South Dakota Oil & Gas Development/Preparedness Executive Branch Work Groups

Summary of Findings

Compiled by
The Office of Governor Dennis Daugaard

September 2012

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Executive Summary

The recent expansion of the North Dakota oil industry due to the development of the Bakken and other oil-bearing formations has generated a great deal of interest in the potential to develop South Dakota's oil and gas industry. Reports of the challenges in the North Dakota oilfields related to the oil boom – law enforcement, emergency services, housing, transportation, infrastructure, education, and others – have led to questions about how our state can prepare to address these issues as the North Dakota boom continues and if South Dakota's oil and gas industry expands.

This report will outline the potential for oil development in South Dakota; discuss the current tax structure and the limited effectiveness of incentives in other states; outline impacts to surface owners; and survey the state's environmental protections currently in place. It will also examine issues related to housing, road infrastructure, emergency services, health care services, water and electrical systems, law enforcement, education, municipalities, counties, and economic development.

While the Oil & Gas Wok Groups discussed natural gas development and this document touches on it at various points, given the weak natural gas market and the readily available supplies in many areas, both groups have focused primarily on impacts related to oil development and preparedness.

Where's the Oil?

The North Dakota Bakken formation is considered a "world class" oil source. Published estimates of Bakken oil generation potential range from 10 billion barrels to 300 billion barrels.[1] However, the Bakken formation does not extend into South Dakota and as a result, potential oil development in South Dakota is likely far less than its northern neighbor.

In 2012, North Dakota has more than 200 rigs, each drilling an average of one new oil well per month. South Dakota currently has one such rig drilling about one new well per month. Under the most optimistic scenario developed during this study, in the next fifteen years South Dakota will have, at most, six rigs each drilling an average of one new well per month. This "very optimistic" level of development could result in approximately 480-720 direct private-sector jobs and as many as 72 new wells per year. **In the most likely scenario, however, for the next fifteen years South Dakota will continue to have one rig drilling about 12 new wells per year, employing about 80 people.**

While South Dakota has some potential for oil and gas development and is under-explored, the modest level of past exploration conducted throughout the state appears to rule out the future discovery of a "Bakken-sized" oil resource in South Dakota. Further, new exploration of northwest South Dakota – the most likely area for future development – may be delayed as operators pursue a "sure thing" in the North Dakota Bakken and other similar plays in Texas, Colorado, and Ohio. Estimates on the duration of the Bakken field development range from ten to twenty years. Production from the fully developed field will likely continue for decades more.

Taxes and Incentives

The oil and gas industry in South Dakota is subject to three main types of taxes – the sales and use tax, the energy mineral severance tax, and the conservation tax. South Dakota imposes a 4% sales and use tax on most tangible personal property and services, including oil and gas development. South Dakota also imposes a 4.5% energy mineral severance tax on the owner or operator of energy

[1] http://democrats.energycommerce.house.gov/sites/default/files/image_uploads/Helms.Testimony.pdf

minerals; the revenues generated by the energy mineral severance tax are split equally between the state and the county in which the energy minerals were severed. A conservation tax of 0.24% is imposed on the taxable value of severed energy minerals to fund DENR's oil and gas program.

As part of this effort, the work group examined whether certain tax incentives or tax holidays will encourage additional oil exploration or development in South Dakota. Based on the experiences of surrounding states, evidence suggests that production and drilling tax deductions and incentives are ineffective at changing the location of oil production.

Surface Owner Impacts

Many of the oil wells in Harding County are located on land owned by local ranchers; some ranchers own the mineral and surface rights, while others own only the surface rights. DENR will not issue a drill permit until oil and gas operators notify the affected surface owner of their right to negotiate payments for surface damages in accordance with SDCL 45-5A. The current statute has a number of protections in place for landowners; while many landowners have had no significant disagreements with oil developers, some believe they are not adequately compensated for surface damages. A contingent of work group members traveled to Harding County to see these concerns firsthand. Some impacts to surface owners were noted. This report contains a summary of statutes related to surface owner impacts in South Dakota, Wyoming, North Dakota, Montana and Colorado.

Environmental Protections

South Dakota currently has a number of statutes that address environmental protections related to oil and gas development. Air and water quality, spills, underground injection, casing requirements, bonding, and reclamation are all addressed. Any future regulatory changes should not hinder South Dakota's potential for oil and gas development.

Given the limited potential for a Bakken-size boom in South Dakota, preparedness efforts should largely focus on preparing northwest South Dakota communities for impacts related to North Dakota oil development.

Housing

Due to the low population of northwest South Dakota, any development that leads to a substantial increase in population will create housing challenges. Only about 52,000 people (about 6% of the state's population) live in the seven counties comprising northwest South Dakota. The area has only 22,338 households, of which there are only about 900 for rent or sale. The South Dakota Housing Development Authority has programs available to assist new homebuyers.

Road Infrastructure

Road infrastructure will be another major challenge that coincides with oil and gas development. The South Dakota highway system is already being impacted by development in North Dakota. Any additional development in South Dakota will further impact the state highway system and have a detrimental impact on county roads. Current traffic volumes in western South Dakota are well within the capacity of the existing highway system, and there is room for increased capacity.

Emergency Services

Ambulance services and fire departments rely on volunteers who already have a heavy work load. If oil and gas development results in population growth (and more service calls), the workload will increase and it will likely become more difficult to retain and recruit volunteers. Services located along highways 85, 79 and 73 are already experiencing increased traffic and calls as a result of the development in North Dakota and are most likely to experience the most strain. While development

in South Dakota is expected on a far lesser scale, if development is substantial, counties may not be able to rely on volunteers for emergency services.

Health Care Services

Northwestern South Dakota currently faces significant challenges due to its large geographical area and limited facilities. There are no general or critical access hospitals in the region and only 11 South Dakota medical clinics providing health care to its 52,000 residents. Indian Health Services are limited and only serve the Native American population. Given the costs of serving sparsely populated areas, no additional services are likely to be offered unless the region experiences significant, long-term population increases.

Water Systems

Most of the four major rural water systems supporting northwest South Dakota do not currently generate enough revenue to pay for long-term infrastructure needs and any substantial growth in the region will create serious challenges for water systems. Upgrades to water systems will also likely hinge on the unpredictable availability of federal funding.

Electrical Systems

The two cooperatives that will most likely be impacted by oil and gas development are the Grand and Moreau/Grand electric cooperatives. While it is difficult to determine the amount and location of future growth, Grand Electric is very comfortable that they have either completed or have made plans for upgrades that will serve higher loads.

Law Enforcement

Crime statistics tend to coincide with population increases and it is difficult to attribute specific criminal activity to a certain industry. Many other factors, such as poverty rates and unemployment, influence criminal activity. Nonetheless, development in any industry that increases population will necessitate increased attention and preparation for an associated increase in criminal activity. Issues related to traffic, particularly truck traffic, will continue to expand as the North Dakota boom continues.

Education

Northwest South Dakota includes 15 school districts, most of which have adequate classroom space to accommodate more growth. Additional teachers and staff may be necessary, depending on the number of new students, and funding may be a challenge. In districts with large geographic areas, additional students may make bussing an issue. Should these districts experience rapid growth, portable classrooms or staggered schedules (to allow double-use of classrooms) may be necessary.

Municipality Issues

Municipalities will be on the front lines of issues relating to oil and gas development. Potential issues facing municipalities in areas affected by oil exploration include planning capacity and zoning regulations, traffic, workforce, and housing.

County Issues

Some counties, such as Harding, have a long history with oil development and have undertaken measures to address the impacts; others lack similar experiences and are not as prepared.

Economic Development

The direct economic impact of oil and gas development in South Dakota will likely be limited. The majority of economic development activities in South Dakota will likely not be related to oil development in South Dakota, but will be secondary effects of energy development in nearby states, including North Dakota's Bakken Formation.

Members, Background & Objectives

In early summer 2012, South Dakota Governor Dennis Daugaard established two work groups related to oil and gas in South Dakota, the Oil and Gas Development Work Group and the Oil and Gas Preparedness Work Group.

Oil and Gas Development Work Group

Leader: Nathan Sanderson, Policy Advisor, Office of the Governor
Other Members:

Jason Glodt, Policy Advisor, Office of the Governor
Pat Costello, Commissioner, Governor's Office of Economic Development
Eric Matt, Policy Analyst, Office of the Governor
Steve Pirner, Secretary, Department of Environment and Natural Resources
Tim Tollefsrud, Department of Environment and Natural Resources
Derric Illes, Department of Environment and Natural Resources
Bob Townsend, Department of Environment and Natural Resources
Mike Lees, Department of Environment and Natural Resources
Jarrod Johnson, Commissioner of School and Public Lands
David Wiest, Deputy Secretary, Department of Revenue
Mike Houdyshell, Department of Revenue
Jason Evans, Department of Revenue

Objectives: Provide information and recommendations in regard to: 1) the potential scope of oil and gas development in South Dakota with respect to geographical area and time; 2) current and potential incentives, including tax structure; and 3) the effect of development on the environment, including impacts to surface landowners.

Oil and Gas Preparedness Work Group

Leader: Jason Glodt, Policy Advisor, Office of the Governor
Other Members:

Nathan Sanderson, Policy Advisor, Office of the Governor
Darin Bergquist, Secretary of Department of Transportation
Senator Ryan Maher
Representative Chuck Turbiville
Bob Wilcox, Association of Counties
Yvonne Taylor, Municipal League
Blaise Emerson, Black Hills Council of Local Governments

Objective: Determine what actions should be taken to prepare for development spurred by oil and gas discovery.

The two work groups held a dozen meetings from May – September 2012, and a smaller group traveled to Harding County to visit with surface owners impacted by oil and gas development. A number of interested parties – current and former legislators, oil and gas attorneys, landowners, industry organization representatives, county officials, county commissioners, business owners, oil industry executives, and others – attended work group meetings, in addition to the regular members.

SOUTH DAKOTA OIL AND GAS FACTS

RIG COUNT - South Dakota typically has one rig drilling (about one new well per month).

- North Dakota has more than 200 rigs drilling (each drilling about one new well per month).

NEW OIL WELLS – about 12 new wells per year are drilled in South Dakota; new wells offset declining production from older wells.

- More than 2,000 new wells are being drilled per year in North Dakota.

OIL PRODUCTION - South Dakota produces about 1.6 million barrels from 150 wells.

- North Dakota produced 152 million barrels from 6,650 wells in 2011.

KNOWN OIL RESERVES IN SOUTH DAKOTA- About 98% of South Dakota's oil is produced from the Red River Formation underlying a 400-square mile area in north central Harding County. Remainder comes from a few Minnelusa wells in Custer and Fall River County.

NORTH DAKOTA FRACKING - Fracking involves injecting large amounts of water, a propping agent such as sand, and a small percentage of chemicals under very high pressure.

- This opens small fractures in tight formations like the Bakken Shale; the fractures are held open by the proppant, thus allowing oil and gas to flow to the well bore.
- A typical North Dakota Bakken frack job involves 300 to 600 truckloads of water to inject 2 to 4 million gallons – equivalent to the amount of water in 3 to 6 Olympic-sized swimming pools.

SOUTH DAKOTA FRACKING – Wells in the Red River Formation do not require fracking because it is more permeable than unconventional oil plays like the Bakken Shale.

- Small-scale fracking has been used in gas wells and water wells for decades in SD.
- Fracking a gas well or water well in SD involves bringing in about 2 truckloads of water to inject 15,000 gallons – equivalent to the amount of water in a 3-foot deep 30-foot diameter aboveground pool.

