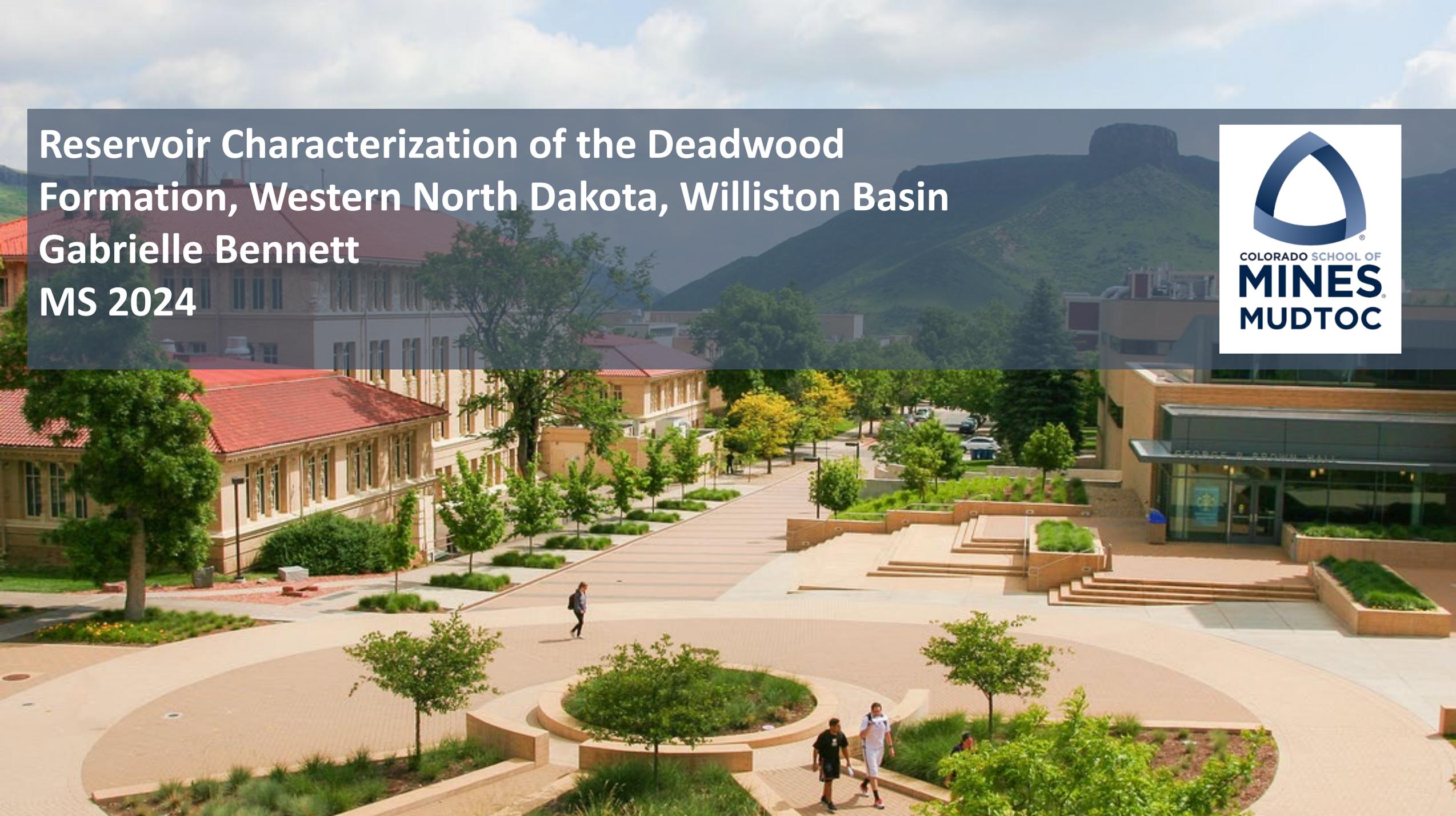
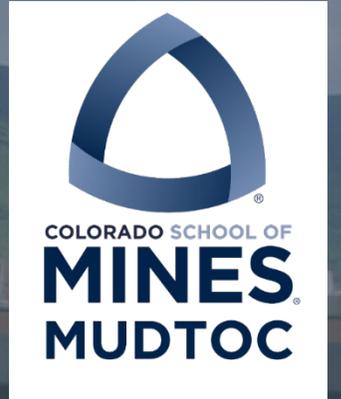


Reservoir Characterization of the Deadwood Formation, Western North Dakota, Williston Basin

Gabrielle Bennett
MS 2024



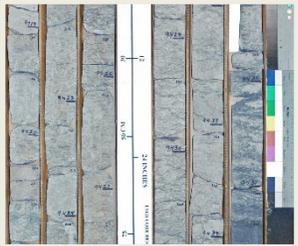
Outline



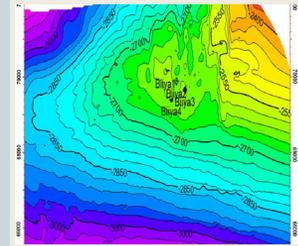
Geologic
Background



Study Area



Core Descriptions
& Facies



Regional
Mapping



Geothermal

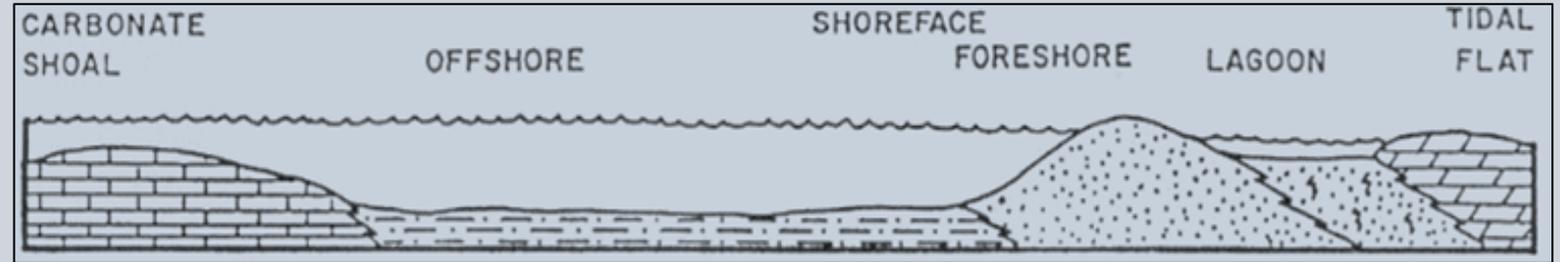


Progress

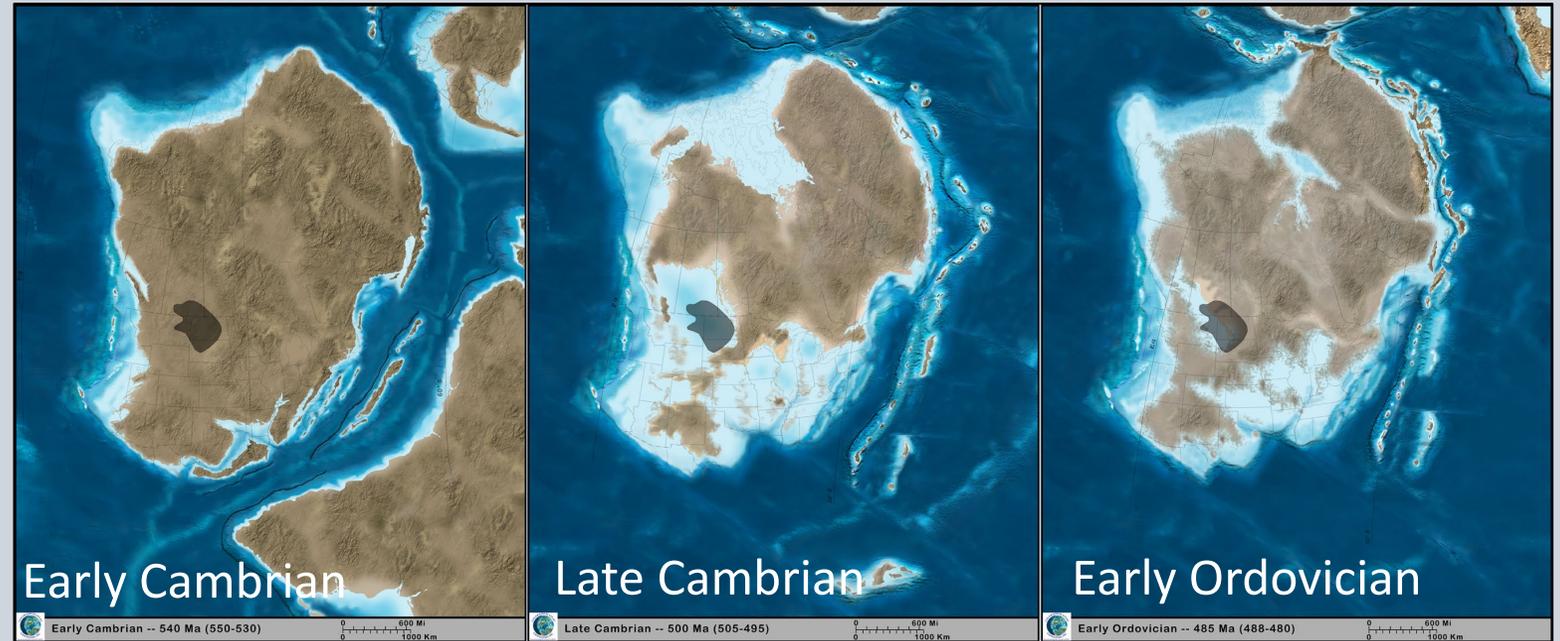
Geologic Background

Age (ma)	Era.	System	Seq.	Formation
444	Paleozoic	Ordovician	Tippecanoe	Stonewall
				Stony Mountain
				Red River
				Roughlock
				Icebox
				Black Island
				Deadwood
455 542	Paleozoic	Cambrian	Sauk	Deadwood
				Pre Cambrian

(Modified from NDGS.gov)



(LeFever,1996)



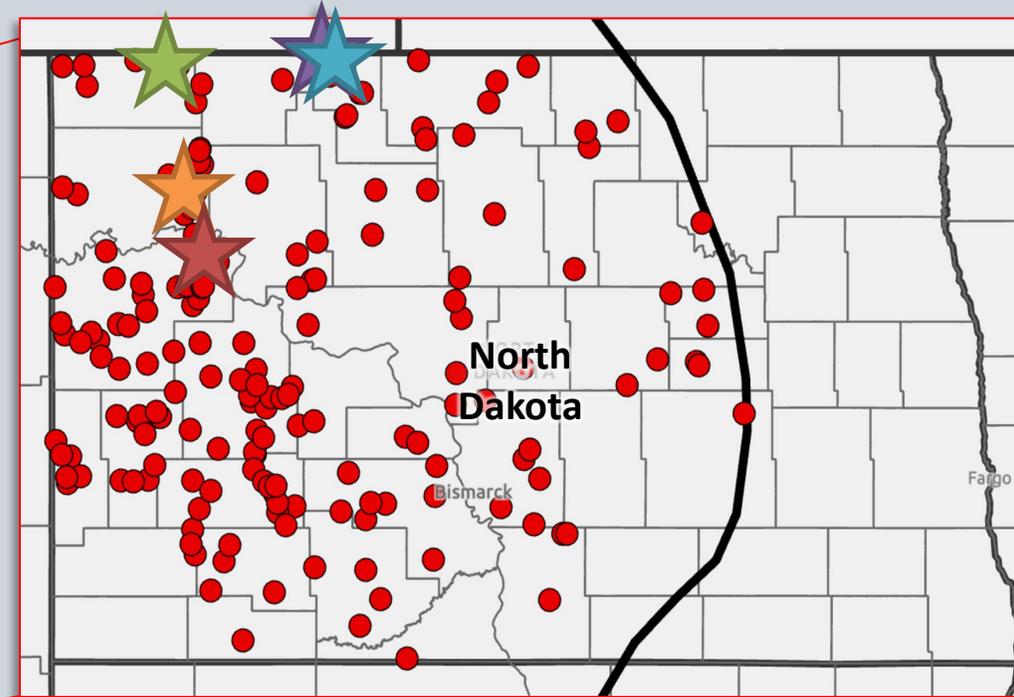
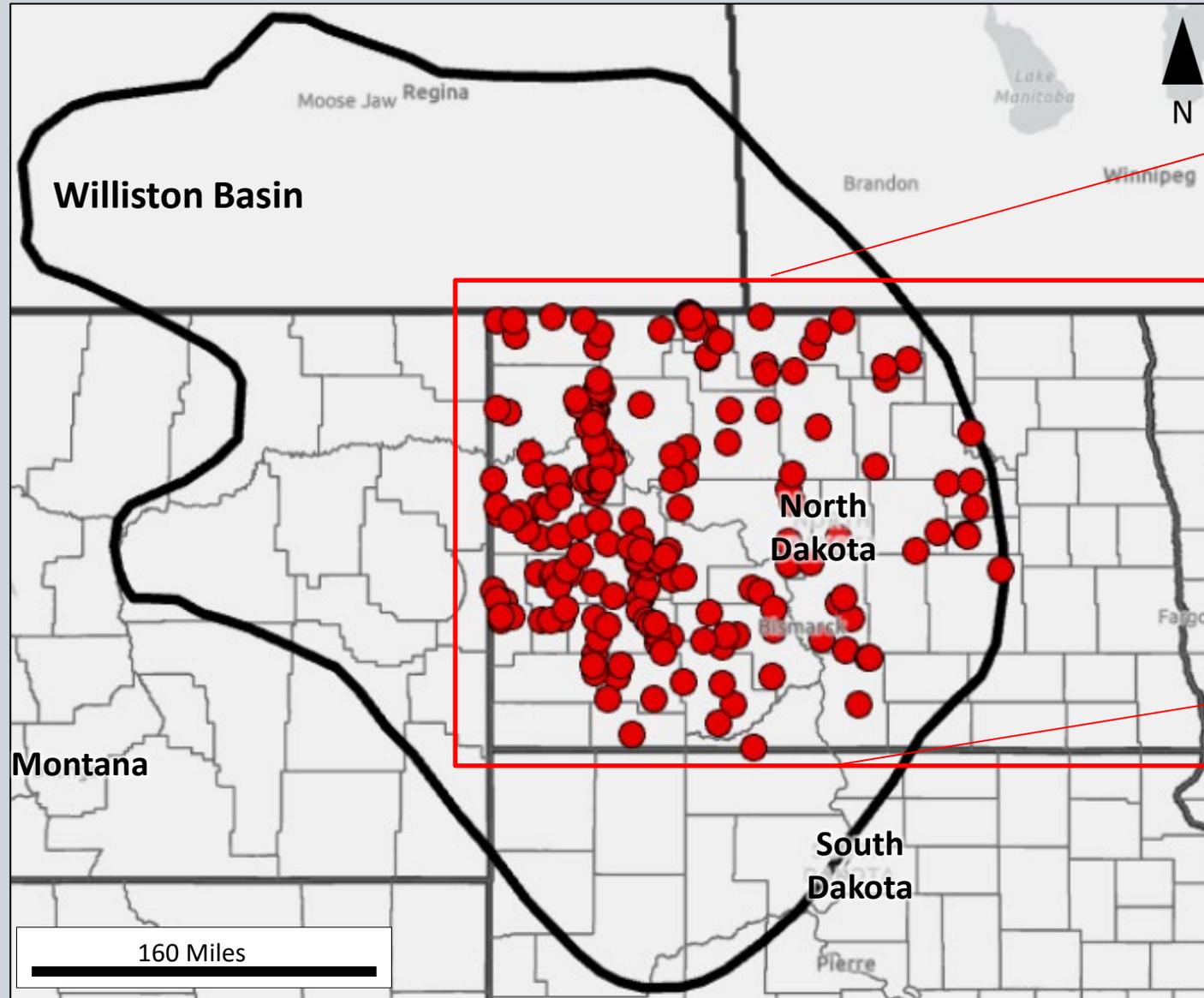
Early Cambrian

