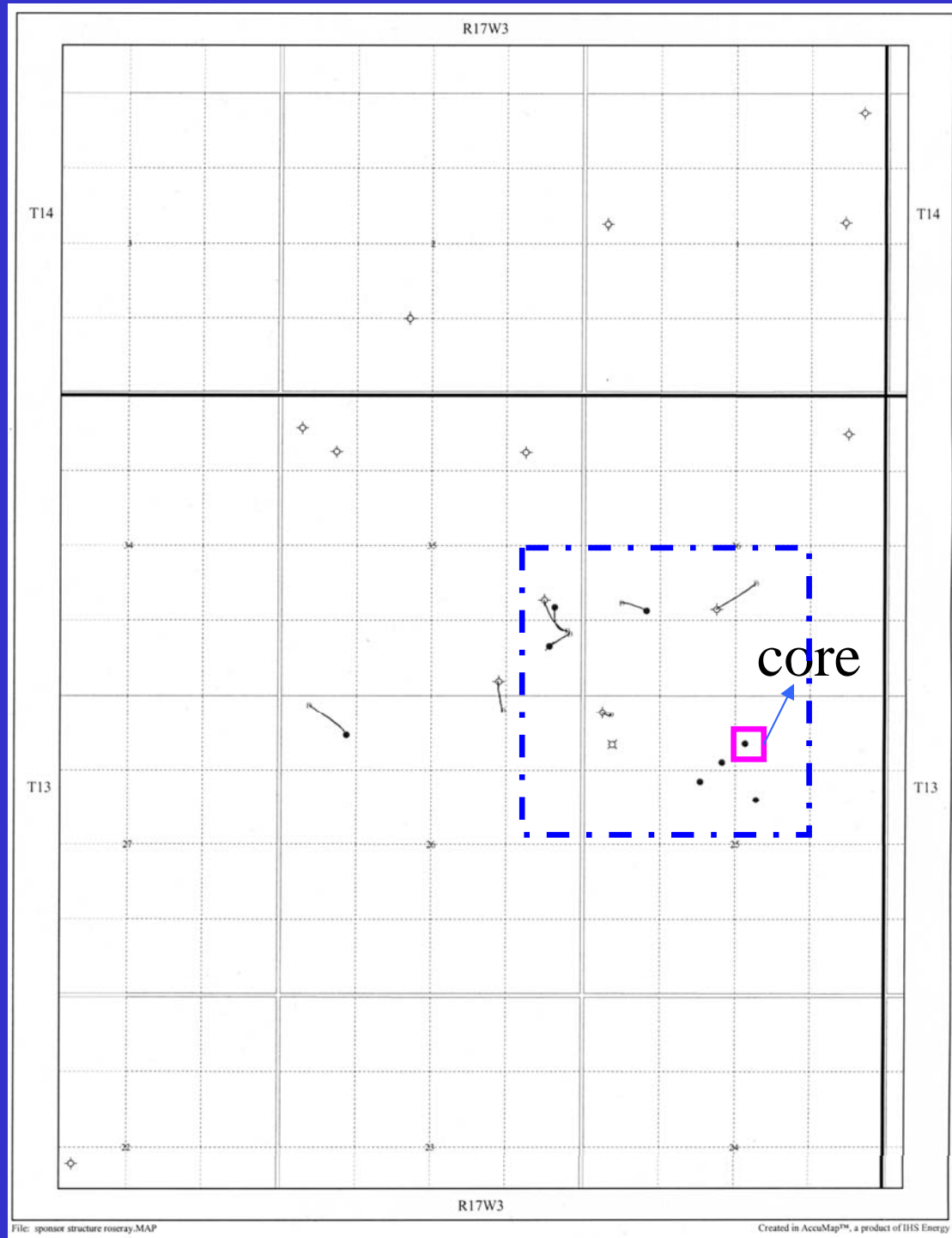
# Structure map

## ❖ Cantuar Marker



