Correlating Core and Geophysical Logs to Redefine the Trenton-Black River Stratigraphic Interval in the Appalachian Basin

TASK 2- STRATIGRAPHY START UP WORK

- Performed literature search on Trenton-Black River interval.
- Collected stratigraphic columns from all states and created a generalized correlation chart.
- Compiled all Ohio seismic data relevant to project.
- Created preliminary database for all Ohio wells that TD in Utica or deeper.
- Generated map showing this data.

TASK 2 – STRATIGRAPHY CORE TASKS COMPLETED

- Collected core databases from all Consortium states and Ontario and created database for all Trenton-Black River cores.
- Constructed a basinwide Trenton-Black River core map.
- Created database for all Ohio Trenton-Black River thin sections-conveyed to PA.
- Compiled and examined all existing Ohio Trenton-Black River core descriptions and records.
- Examined 12 cores, photographed and correlated to geophysical logs.
- Assisted in selecting sample intervals in cores for Task 3 (petrography) and Task 4 (C 13 isotope work).

TASK 2 - STRATIGRAPHY CROSS SECTION TASKS COMPLETED

- Compiled database of all Precambrian wells for use in regional cross sections.
- Scanned significant Ohio geophysical logs (including those of significant cores) into tiff files and collected scanned logs from other states and Ontario for use in preliminary cross sections.
- Laid out 16 regional cross section lines across the basin using Precambrian wells and cores.
- Completed 8 stratigraphic cross sections illustrating the stratigraphy for the Ordovician interval.



MAPPABLE UNITS

- Onondaga Ls*
- Ordovician *
- Kope Fm
- Point Pleasant
- Trenton Ls*
- Black River Ls
- Wells Creek Fm
- Knox Dol*
- Rose Run Ss*
- Copper Ridge Dol
- Conasauga Fm*
- Rome Fm*
- Basal Cambrian ss
- Precambrian*
- * Denotes a mappable seismic reflection unit.



Carbonate ramp:	"Have gentle slopes (generally,< 1 ⁰) on which shallow wave-agitated facies of the nearshore zone pass downslope (without marked break in slope) into deeper water, low-energy deposits" (Ahr, 1973; Wilson, 1975; Read, 1985). "Homoclinal ramps have relatively uniform, gentle slopes (1m/km) or a fraction of a degree) into the basin" (Read, 1985).
Carbonate platform:	"Carbonate bodies with a more or less horizontal top and abrupt shelf margins where high energy sediments occur. The normal process of sedimentation effectively turn ramps into platforms and create narrow, steep shelf margin ridges. Slopes on some ramps may be so gentle as to make them commonly indistinguishable from platforms. Thus, these terms are often used interchangeably. Rare platform have gently sloping margins (ramp-like profiles) (Read, 1985).
Low-relief platform:	NW Ohio. Carbonate body with overall ramp- like slope but with an abrupt change in slope from approximately 1m/km to 12 m/km on the platform margin and then back to 1 m/km.



Isopach map of the Trenton Ls (Wickstrom and others, 1992)

FIGURE 10.—Isopach map of the Trenton Limestone. Contour interval 20 feet.



Facies distribution in the Trenton Limestone of NW Ohio and schematic diagram illustrating relationships between facies and formations (Wickstrom and others, 1992).

Reconstruction of depositional and tectonic elements during Point Pleasant/Trenton time (Wickstrom and others, 1992)

6



Trenton-Black River producing fields, major structural features, and depositional elements.





CORE 3372, CHEVRON, 1A PRUDENTIAL, MARION CO., OH, CURDSVILLE CONTACT AT 1480'



CORE 3372, MARION CO., CHEVRON, 1A PRUDENTIAL, MILLBRIG BENTONITE, DEPTH 1548



CORE 3372, CHEVRON, 1A PRUDENTIAL, MARION CO., OH TYPICAL BLACK RIVER, 1622'-1631'



CORE 3372, CHEVRON, 1A PRUDENTIAL, MARION CO., OH BKRV HYDROTHERMAL DOLOMITIZED ZONE, DEPTH 1840-1849'



CORE 3372, CHEVRON, 1A PRUDENTIAL, MARION CO., OH BKRV LS, SECONDARY CALCITE MINERALIZATION, DEPTH 1892-1904'



CORE 3372, CHEVRON, 1A PRUDENTIAL, MARION CO., OH LIMESTONE, FRACTURED RUBBLE ZONE, DEPTH 1914-1924'



CORE 3372, CHEVRON, 1A PRUDENTIAL, MARION CO., OH BLACK RIVER LIMESTONE, DEPTH 1924-1933'



CORE 3372, CHEVRON, 1A PRUDENTIAL, MARION CO., OH KNOX UNCONCORMITY CONTACT AT 2027.8'



SENECA CO., OH CORE 2580 ODGS M&B ASPHALT PERMNO 60840



SENECA CO., OH, CORE 2580, ODGS, M&B ASPHALT PNPL/TRNN CONTACT AT 1450'



SENECA CO., OH, CORE 2580, ODGS, M&B ASPHALT GRADATIONAL TRNN/BKRV CONTACT, DEPTH 1607'



SENECA CO., OH, CORE 2580, ODGS, M&B ASPHALT TRNN BENTONITE AT 1474'



SENECA CO., OH, CORE 2580, ODGS, M&B ASPHALT BKRV LS, DEPTH 1800-1810'



SENECA CO., OH, CORE 2580, ODGS, M&B ASPHALT KNOX UNCONFORMITY AT 2143.5





















D4







S1



Possible platform margin play



Reconstruction of depositional and tectonic elements during Late Trenton/Point Pleasant time (Wickstrom and others, 1992).