PIERRE GAS FIELD REVISITED

By
Fred V. Steece
And
Mack McGillivray

DIVISIONS

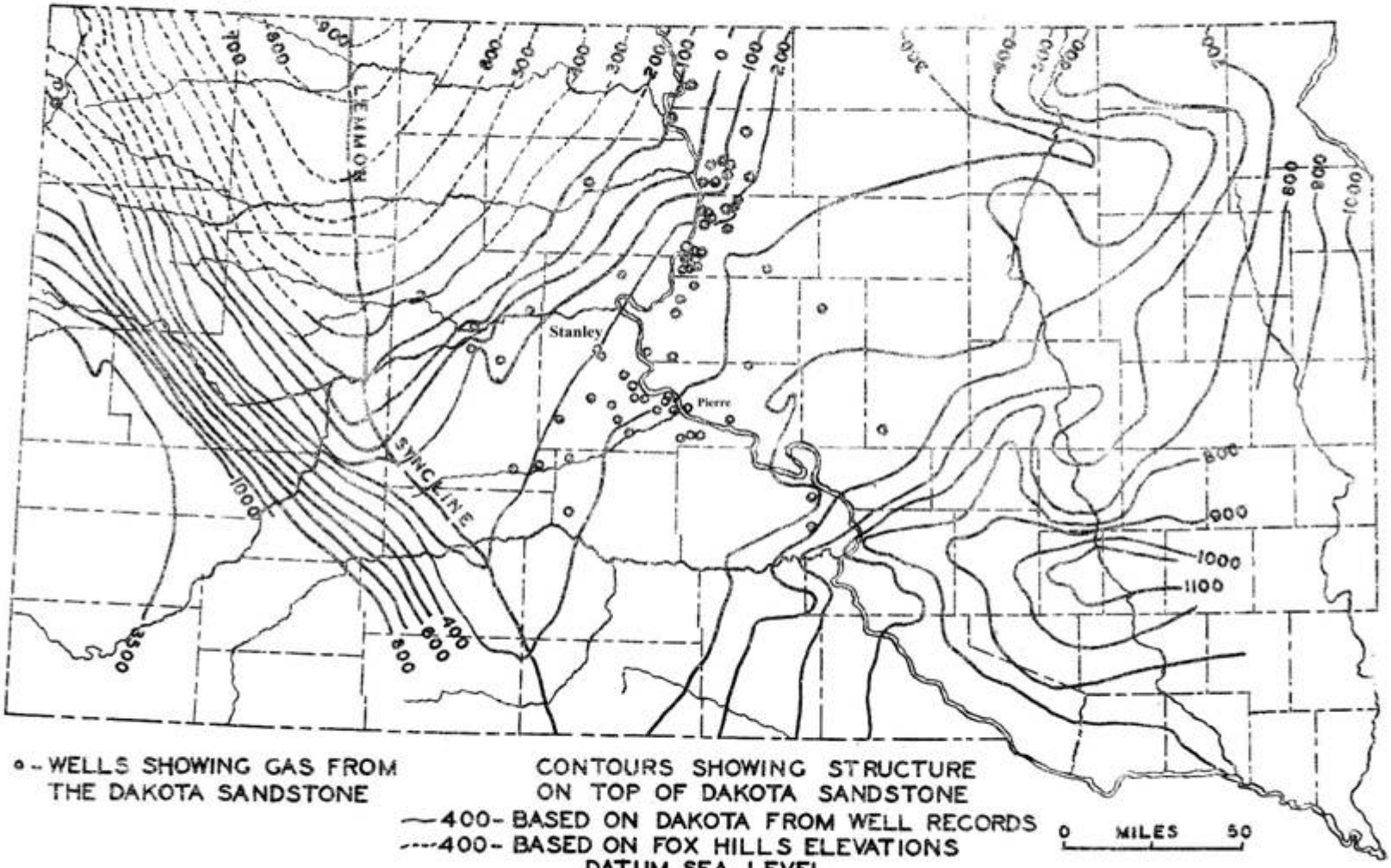
1. HISTORY
2. STRATIGRAPHY/STRUCTURE
3. CONCLUSIONS

HISTORY

- 1889 Pierre Gas Plant installed
- 1892 Gas from Indian School water well *flared* until 1939
- 1894
  - Locke Hotel; cook, heat, lights
  - City Gas Plant; “(every) home…”
  - City Streets; all lit with gas