Late Cambrian

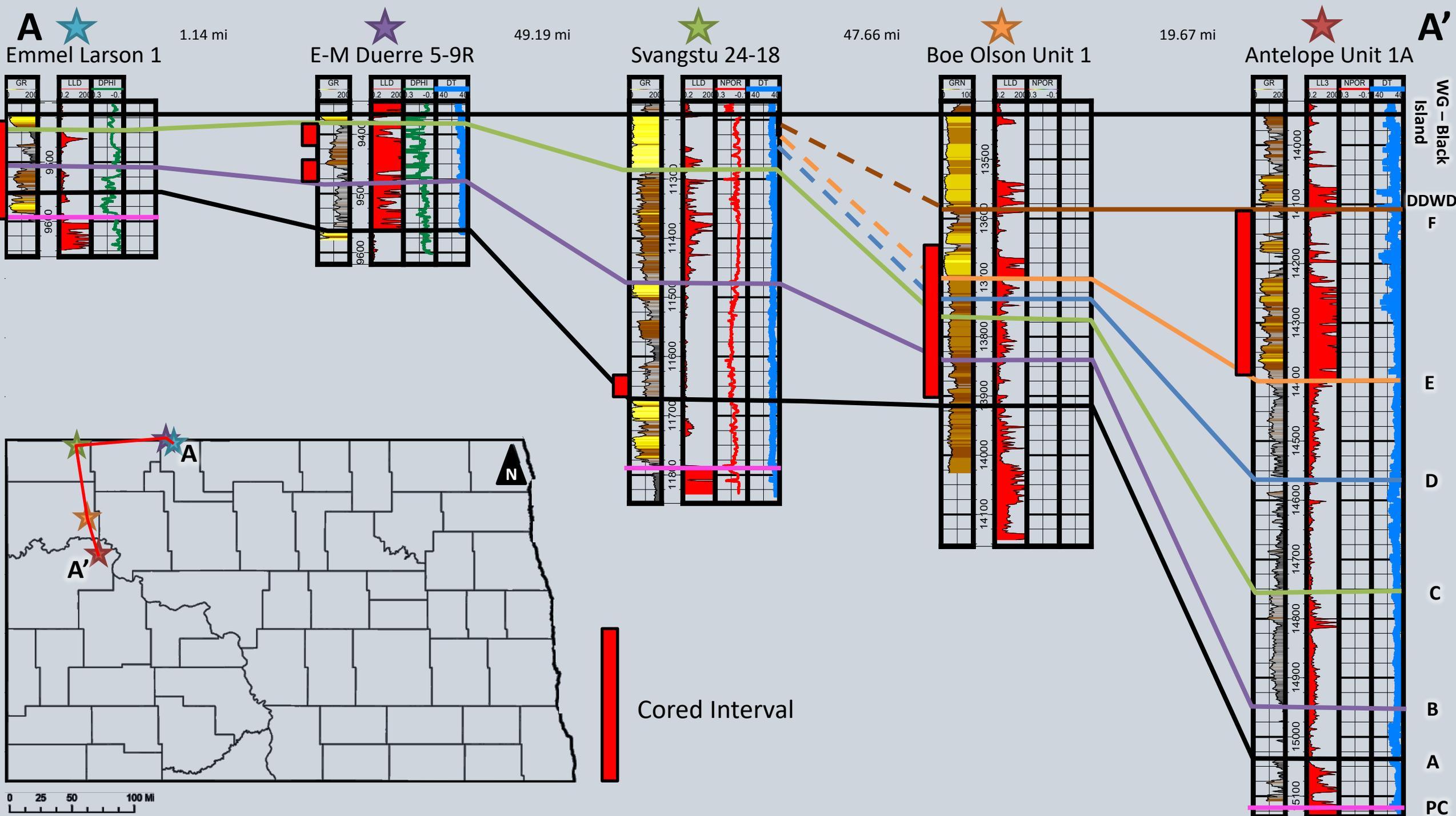
Early Ordovician

(Blakey,2013)

Study Area



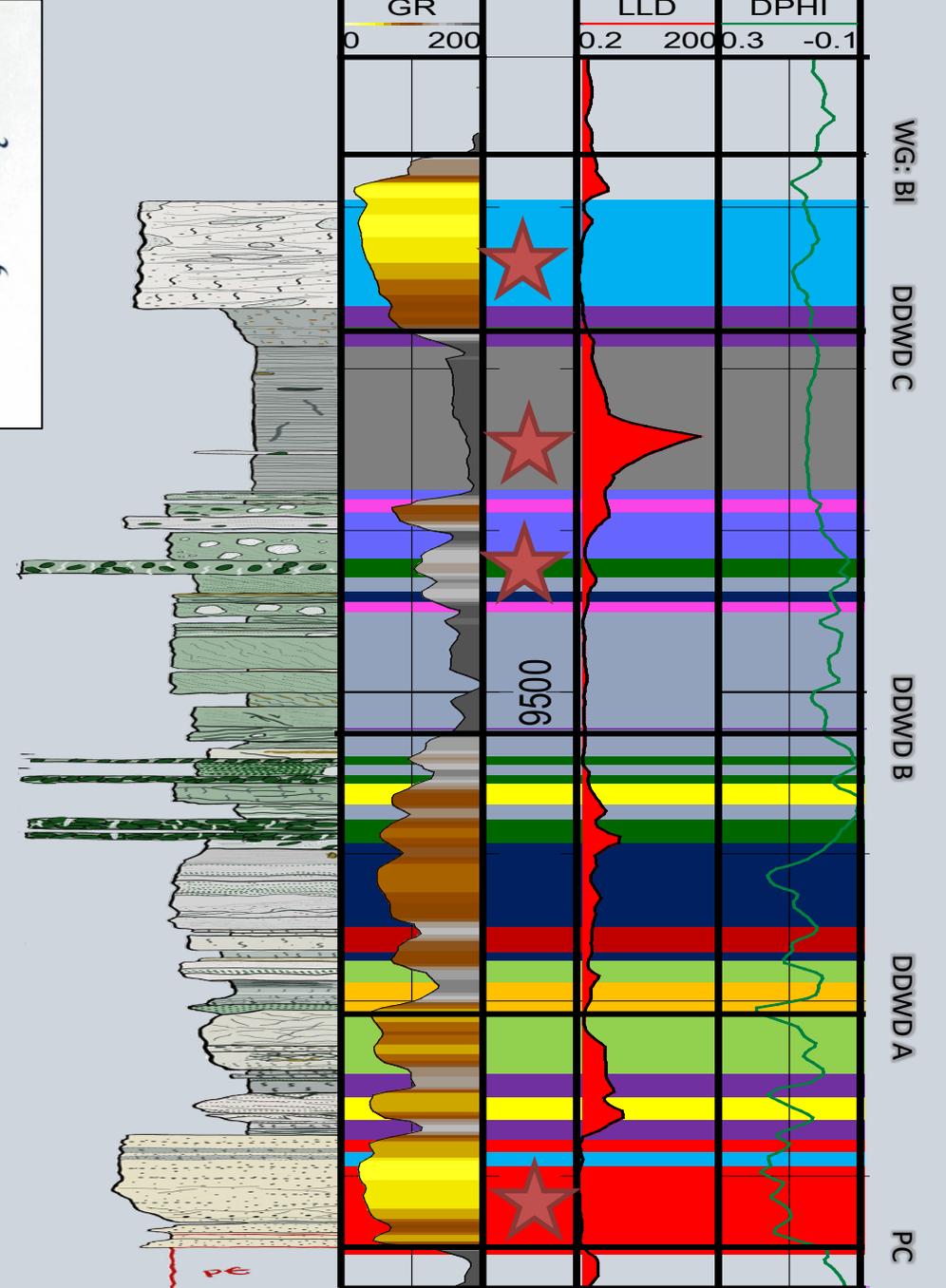
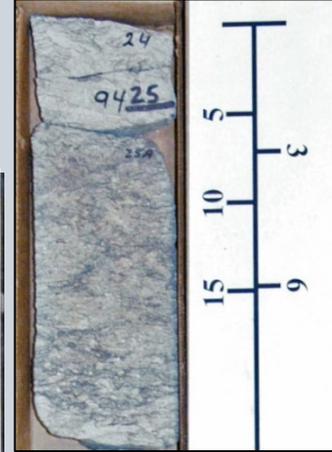
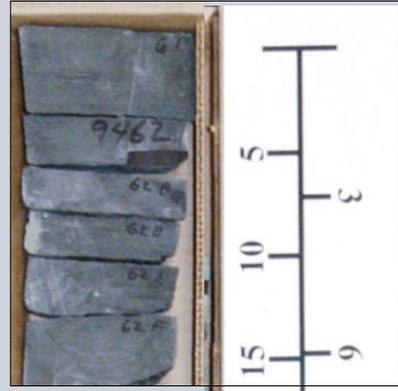
	211 Winnipeg Group/ Deadwood Wells	
	Emmel Larson 1	Renville Co
	E-M Duerre 5-9R	Renville Co
	Svangstu 24-18	Divide Co
	Boe Olson 1	Williams Co
	Antelope Unit 1A	McKenzie Co



Emmel Larson 1

Renville, Co

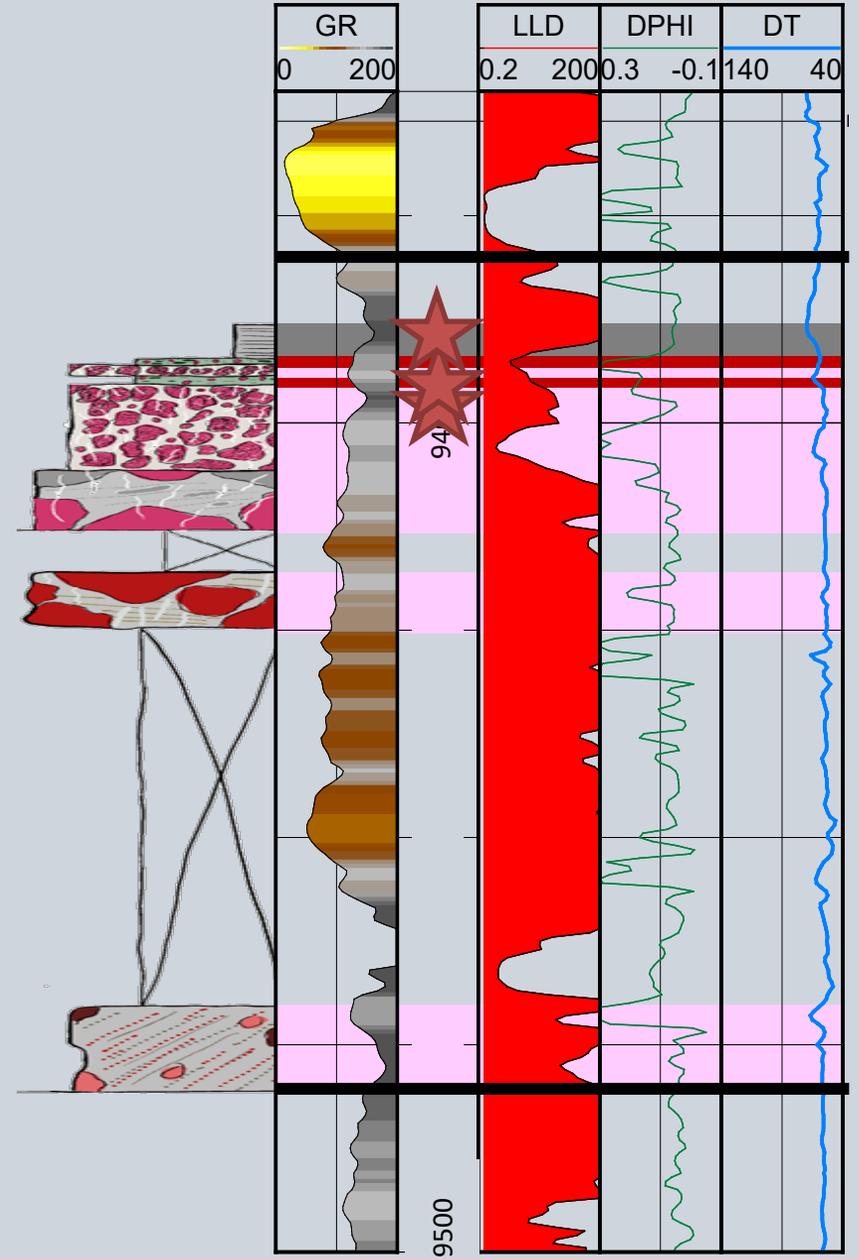
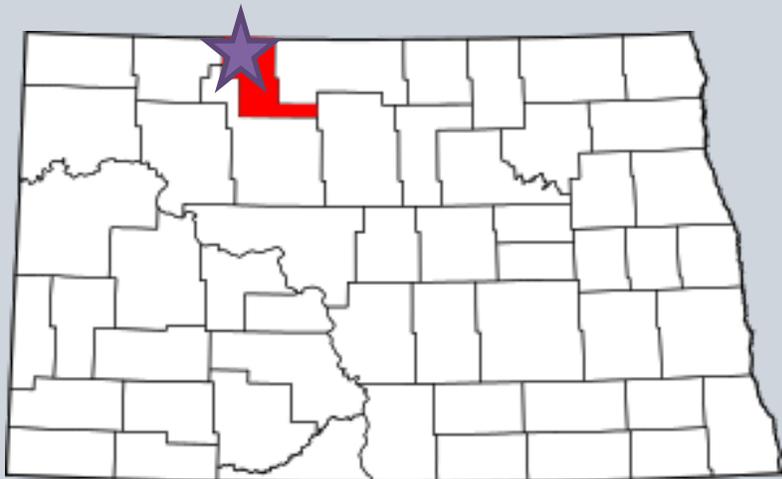
Lithofacies	
	Structureless Coarse-Grained Sandstone
	Bioturbated Coarse-Grained Sandstone
	Bioturbated Siliceous Mudstone
	Heterolithic Siltstone
	Fine-Grained Sandstone with Pebble Lags
	Bioturbated Fine Grained Sandstone
	Low Angle Planar Laminated Fine Sandstone
	Medium Grained Sandstone with Glauconite
	Glauconitic Flat Pebble Conglomerate
	Glauconitic Siltstone
	Glauconitic Low Angle Laminated Mudstone
	Glauconitic Matrix Supported Breccia
	Laminated Shaley Mudstone