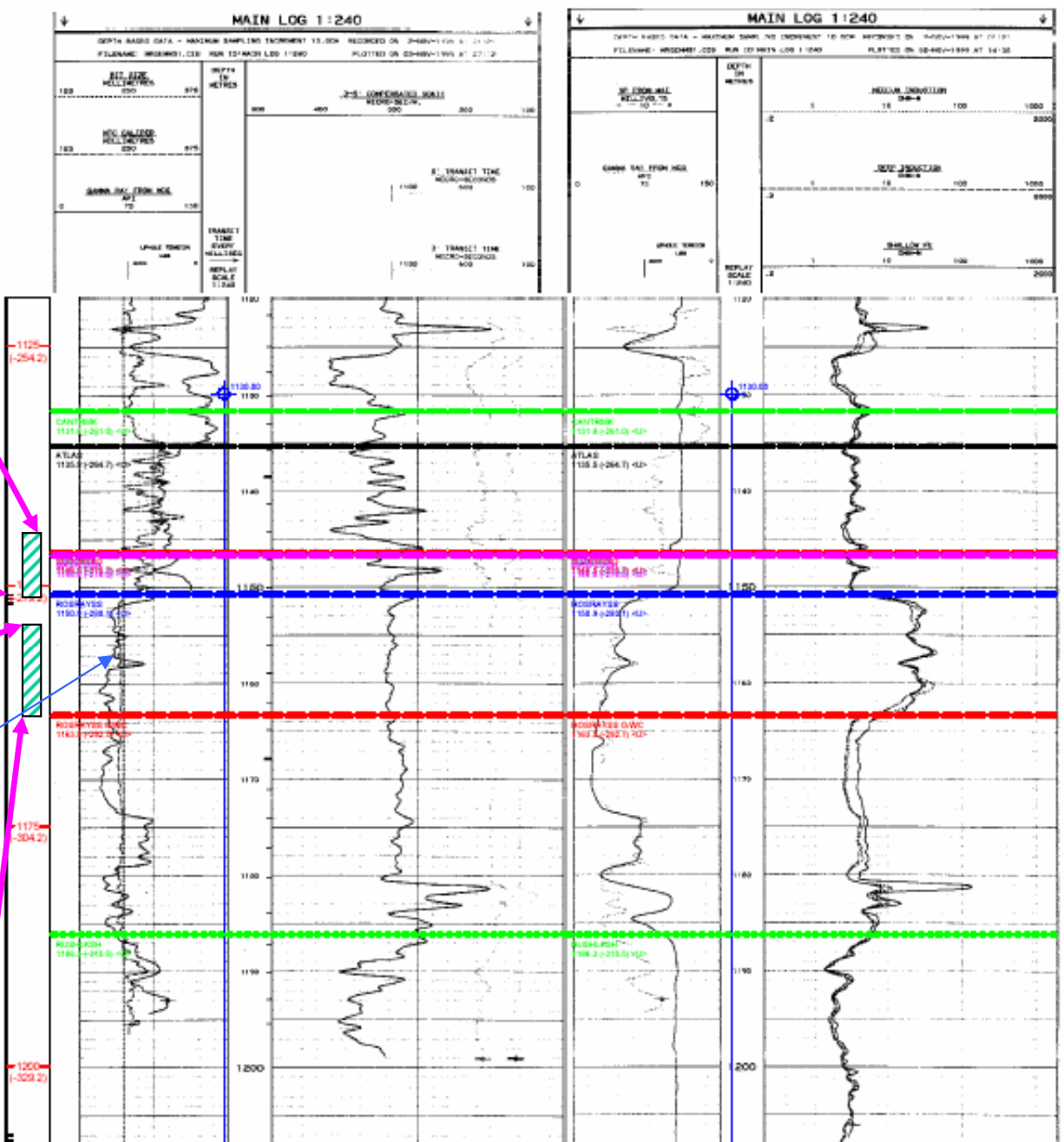
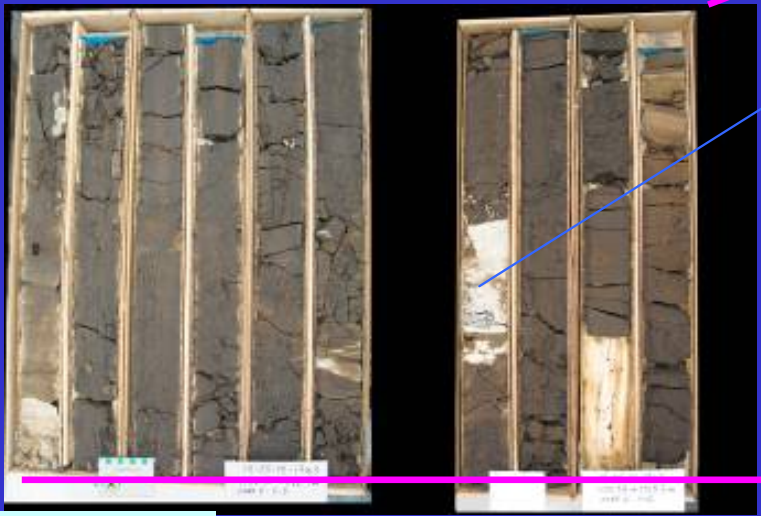