PLATE IV

GAS AND STRUCTURE MAP
OF SOUTH DAKOTA



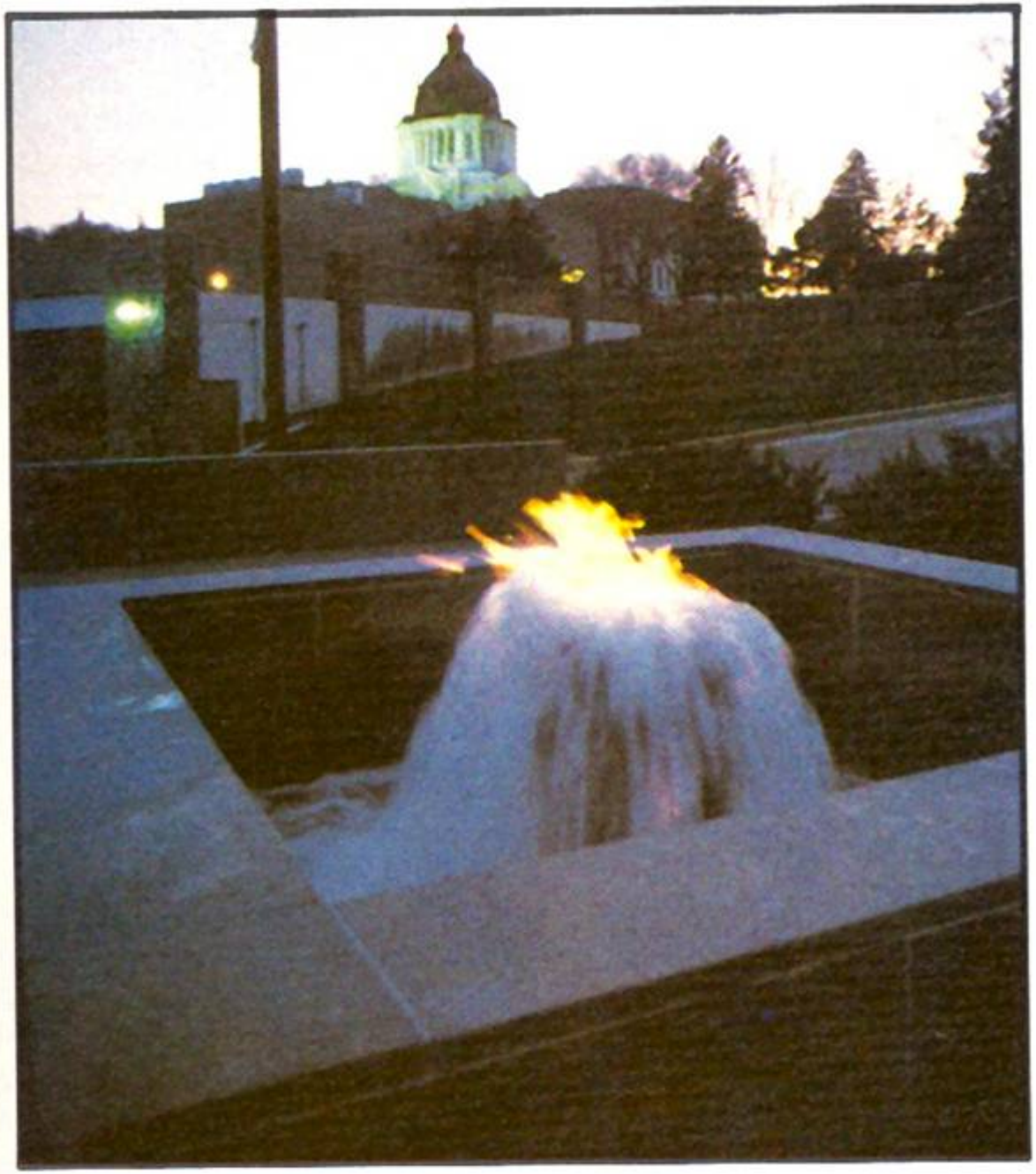
o - WELLS SHOWING GAS FROM THE DAKOTA SANDSTONE

