

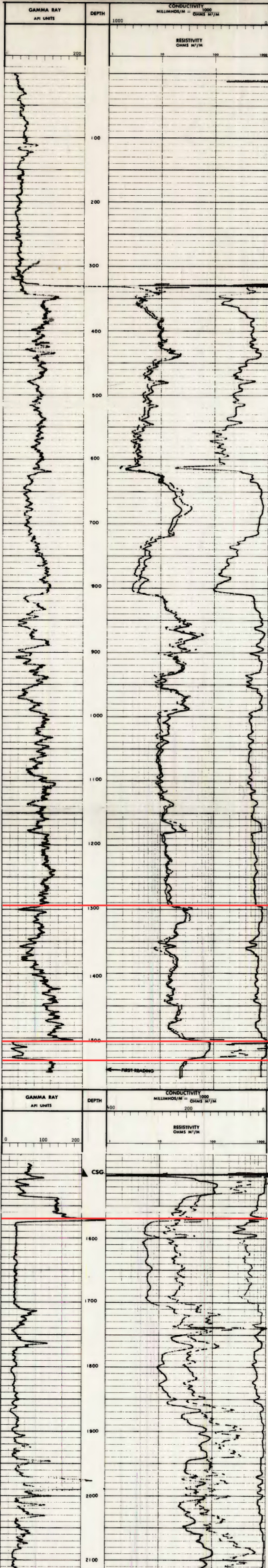
**BIRDWELL**  
**Gamma Ray-Induction**

COMPANY: D.S.C.S.  
 WELL: MADISON TEST WELL #1  
 FIELD: CHOOK  
 COUNTY: CHOOK STATE: WYOMING  
 LOCATION: SEC. 13 TWP. 37N R. 6E E34

PERMANENT DATUM: GROUND LEVEL JULY 2005 (ELEV. 8,303)  
 LOG MEASURED FROM: 14 FT ABOVE PERM. DATUM @ 2017  
 DRILLING MEASURED FROM: SMALL BEARING @ 1.3021

DATE	7-24-78	8-15-78	10-15-78
WELL NO.	200	200	200
DEPTH - DEPTH	1574	2267	4353
DEPTH - LOGGING	1560	2260	4340
DEPTH - LOG METER	1554	2270	4343
TOP LOG METER	318	3200	3230
CASING - DEPTH	22" @ 138	22 3/8" @ 1303	8 1/2" @ 2333
CASING - LOGGING	324	3200	3230
LOG SITE	2 7/8	2 7/8	2 7/8
TYPE FLUID IN	CR	CR	CR

Madison Test Well No.1  
 API No. 4901109528  
 GL = 3,604'  
 KB = 14'

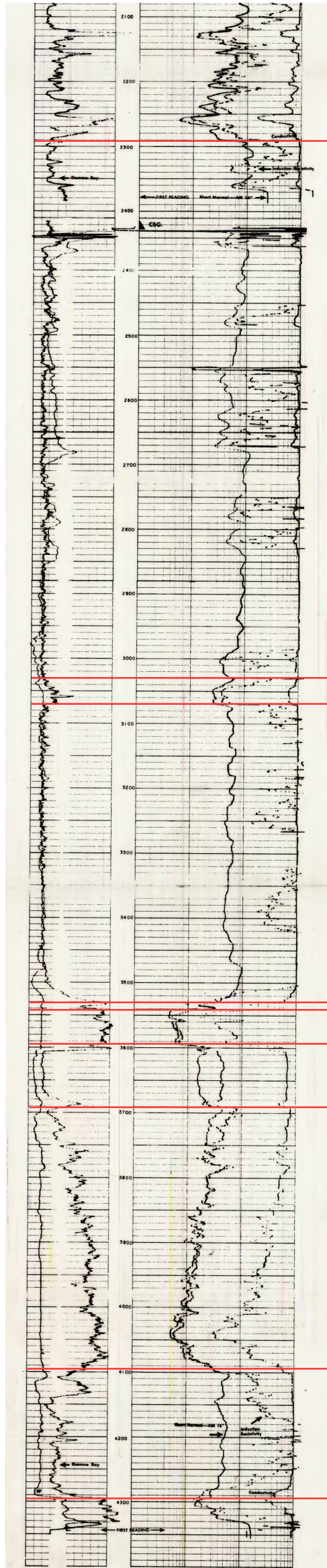


1,294'  
 Goose Egg Formation

1,506'  
 Minnekahta Formation

1,534' Opeche Formation

1,570'  
 Minnelusa Formation



2,292'  
 Madison Formation

3,030'  
 Englewood Formation

3,070'  
 Red River Formation

3,530'  
 Winnipeg Top

3,542' Icebox Shale

3,596'  
 Aladdin-Winnipeg Sandstone

Winnipeg Group

3,692'  
 Deadwood Formation

4,096'  
 Flathead Formation

4,295'  
 Precambrian Formation

TD = 4,355'