E-M Duerre 5-9R

Renville, Co

Lithofacies	
	Conglomerate with Precambrian clasts
	Medium Grained Sandstone with Glauconite
	Laminated Shaley Mudstone



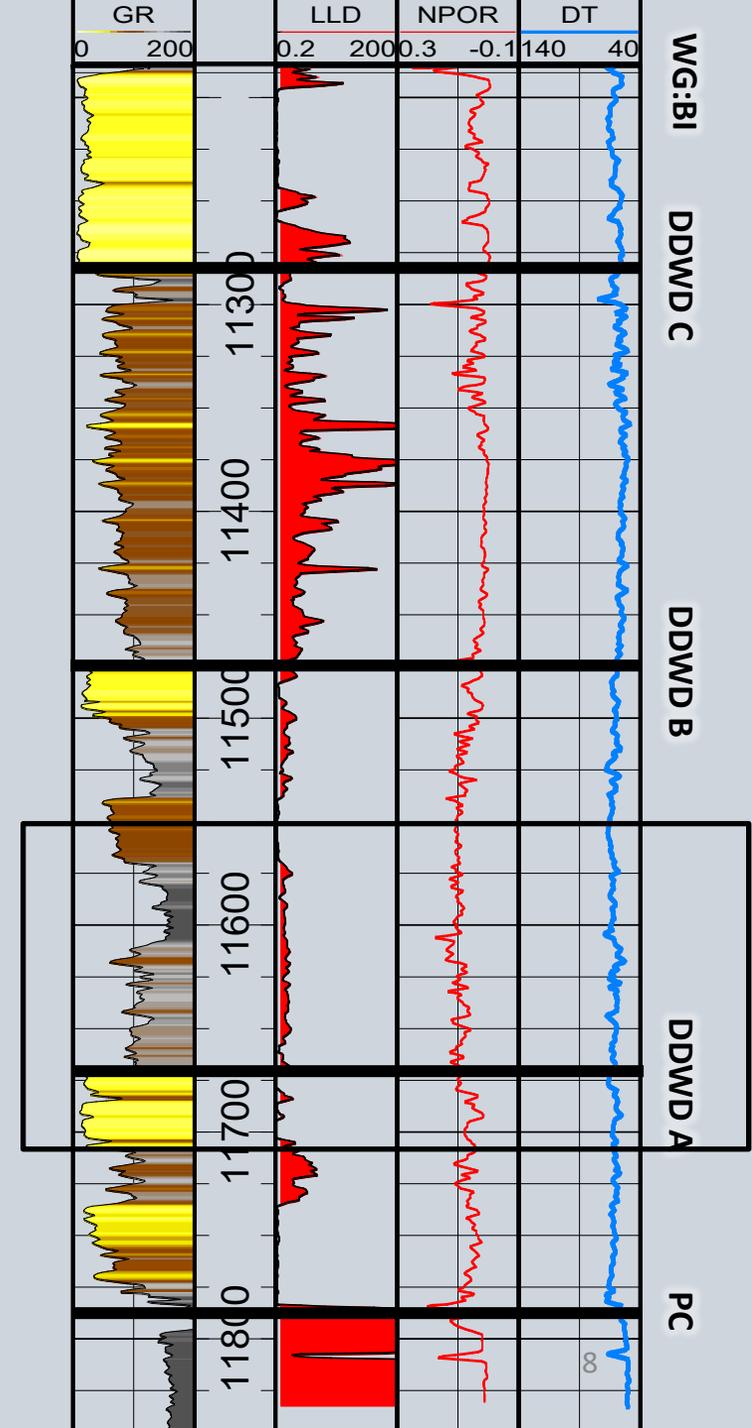
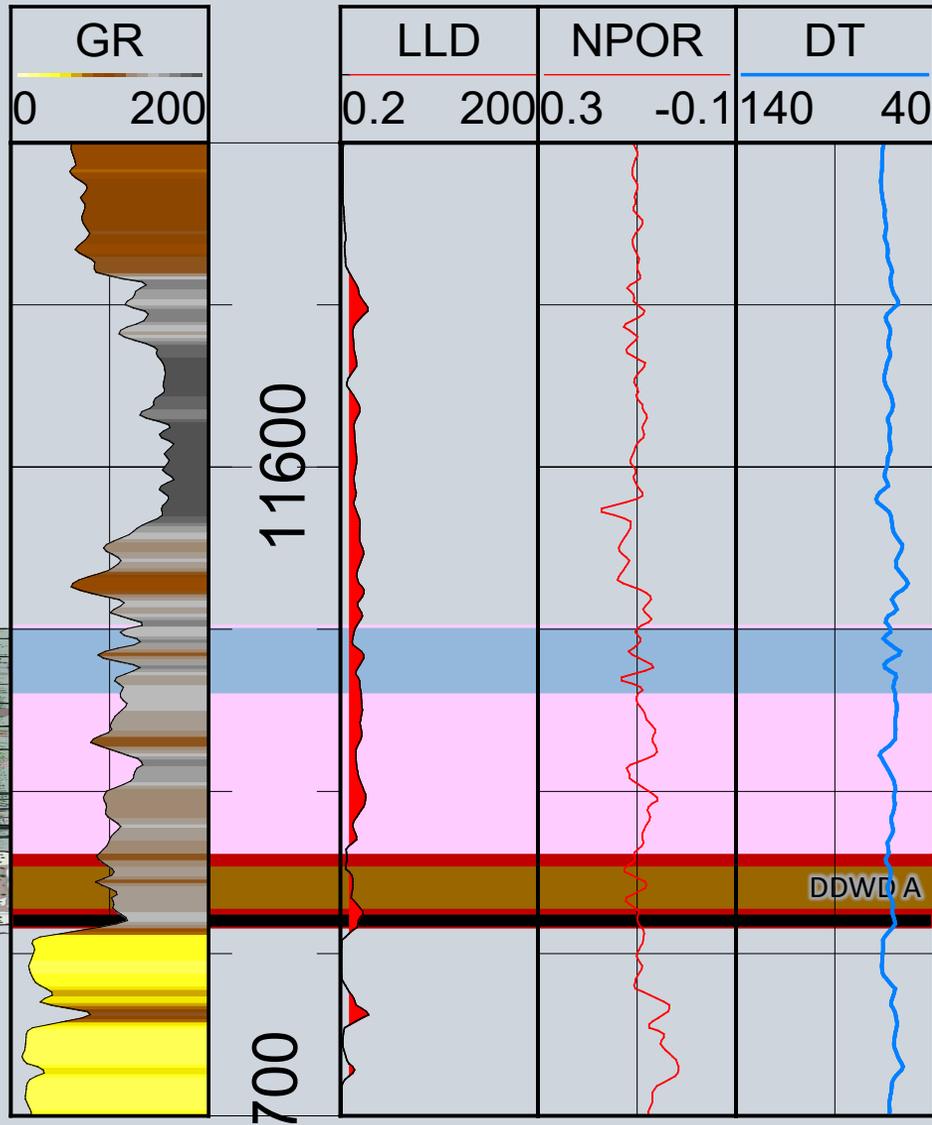
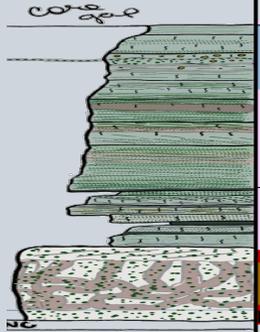
DDWDC

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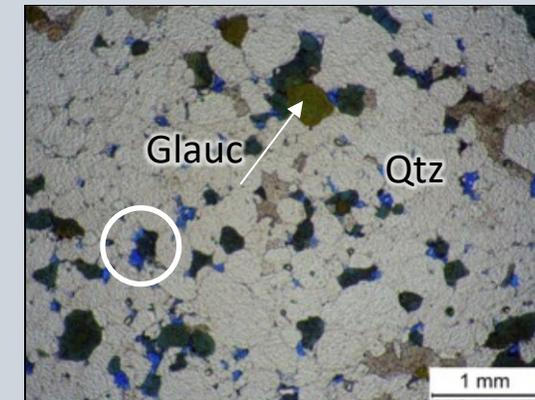
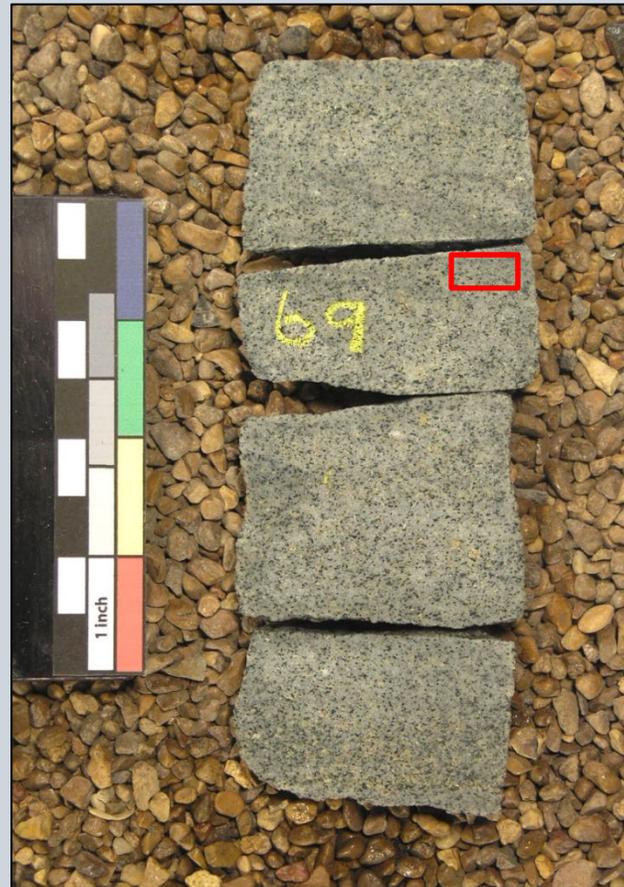
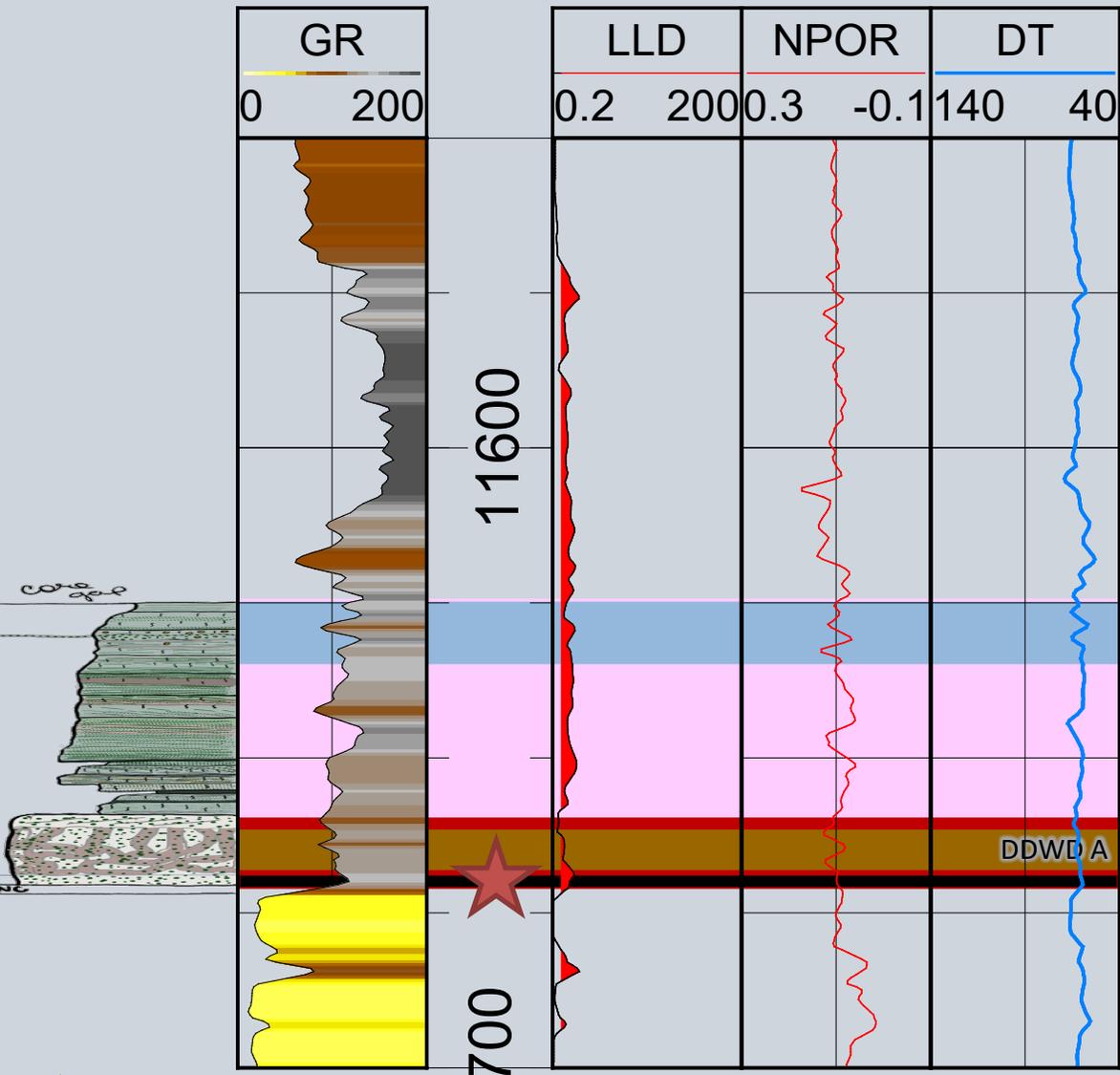
Svangstu 24-18