HORIZONTAL WELLS - Horizontal Red River wells in South Dakota are about 8,500 feet deep and cost about $2.5 million to drill. Fracking is not required for oil production.

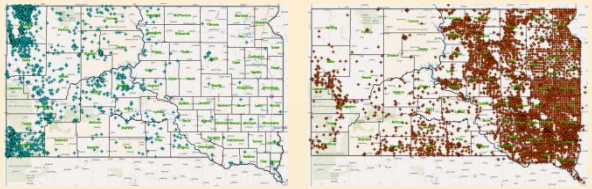
- Horizontal Bakken wells in North Dakota are 10,000 feet deep and cost about $7.9 million to drill. The additional cost is due mostly to high-pressure, multi-stage fracking.

POTENTIAL FOR FUTURE DEVELOPMENT IN SOUTH DAKOTA

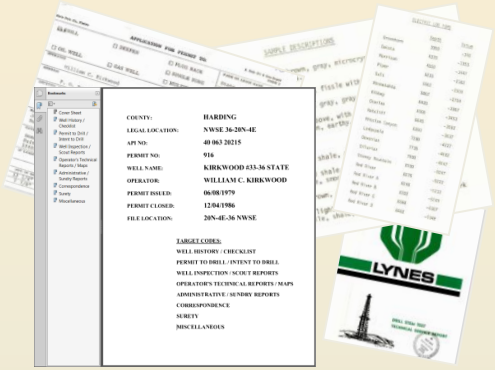
- The Bakken Formation occurs in North Dakota, Montana, and Saskatchewan, but does not extend into South Dakota. However, a number of formations that produce oil in North Dakota, such as the Tyler and Three Forks, do extend into South Dakota. Only additional exploration will tell if any of these formations will produce oil in South Dakota.
- New exploration of northwest South Dakota may be delayed as operators pursue a "sure thing" in the ND Bakken and other similar plays in Texas, Colorado, and Ohio.
- South Dakota is underexplored in terms of oil and gas. However, the modest level of past exploration conducted throughout the state appears to rule out a future discovery of a "Bakken-sized" oil resource in South Dakota. We are hopeful that exploration will discover new oil resources comparable in size to the existing Harding County oil patch.

1. Interactive Maps

Available at sddenr.net/sdoil/oilgas_app.html

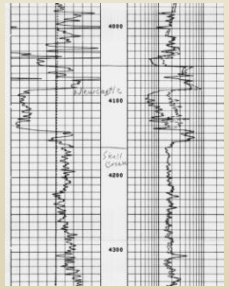


Interactive point-and-click maps for oil and gas permits, geophysical logs, and records of drilling & well completion



Click on a well to instantly get a complete oil and gas permit file, in bookmarked PDF format

Click on a well to instantly get a drilling record



Click on a well to instantly get geophysical logs

- Various **base maps** showing street, aerial, terrain, and topography are provided by ESRI's online mapping service and are readily changeable.
- There are several **data layers** that can be turned on and off.

Department of Environment and Natural Resources (DENR)

Oil and Gas Initiative

Promoting Exploration and Development of South Dakota's Oil and Gas Resources

DENR's One-Stop Shop for Oil and Gas Information

Available at sddenr.net/sdoil

Three ways to get information!

1. **Browse, view, and download data using interactive maps.**
2. **Use online databases to search for and download data.**
3. **Download publications.**

Plus

Regulations Streamlined in 2011

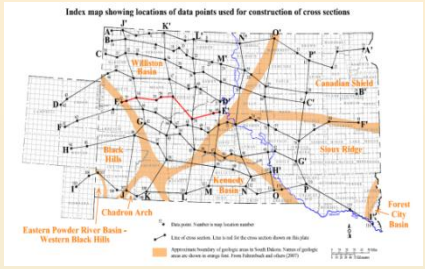
Unnecessary rules were eliminated and others were changed to expedite industry activity.

2. Online Databases for nearly 100,000 drill holes

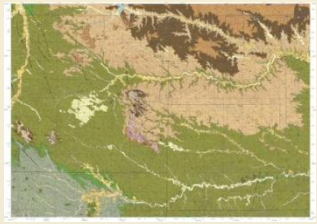
- **Records of oil and gas drilling** from ≈1,900 locations at sddenr.net/oil_gas/
- **Records of water well completion** from ≈62,245 locations at denr.sd.gov/des/wr/dblogsearch.aspx
- **Other records of test hole and well drilling** from ≈34,350 locations at sddenr.net/lithdb/
- **Records of DENR's observation well measurements** from 1,555 wells at denr.sd.gov/des/wr/dbobsearch.aspx

3. Examples of Publications

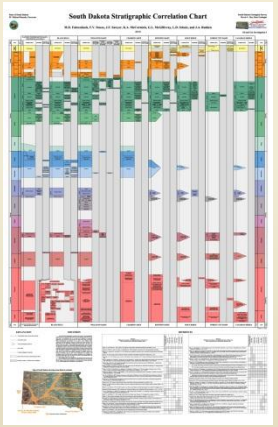
Order hard copy or get free downloads at www.sdgs.usd.edu



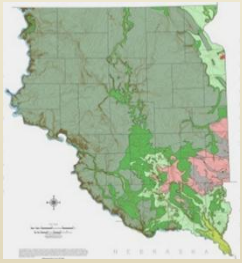
Statewide cross sections



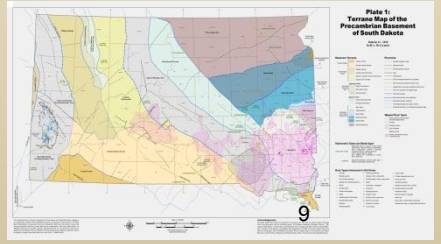
Surface geologic maps



Names and distribution of geologic units



Bedrock geologic map

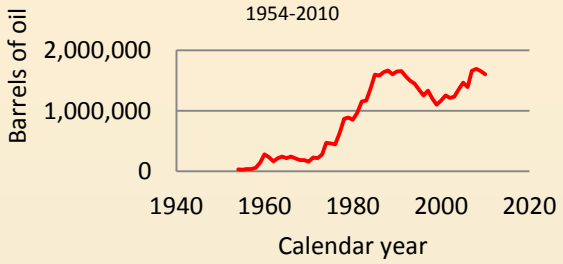


Subdivisions of the Precambrian surface

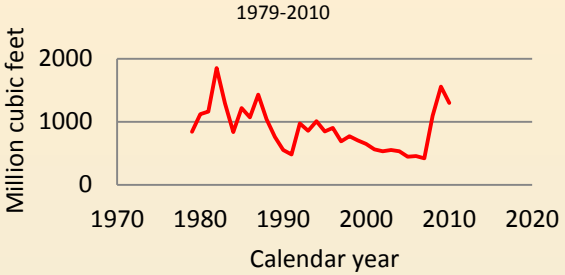
South Dakota Oil and Gas Facts

- Oil production began in 1954.
- The discovery well was drilled in 1953 in Harding County by Shell Oil Company.
- The well was drilled to a depth of 9,332 feet.
- The producing geologic unit is the Red River Formation.
- The Red River Formation remains South Dakota's most productive geologic unit for oil.
- North Dakota's Bakken Formation does not exist in South Dakota.
- The Tyler Formation and Three Forks Shale being developed in North Dakota do exist in South Dakota but remain effectively unexplored.

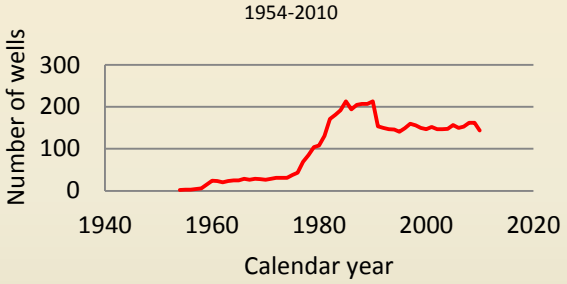
Barrels of Oil Produced



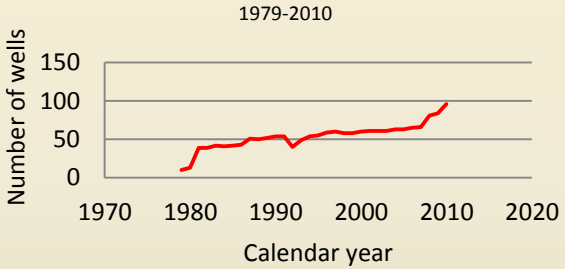
Marketable Gas Production



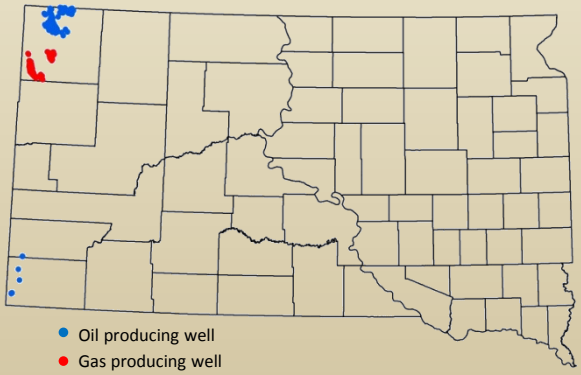
Number of Producing Oil Wells



Number of Producing Gas Wells



Areas of Oil and Gas Production

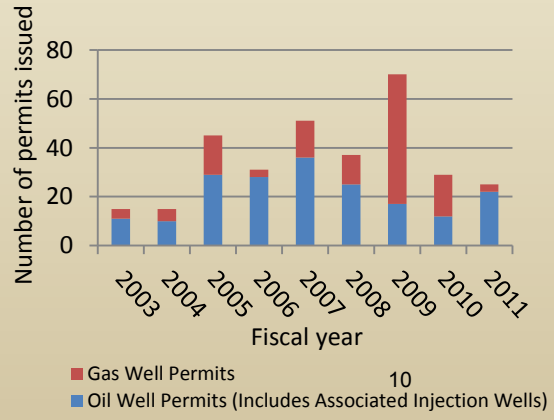


State Oil and Gas Revenues

Fiscal year	Conservation tax[1]	Severance tax[2]	Permit fees[3]
2011	$281,440	$5,276,994	$2,500
2010	$240,282	$4,505,530	$3,100
2009	$297,771	$5,596,540	$7,100
2008	$294,773	$5,526,990	$3,600
2007	$168,178	$3,152,890	$5,000
2006	$173,710	$3,255,856	$2,900

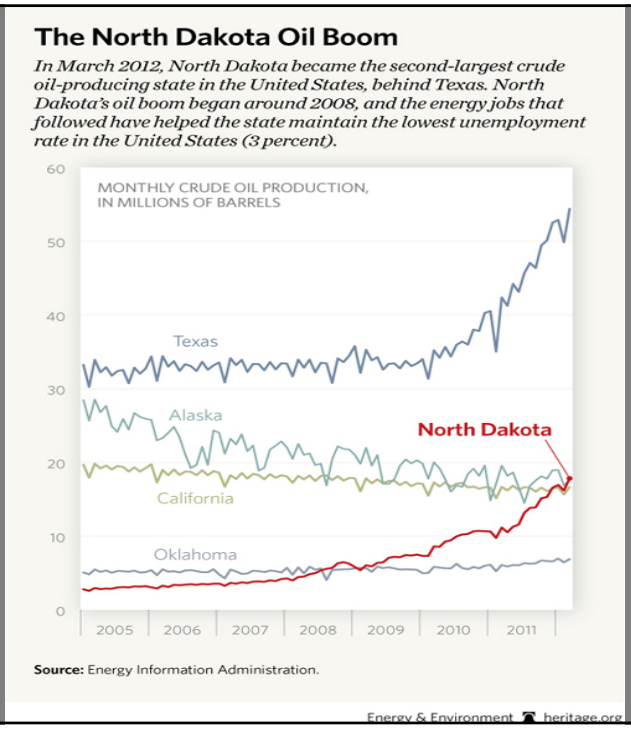
[1] SDCL 10-39B: 0.24% of the value of oil and gas produced; dedicated to DENR to carry out oil and gas activities.
[2] SDCL 10-39A: 4.5% of the value of oil and gas produced; half goes to the state general fund and half goes to the county in which the production occurred.
[3] Application fee of $100 for a permit to drill an oil or gas well; dedicated to DENR to carry out oil and gas activities.