CONTOURS SHOWING STRUCTURE ON TOP OF DAKOTA SANDSTONE

—400- BASED ON DAKOTA FROM WELL RECORDS

----400- BASED ON FOX HILLS ELEVATIONS

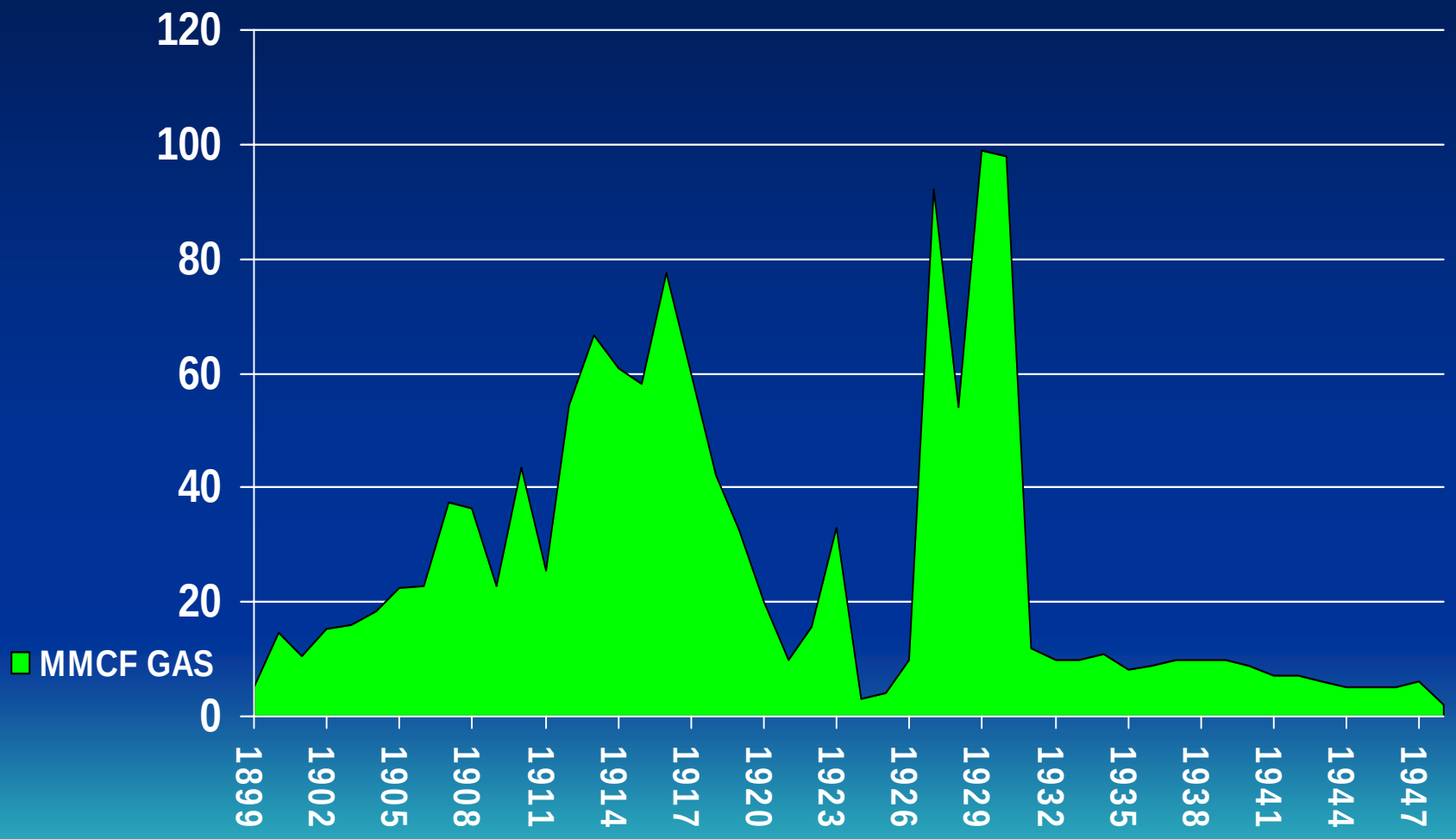
DATUM SEA LEVEL

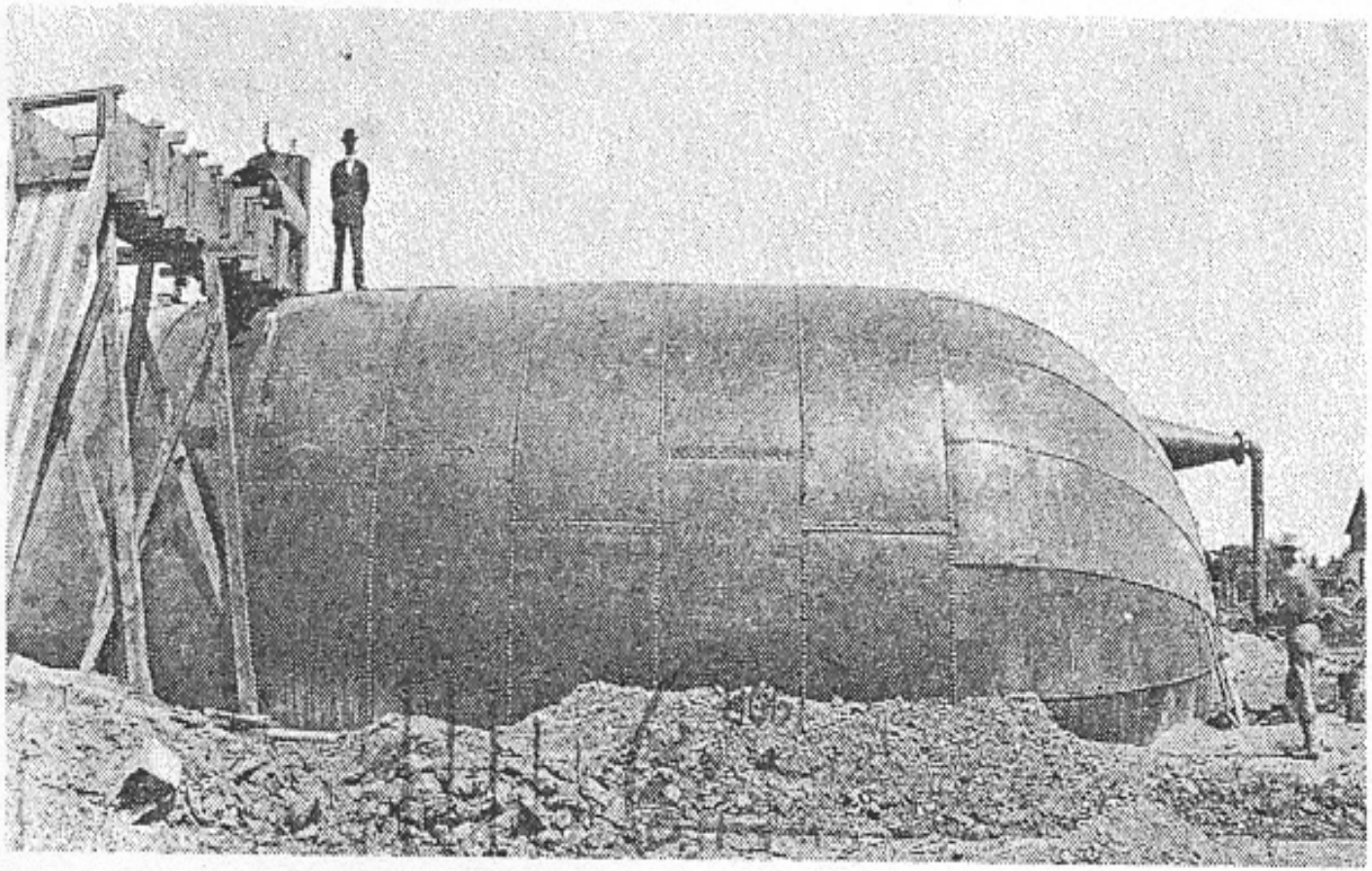


HISTORY (CONTD)