# Ross Lake pool

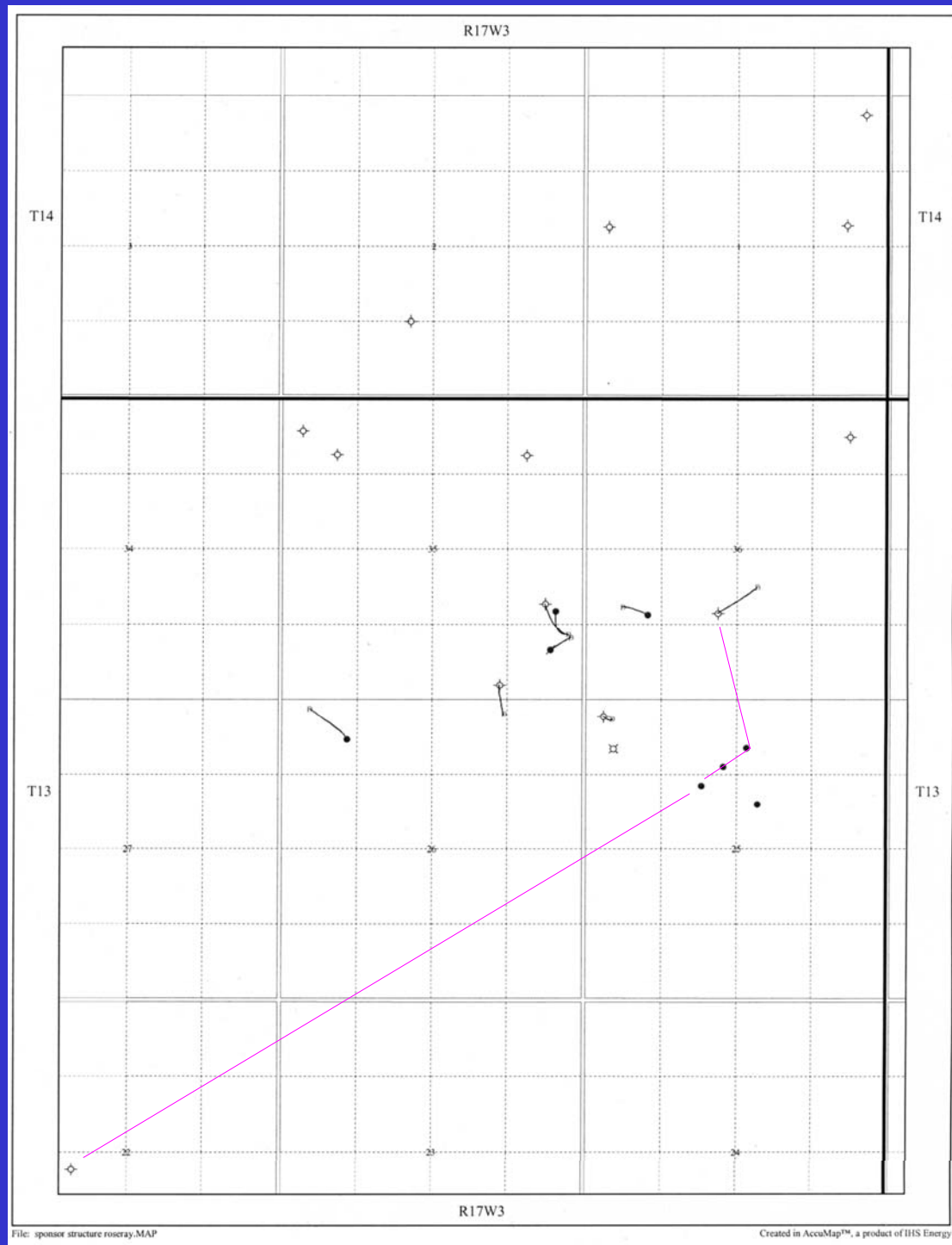


# Ross Lake pool

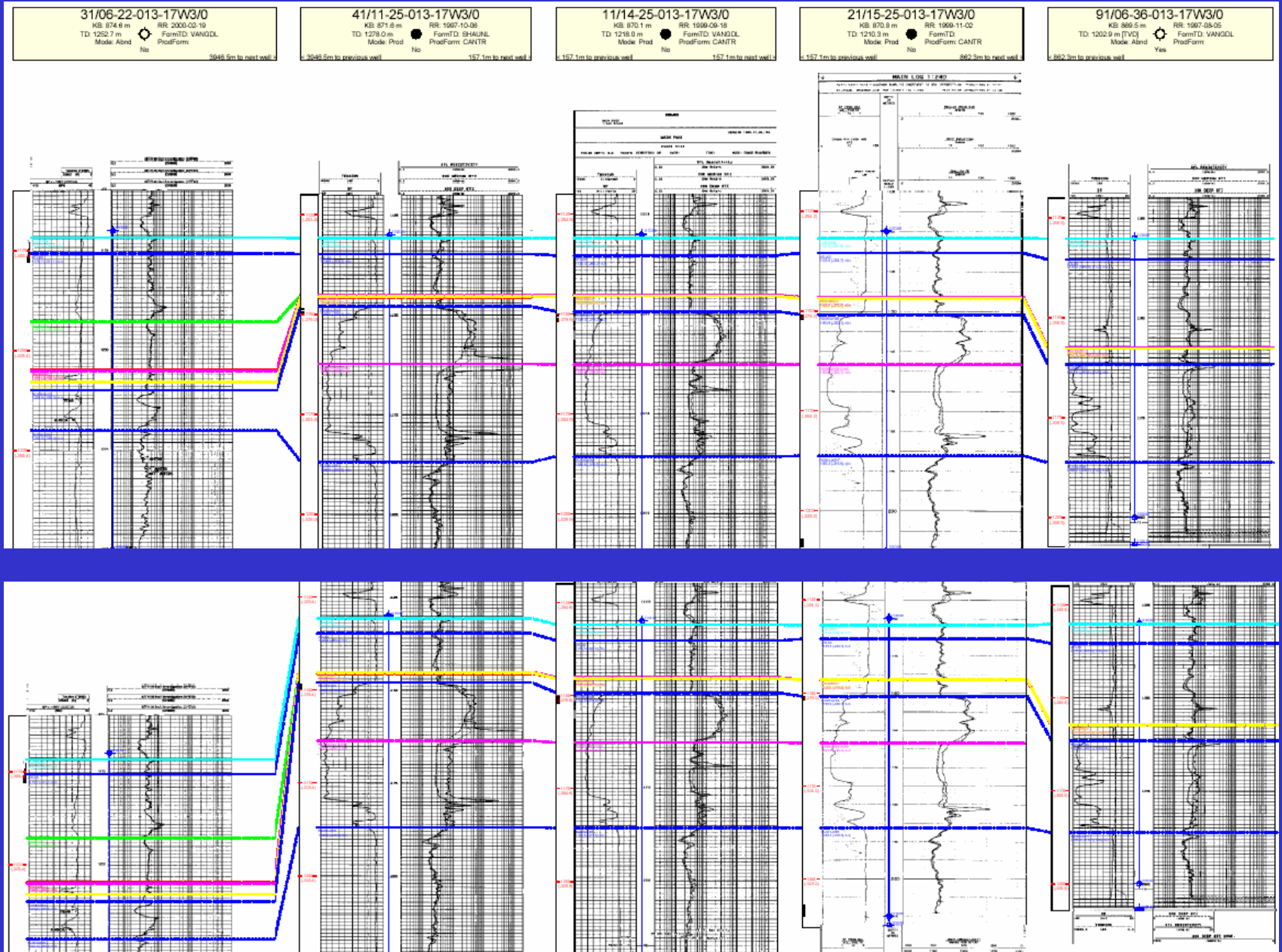
21/15-25-013-17W3/0  
 KB: 870.8 m RR: 1999-11-02  
 TD: 1210.3 m ProdForm: CANTR  
 Mode: Prod Fluid: Oil  
 RENAISSANCE WEBB S 15-25-13-17