Oil & Gas Drilling Permits Issued



South Dakota's Oil and Gas Potential

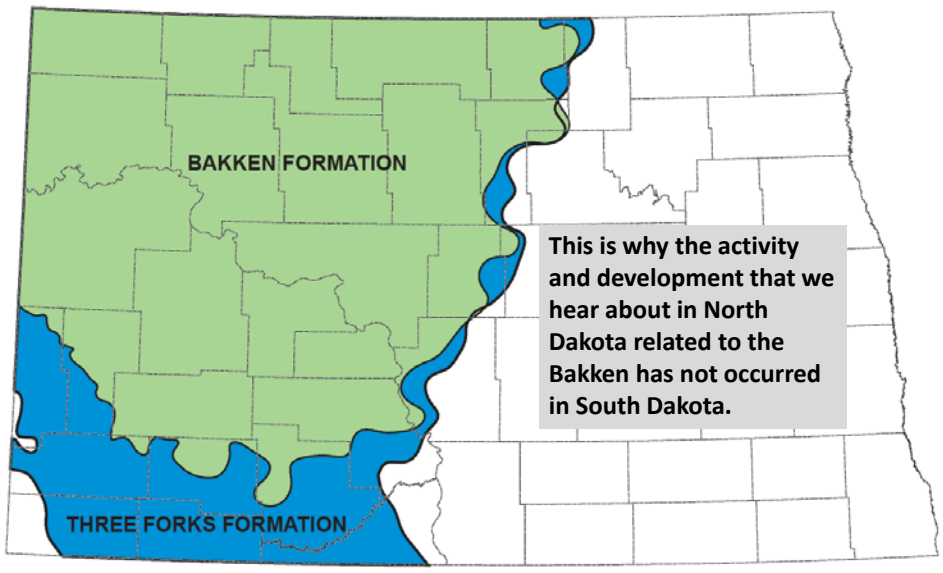
This section outlines the Department of Environment and Natural Resource's (DENR) efforts to increase accessibility to information necessary for oil and gas development in South Dakota.



NORTH DAKOTA OIL BOOM

- Born in the Bakken formation, which is a tight shale.
- Oil in ND's Bakken was known for 50 years, but no one could economically develop it.
- New technology opened up the Bakken:
  - ability to drill long horizontal laterals (10,000 feet)
  - multi-stage, high pressure hydraulic fracturing (20 - 40 stages)
- That technology is now making other tight shale oil plays possible globally.

Extent of Bakken and Three Forks Formations in *North* Dakota



Map taken from North Dakota Geological Survey Geologic Investigations No. 64; published in 2008

North Dakota's oil-producing units in 2011

Spearfish

Devonian age

Bakken, Sanish

Three Forks

Birdbear

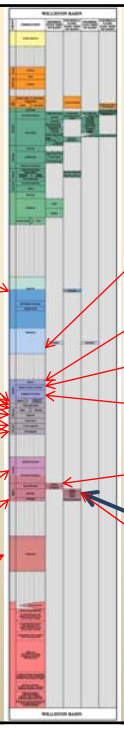
Duperow

Dawson Bay

Winnipegosis

Stonewall, Silurian age

Cambrian-Ordovician age, Ordovician age, Winnipeg, Deadwood



South Dakota's oil-producing unit in 2011, in Harding County

Tyler, Tyler A, Heath

Charles, Ratcliffe

Mission Canyon, Midale/Nesson

Madison

Lodgepole

Gunton

Red River

Red River

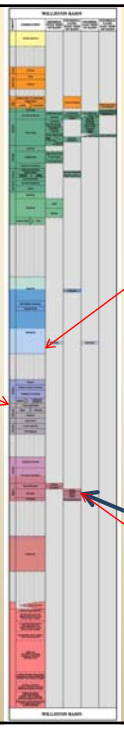
North Dakota production statistics: https://www.dmr.nd.gov/oilgas/stats/statisticsvw.asp

Geologic column excerpted from SD Geological Survey Oil and Gas Investigation 3

South Dakota's "Best Bet" Oil-Bearing Formations

Three Forks

Three Forks

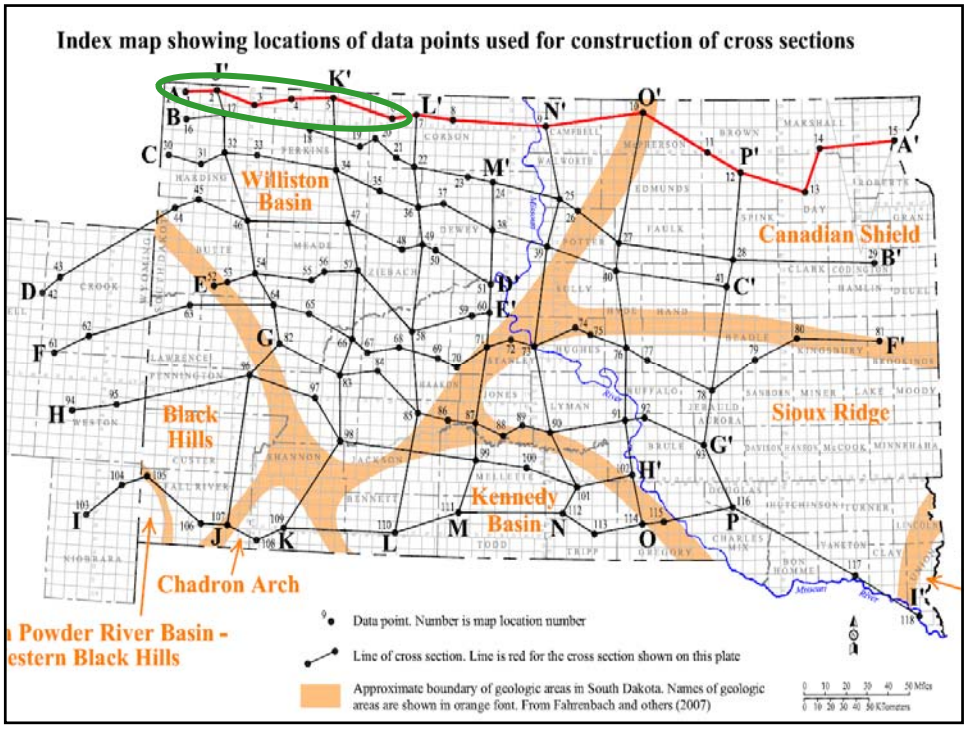


Tyler, Tyler A, Heath

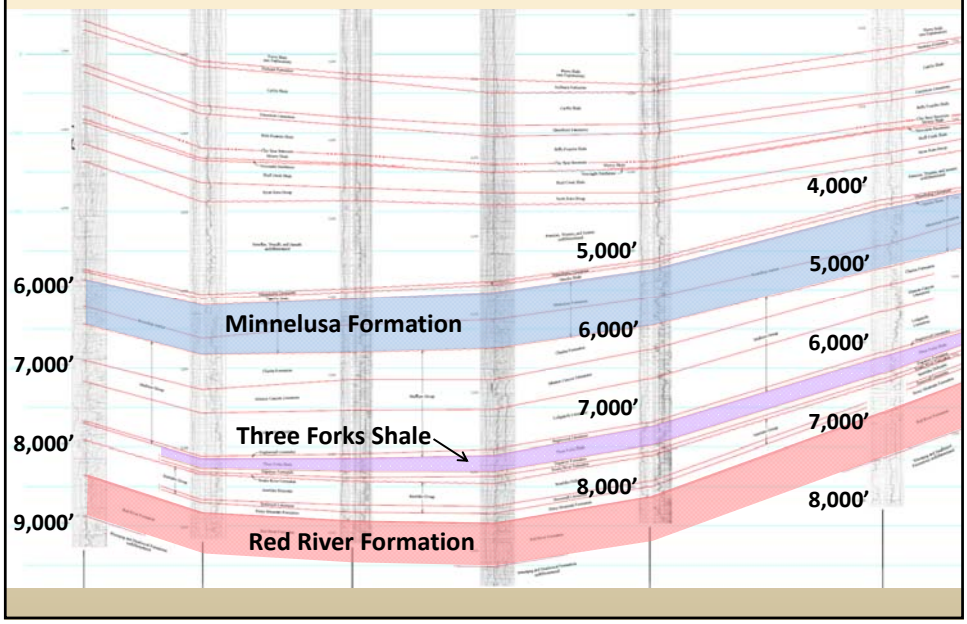
Minnelusa

Red River

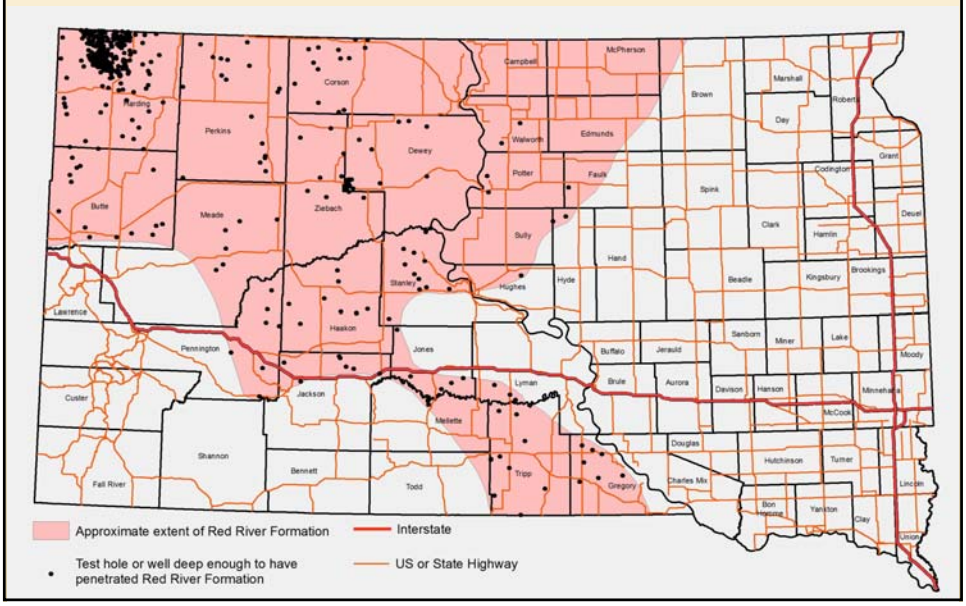
Red River



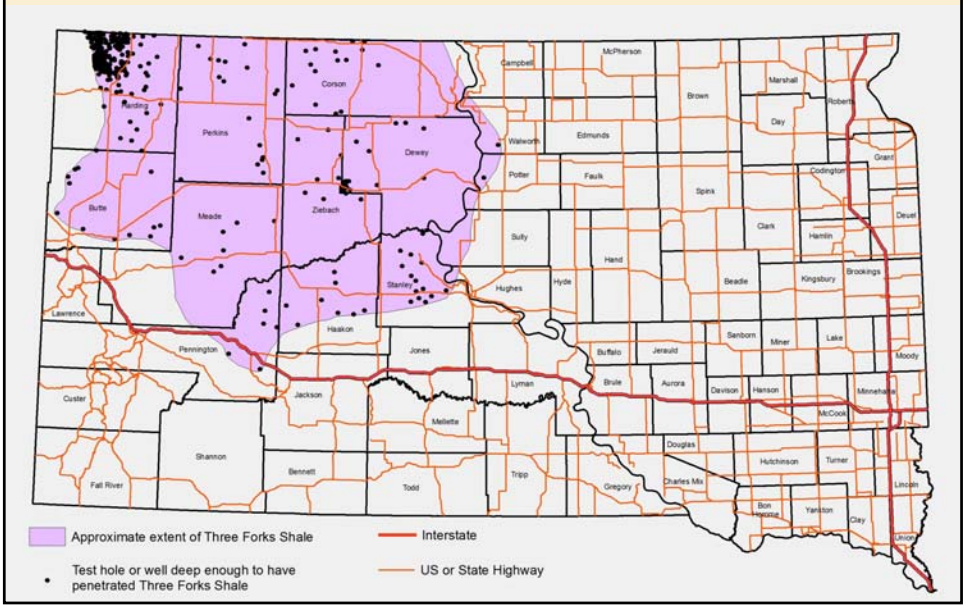
Depths of the Red River Formation, Three Forks Shale, and Minnelusa Formation along part of the North Dakota-South Dakota border.