Divide, Co

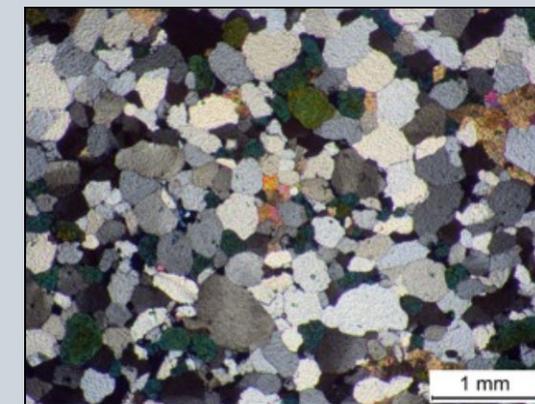
Lithofacies	
	Medium Grained Sandstone with Glauconite
	Brecciated coarse grained sandstone with hematite cement
	Structured Fine Sandstone with Glauconite and Hematite
	Glauconitic Siltstone



Medium Grained Sandstone with Glauconite



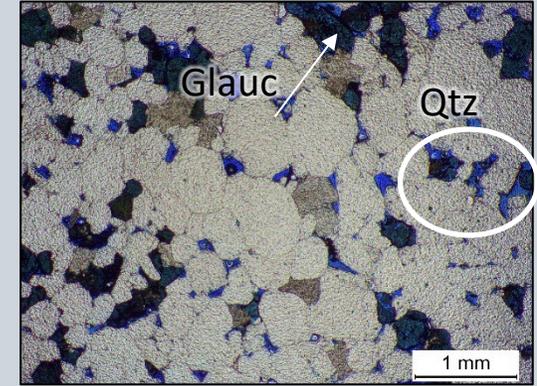
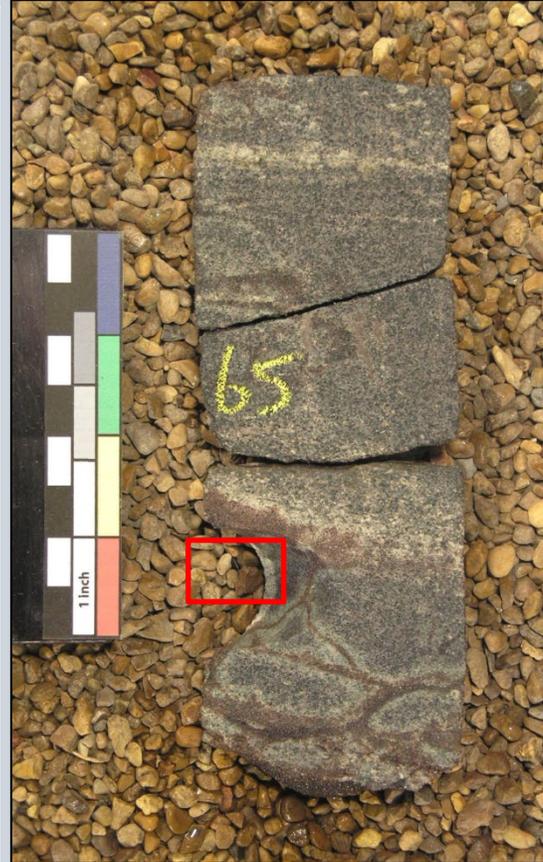
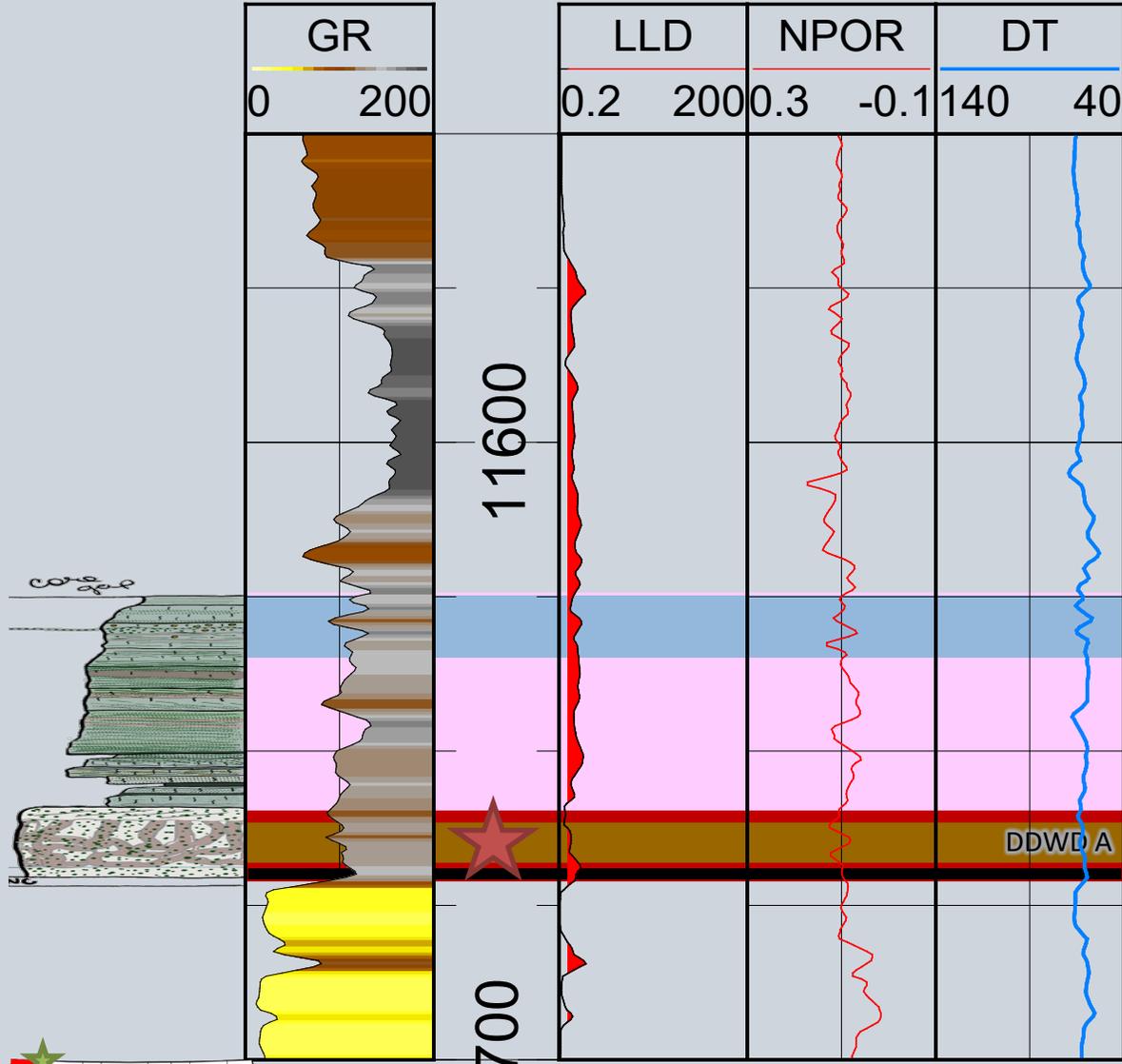
11669' PPL



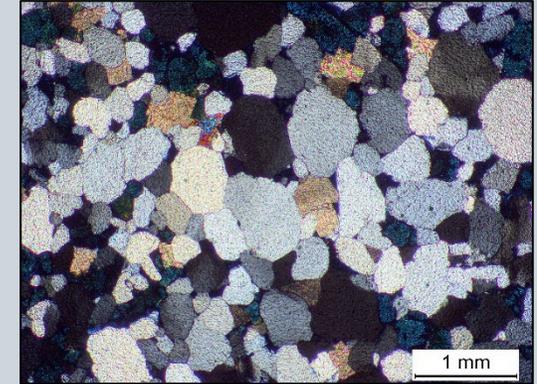
11669' XPL



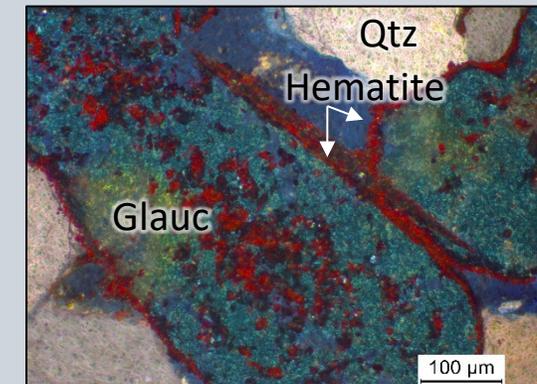
Brecciated coarse grained sandstone with Hematite Cement



11665' PPL

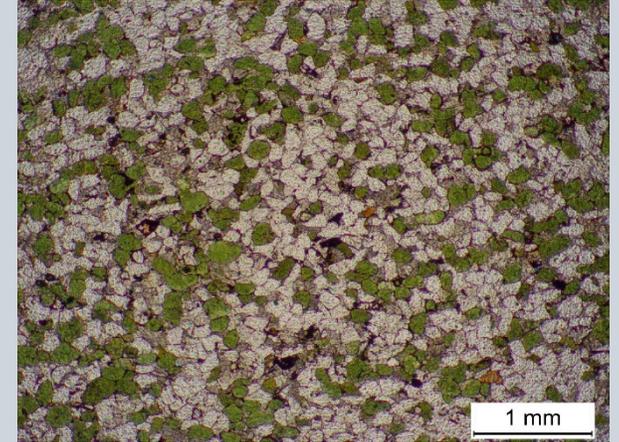
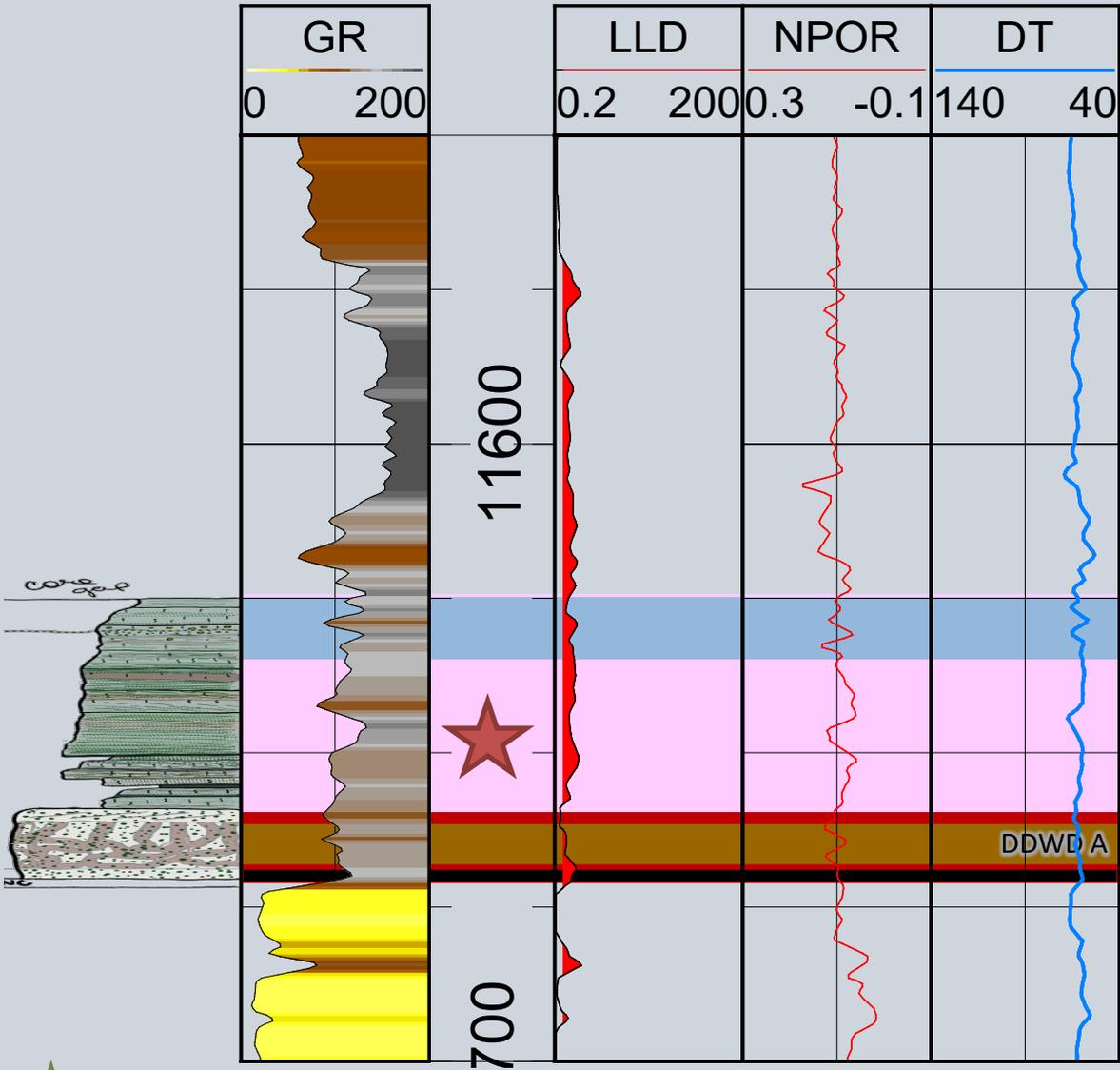