- **1910 State Capitol Well: 165 PSI; 2,650 GPM, 85,000 cu. ft. gas**
- **1930 Norbeck City Well; 14 million cu. ft./year; 75 cts/Mcf**
- **1949 Records stopped**

Pierre Area Natural Gas Production
1899 - 1948





Tank for natural gas separated from artesian water in Fort Pierre, 1908.

(Photo courtesy of Robert E. Kolbe collection)

GAS ANALYSES

- State Capitol Well
  - CH4……94 %
  - N2…….. 5.7
  - O2…….. 0.13
  - CO2……0.06
  - Btu……..907

  Analysis by S.D. State College

- Pierre City Wells
  - Methane…….78.8%
  - Ethane……13.2
  - Propane……..10.7
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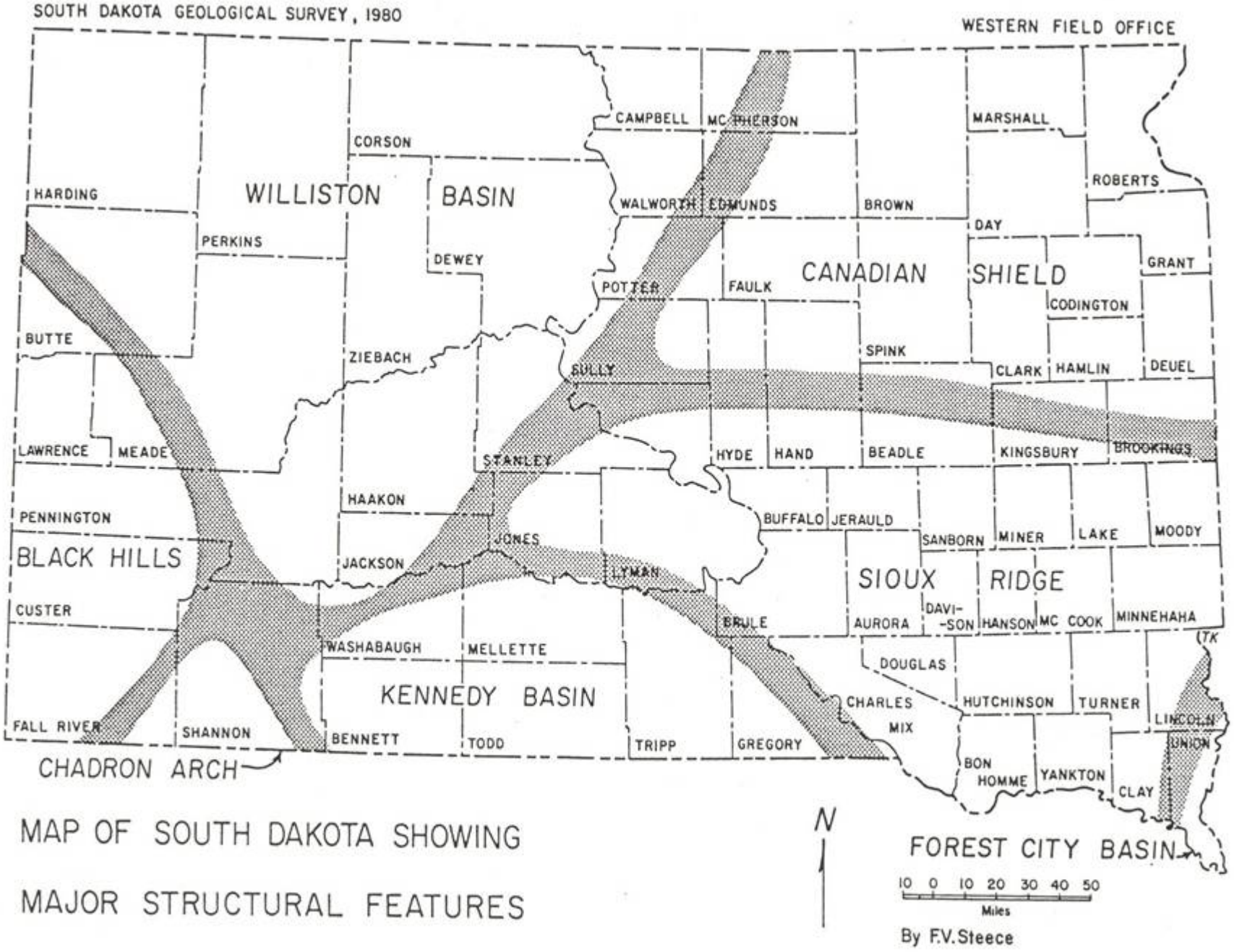
  Analysis by Carter Oil Company