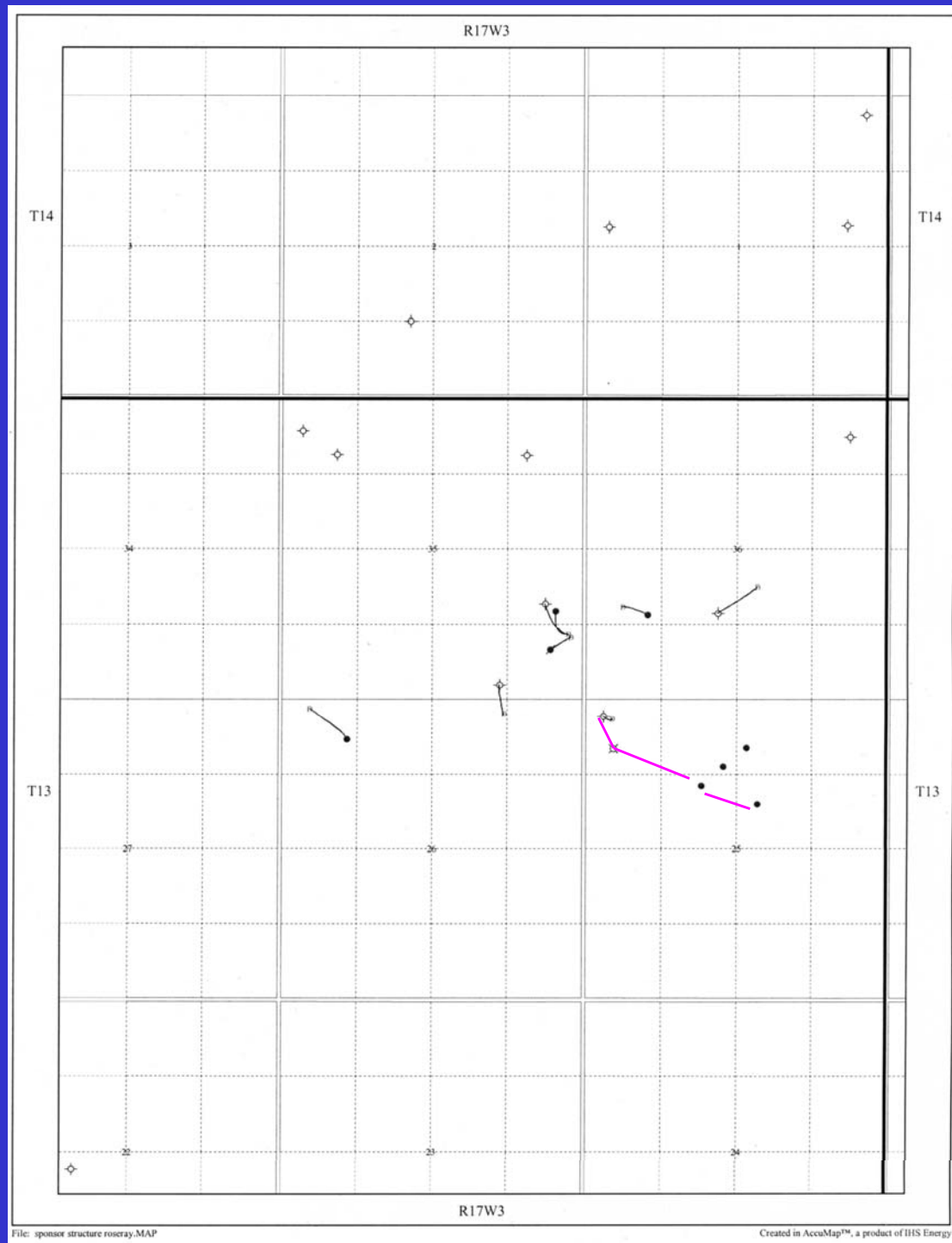
# Ross Lake pool



# Ross Lake pool



# Ross Lake pool



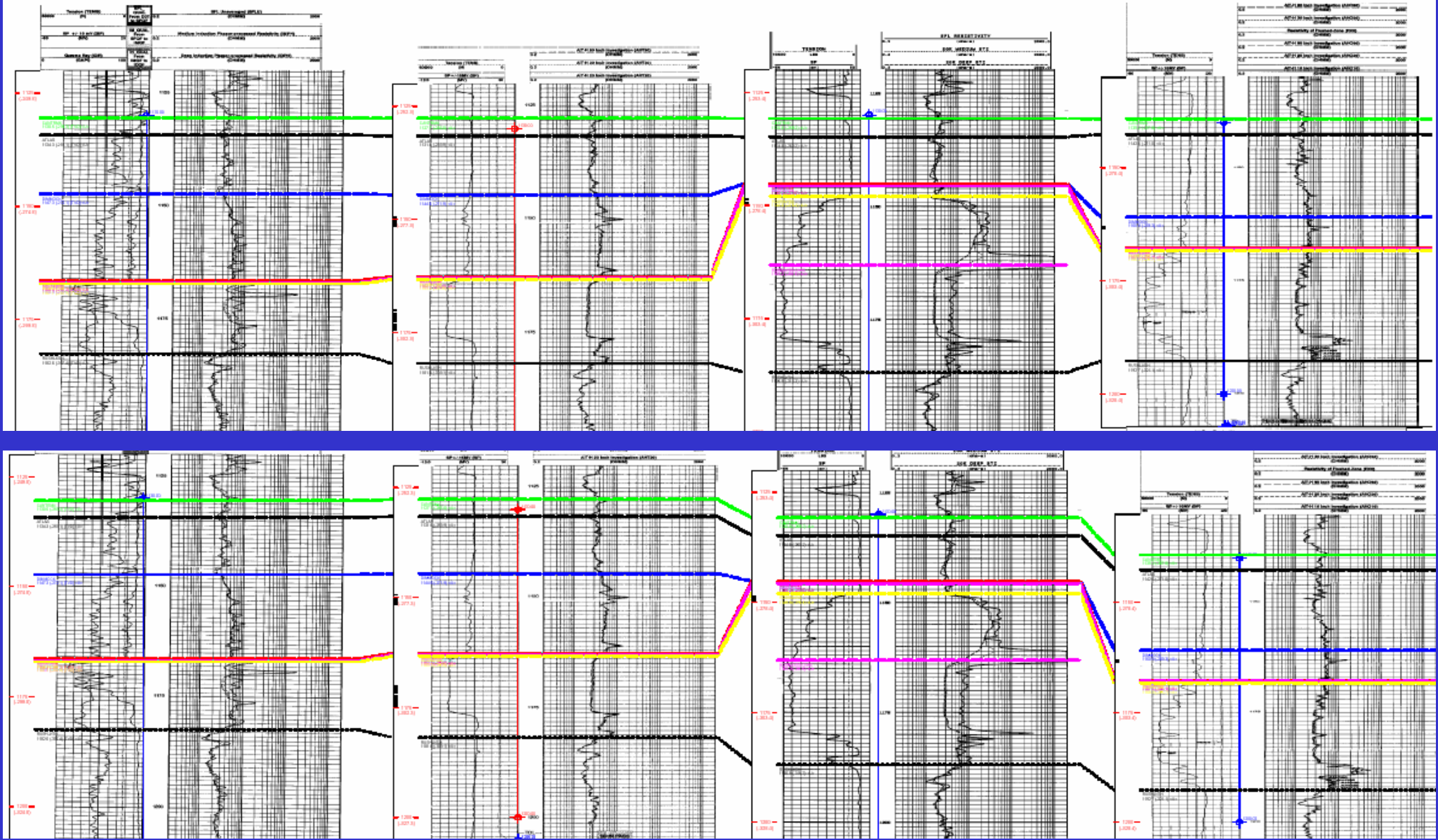
# Ross Lake pool

31/13-25-013-17W3/0  
 KB: 875.2 m RR: 1096-07-11  
 TD: 1271.6 m [TV] ProdForm: SHALNL  
 Mode: Abnd Yes  
 180.4m to next well

21/13-25-013-17W3/0  
 KB: 872.7 m RR: 2000-01-28  
 TD: 1205.0 m Mode: Disp ProdForm: VANGDL  
 No  
 508.0m to next well

41/11-25-013-17W3/0  
 KB: 871.8 m RR: 1997-10-08  
 TD: 1228.0 m Mode: Prod ProdForm: SHALNL  
 No  
 508.0m to previous well 315.5m to next well

31/10-25-013-17W3/0  
 KB: 871.8 m RR: 1999-11-24  
 TD: 1206.0 m Mode: N/A ProdForm: VANGDL  
 No  
 315.5m to previous well