Note All footages are KB (ft)

**STRATA ENERGY**

Figure 7  
 East Type Log

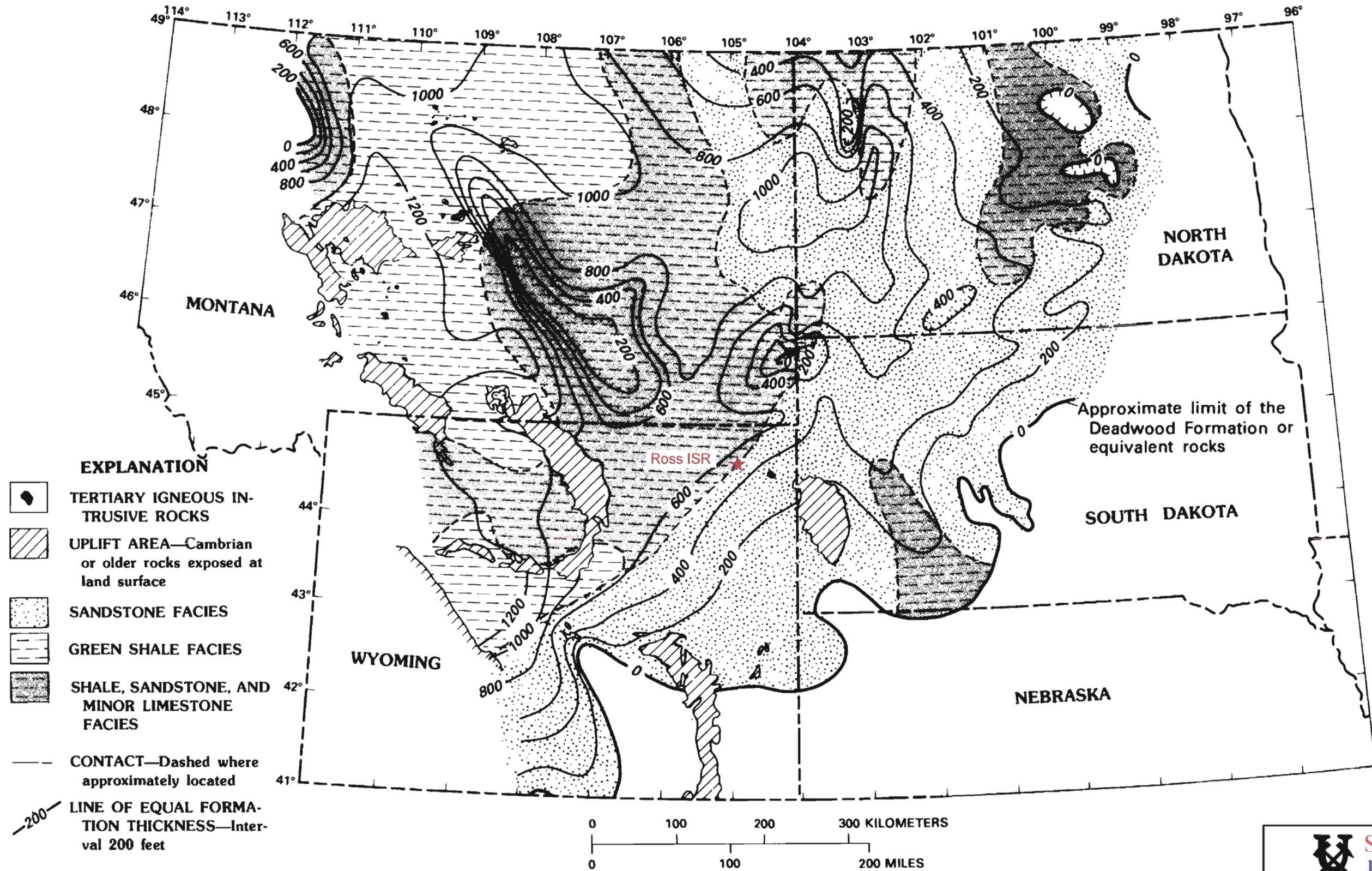
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Scale: NTS	Date: May 2010
2010_Ross_CIPA_Fig_07.ai	By: JLM Checked: HD