MAP OF SOUTH DAKOTA SHOWING

MAJOR STRUCTURAL FEATURES

GENERALIZED STRATIGRAPHIC CORRELATION CHART FOR SOUTH DAKOTA

SOUTH DAKOTA GEOLOGICAL SURVEY, 1980

By F.V. Steece and T.L. Kenyon

WESTERN FIELD OFFICE

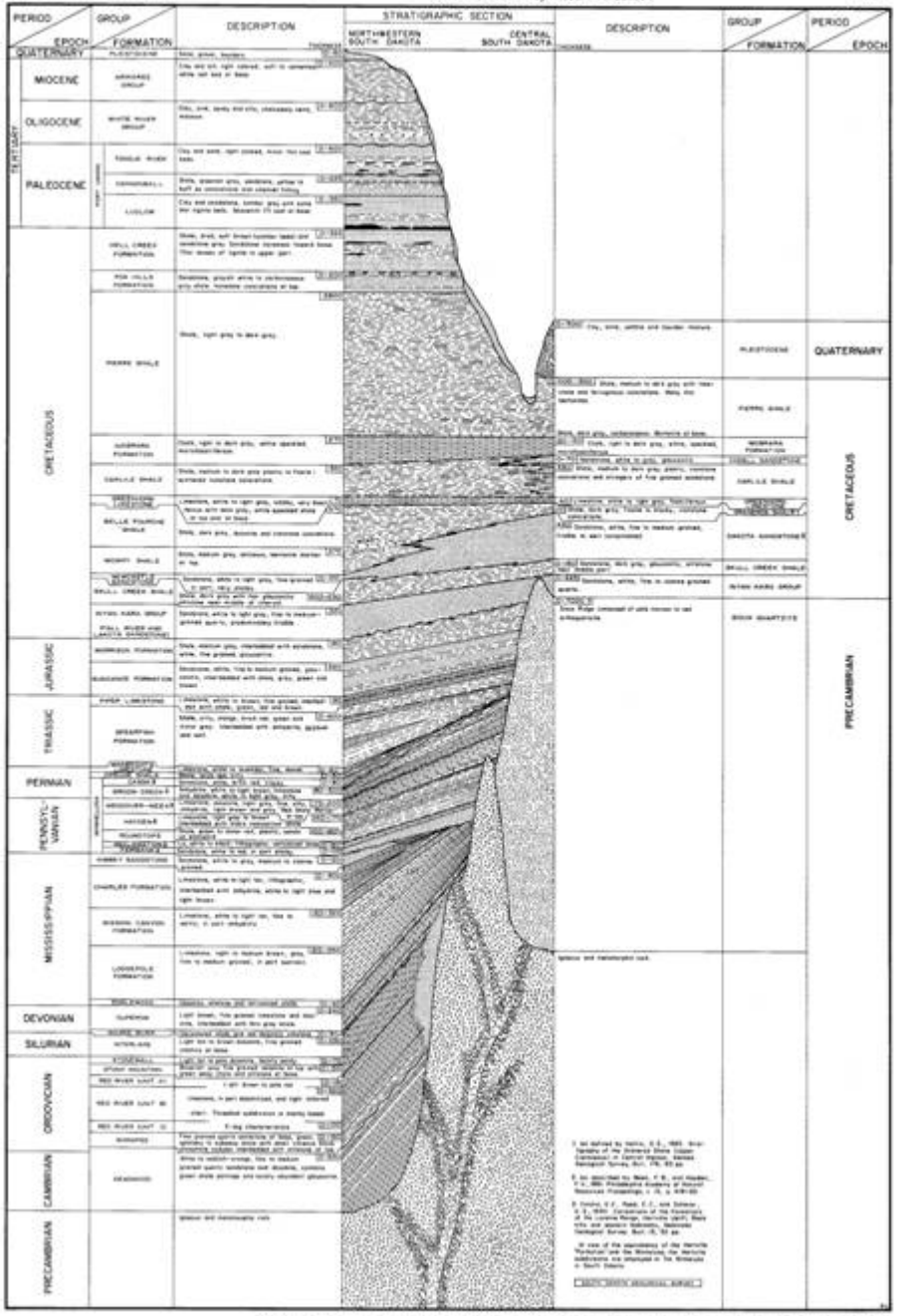
ERA		PERIOD or EPOCH	BLACK HILLS	WILLISTON BASIN	CHADRON ARCH	KENNEDY BASIN	SIOUX RIDGE	FOREST CITY BASIN	CANADIAN SHIELD	PERIOD or EPOCH		ERA
CENOZOIC	Quat.	Pleistocene	Sands, gravels	Sands, gravels	Sands, gravels	Sand Hills Fm.	Glacial drift	Glacial drift	Glacial drift	Pleistocene	Quat.	CENOZOIC
	TERTIARY	Pliocene	Ogallala Grp.	Ogallala Grp.		Ogallala Grp.	Ogallala; Ft. Randall			Pliocene	TERTIARY	
		Miocene	Arikaree Grp.	Arikaree Grp.		Arikaree Grp.				Miocene		
		Oligocene	White River Grp.	White River Grp.		White River Grp.				Oligocene		
		Paleocene	Fort Union Fm.	Fort Union Fm.						Paleocene		
MESOZOIC		Cretaceous	Hell Creek Fm.	Hell Creek Fm.						Cretaceous		MESOZOIC
			Fox Hills Fm.	Fox Hills Fm.								
			Pierre Shale	Pierre Shale	Pierre Shale	Pierre Shale	Pierre Sh.		Pierre Sh.			
			Niobrara Fm.	Niobrara Fm.	Niobrara Fm.	Niobrara Fm.	Niobrara Fm.		Niobrara Fm.			
			Carlile Shale	Carlile Shale	Carlile Shale	Carlile Shale	Carlile Shale	Carlile Shale	Carlile Shale			
			Greenhorn Ls.	Greenhorn Ls.	Greenhorn Ls.	Greenhorn Ls.	Greenhorn Ls.	Greenhorn Ls.	Greenhorn Ls.			
			Graneros Grp.: Belle Fourche Shale	Belle Fourche Sh.	Belle Fourche Sh.	Belle Fourche Sh.	Belle Fourche Sh.	Belle Fourche Sh.	Belle Fourche Sh.			
			Graneros Grp.: Mowry Shale	Mowry Shale	Mowry Shale	Mowry Shale	Mowry Shale	Mowry Shale	Mowry Shale			