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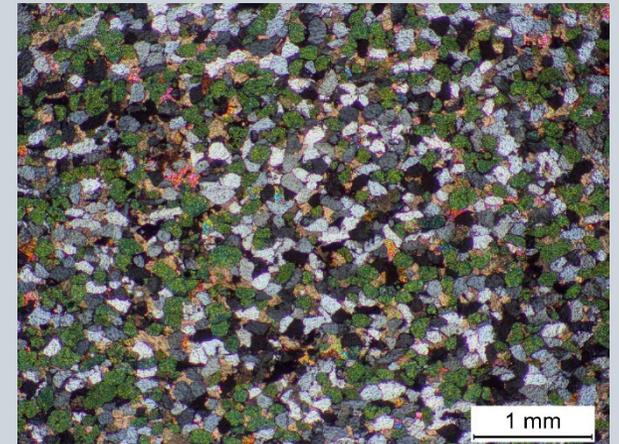


11665' XPL/RFL

Structured Fine Sandstone with Glauconite and Hematite

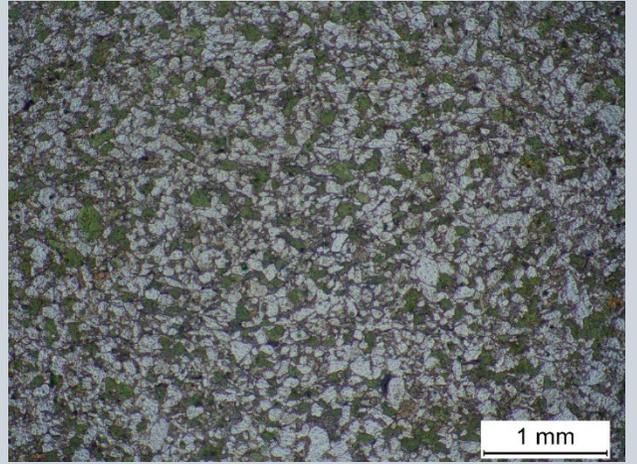
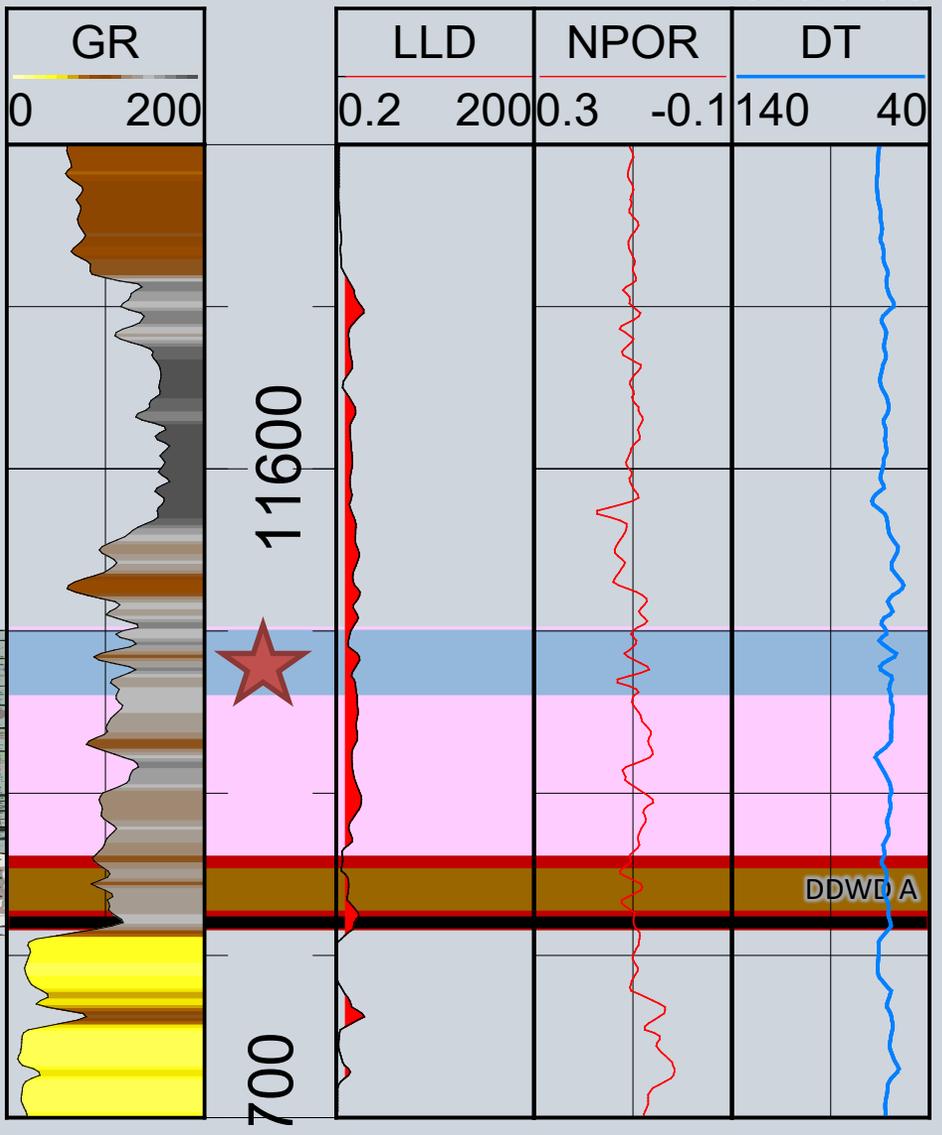


11652' PPL

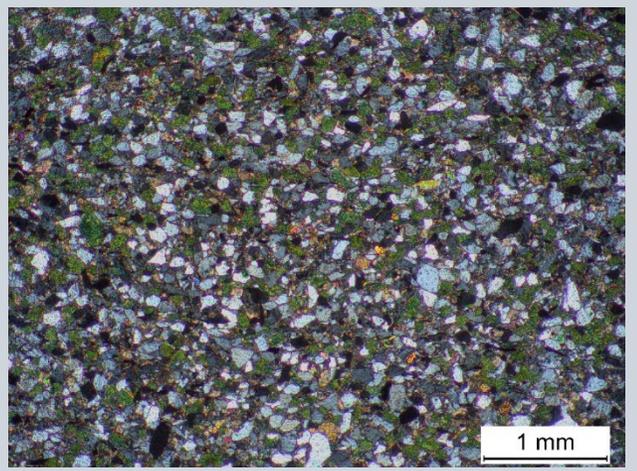


11652' XPL

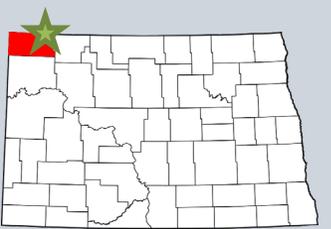
Glauconitic Siltstone



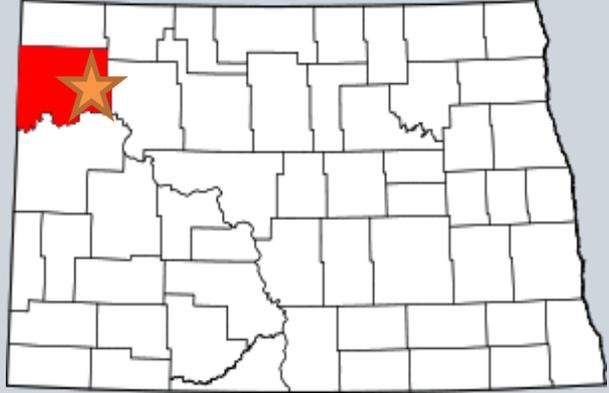
11637' PPL



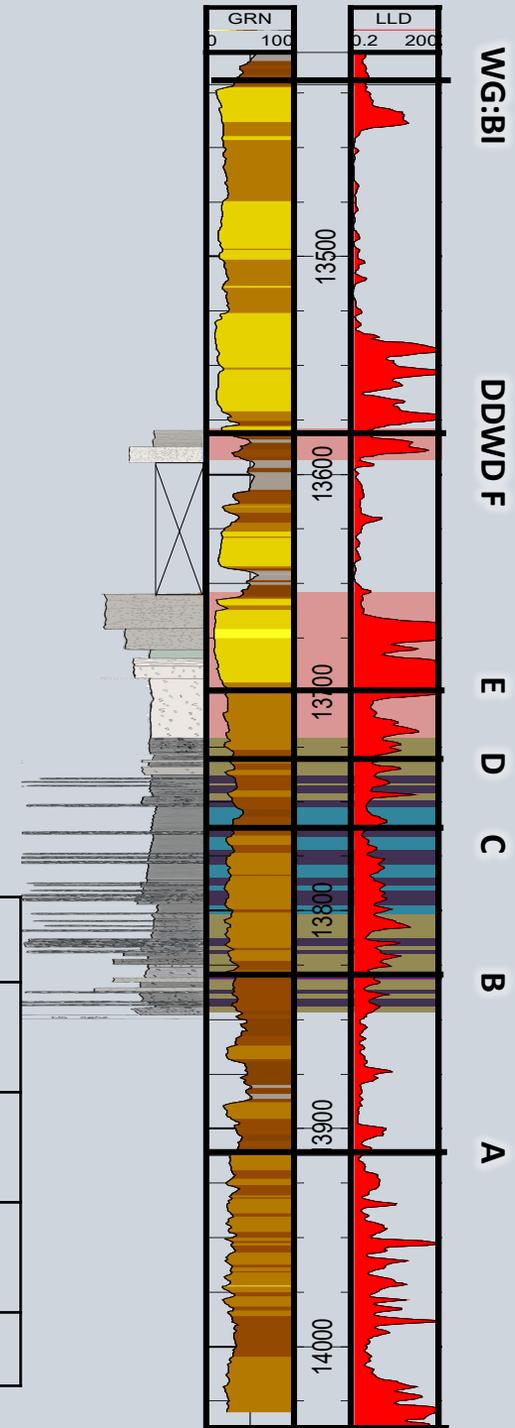
11637' XPL



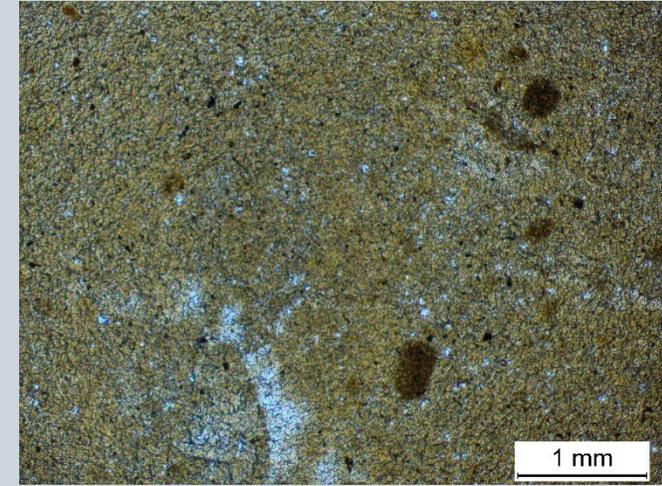
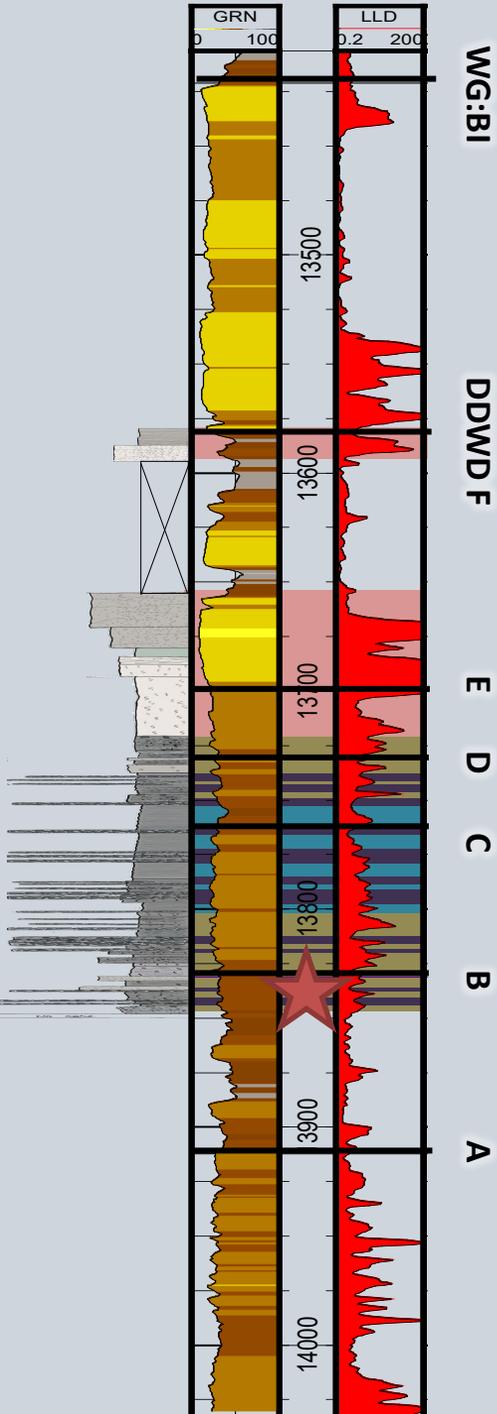
Boe Olson Unit 1 Williams, Co