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**EXPLANATION**

-  TERTIARY IGNEOUS INTRUSIVE ROCKS
-  UPLIFT AREA—Cambrian or older rocks exposed at land surface
-  SANDSTONE FACIES
-  GREEN SHALE FACIES
-  SHALE, SANDSTONE, AND MINOR LIMESTONE FACIES
-  CONTACT—Dashed where approximately located
-  LINE OF EQUAL FORMATION THICKNESS—Interval 200 feet

From:  
Geological Survey Professional Paper 1273-A  
Peterson, 1984



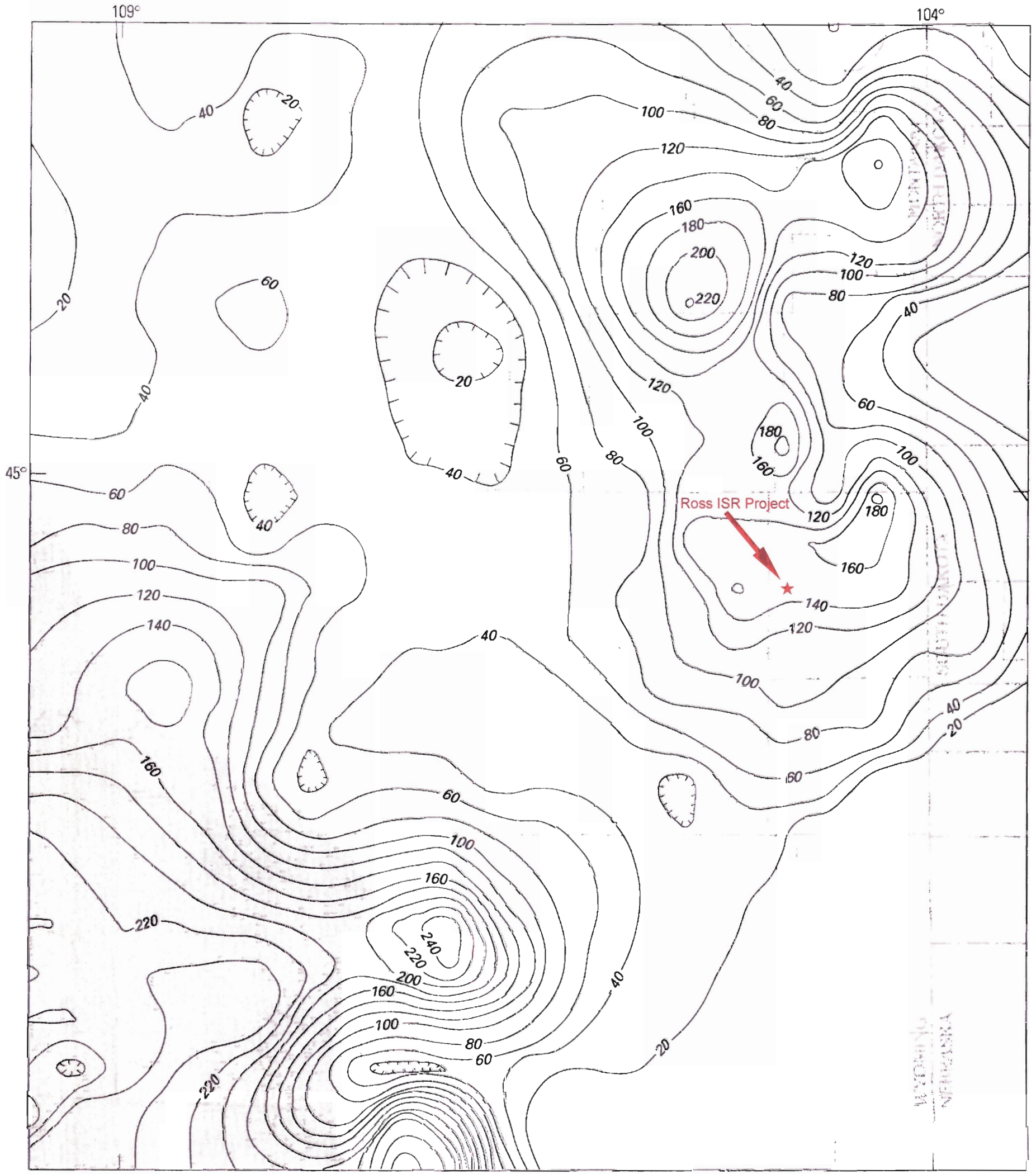
Figure 8  
Isopach Map of the  
Deadwood Formation

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Scale: See Bar Scale	Date: May 2010
2010_Ross_CIPA_Fig_08.ai	By: JLM   Checked: HD