			Graneros Grp.: Newcastle / Skull Creek Sh.	Newcastle / Skull Creek Shale	Newcastle / Skull Creek Shale	Newcastle / Skull Creek Shale	Dakota Ss. / Skull Creek Shale	Dakota Ss. / Skull Creek Shale	Dakota Ss. / Skull Creek Shale			
			Inyan Kara: Fall River Ss.	Fall River Ss.	Fall River Ss.	Fall River Ss.	Fall River Ss.	Fall River Ss.	Fall River Ss.			
			Inyan Kara: Lakota Fm.	Lakota Fm.	Lakota Fm.	Lakota Fm.	Lakota Fm.	Lakota Fm.	Lakota Fm.			
		Jurassic	Morrison Fm. / Unkpapa Ss.	Morrison Fm.	Morrison Fm.				Sundance Formation	Jurassic		
			Sundance Fm.	Sundance Fm.	Sundance Fm.							
			Gypsum Spring									
		Triassic	Spearfish Fm.	Piper Ls. / Spearfish Fm.	Spearfish Fm.					Triassic		
PALEOZOIC		Permian	Minnekahta Ls.	Minnekahta Ls.	Minnekahta Ls.					Permian		PALEOZOIC
			Opeche Shale	Opeche Shale	Opeche Shale							
		Pennsylvanian	Minnelusa Fm.	Minnelusa Fm.	Minnelusa Fm.	Minnelusa Fm.	Minnelusa Fm.		Minnelusa Fm.	Pennsylvanian		
		Mississippian	Pahasapa Ls.	Kibbey Ss.	Madison Ls.				Madison Ls.	Mississippian		
				Madison Ls.								
		Devonian	Englewood Ls.	Englewood Ls.						Devonian		
				Duperow Fm.								
				Souris River Fm.								
		Silurian		Interlake Dol.						Silurian		
		Ordovician		Stonewall Fm.				Decorah-Plattteville Fm.	Red River Fm.	Ordovician		
			Whitewood Fm.	Stony Mtn. Fm.				St. Peter Ss.	Winnipeg Fm.			
			Winnipeg Fm.	Red River Fm.				Tremadocian Grp.				
				Winnipeg Fm.				Francona Grp.				
		Cambrian	Deadwood Fm.	Deadwood Fm.				Deadbach Grp.		Cambrian		
PRE-PALEOZOIC		Precambrian	Metamorphic and Igneous Rock	Metamorphic and Igneous Rock	Granite	Granite	Sioux Qtzite / Granite	Sioux Quartzite / Schist / Granite	Sioux Qtzite / Granite	Precambrian		PRE-PALEOZOIC