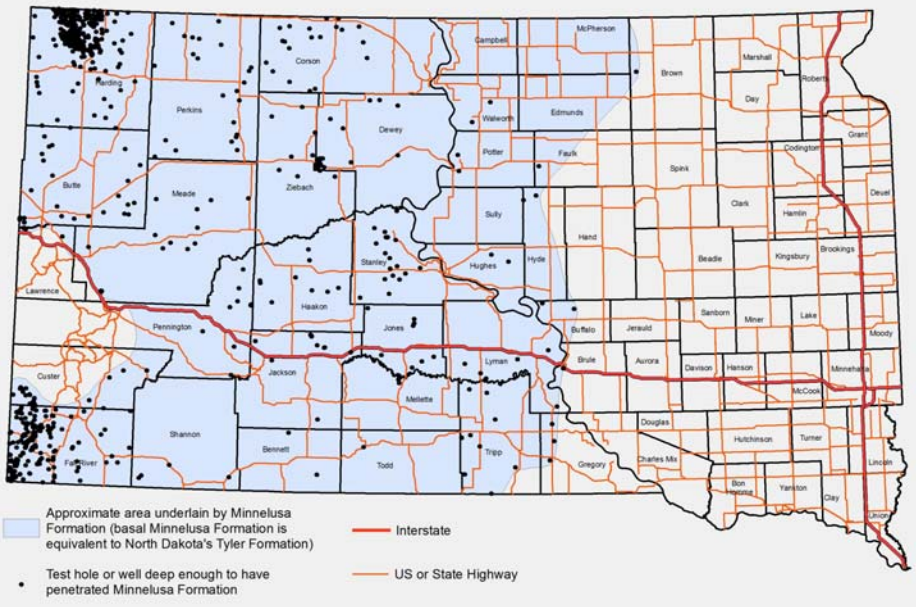
Approximate extent of the Red River Formation and locations of ≈540 test holes and wells deep enough to have penetrated it.



Approximate extent of the Three Forks Shale and ≈438 test holes or wells deep enough to have penetrated it.

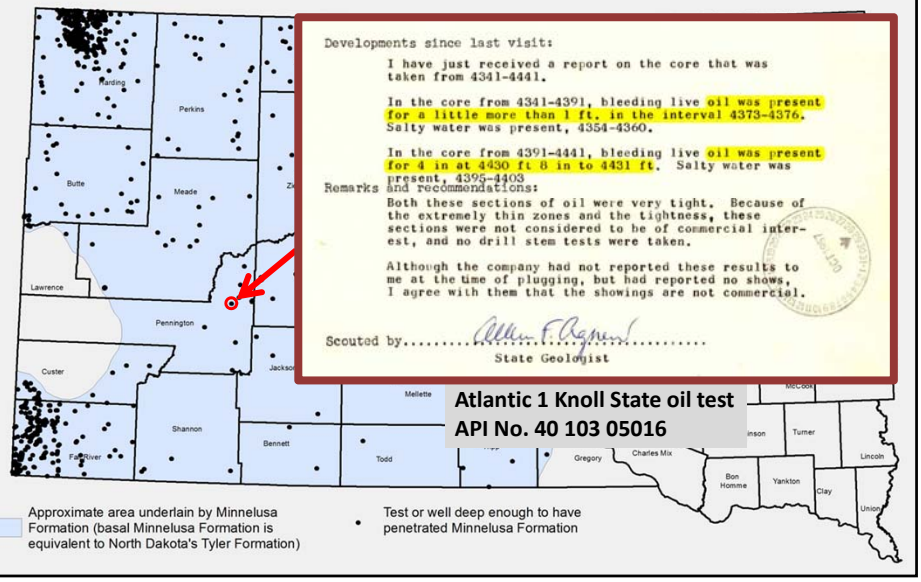


Approximate extent of the Minnelusa Formation and ≈904 test holes or wells deep enough to have penetrated it.



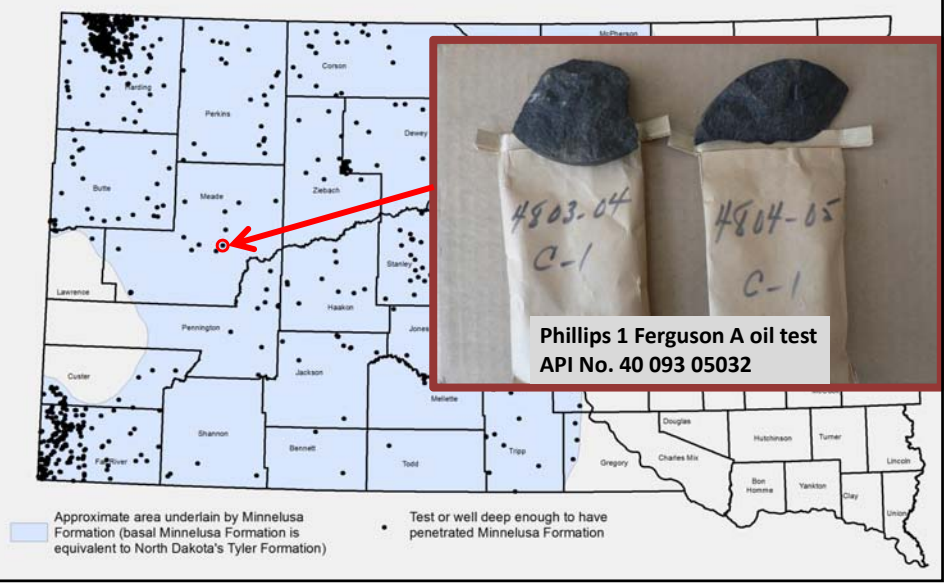
Oil Show in Minnelusa Formation

Drilled in 1957, Pennington County – just North of Wall



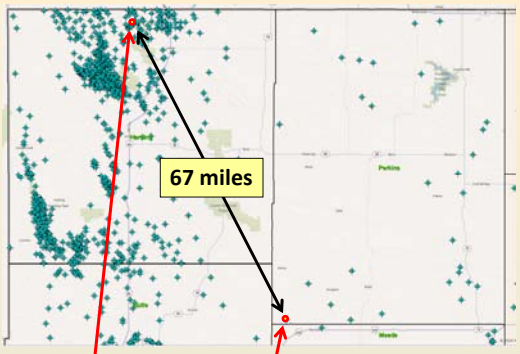
Oil Staining in the Basal Minnelusa Formation

Drilled in 1957,
Central Meade County



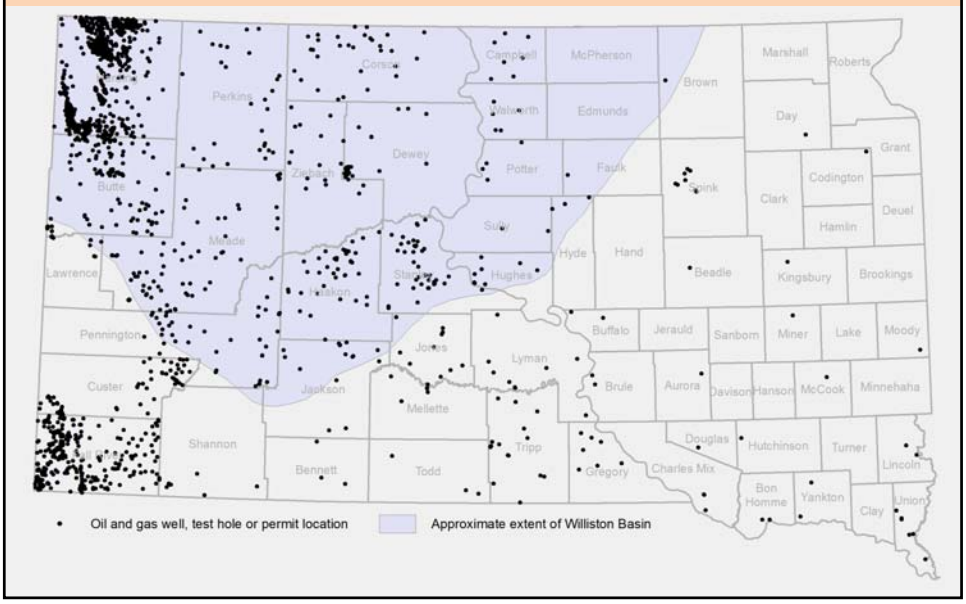
Geological Disadvantages

1. **No Bakken formation**
2. **No Bakken oil leakage to other formations**
3. **Williston Basin shallows and thins to the South**

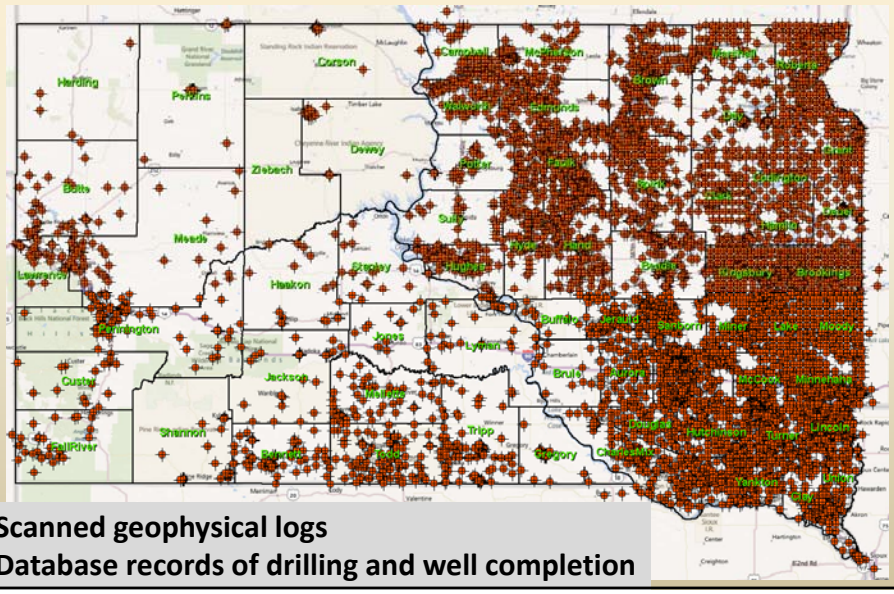


Formation	North Dakota	Harding Co.	Perkins Co.
	Depth (ft)		
Minnelusa (Tyler)	7,500-8,200	6,170	4,642
Bakken	9,000-10,000	Not present	
Three Forks Shale	10,000-10,500	8,228	6,310
Red River	14,000	8,826	6,752

Map showing the approximately 1,900 locations for which the Minerals and Mining Program has an oil and gas permit file.