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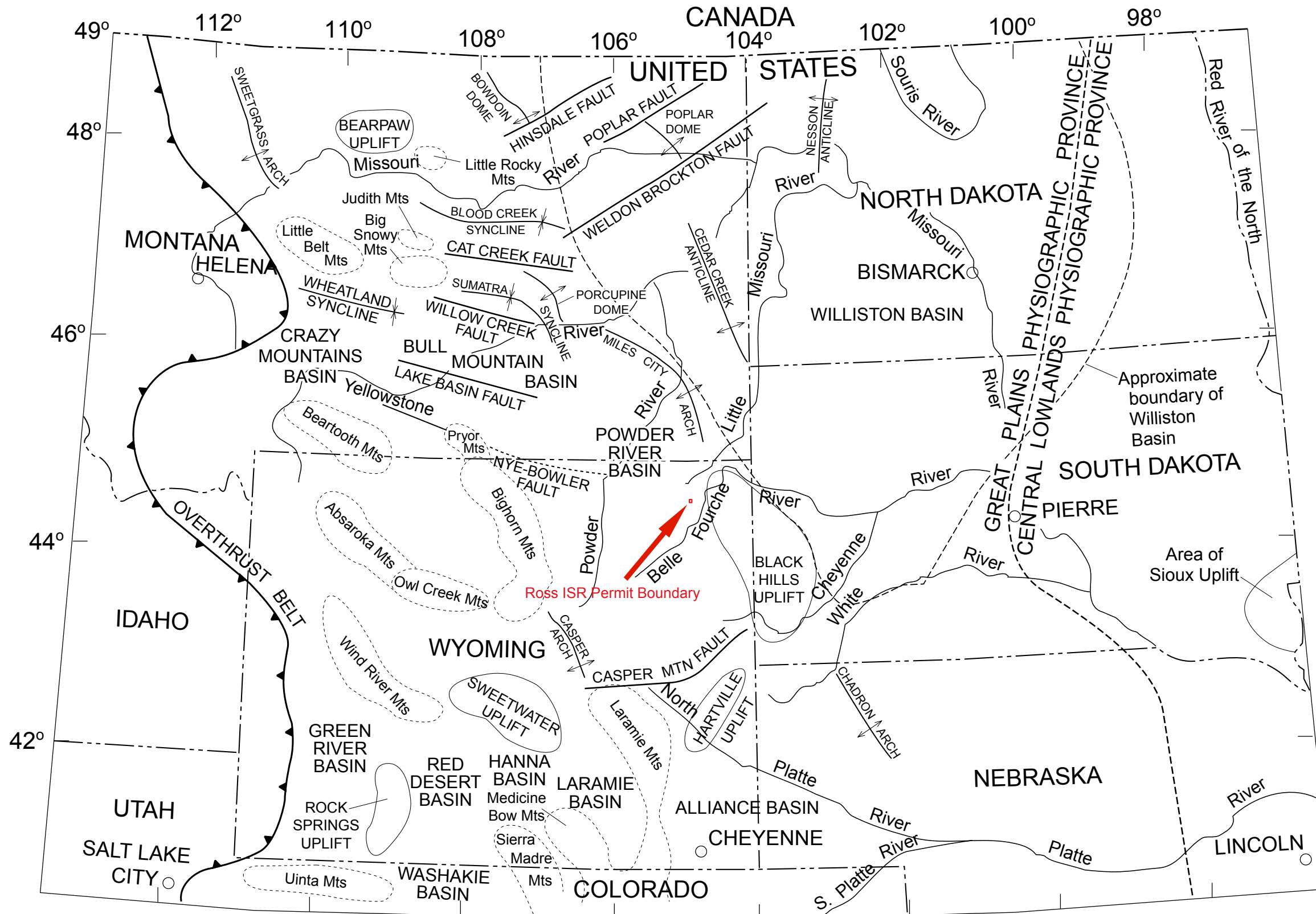


From:  
USGS Bulletin 1917  
by:  
D. Macke, 1993



Figure 9 Isopach Map of the Flathead Formation	
2010 Ross ISR Class I Permit Application	
Scale: See Bar Scale	Date: May 2010
2010_Ross_CIPA_Fig_09.ai	By: JLM Checked: HD
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From:  
 Water-Resources Investigations Report 02-4094  
 (after Peterson, 1981 and Busby et al., 1995,  
 modified by Driscoll et al., 2002)