TK

Department of Natural Resource Development
South Dakota Geological Survey

GENERALIZED STRATIGRAPHIC COLUMN OF CENTRAL AND NORTHWESTERN SOUTH DAKOTA—by Robert A. Schoon

Educational Series
Map Six



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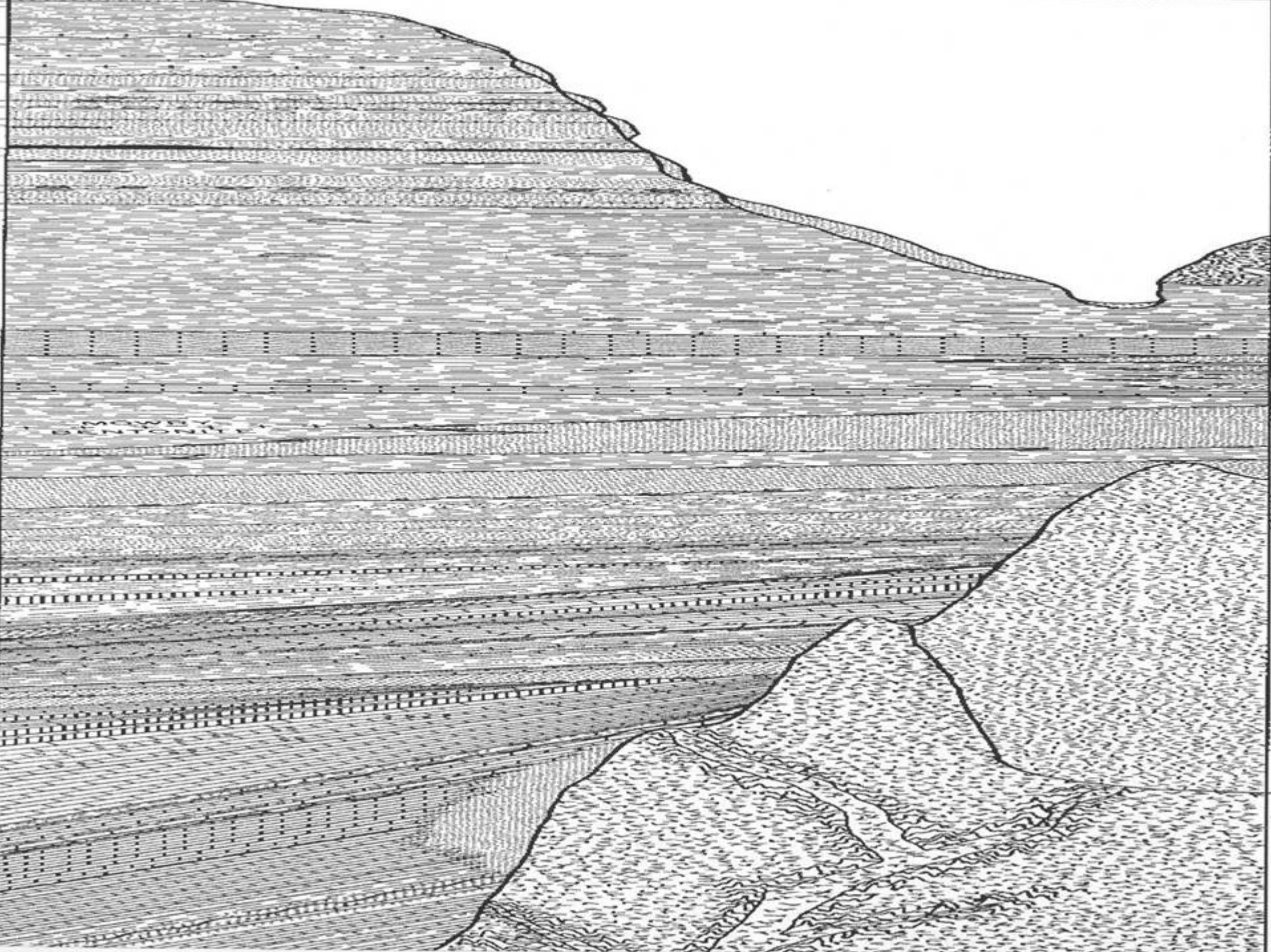