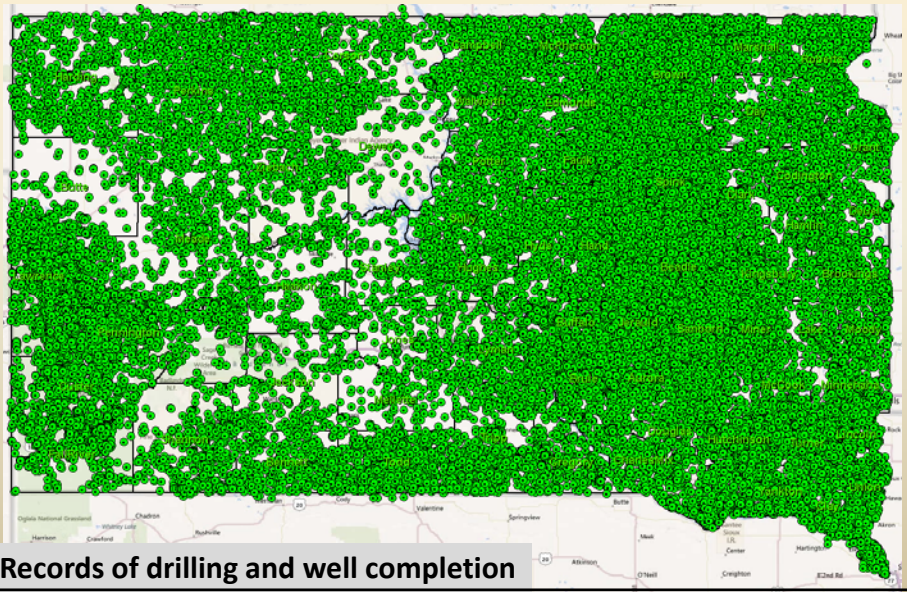


"Geophysical Logs from SDGS Database" data layer showing approximately 5,391 locations for which the Geological Survey Program has down-hole geophysical logs in its files.



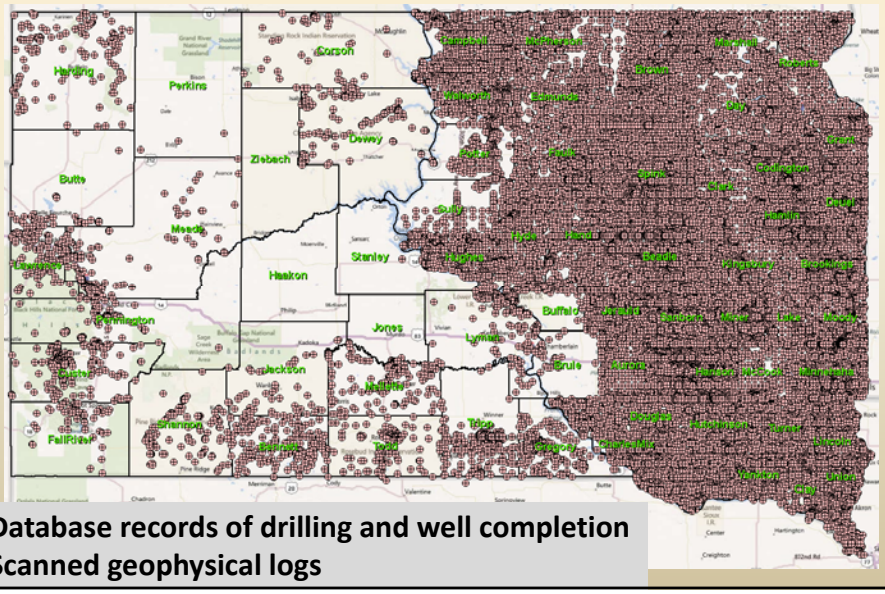
- Scanned geophysical logs
- Database records of drilling and well completion

"Water Rights Water Well Completion Reports" data layer showing approximately 62,245 locations for which the Water Rights Program has a water well completion report.



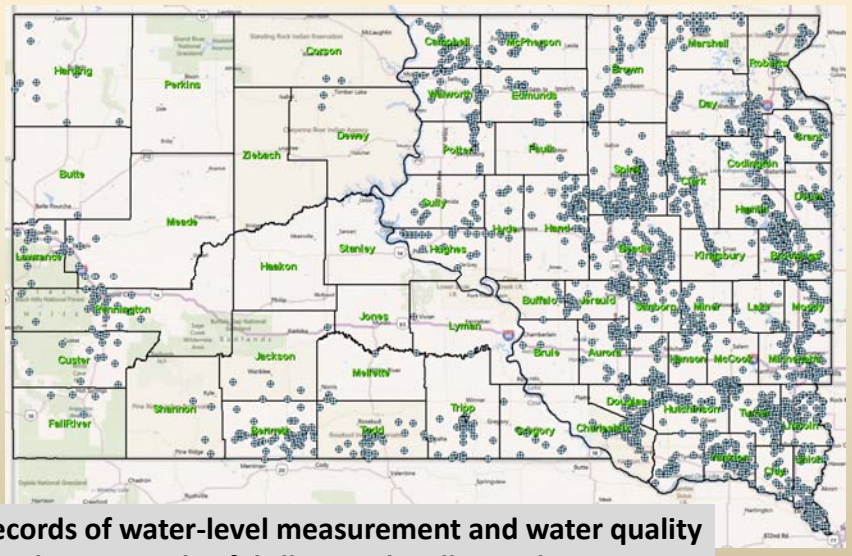
- Records of drilling and well completion

"Lithologic Logs from SDGS Database" data layer showing approximately 34,350 locations for which the Geological Survey Program has a lithologic log.



- Database records of drilling and well completion
- Scanned geophysical logs

"Water Rights Observation Wells" data layer showing approximately 1,555 locations at which the Water Rights Program has an observation well.



- Records of water-level measurement and water quality
- Database records of drilling and well completion

How to get information from the data layers.

Well Name: SHELL 32-31B NIEMI
Permit Number: 270
API Number: 40 063 05015

Well Name: KIRKWOO
Permit Numbe
API Number: 40 0

Oil and Gas Wells : KIRKWOOD 33-36 STATE [Permit# 916]

API Number	40 063 20215
Permit	916
Operator	WILLIAM C KIRKWOOD
Well Name	KIRKWOOD 33-36 STATE
Well Field	BUFFALO
Location	20N-4E-36 NWSE
County	HARDING
Cores Available	N
Kelly Bushing Elevation	3,043.00
Ground Surface Elevation	3,032.00
Total Depth	8,500.00
Class	DRY HOLE
Well Type	DRY HOLE
Status	P&A
Bottom Hole Formation	Red River Formation
Database Record	http://sddenr.net/oil_gas/ind
Scanned Permit File	http://www.sddenr.net/ogfile
Scanned Elogs	http://www.sddenr.net/oglog
Date Issued	6/8/1979 12:00:00 AM
Date Spudded	9/18/1979 12:00:00 AM
Date Plugged	10/13/1979 12:00:00 AM

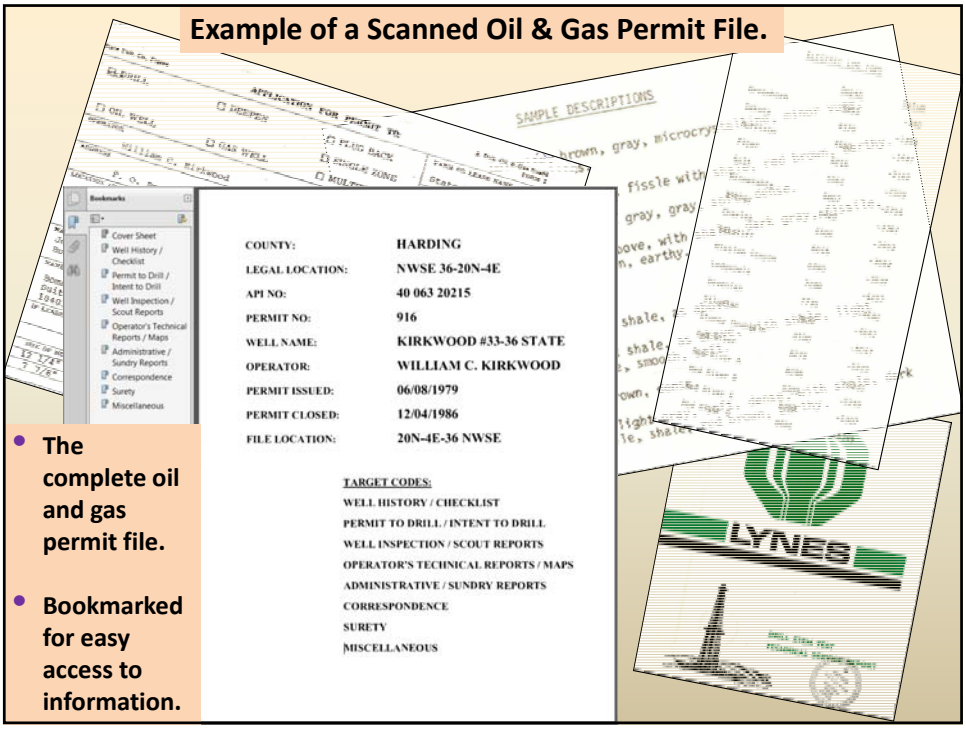
1. Click on
   - a data point,
   - an enhanced recovery unit, or
   - an oil and gas field

   to retrieve information for that location, unit, or field.

Data layers are also searchable.

2. Click on available links to access more information.

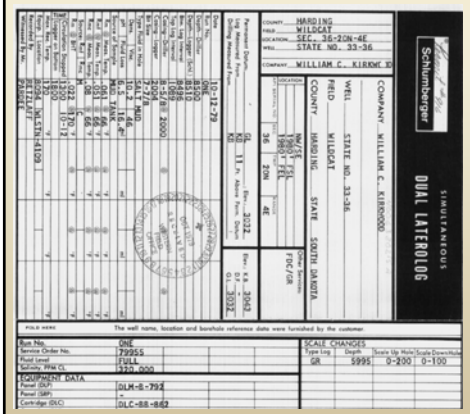
Example of a Scanned Oil & Gas Permit File.

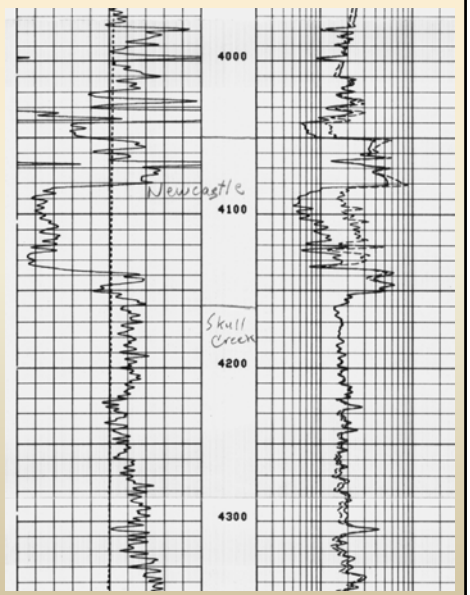


- The complete oil and gas permit file.
- Bookmarked for easy access to information.

Example of a Directory of Scanned "Elogs" for a Particular Well, and a Geophysical Log.

Click on a link to download a log.