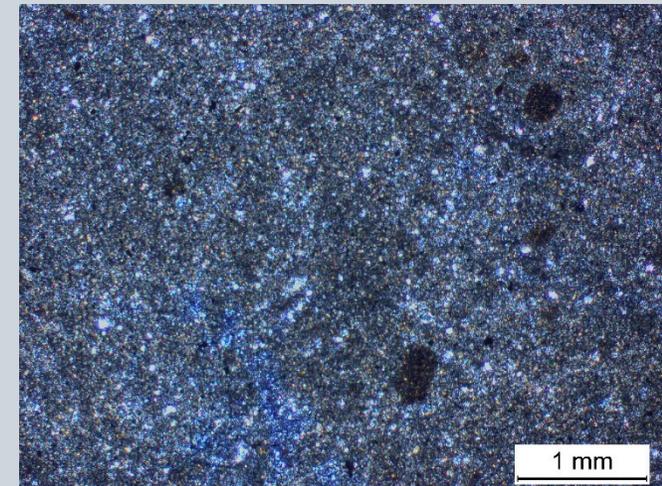
Lithofacies	
	Bioturbated Carbonate Mudstone
	Laminated Carbonate Mudstone
	Flat Pebble Conglomerate
	Fine Sandstone with Dolomite



Laminated Carbonate Mudstone

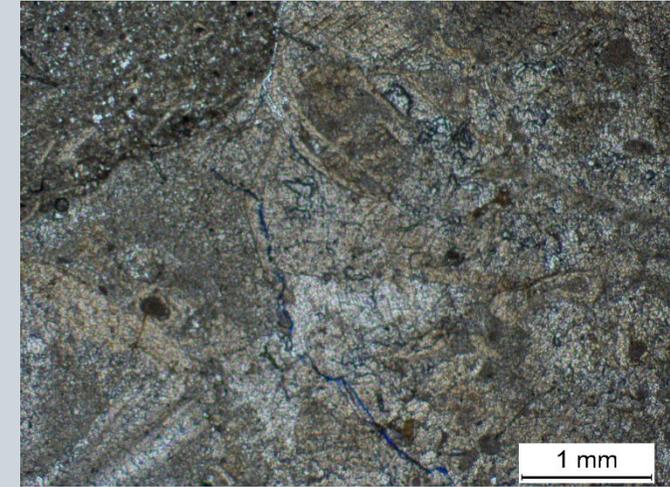
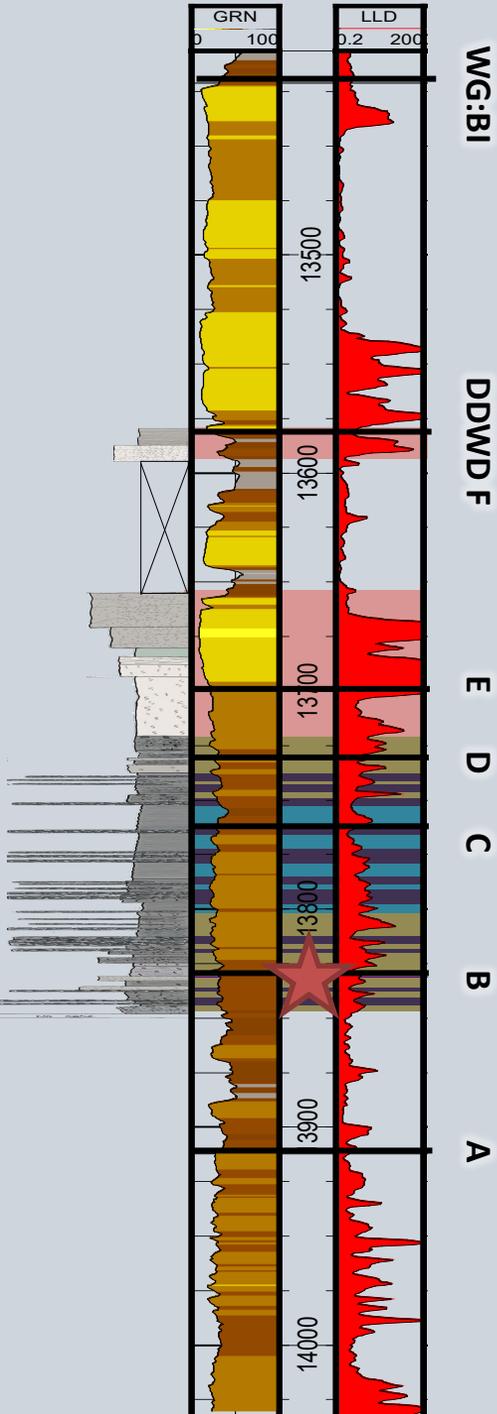


1403-13,842' PPL

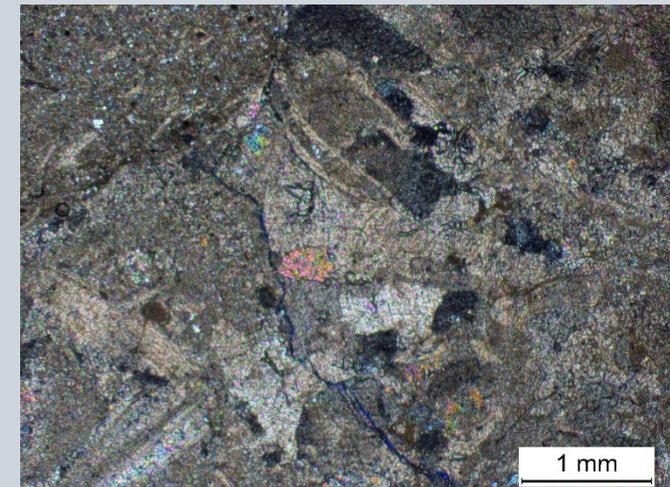


1403-13,842' XPL

Bioturbated Carbonate Mudstone

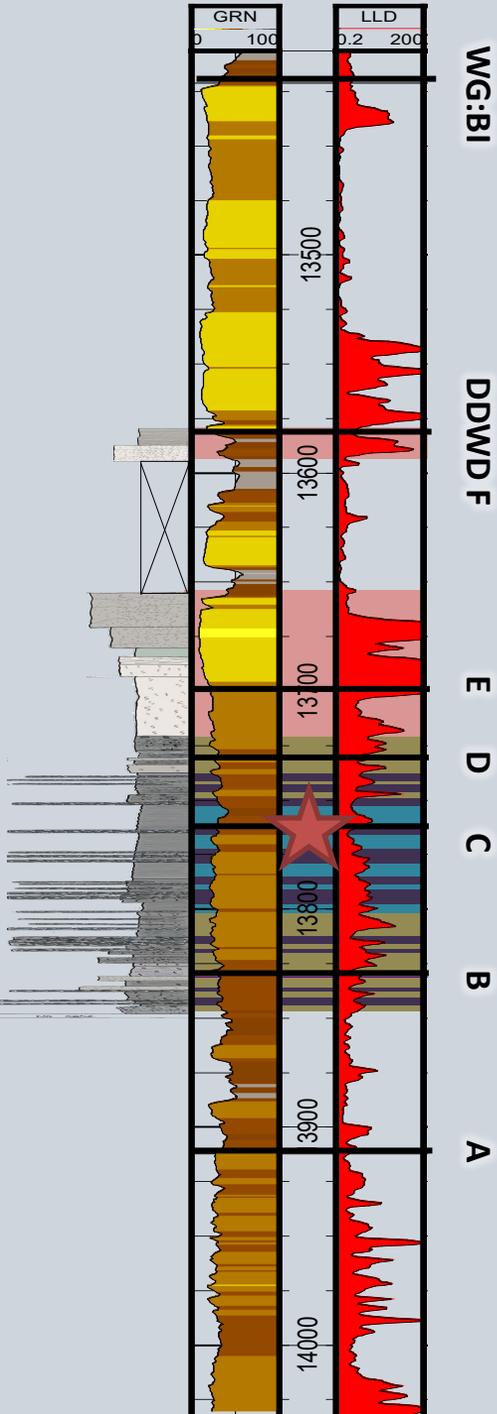


1403-13,836' PPL



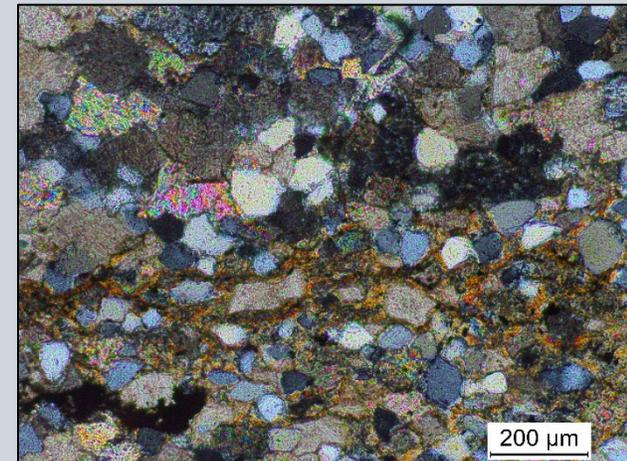
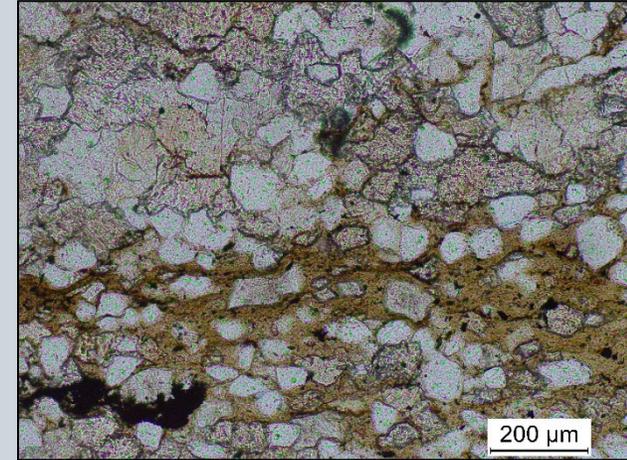
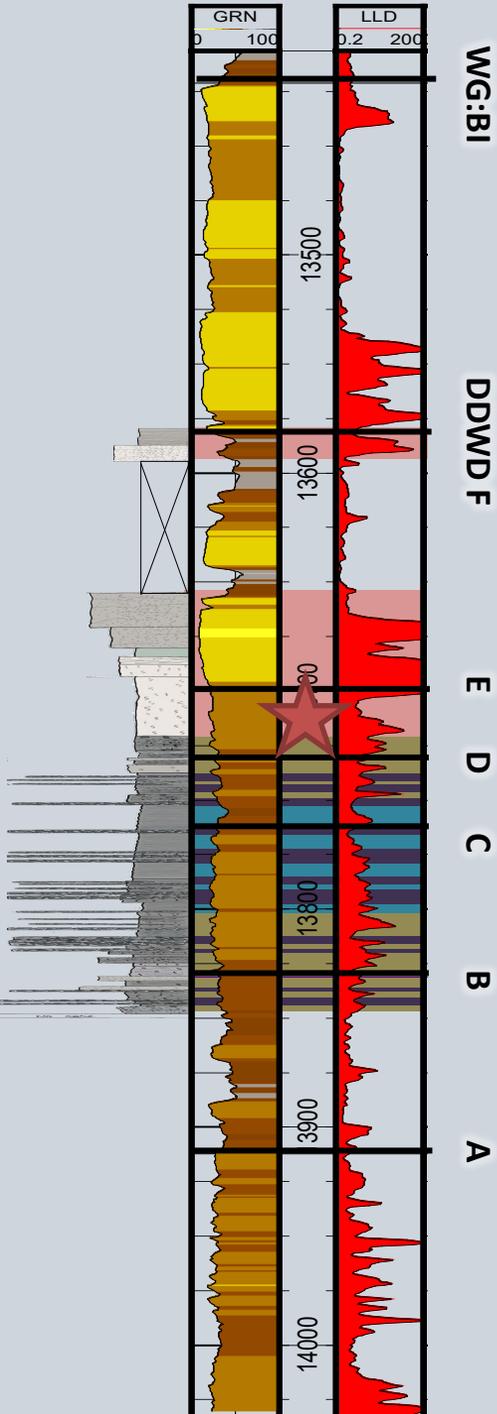
1403-13,836' XPL

Flat Pebble Conglomerate



1403-13,749':unpolished surface

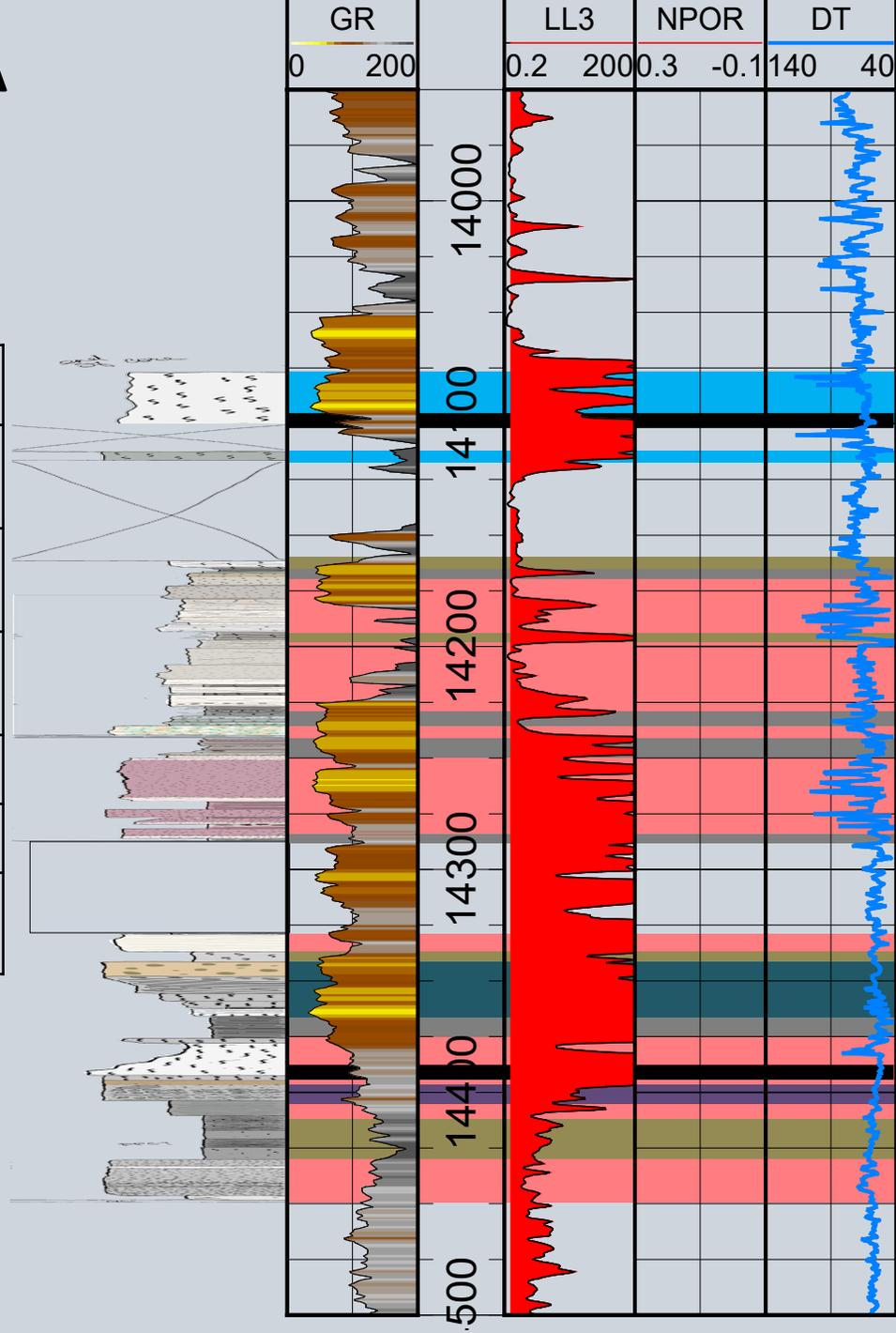
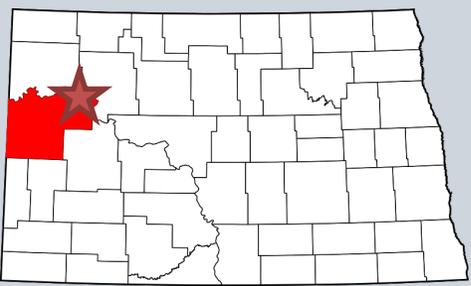
Very Fine Sandstone with Dolomite