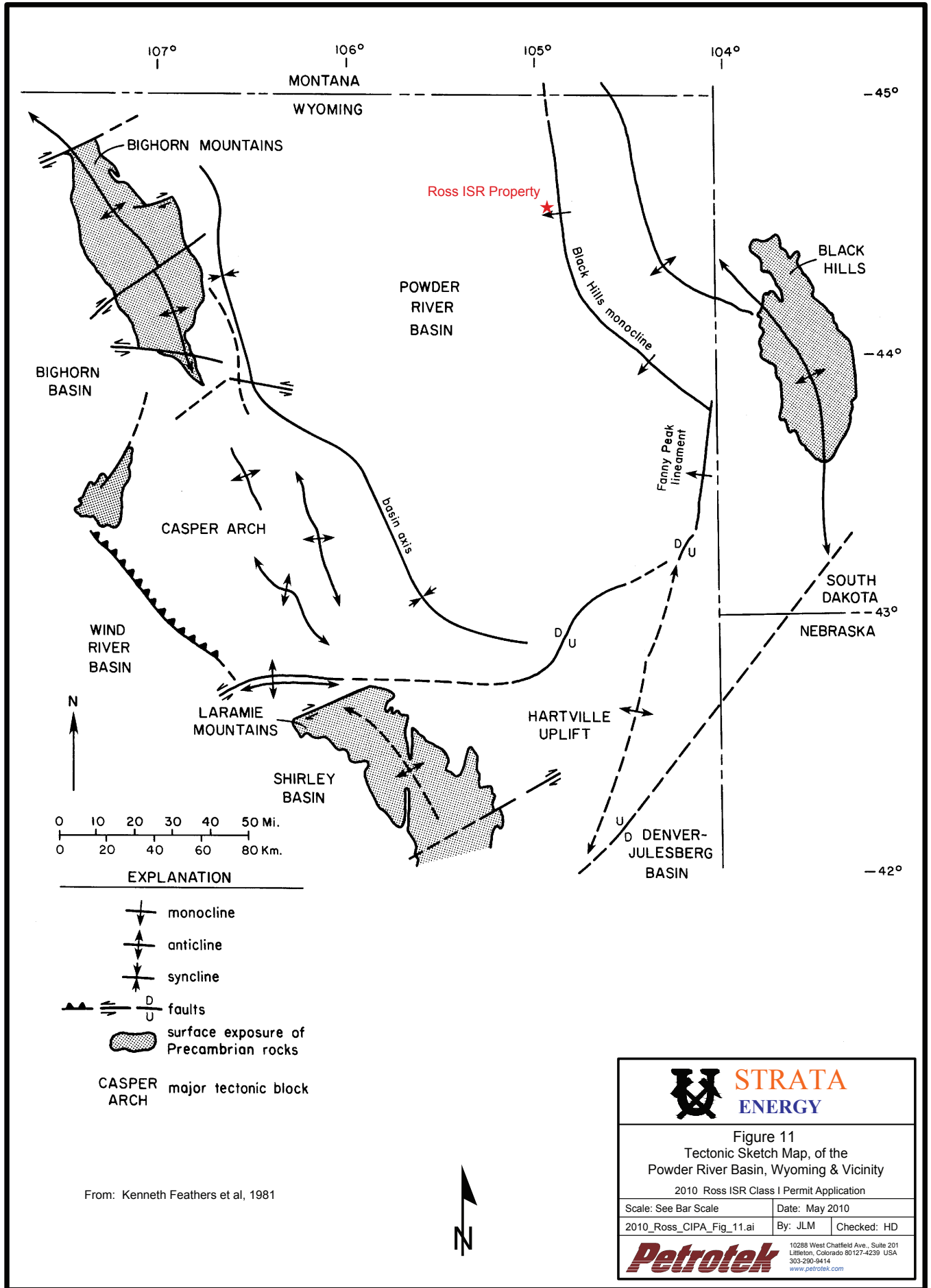
**STRATA ENERGY**

Figure 10  
 Present-day Structure and Physiographic  
 Features in the Northern Great Plains Area  
 2010 Ross ISR Class I Permit Application