SOUTH DAKOTA OIL DEVELOPMENT PROJECTIONS

Purpose: Estimate the scope of oil development in South Dakota through 2027. The Department of Environment and Natural Resources, in consultation with the Office of the Governor, developed these estimates as a planning tool designed to help state and local leaders assess the state's level of preparedness in light of possible future increases in South Dakota's oil development.

General Assumptions/Information:

1. Drilling & Production Data: The following table contains the fiscal, drilling, and production data used in developing the projections in this report.

Year	SD Crude Oil First Purchase Price (Dollars per Barrel, from US EIA, Calendar Year)	Total Barrels Produced in SD (Calendar Year)[1]	New Large Scale Oil Wells Drilled (Calendar Year)[2]	Total Number of Producing Oil Wells in SD (Calendar Year) [3]	Approximate Total Value of Oil Produced in SD (Calendar Year)	Severance Tax (4.5% of oil & gas, Fiscal Year) [4]
1995	$15.53	1,352,436	7	143	$20,783,666	$988,468
1996	$19.63	1,257,748	8	149	$19,258,372	$945,898
1997	$18.16	1,335,293	8	152	$24,749,089	$1,178,336
1998	$12.83	1,206,463	1	147	$20,120,307	$966,485
1999	$16.35	1,100,249	4	137	$11,930,446	$599,221
2000	$28.14	1,170,665	7	140	$21,205,264	$1,051,052
2001	$23.52	1,254,741	5	137	$32,763,298	$1,565,796
2002	$23.83	1,213,752	4	137	$26,126,606	$1,239,037
2003	$28.96	1,237,308	3	139	$29,690,547	$1,444,796
2004	$38.37	1,355,260	7	141	$34,246,851	$1,658,364
2005	$50.50	1,469,635	29	142	$52,768,944	$2,506,931
2006	$51.89	1,394,290	17	141	$69,734,974	$3,255,856
2007	$61.22	1,664,889	29	144	$67,683,869	$3,152,890
2008	$87.29	1,696,842	19	145	$114,933,208	$5,526,990
2009	$51.00	1,658,196	6	144	$119,220,059	$5,596,540
2010	$69.00	1,606,259	8	145	$94,876,638	$4,505,530
2011	$87.10	1,612,969	7	147	$113,945,232	$5,276,994
Annual Average	**$36.49**	**1,387,470**	**10**	**143**	**$51,413,963**	**$2,438,776**
	17-Year Total	**23,586,995 Barrels**	**169 [5] New Wells**		**$874,037,370 Production Value**	**$41,459,184 Taxes Paid**

1. Historic production data is approximate and currently under review by DENR.
2. In South Dakota, large scale oil wells are drilled with oil rigs at an approximate cost of $2.5 million per well, and generally involve thousands of feet of horizontal well bore in deep (8,000 to 9,000 feet) geological units. Conversely, small scale oil wells are drilled with conventional water well rigs at an approximate cost of $100,000 per well, and are generally vertical wells targeting shallow geological units (500 to 3,000 feet).
3. Includes both large scale and small scale wells producing statewide. Does not include enhanced recovery injection wells. The stable trend in number of producing wells indicates new wells are drilled at about the same rate as old wells are abandoned.
4. Annual severance tax includes tax paid on natural gas produced in South Dakota. On average, 94% of severance tax is generated from oil production, and 6% is generated from natural gas production.
5. The 169 large scale wells drilled since 1995 include 10 dry holes, 22 enhanced recovery injection wells, and 137 new production wells. Many of the "new" production wells are horizontal laterals drilled off older vertical wells.

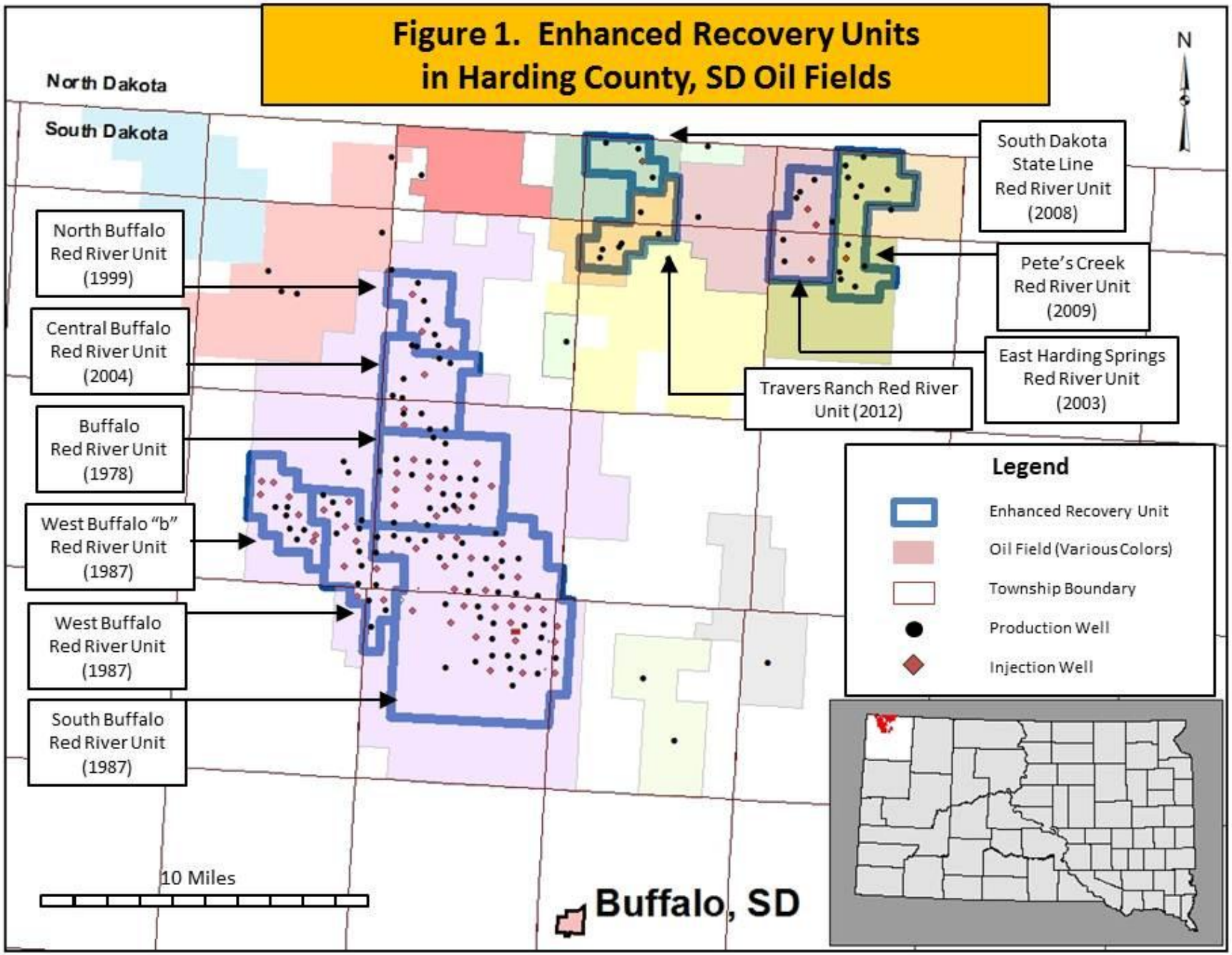
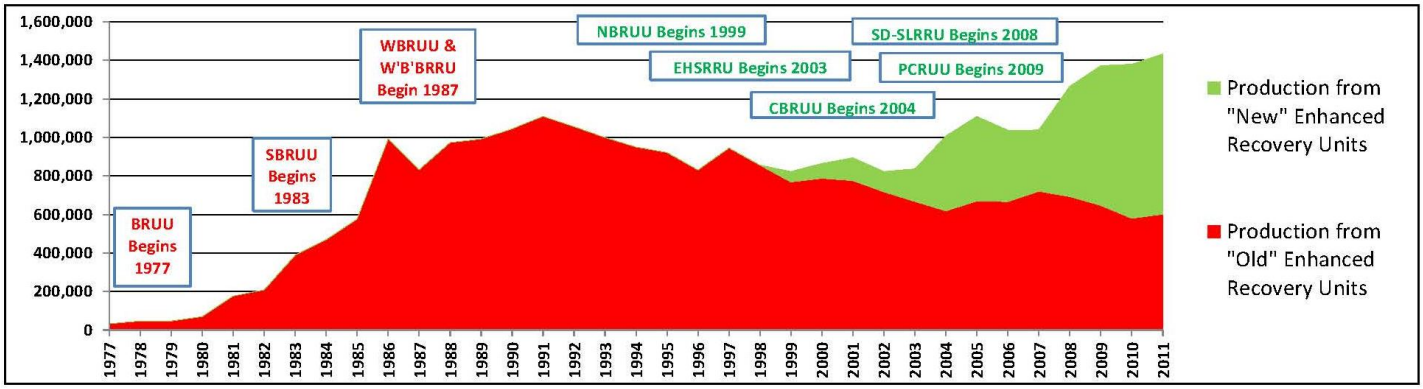


Figure 1. Enhanced Recovery Units in Harding County, SD Oil Fields
North Dakota
South Dakota
N
South Dakota State Line Red River Unit (2008)
Pete's Creek Red River Unit (2009)
East Harding Springs Red River Unit (2003)
Travers Ranch Red River Unit (2012)
North Buffalo Red River Unit (1999)
Central Buffalo Red River Unit (2004)
Buffalo Red River Unit (1978)
West Buffalo "b" Red River Unit (1987)
West Buffalo Red River Unit (1987)
South Buffalo Red River Unit (1987)
Legend
Enhanced Recovery Unit
Oil Field (Various Colors)
Township Boundary
Production Well
Injection Well
10 Miles
Buffalo, SD

2. Background Information: Approximately 98% of the oil produced in South Dakota comes from a 400-square mile area located between the town of Buffalo and the North Dakota border (Figure 1). This north central Harding County production area is made up of 14 oil fields, of which the largest and oldest is the Buffalo Field. The producing geologic unit associated with these fields is the Red River Formation, which occurs at a depth of between 8,000 and 9,000 feet. The Red River Formation is several hundred feet thick, but the producing zones are much thinner. The primary target zone is a 10 to 15-foot thick sub-unit of the Red River Formation known as the Red River "B". While the vast majority of Red River production comes from the "B" layer, oil has been or is currently produced from other relatively thin Red River sub-units, particularly the Red River "D". Production in the Buffalo area began in 1954. To date, the Red River pool underlying north central Harding County is the only known significant oil resource in South Dakota. Most oil produced from the Buffalo field area is transported to Baker, Montana via truck or pipeline.

Current Buffalo field area Red River production (2011) amounts to around 1.6 million barrels of oil per year produced from about 150 wells. In comparison, North Dakota's Bakken production (2011) amounts to approximately 126 million barrels per year from about 3,350 wells. (North Dakota's total 2011 production from all geologic units amounts to approximately 152 million barrels from about 6,650 wells.) The Buffalo field area is considered "mature" in terms of oil development and production. More than 88% of Buffalo area production involves enhanced recovery techniques such as "water flood" (water injection) or "fire flood" (air injection) to improve or rejuvenate production later in a field's life (see Figure 1 for the locations of the 10 enhanced recovery units in the Buffalo production area). Some oil fields in the Buffalo area have been subject to enhanced recovery for decades. Production rates associated with decades-old enhanced recovery projects are characterized by steady decline. Overall production trends for the Buffalo area remain level as increased production from newer secondary recovery units makes up for declining production from the older secondary recovery projects (Figure 2).