Antelope Unit 1A

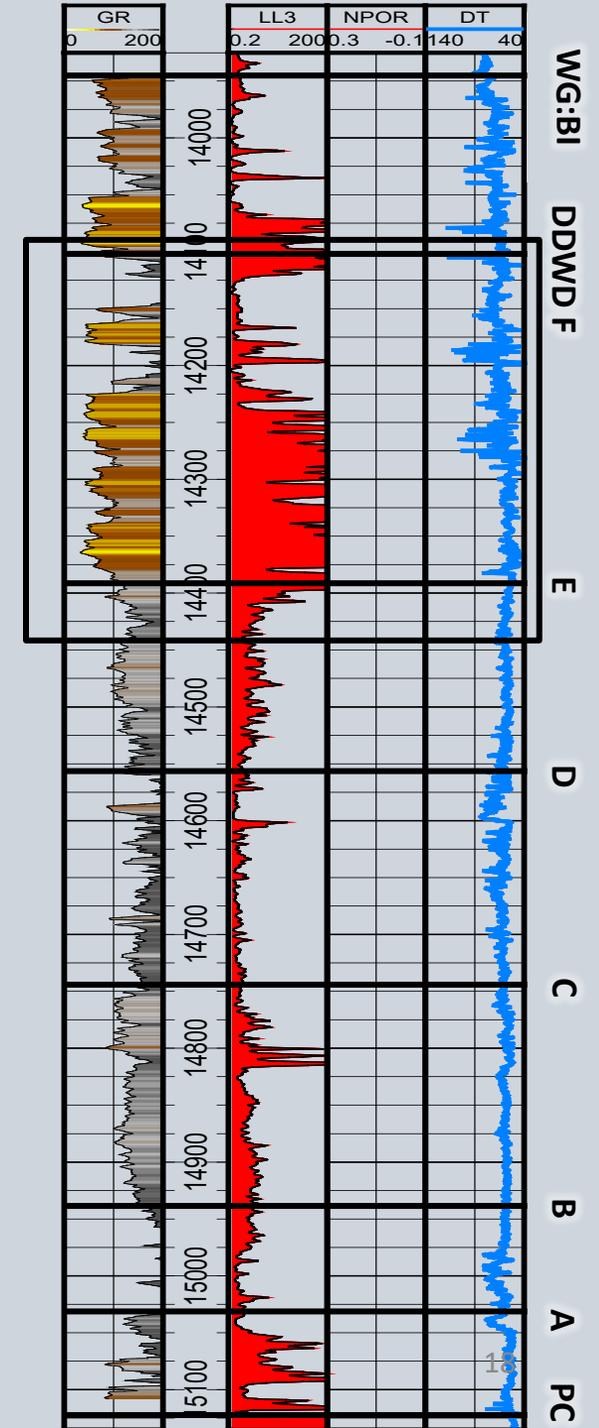
McKenzie, Co

Lithofacies	
	Heterolithic Sandstone
	Fine Heterolithic Sandstone with Calcite Cement
	Bioturbated Carbonate Mudstone
	Flat Pebble Conglomerate
	Laminated Shaley Mudstone
	Bioturbated Coarse-Grained Sandstone