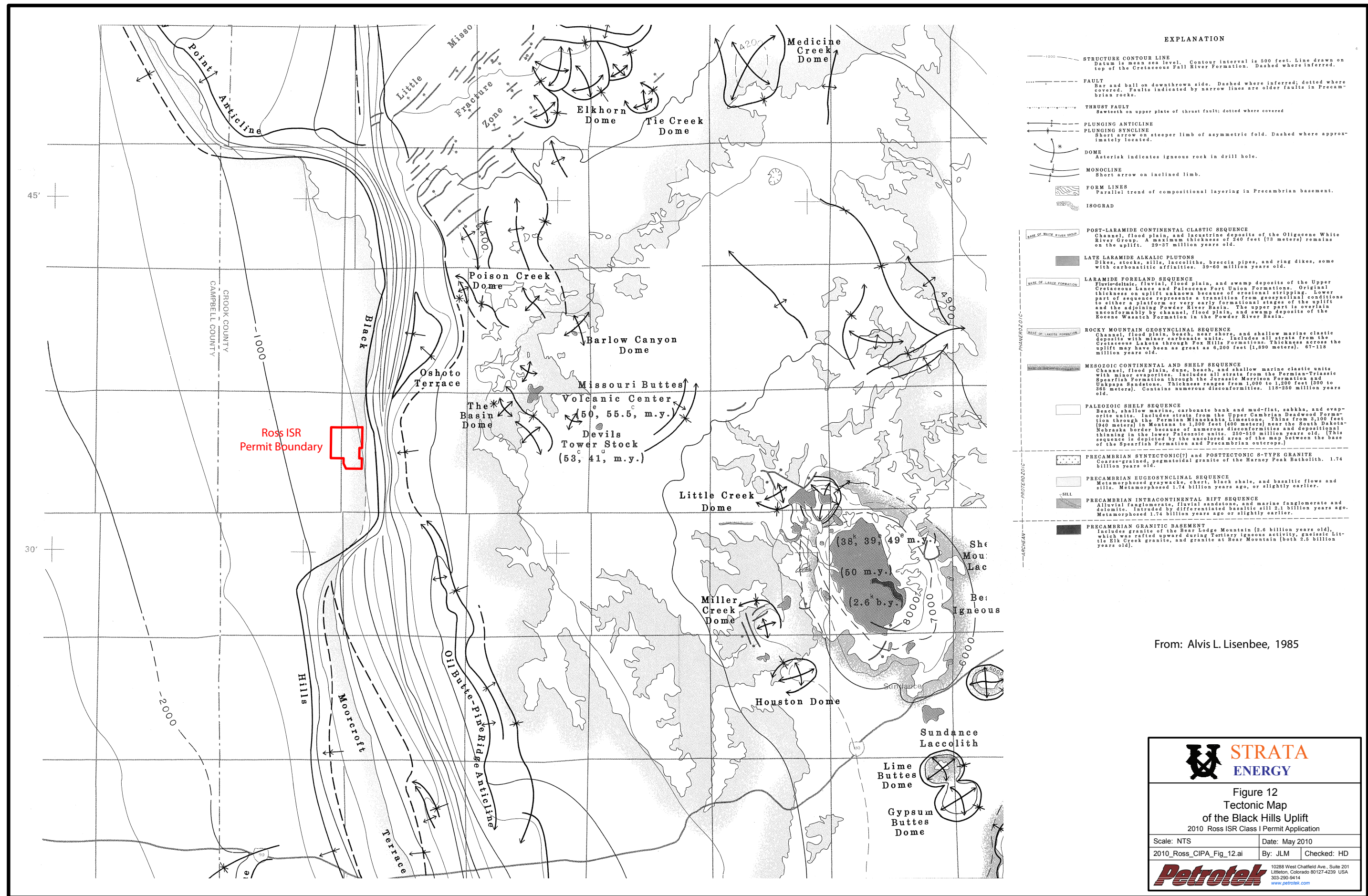
Scale: See Bar Scale	Date: May 2010
2010_Ross_CIPA_Fig_10.ai	By: JLM Checked: HD

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**EXPLANATION**

—1000— STRUCTURE CONTOUR LINE  
Datum is mean sea level. Contour interval is 500 feet. Line drawn on top of the Cretaceous Fall River Formation. Dashed where inferred.

--- FAULT  
Bar and ball on downthrown side. Dashed where inferred; dotted where covered. Faults indicated by narrow lines are Precambrian rocks.

--- THRUST FAULT  
Sawtooth on upper plate of thrust fault; dotted where covered

--- PLUNGING ANTICLINE  
Short arrow on steeper limb of asymmetric fold. Dashed where approximately located.

--- DOME  
Asterisk indicates igneous rock in drill hole.

--- MONOCLINE  
Short arrow on inclined limb.

--- FORM LINES  
Parallel trend of compositional layering in Precambrian basement.

--- ISOGRAD

--- POST-LARAMIDE CONTINENTAL CLASTIC SEQUENCE  
Channel, flood plain, and lacustrine deposits of the Oligocene White River Group. A maximum thickness of 240 feet (73 meters) remains on the uplift. 29-37 million years old.

--- LATE LARAMIDE ALKALIC PLUTONS  
Dikes, stocks, sills, laccoliths, breccia pipes, and ring dikes, some with carbonatitic affinities. 39-60 million years old.