Figure 2. Barrels of Oil per Year Produced from Buffalo Area Enhanced Recovery Units (Old vs. New)



3. Assumptions—Oil Exploration as Related to Expanded Development: South Dakota is generally considered underexplored compared with surrounding states. However, South Dakota is not unexplored. There have been hundreds of oil test wells and other deep wells drilled throughout the northwestern part of the state, which is the region of greatest potential for future oil discovery. Geophysical data and other detailed information describing oil and water wells drilled throughout the state are available on the DENR's Oil and Gas Map-Based Data Source at http://www.sdgs.usd.edu/SDOIL/oilgas_app.html. Given the level of exploration performed to date, discovery of a "Bakken-sized" oil reserve in South Dakota is unlikely.

The existence of oil in North Dakota's Bakken formation was well-known for approximately 50 years prior to recent extensive development. Unfortunately, South Dakota has no significant known oil resources other than

the Buffalo Red River pool. This means a significant increase in statewide oil development can only occur if a new oil resource is discovered. The exploration work necessary to discover a new reserve would likely take several years, or longer. Unfortunately, it's unlikely that existing or new operators will forsake known North Dakota reserves to invest millions of dollars in risky exploration work needed to identify a new field in northwestern South Dakota. However, exploration risk is related to the price of oil, so if oil prices climb over the next ten years, the intensive exploration needed to bring about major increases in South Dakota oil development may become economically feasible.

Significant future exploration in South Dakota would probably be delayed if crude oil prices decline in the immediate future. This may occur as new horizontal drilling and high-pressure multi-stage hydraulic fracturing (fracking) technologies spread to other parts of the world. For example, the Bazhenov Formation in Russia is purportedly 80 times the size of North Dakota's Bakken Formation. Implementation of "tight oil" production technologies in this and other "tight shale oil" formations around the globe may stabilize or lower the price of crude oil over the next 15 years as has recently occurred with natural gas prices.

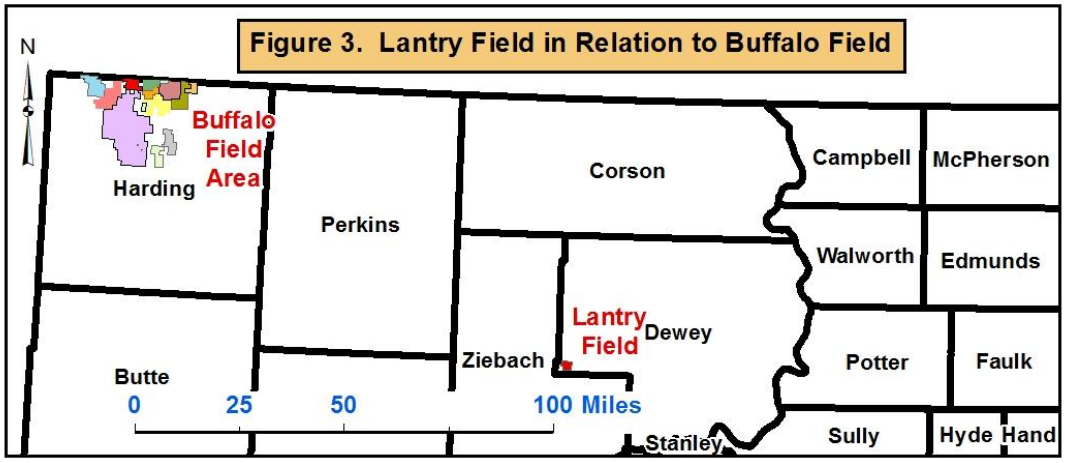
4. Assumptions—Target Formations: While most of western South Dakota lies within the Williston Basin, the Bakken Formation does not occur in South Dakota. Other geologic units known to produce oil in North Dakota and other adjacent states do occur in western South Dakota. Most notably, the Minnelusa Formation (the bottom-most layer of the Minnelusa is equivalent to North Dakota's Tyler Formation) and the Three Forks Formation both occur in northwestern South Dakota at depths between 4,000 and 8,000 feet below the surface. Both of these potential target formations are younger than the Red River Formation, meaning they occur above the Red River in the stratigraphic column. This is noteworthy because the (deeper) Red River Formation has been extensively drilled in Harding County without a known discovery of economically producible oil from one of the overlying stratigraphic units.

While both the Three Forks and Minnelusa are potential exploration targets in South Dakota, the likelihood of discovering oil in these units is less than that of discovering a new Red River oil resource. In regard to the Three Forks, this assumption is supported by prevalent thought on the source of oil in this formation. Although still subject to scientific debate, many think the source of oil in North Dakota's Three Forks is the Bakken Formation, which directly overlies the Three Forks in North Dakota. So, since South Dakota does not have the Bakken, the Three Forks may prove much less productive in South Dakota than in North Dakota. Geologic data describing the Minnelusa indicate the spatial extent of this formation that is most likely to yield significant quantities of oil coincides with the existing Buffalo field area. Therefore, the fact that no significant Minnelusa oil has been discovered during the 60 years of Harding County oil development is discouraging. The lack of an inadvertent Minnelusa discovery during the past 60 years does not preclude the possibility of a future discovery in Harding County or elsewhere in northwest South Dakota. However, the likelihood of a significant Minnelusa discovery in northwest South Dakota is low relative to the likelihood of a new Red River discovery.

The portion of northwest South Dakota between the Buffalo production area and Dewey County is of particular interest in terms of potential for future oil discovery (Figure 3). The Buffalo area and the previously produced Lantry Field (on the Ziebach-Dewey County line) share the same oil producing unit, which is the Red River Formation. Lantry Field produced approximately 130,000 barrels of Red River oil between 1976 and 2002. The 100-mile long by 30-mile wide area between Buffalo and Lantry is one of the least explored portions of western South Dakota. Existing exploration data associated with this area does not rule out the possibility that a Red River

oil resource comparable in size to the Buffalo field area may yet be discovered somewhere between Buffalo and Lantry Field.

The oil production scenarios (pages 6 – 9) account for only large scale oil drilling activities. Additional small scale drill rigs (essentially small water well drill rigs) will continue to drill shallow "Minnelusa" oil wells in Fall River County and possibly target other shallow reserves along the fringes of the Black Hills. Shallow small scale drilling activities would involve a significantly smaller (probably negligible) effect on statewide production and the economy as compared to large scale drilling in northwest South Dakota.



5. Job Assumptions:

The 80 total full-time jobs associated with each large scale rig (drilling deep horizontal wells at a cost of $2.5 million/well) include:

30 Drill Rig Personnel:

-15 full-time rig crew

-7 specialty workers (14 half-time workers—casing & cementing crews)

-8 full-time work-over rig personnel

10 Direct Support Personnel:

-10 full-time road/pad construction & maintenance crews, truck drivers, etc.

40 Service Support Personnel:

-1 full-time service support worker for each rig hand and direct support position—Wal-Mart, McDonalds, lodging, EMS, etc.

The 120 total full-time jobs associated with large scale rigs potentially developing unconventional (Three Forks Shale) reserves in South Dakota are similar to those listed above. However, more specialty workers (hydraulic fracturing crews) and associated support positions account for the higher estimated number of total workers associated with drilling for unconventional oil.

Projected Oil Development Scenarios: The following scenarios comprise a "best educated guess" at what South Dakota's oil development will look like during the next 15 years. These projections are loosely tiered according to likelihood and/or utilizing a best-case scenario versus worst-case scenario approach. Fiscal projections do not account for inflation. The table on page 10 summarizes the ranges of projected figures developed under the four scenarios.

Scenario 1: "LIKELY"

Scenario 1—Narrative: This scenario assumes, 1) steady oil prices; 2) no new exploration occurs in northwest South Dakota; 3) no new oil resources are discovered in South Dakota; and 4) current Buffalo area Red River operations and development continue at a steady rate. Under this scenario, the price of oil remains steady due to the spread of tight-oil production technologies to other countries with vast tight-oil resources. Development of North Dakota's Bakken continues at a diminished yet robust pace. Based upon the steady price of oil, the substantial exploration investment necessary to discover a new oil resource in northwest South Dakota remains uneconomical. New development of South Dakota's known Buffalo area oil resource continues at the baseline rate of around 12 new wells per year. Overall Harding County production remains level as yields from new developments replace declining production from aging enhanced recovery units.

Scenario 1—Table:

Timeframe	Full-time Rigs Drilling in SD	Private Jobs	Type of Operations	Primary Target Unit	Primary Production Area	New Wells per Year[1]	Total Producing Oil Wells in SD	Statewide Annual Oil Production	Average Value[3] of Crude in NW SD	Annual Oil Severance Tax Paid (4.5%)
2008 -2012 BASELINE	1	80	Enhanced Recovery in Mature Fields	Red River "B"	North Central Harding Co.	12	145	1.6 Million Barrels[2]	$73	$5.3 Million
2013 - 2017	1	80	Enhanced Recovery in Mature Fields	Red River "B"	North Central Harding Co.	12	145	1.6 Million Barrels	$73	$5.3 Million
2018 - 2022	1	80	Enhanced Recovery in Mature Fields	Red River "B"	North Central Harding Co.	12	145	1.6 Million Barrels	$73	$5.3 Million
2023 - 2027	1	80	Enhanced Recovery in Mature Fields	Red River "B"	North Central Harding Co.	12	145	1.6 Million Barrels	$73	$5.3 Million

1. A large scale oil rig drills approximately one horizontal Red River "B" well per month.

2. Production has been steady from 2007 – 2012. New production from new enhanced recovery units and wells is essentially replacing declining production from existing (mature) units and wells. Projected monetary figures listed in 2012 US dollars.

3. SD Crude Oil First Purchase Price; baseline is an approximate average of available 2008 – 2012 monthly average price from US Energy Information Administration.

Scenario 2: "PESSIMISTIC"

Scenario 2—Narrative: This scenario assumes, 1) declining oil prices; 2) no new exploration occurs in northwest South Dakota; 3) no new oil resources are discovered in South Dakota; and 4) current Buffalo area Red River operations and development continue at a diminished rate. Under this scenario, the price of oil declines as the spread of tight-oil production technologies to other countries with vast tight-oil resources exceeds global demand. Development of North Dakota's Bakken continues at a diminished pace until operators' production costs exceed their profit threshold. Based upon the declining price of oil, the substantial exploration investment necessary to discover a new oil resource in northwest South Dakota remains uneconomical. New development of South Dakota's known Buffalo area oil resource continues at around 50% of the baseline rate. Overall Harding County production declines because yields from new development no longer balance declining production from aging enhanced recovery units.

Scenario 2—Table:

Timeframe	Full-time Rigs Drilling in SD	Private Jobs	Type of Operations	Primary Target Unit	Primary Production Area	New Wells per Year[1]	Total Producing Oil Wells in SD	Statewide Annual Oil Production	Average Value[3] of Crude in NW SD	Annual Oil Severance Tax Paid (4.5%)
2008 -2012 BASELINE	1	80	Enhanced Recovery in Mature Fields	Red River "B"	North Central Harding Co.	12	145	1.6 Million Barrels[2]	$73	$5.3 Million
2013 - 2017	0.8	64	Enhanced Recovery in Mature Fields	Red River "B"	North Central Harding Co.	10	135	1.5 Million Barrels	$65	$4.4 Million
2018 - 2022	0.66	48	Enhanced Recovery in Mature Fields	Red River "B"	North Central Harding Co.	8	115	1.3 Million Barrels	$50	$2.9 Million
2023 - 2027	0.5	40	Enhanced Recovery in Mature Fields	Red River "B"	North Central Harding Co.	6	85	0.9 Million Barrels	$40	$1.6 Million

1. A large scale oil rig drills approximately one horizontal Red River "B" well per month.

2. Production has been steady from 2007 – 2012. New production from new enhanced recovery units and wells is essentially replacing declining production from existing (mature) units and wells. Projected monetary figures listed in 2012 US dollars.