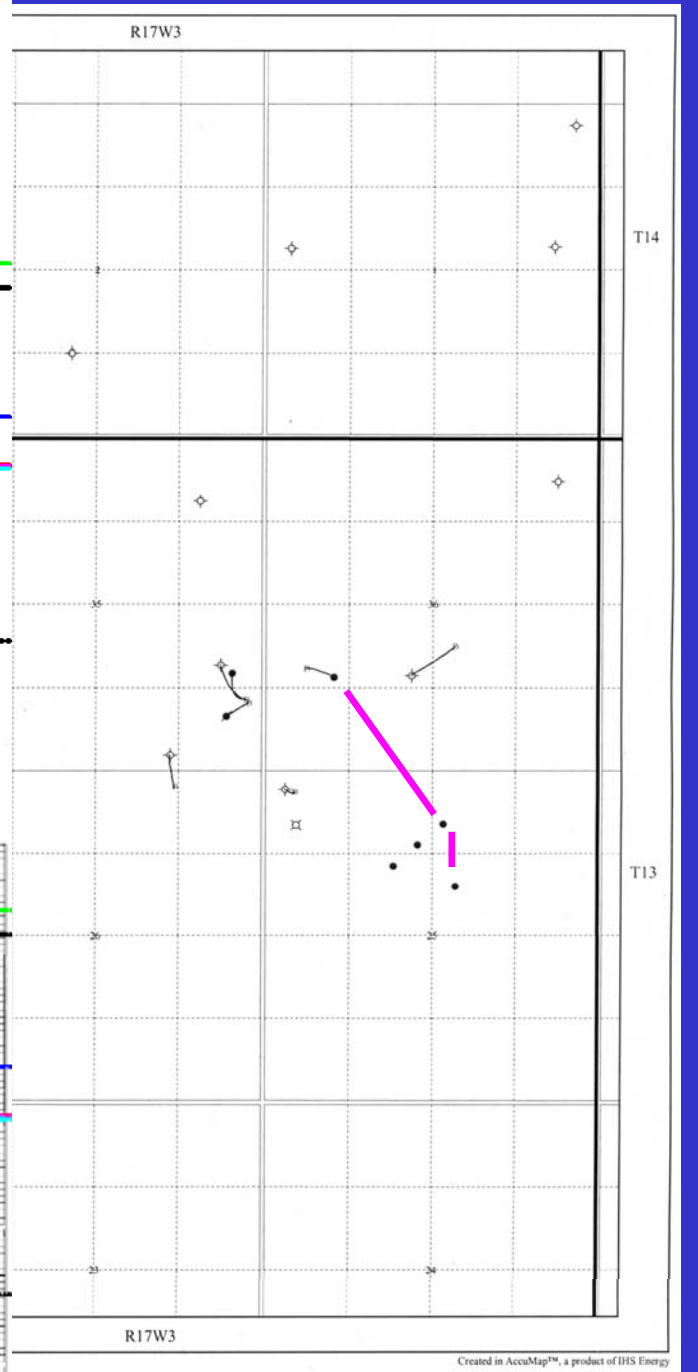
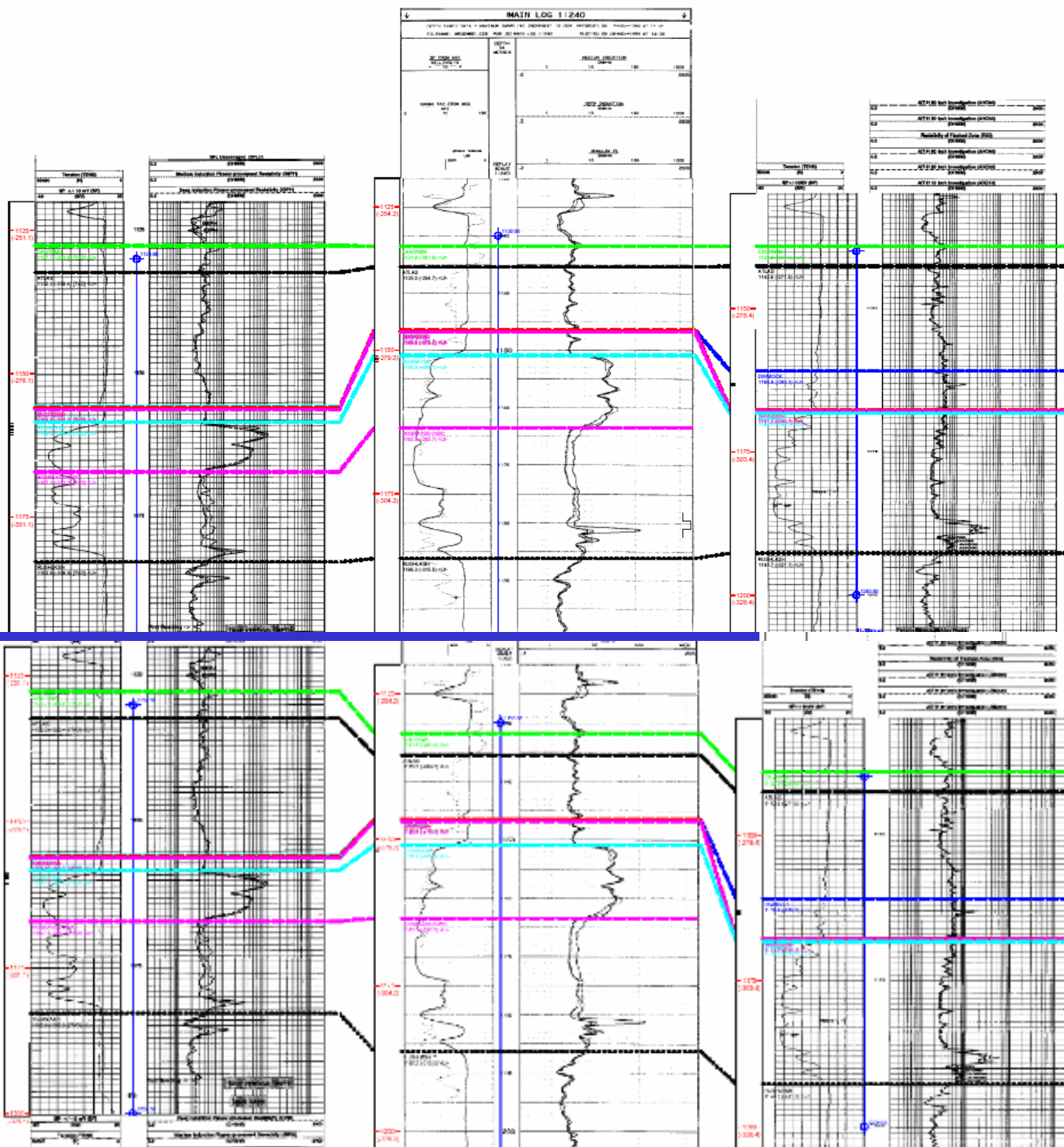


# Ross Lake pool

11/05-36-013-17W3/0  
 KB: 873.9 m RR: 1997-01-24  
 TD: 1196.7 m [TVD] ● FormTD: VANGDL  
 Mode: Prod ProdForm: ROSRAYSS  
 Yes  
 1004.4m to next well >

21/15-25-013-17W3/0  
 KB: 870.8 m RR: 1999-11-02  
 TD: 1210.3 m ● FormTD:  
 Mode: Prod ProdForm: CANTR  
 No  
 < 1004.4m to previous well 309.5m to next well >

31/10-25-013-17W3/0  
 KB: 871.6 m RR: 1999-11-24  
 TD: 1206.0 m ● FormTD: VANGDL  
 Mode: N/A ProdForm:  
 No  
 < 309.5m to previous well