--- LARAMIDE FORELAND SEQUENCE  
Fluvio-deltaic, fluvial, flood plain, and swamp deposits of the Upper Cretaceous Lance and Paleocene Fort Union Formations. Original thickness on uplift unknown because of erosional stripping. Lower part of sequence represents a transition from geosynclinal conditions to either a platform or very early formational stages of the uplift and the adjoining Powder River Basin. The upper part is overlain unconformably by channel, flood plain, and swamp deposits of the Eocene Wasatch Formation in the Powder River Basin.

--- ROCKY MOUNTAIN GEOSYNCLINAL SEQUENCE  
Channel, flood plain, beach, near shore, and shallow marine clastic deposits with minor evaporites. Includes all strata from the Cretaceous Lakota through Fox Hills Formations. Thickness across the uplift may have been as great as 6,200 feet (1,890 meters). 67-118 million years old.

--- MESOZOIC CONTINENTAL AND SHELF SEQUENCE  
Channel, flood plain, beach, and shallow marine clastic units with minor evaporites. Includes all strata from the Permian-Triassic Spearfish Formation through the Jurassic Morrison Formation and Ute Sandstone. Thickness range from 1,000 to 1,200 feet (300 to 365 meters). Contains numerous disconformities. 118-250 million years old.

--- PALEOZOIC SHELF SEQUENCE  
Beach, shallow marine, carbonate bank and mud-flat, sabkha, and evaporite units. Includes strata from the Upper Cambrian Deadwood Formation through the Permian Missoula Limestone. Thins from 3,100 feet (940 meters) in Montana to 1,300 feet (400 meters) near the South Dakota-Nebraska border because of numerous disconformities and depositional thinning in the lower Paleozoic units. 250-510 million years old. (This sequence is depicted by the uncolored area of the map between the base of the Spearfish Formation and Precambrian outcrops.)

--- PRECAMBRIAN SYNTECTONIC(?) and POSTTECTONIC S-TYPE GRANITE  
Coarse-grained, pegmatoidal granite of the Harney Peak Batholith. 1.74 billion years old.

--- PRECAMBRIAN EUGEOSYNCLINAL SEQUENCE  
Metamorphosed graywacke, chert, black shale, and basaltic flows and sills. Metamorphosed 1.74 billion years ago, or slightly earlier.

--- PRECAMBRIAN INTRACONTINENTAL RIFT SEQUENCE  
Alluvial fan, fluvial sandstone, and marine fanlomerate and dolomite. Intruded by differentiated basaltic sill 2.1 billion years ago. Metamorphosed 1.74 billion years ago or slightly earlier.

--- PRECAMBRIAN GRANITIC BASEMENT  
Includes granite of the Bear Lodge Mountain (2.6 billion years old), which was rifted upward during Tertiary igneous activity, gneissic Little Elk Creek granite, and granite at Bear Mountain (both 2.5 billion years old).

From: Alvis L. Lisenbee, 1985

**STRATA ENERGY**

Figure 12  
Tectonic Map  
of the Black Hills Uplift  
2010 Ross ISR Class I Permit Application

