

NORTH DAKOTA STRATIGRAPHIC COLUMN



INTERLAKE SUMMARY

DRILL STEM TESTS AND PRODUCTION MAPPING

Prepared by
Travis Stollendorf

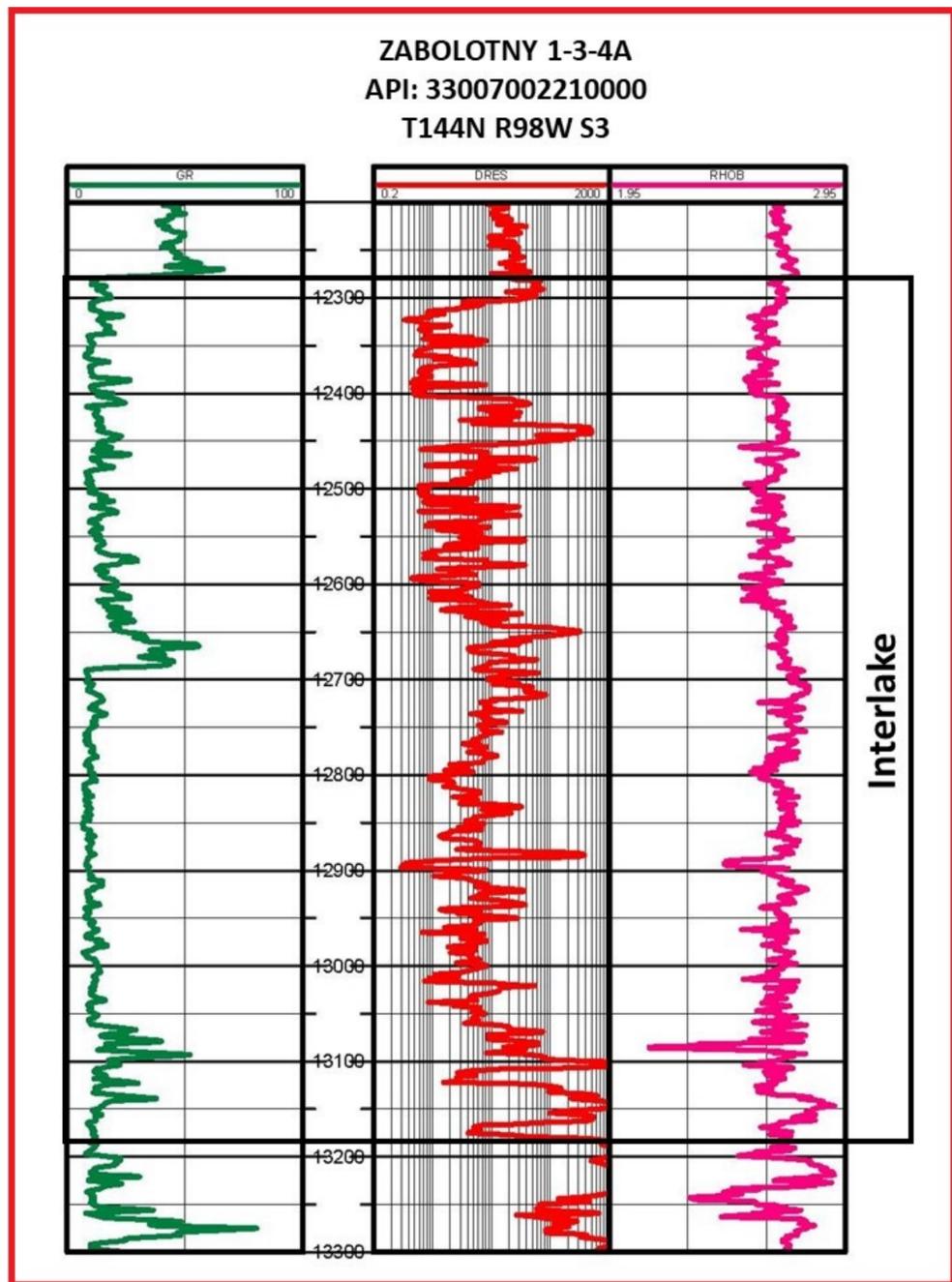
In order to better facilitate petroleum exploration and development in the Williston Basin, the North Dakota Geological Survey (NDGS) has published a series of production-related maps and corresponding data sets. These maps sets include production and drill stem test (DST) results with an accompanying spreadsheet for easy data extraction. The primary goal of this project is to create a database showing the distribution of hydrocarbons within each productive unit.