# Ross Lake pool

11/05-36-013-17W3/0

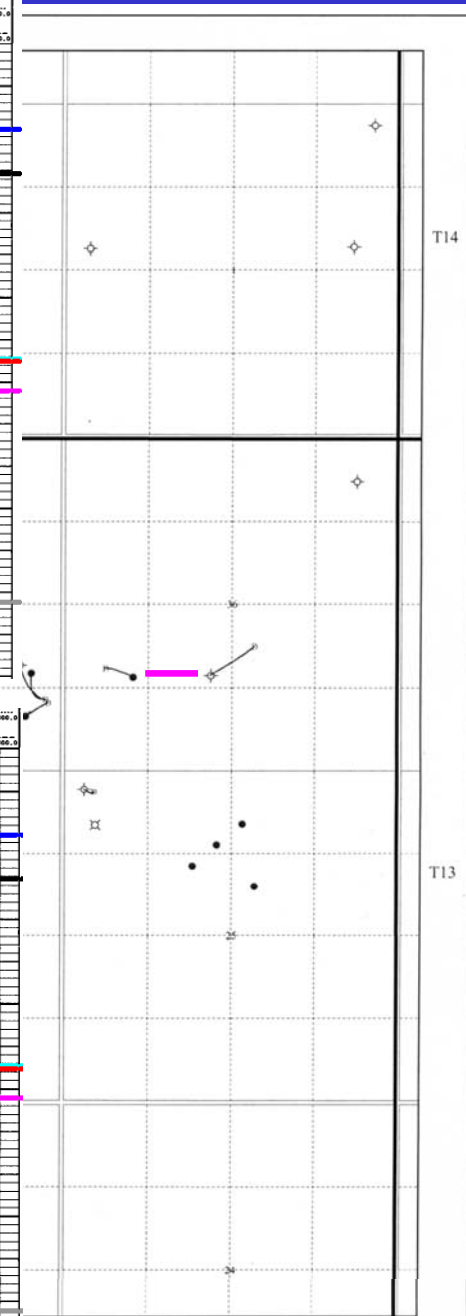
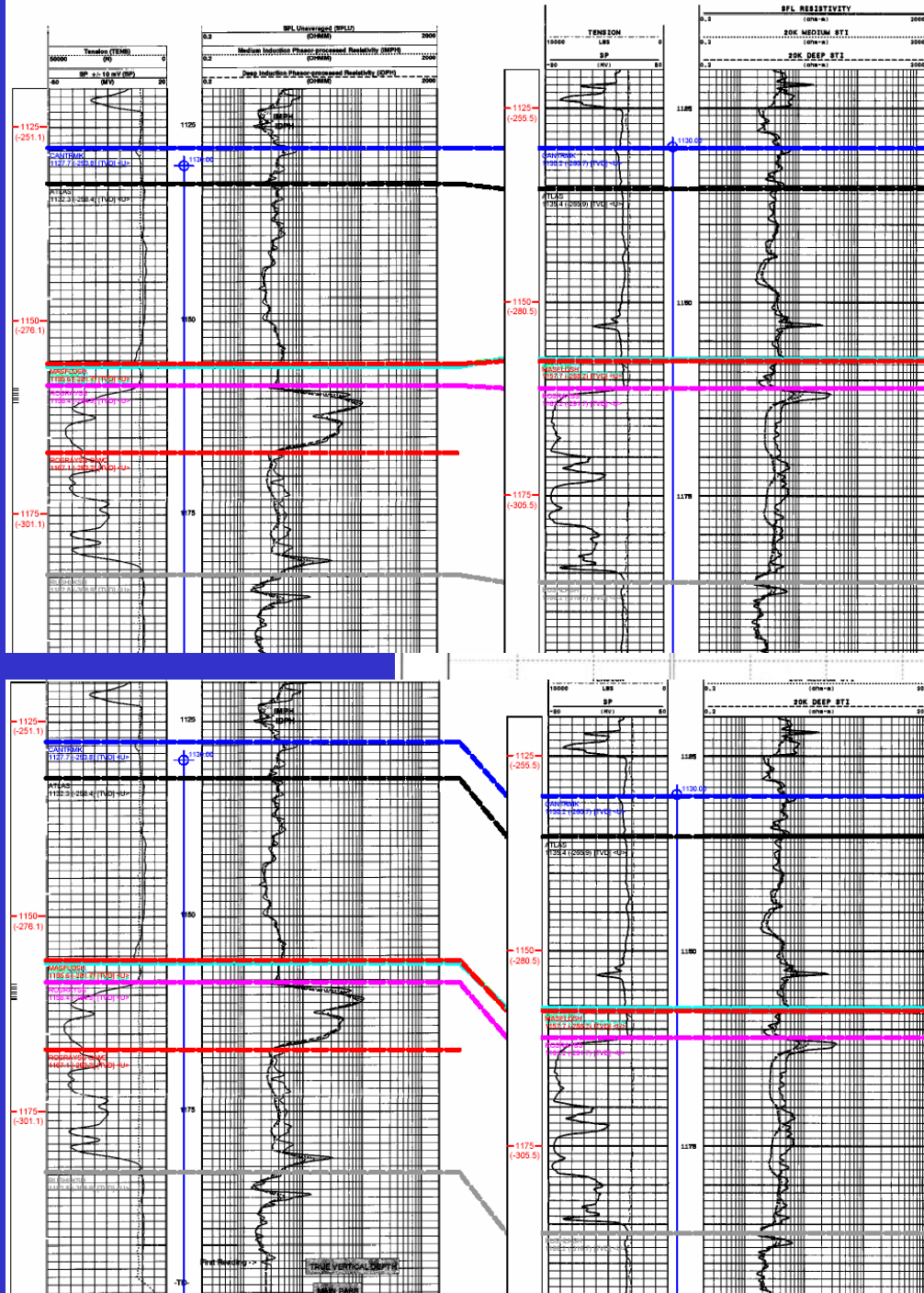
KB: 873.9 m  
 TD: 1196.7 m [TVD]  
 Mode: Prod  
 FormTD: VANGDL  
 ProdForm: ROSRAYSS  
 Yes