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SOUTH DAKOTA

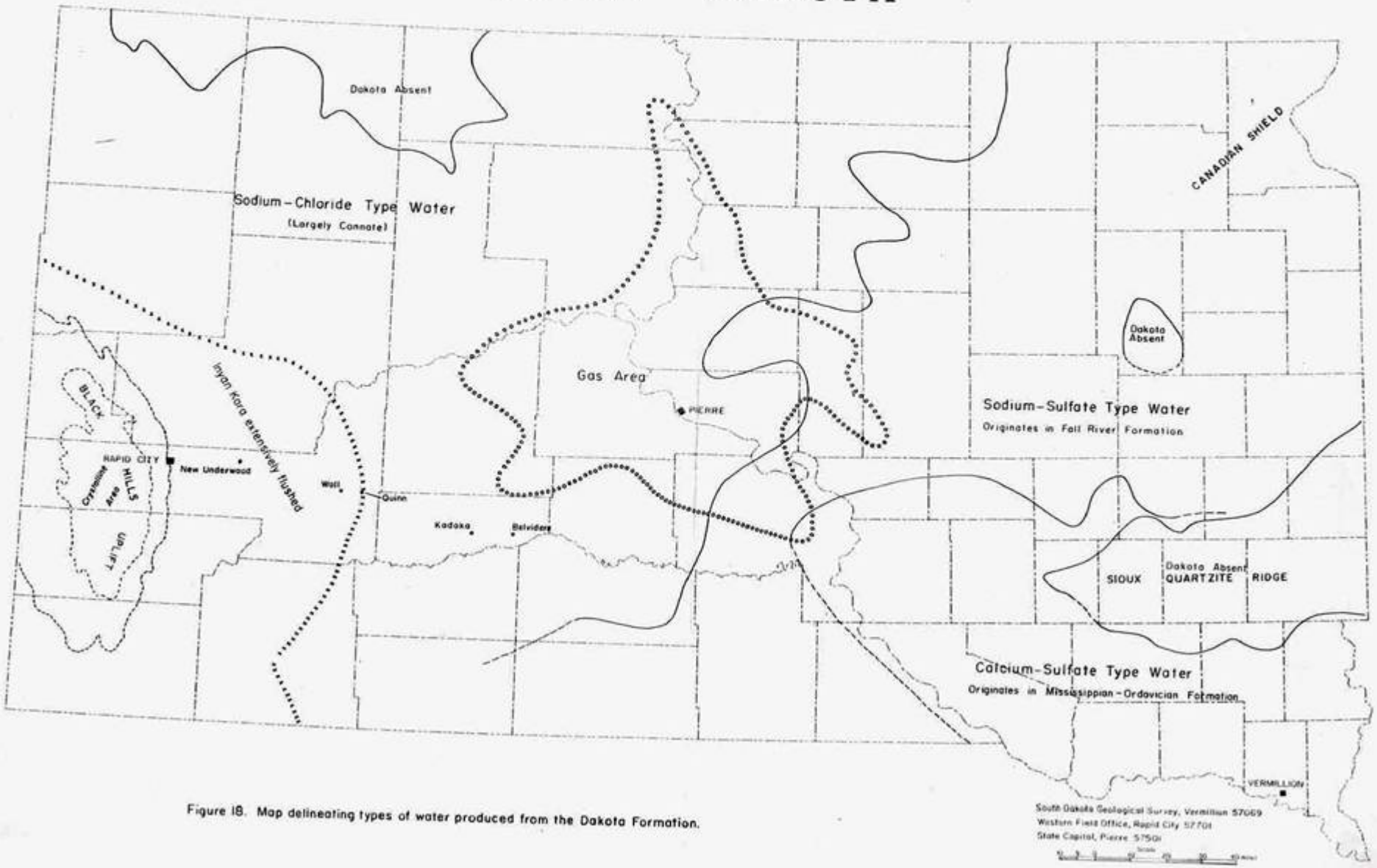

Figure 18. Map delineating types of water produced from the Dakota Formation.

SOUTH DAKOTA

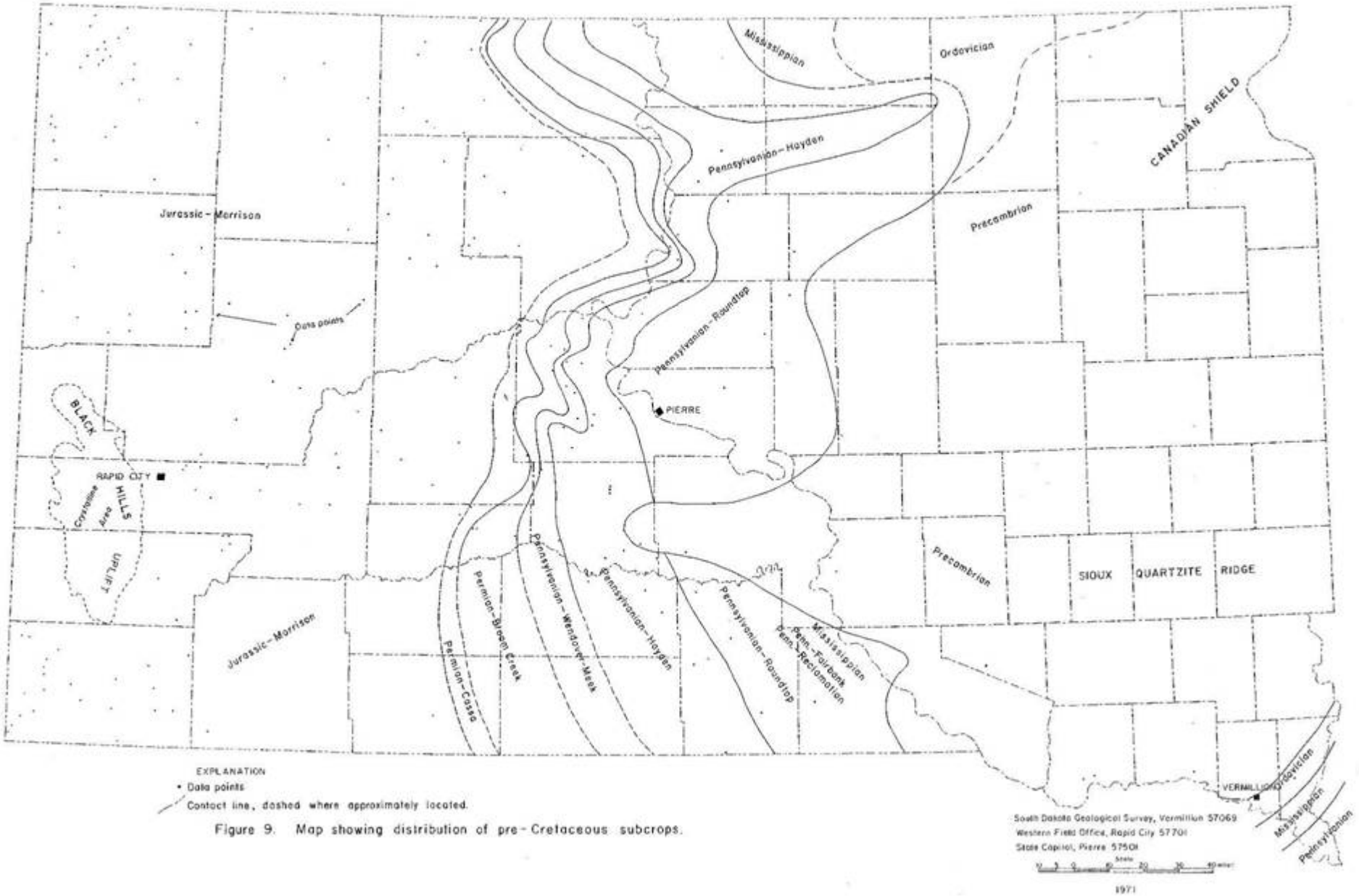

Figure 9. Map showing distribution of pre-Cretaceous subcrops.