Prior to this project, over 55% of the DST results in the state did not have an associated geologic interval. The NDGS utilized a series of filters in Petra and Excel to unite formation tops with DST results. Now over 95% of DST results are associated with a geologic interval. After removing failed (misrun) DSTs, the remaining DST results were then separated into three groups. The first group (Positive DSTa) contains wells that have recovered oil or gas (in either the drill pipe or the sampler), or those that list oil or gas as the primary component of the fluid/gas mixture (e.g. 10' mud cut oil) in the description. Secondly, Positive DSTb wells display results for oil or gas as the secondary component of the fluid/gas mixture (e.g. 50' gas cut mud). Although Positive DSTb wells do show signs of hydrocarbons, the hydrocarbon signal is considered weaker than those in the Positive DSTa group. Lastly, the Negative DST results have no indication of hydrocarbons. Detailed information for each DST (time-pressure data, interval depths, fluid and gas recovery information) can be accessed through the well file database maintained by the North Dakota Industrial Commission (NDIC) Oil and Gas Division.

Production for each well was determined using the NDIC's Production Pools and associated monthly production totals. The production pools utilized are shown on the Production Map for each interval. Cumulative production for each well was calculated through September 2019.

This project is a summary of the Interlake Formation's production and drill stem test results. Map sets include a production map, cumulative production map and DST results in North Dakota's portion of the Williston Basin. The Interlake Formation is highlighted by the red box on the North Dakota Stratigraphic Column on the left. A representative log of the Interlake Formation is shown below along with a map showing the well's approximate location.

AGE MILLIONS OF YEARS BEFORE PRESENT	ERA/THEM	SYSTEM	SEQUENCE	ROCK UNIT					
				GROUP	FORMATION	MEMBER			
							SERIES		
0-0.01	CENOZOIC	Quaternary	TELLAS	Oahe	Riverdale	Riverdale			
Pleistocene					West Central	Poplar River	Poplar River		
		Pliocene		(Unnamed Unit)	Golden Valley	Golden Valley	Golden Valley		
Miocene					Arikaree	White River	White River	White River	
		Oligocene		White River		Chadron	Chadron	Chadron	
Eocene					White River	Golden Valley	Golden Valley	Golden Valley	
		MESOZOIC		Cretaceous		ZUNI	Fort Union	Sentinel Butte	Sentinel Butte
Bullion Creek					Bullion Creek			Bullion Creek	
Slope					Slope			Slope	
Cannonball					Cannonball			Cannonball	
Ludlow	Ludlow		Ludlow						
Upper	Hell Creek		Hell Creek		Hell Creek			Hell Creek	Hell Creek
					Fox Hills			Fox Hills	Fox Hills
					Montana			Montana	Montana
					Pierre			Pierre	Pierre
					Dakota			Dakota	Dakota
Lower	Dakota	Dakota	Swift	Swift	Swift				
			Rierdon	Rierdon	Rierdon				
			Piper	Piper	Piper				
			Spearfish	Spearfish	Spearfish				
			Minnekahta	Minnekahta	Minnekahta				
PALEOZOIC	Carboniferous	ARAPAHO	Minnelusa	Broom Creek	Broom Creek	Broom Creek			
				Big Snowy	Big Snowy	Big Snowy			
				Mississippian	Madison	Charles	Charles	Charles	
						Mission Canyon	Mission Canyon	Mission Canyon	
				DEVONIAN	KANSASIA	Jefferson	Lodgepole	Lodgepole	Lodgepole
							Bakken	Bakken	Bakken
							Three Forks	Three Forks	Three Forks
							Birdbear	Birdbear	Birdbear
							Duperow	Duperow	Duperow
							Manitoba	Manitoba	Souris River
Dawson Bay	Dawson Bay	Dawson Bay							
Elk Point	Elk Point	Prairie	Prairie				Prairie		
		Winnipegosis	Winnipegosis				Winnipegosis		
		Ashern	Ashern				Ashern		
SILURIAN	TIPPECANOE	Big Horn	Interlake	Interlake	Interlake				
			Stonewall	Stonewall	Stonewall				
			Stony Mountain	Stony Mountain	Stony Mountain				
			Red River	Red River	Red River				
			Roughlock	Roughlock	Roughlock				
ORDOVICIAN	SNAK	Winnipeg	Icebox	Icebox	Icebox				
			Black Island	Black Island	Black Island				
			Deadwood	Deadwood	Deadwood				
CAMBRIAN	SAUK	Winnipeg	Black Island	Black Island	Black Island				
			Deadwood	Deadwood	Deadwood				
PRECAMBRIAN	WYOMING PROVINCE	SUPERIOR PROVINCE	Winnipeg	Winnipeg	Winnipeg				
			Black Island	Black Island	Black Island				



References

Murphy, E.C., Nordeng, S.H., Juenker, B.J., and Hoganson, J.W., 2009, North Dakota Stratigraphic Column, North Dakota Geological Survey, MS-91, 1p.

North Dakota Industrial Commission, Department of Mineral Resources, Oil and Gas Statistics, retrieved October 2019, <https://www.dmr.nd.gov/oilgas/>

NORTH DAKOTA LOCATION MAP