722.4m to next well

91/06-36-013-17W3/0

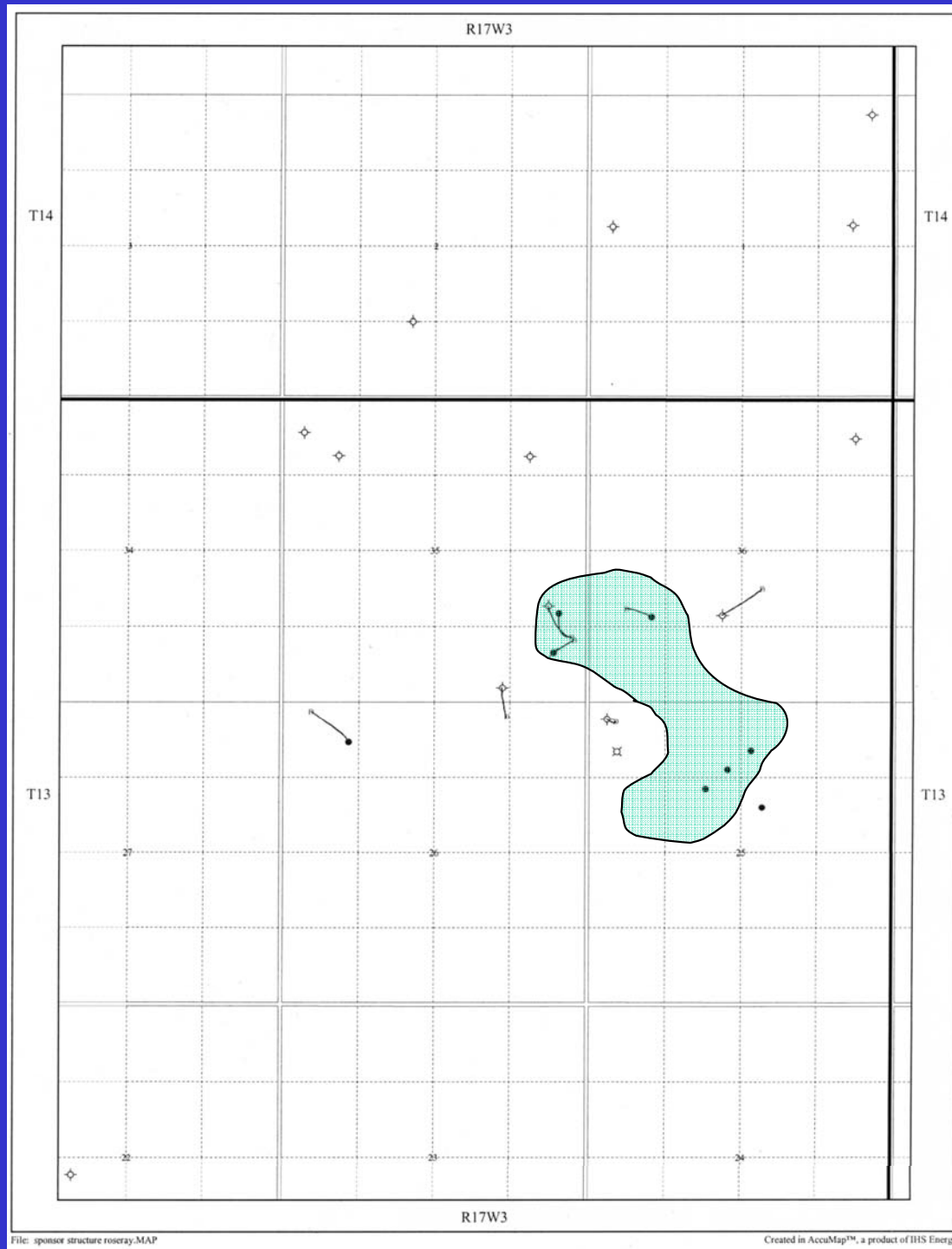
KB: 869.5 m  
 TD: 1202.9 m [TVD]  
 Mode: Abnd  
 FormTD: VANGDL  
 ProdForm:  
 Yes

722.4m to previous well





# Ross Lake pool



## Conclusions

- ❖ The Cantuar Formation and the adjacent strata demonstrate characteristic log responses, which can be identified and correlated by integrating the three major approaches (marker beds, unit association correlation, and consideration of depositional environment). The valley fill and interfluvial deposits form two readily distinguished log patterns.
- ❖ Cross sections present the greatly variable paleomorphology across the study area during the deposition of the Cantuar Formation. Isopach maps reflect the progressive valley fill from the thalweg (base), through the terrace, to the edge (top) of the valley.

## Conclusions

- ❖ Well log studies are of significant use in subsurface mapping and stratigraphic interpretation. However, they can only provide a general stratigraphic framework and interpretation of the depositional environments. More detailed and reliable results can be achieved on the basis of core-log integration.
- ❖ Ross Lake pool is formed in a valley-cut remnant of the Roseray sandbody. It's a stratigraphic trap with structural contribution.

# Acknowledgement

- ❖ HIS Energy (Accumap)
- ❖ Saskatchewan Subsurface Geological Laboratory (Core)
- ❖ Jim Christopher
- ❖ Chris Collom