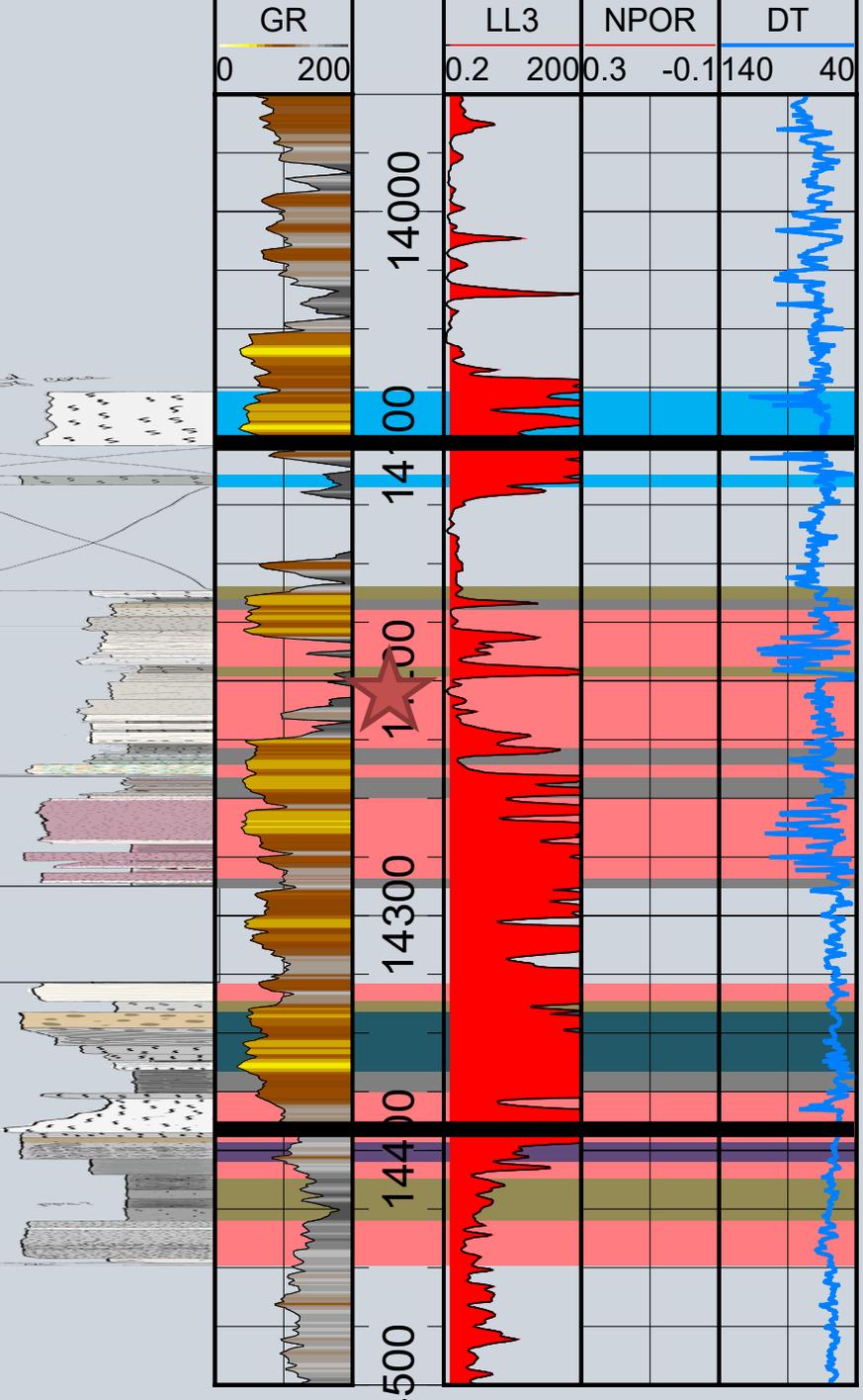
DDWD F

DDWD E



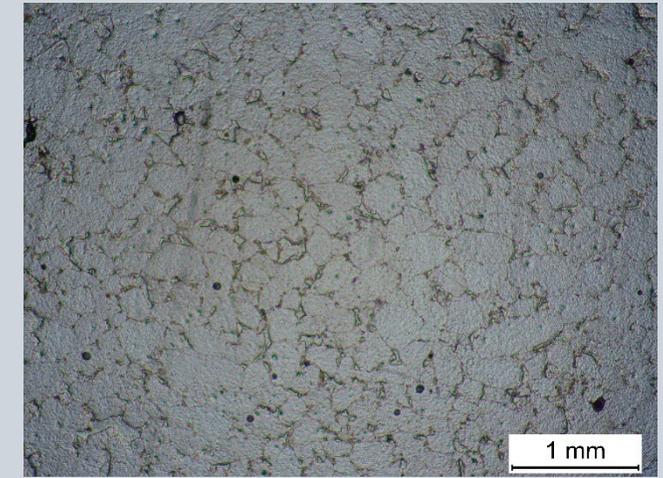
WG:BI
DDWD F
E
D
C
B
A
PC

Heterolithic Sandstone

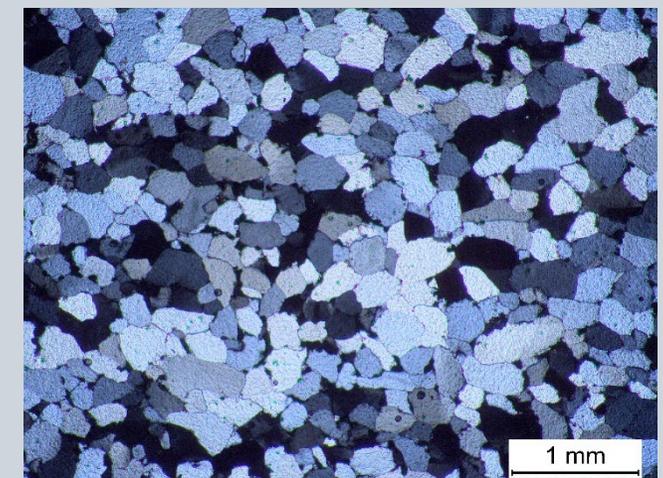


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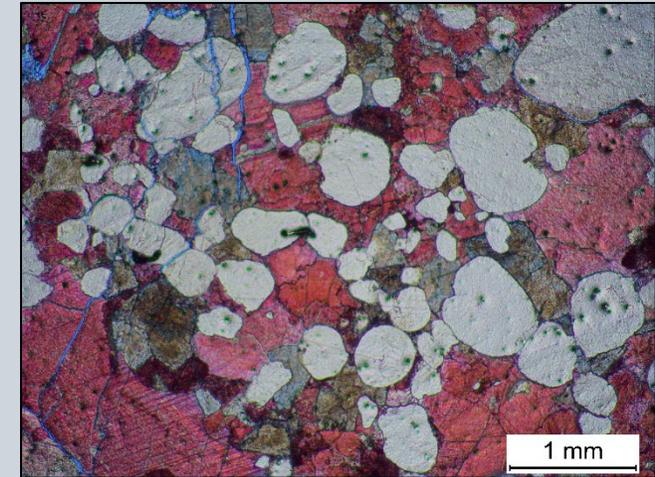
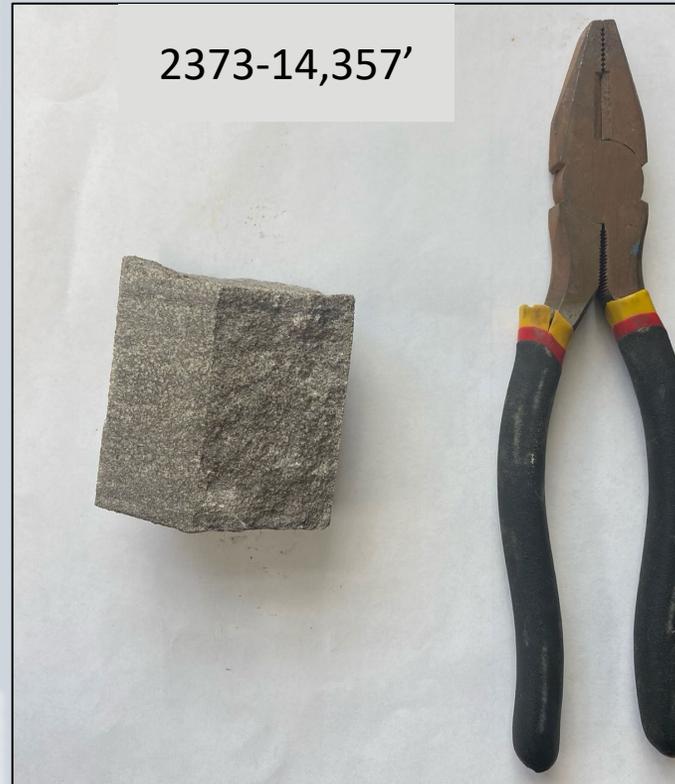
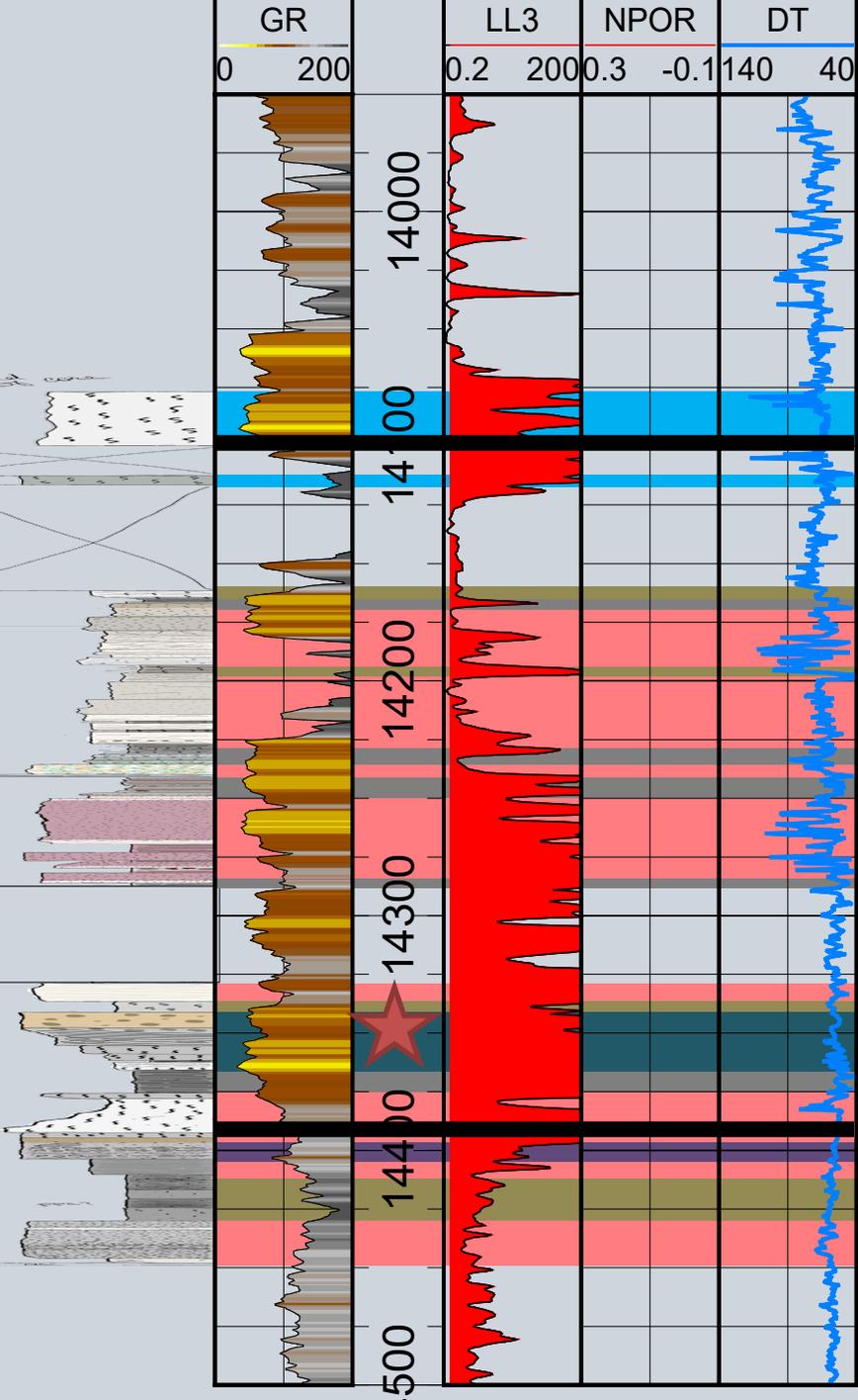


2373-14,203' PPL

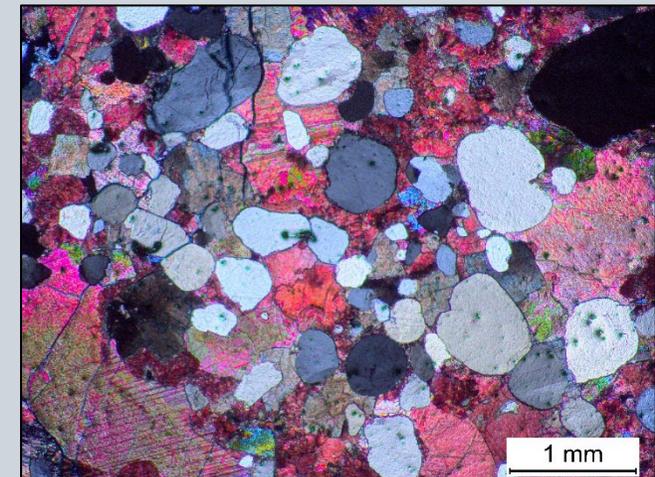


2373-14,203' XPL

Fine Sandstone with Calcite Cement

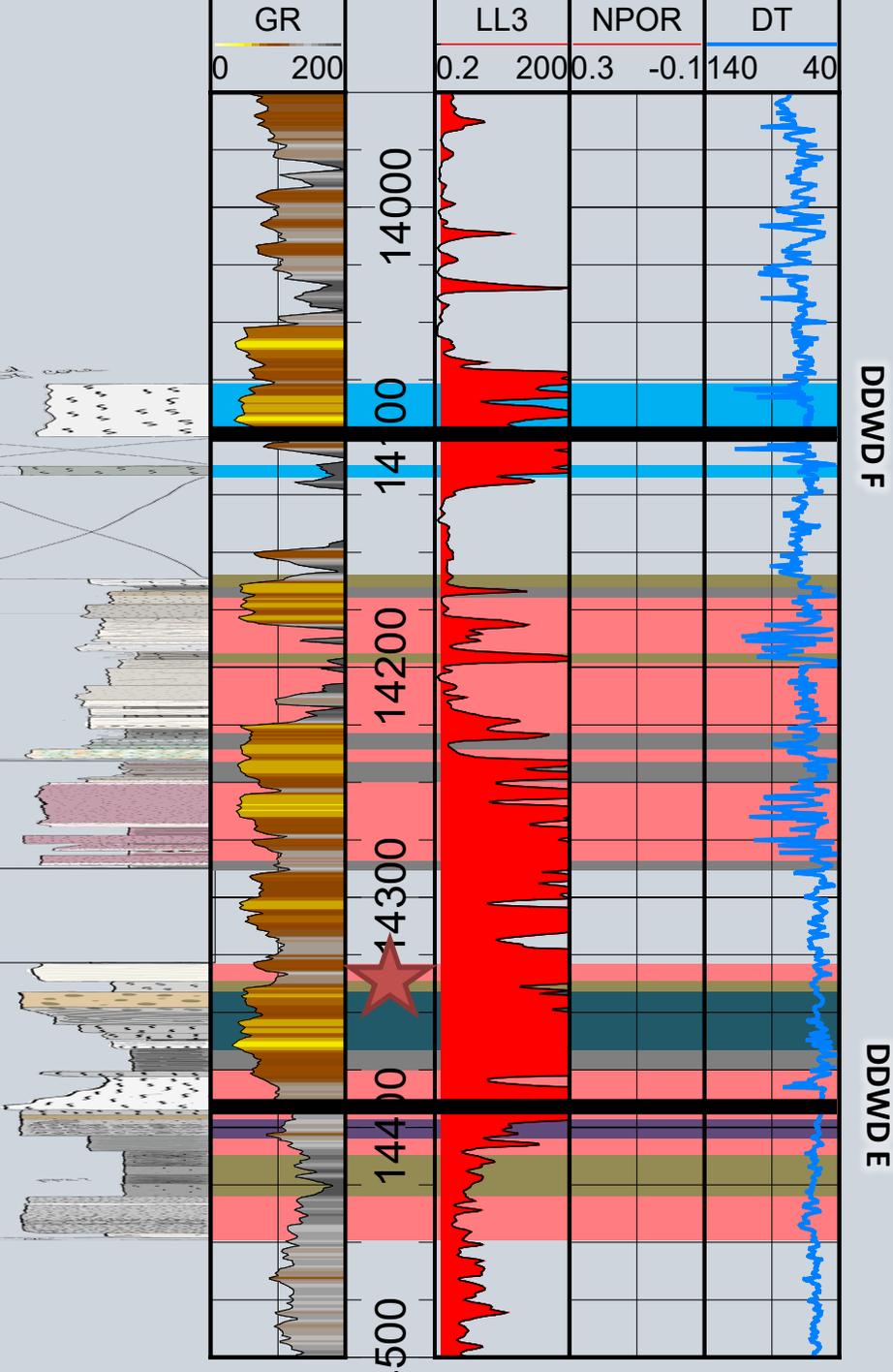


2373-14,537' PPL

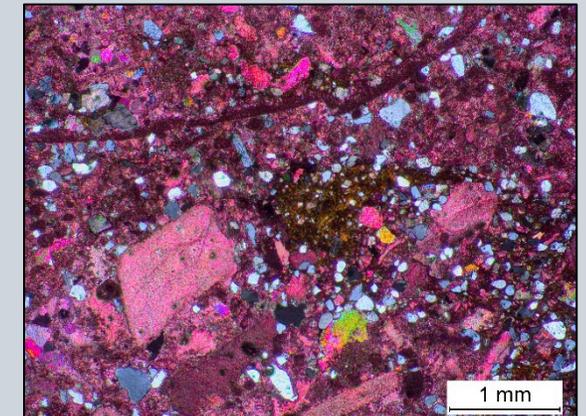


2373-14,537' XPL

Bioturbated Carbonate Mudstone

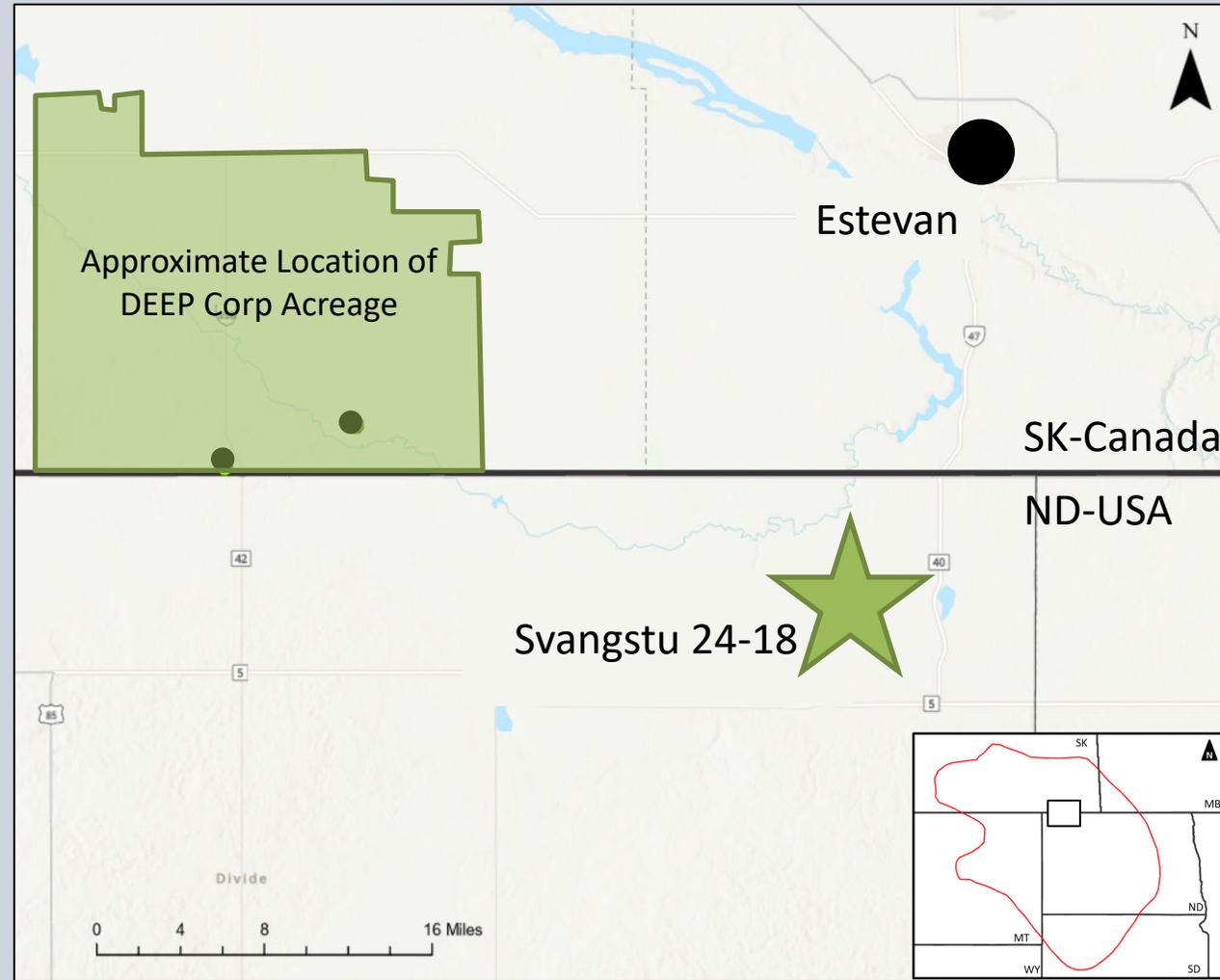


2373-14,349' PPL



2373-14,349' XPL

DEEP Corp to Svangstu 28-14



Project Progress

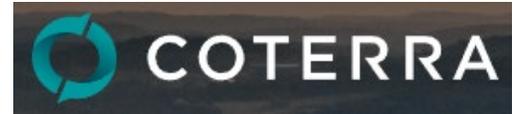
Fall 2022	<ul style="list-style-type: none"> ✓ Literature Review ✓ Compile Committee 	
Spring 2023	<ul style="list-style-type: none"> ✓ Literature Review ✓ Proposal Defense 	
Fall 2023	<ul style="list-style-type: none"> ✓ Literature Review ✓ Core Descriptions ✓ Mapping ✓ Finish Classes!!! 	
Spring 2024	<ul style="list-style-type: none"> ✓ Thin Section Analysis ✓ XRF Analysis on USGS Cores ✓ Core Descriptions Cont. ➤ Begin Writing 	
Fall 2024	<ul style="list-style-type: none"> ➤ FE-SEM ➤ Write ➤ Defend ➤ Graduate 	

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