Scale: NTS	Date: May 2010
2010_Ross_CIPA_Fig_12.ai	By: JLM Checked: HD

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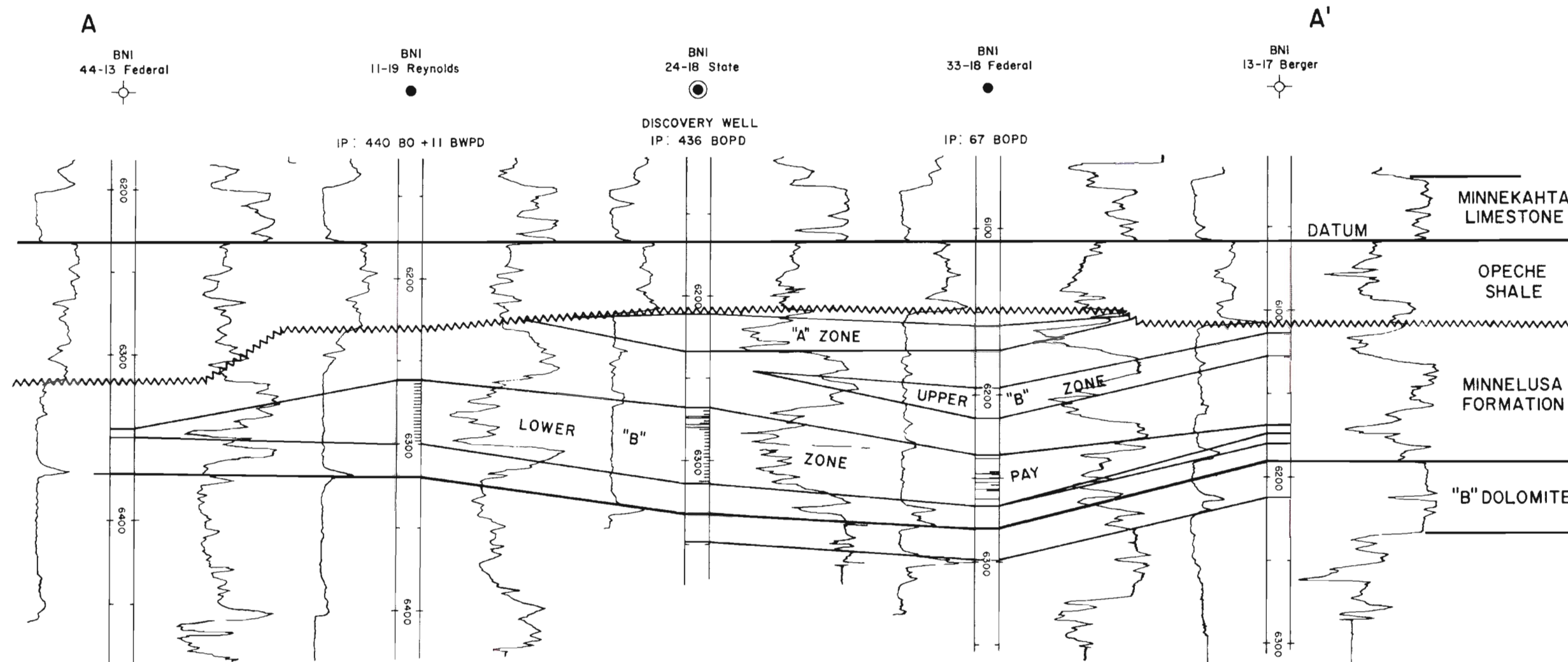


FIGURE 1  
**DEADMAN CREEK FIELD**  
 CROOK COUNTY, WYOMING  
 CROSS SECTION A-A'  
 E. ARRO  
 APRIL, 1976

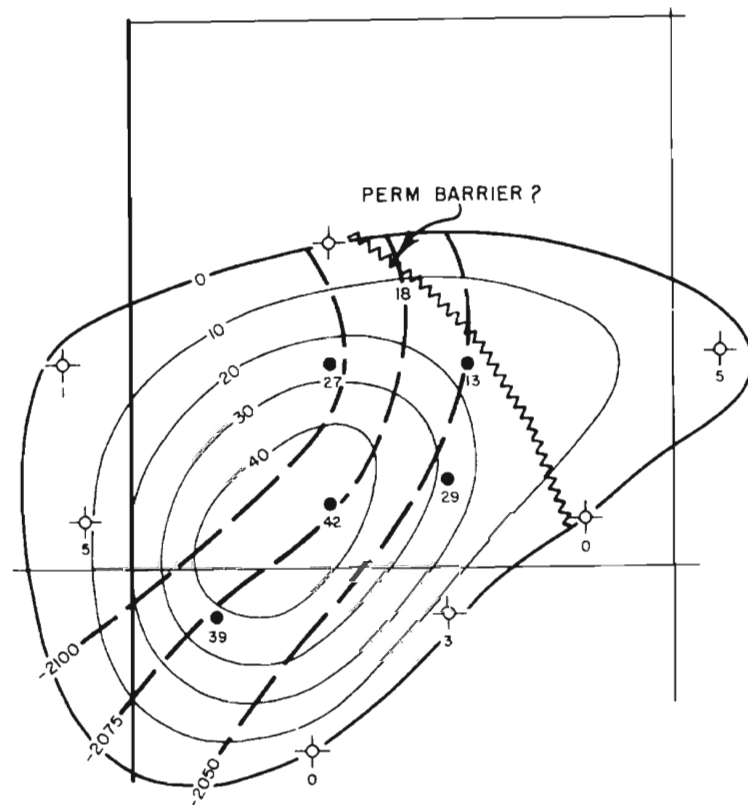


FIGURE 2  
**DEADMAN CREEK FIELD**  
 CROOK COUNTY, WYOMING  
 ISOPACH-MINNELUSA LOWER "B" SAND  
 (POROSITY  $\geq$  12%)  
 WITH STRUCTURE MAP-TOP LOWER "B"  
 CONTOUR INTERVAL 10 FEET AND 25 FEET  
 E. ARRO  
 APRIL, 1976

Note  
 See Figure 15 for cross-section  
 location relative to the Ross Property.

Figure 13 Deadman Creek Field Cross Section A - A' and Isopach - Minnelusa Lower "B" Sand		
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Scale: NTS	Date: May 2010	
2010_Ross_CIPA_Fig_13.ai	By: JLM	Checked: HD
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