3. SD Crude Oil First Purchase Price; baseline is an approximate average of available 2008 – 2012 monthly average price from US Energy Information Administration.

Scenario 3: "OPTIMISTIC"

Scenario 3—Narrative: This scenario assumes, 1) increasing oil prices; 2) significant exploration occurs in northwest South Dakota; 3) a new Red River oil resource comparable in size to the existing Buffalo area resource is discovered in northwest South Dakota; and 4) current Buffalo area Red River operations and development continue at an increased rate. Under this scenario, the price of oil increases as with global demand. Development of North Dakota's Bakken continues at a steady pace. New development of South Dakota's known Buffalo area oil resource increases to around 150% of the baseline rate. Based on the increasing price of oil, operators pursue the substantial exploration investment necessary to discover a new Red River oil resource in northwest South Dakota. Production from the existing Buffalo area resource increases as yields from new development exceed the production losses associated with aging enhanced recovery units. Development of the newly discovered (hypothetical) Red River resource fosters a significant surge in statewide production.

Scenario 3—Table:

Timeframe	Full-time Rigs Drilling in SD	Private Jobs	Type of Operations	Primary Target Unit	Primary Production Area	New Wells per Year[1]	Total Producing Oil Wells in SD	Statewide Annual Oil Production	Average Value[3] of Crude in NW SD	Annual Oil Severance Tax Paid (4.5%)
2008 -2012 BASELINE	1	80	Enhanced Recovery in Mature Fields	Red River "B"	North Central Harding Co.	12	145	1.6 Million Barrels[2]	$73	$5.3 Million
2013 - 2017	1.5	120	BASELINE + **Major Expansion of BASELINE Production Area**	Red River "B"	North Central Harding Co.	18	175	1.9 Million Barrels	$83	$7.1 Million
2018 - 2022	3	240	Continuing Expanded BASELINE + **Developing a New Major Red River "B" Field**	Red River "B"	North Central Harding Co. + **Unidentified Area in Northwest South Dakota**	36	295	3.2 Million Barrels	$93	$13.4 Million
2023 - 2027	2	160	Enhanced Recovery in Mature Fields + **Unitization and Enhanced Recovery in New Field**	Red River "B"	North Central Harding Co. + **Unidentified Area in Northwest South Dakota**	24	355	3.9 Million Barrels	$103	$18.1 Million

1. A large scale oil rig drills approximately one horizontal Red River "B" well per month.

2. Production has been steady from 2007 – 2012. New production from new enhanced recovery units and wells is essentially replacing declining production from existing (mature) units and wells. Projected monetary figures listed in 2012 US dollars.

3. SD Crude Oil First Purchase Price; baseline is an approximate average of available 2008 – 2012 monthly average price from US Energy Information Administration.

Scenario 4: "VERY OPTIMISTIC"

Scenario 4 Narrative: This scenario assumes, 1) increasing oil prices; 2) significant exploration occurs in northwest South Dakota; 3) a new Red River oil resource comparable in size to the existing Buffalo area resource is discovered in northwest South Dakota; 4) a new Minnelusa or Three Forks oil resource is discovered in northwest South Dakota; and 5) current Buffalo area Red River operations and development continue at an increased rate. Under this scenario, the price of oil increases as with global demand. Development of North Dakota's Bakken continues at a steady pace. New development of South Dakota's known Buffalo area oil resource increases to around 150% of the baseline rate. Based on the increasing price of oil, operators pursue the substantial exploration investment necessary to discover both a new Red River oil resource and a significant Minnelusa or Three Forks oil resource in northwest South Dakota. Production from the existing Buffalo area oil resource increases as yields from new development exceed the production losses associated with aging enhanced recovery units. Development of the newly discovered (hypothetical) Red River and Minnelusa/Three Forks resources fosters a significant surge in statewide production.

Scenario 4—Table:

Timeframe	Full-time Rigs Drilling in SD	Private Jobs	Type of Operations	Primary Target Unit	Primary Production Area	New Wells per Year[2]	Total Producing Oil Wells in SD	Statewide Annual Oil Production	Average Value[4] of Crude in NW SD	Annual Oil Severance Tax Paid (4.5%)
2008 -2012 BASELINE	1	80	Enhanced Recovery in Mature Fields	Red River "B"	North Central Harding Co.	12	145	1.6 Million Barrels[3]	$73	$5.3 Million
2013 - 2017	1.5	120	BASELINE + **Major Expansion of BASELINE Production Area**	Red River "B"	North Central Harding Co.	18	175	1.9 Million Barrels	$83	$7.1 Million
2018 - 2022	3	240	Continuing Expanded BASELINE + **New Major Red River "B" Field**	Red River "B"	North Central Harding Co. + **Unidentified Area in Northwest South Dakota**	36	295	3.2 Million Barrels	$93	$13.4 Million
2023 - 2027	6	480 - 720[1]	Continuing Expanded BASELINE + **New Major Red River "B" Field** + **New Major Minnelusa or Three Forks Field**	Red River "B" + Minnelusa or Three Forks	North Central Harding Co. + **Unidentified Area in Northwest SD** + **A Second Unidentified Area in Northwest SD**	72	595	6.5 Million Barrels	$103	$30.1 Million

1. Total workers per rig would be higher (up to 120 drilling, support, and service positions per rig) if drilling occurs in the Three Forks unconventional play, which would involve multi-stage hydraulic fracturing crews.

2. A large scale oil rig drills approximately one horizontal Red River "B" well per month.

3. Production has been steady from 2007 – 2012. New production from new enhanced recovery units and wells is essentially replacing declining production from existing (mature) units and wells. Projected monetary figures listed in 2012 US dollars.

4. SD Crude Oil First Purchase Price; baseline is an approximate average of available 2008 – 2012 monthly average price from US Energy Information Administration.

Summary of Scenarios 1 – 4

Summary: The following table outlines the range of projected figures developed under the four scenarios. The lower end of each range is the number/parameter projected under the "Pessimistic" scenario, and the upper end of each range is the figure projected under the "Very Optimistic" scenario.

Timeframe	Full-time Rigs Drilling in SD	Private Jobs	Type of Operations	Primary Target Unit	Primary Production Area	New Wells per Year[2]	Total Producing Oil Wells in SD	Statewide Annual Oil Production	Average Value[4] of Crude in NW SD	Annual Oil Severance Tax Paid (4.5%)
2008 -2012 BASELINE	1	80	Enhanced Recovery in Mature Fields	Red River "B"	North Central Harding Co.	12	145	1.6 Million Barrels[3]	$73	$5.3 Million
2013 - 2017	0.8 – 1.5	64 -120	Declining BASELINE vs. Major Expansion of BASELINE Area	Red River "B"	North Central Harding Co.	10 - 18	135 - 175	1.5 - 1.9 Million Barrels	$65 - $83	$4.4 - $7.1 Million
2018 - 2022	0.66 - 3	48 - 240	Declining BASELINE vs. Expanded BASELINE + New Major Red River "B" Field	Red River "B"	North Central Harding Co. Only vs. BASELINE + Unidentified Area in Northwest SD	8 - 36	115 - 295	1.3 – 3.2 Million Barrels	$50 - $93	$2.9 - $13.4 Million
2023 - 2027	0.5 - 6	40 -720[1]	Declining BASELINE vs. New Major Red River "B" Field + New Major Minnelusa or Three Forks Field	Red River "B" vs. Red River "B" + Minnelusa or Three Forks	North Central Harding Co. vs. BASELINE + Unidentified Area in Northwest SD + A Second Unidentified Area in Northwest SD	6 - 72	85 - 595	0.9 – 6.5 Million Barrels	$40 - $103	$1.6 - $30.1 Million

1. Total workers per rig would be higher (up to 120 if drilling occurs in the Three Forks unconventional play, which would involve multi-stage hydraulic fracturing crews and additional support positions.

2. A large scale oil rig drills approximately one horizontal Red River "B" well per month.

3. Production has been steady from 2007 – 2012. New production from new enhanced recovery units and wells is essentially replacing declining production from existing (mature) units and wells. Projected monetary figures listed in 2012 US dollars.

4. SD Crude Oil First Purchase Price; baseline is an approximate average of available 2008 – 2012 monthly average price from US Energy Information Administration.

Oil & Gas Taxation in South Dakota

The oil and gas industry in South Dakota is subject to three types of taxes: the sales and use tax, the energy mineral severance tax, and the conservation tax. While other taxes may also apply to the industry, this discussion will focus on these three taxes.

SALES AND USE TAX

South Dakota imposes a 4% sales and use tax on the sale or use of most tangible personal property as well as most services.[1] The oil and gas industry is no exception and the tax applies to oil and gas field services as well as equipment used in the performance of those services. Since oil and gas activity is generally located outside of a municipality, municipal taxes are not a factor.

Examples of taxable equipment and other products brought into South Dakota to be used in oil and gas field services may include drill rigs, gravel, tools, construction equipment, and diesel fuel. When taxable equipment or other products are brought into South Dakota from another state, and no tax has been paid, use tax is due to South Dakota.

Examples of taxable services performed at the well site may include chemically treating wells, cleaning wells & tanks, drilling, gas compressing, hot shot services, fracturing, oil sampling, pipe testing, plugging wells, pumping, repairs, roustabout services, dismantling of wells, and surveying.

Sales and use tax collections from the oil and gas industry totaled approximately $1,118,162.60 in calendar year 2011. This figure represents receipts from three Standard Industrial Classification Manual categories: Drilling Oil and Gas Wells, Oil and Gas Field Exploration Services, and Oil and Gas Field Services. These three categories would include the drilling of new wells in addition to work performed on existing wells.

ENERGY MINERAL SEVERANCE TAX

South Dakota imposes a 4.5% energy mineral severance tax on the owner or operator of energy minerals for the privilege of severing energy minerals in the state.[2] Energy minerals are defined as any mineral fuel including coal, lignite, petroleum, oil, natural gas, uranium, and thorium and any combination of minerals used in the production of energy.[3] The taxable value is the sale price or market value of the energy mineral less any royalty payment belonging to the Unites States or the State of South Dakota or its political subdivisions.[4] However, if the energy mineral has a posted field price at the point of production, then that posted field price is the taxable value.[5]

Revenue collected from the energy mineral severance tax averaged $4,811,846.84 annually during fiscal years 2007-2011. The revenues generated are split equally between the State and the county in which the energy minerals were severed, with the state portion credited to the general fund.[6] The county portion may be used for school and road purposes to offset social, economic, or physical impacts resulting from energy development or production.[7]

In a comparison of severance tax rates of neighboring oil producing states, South Dakota's 4.5% rate is relatively low. North Dakota's rate is generally 11.5%, but there are exemptions for certain production volumes. Montana's rate varies from 0.5% to 14.8% according to the well and type of production. Wyoming's rate is 6% on crude oil and 4% on stripper oil. The document titled "Oil and Gas State Severance Tax as of

[1] SDCL §§ 10-45-2, 10-45-4, 10-46-2, 10-46-2.1.
[2] SDCL § 10-39A-1.
[3] SDCL § 10-39A-1.1(1).
[4] SDCL § 10-39A-2.
[5] SDCL § 10-39A-3.
[6] SDCL § 10-39A-8.
[7] SDCL § 10-39A-10.

2012" from the National Conference of State Legislatures (NCSL) website provides information regarding the tax rates in other states.[8]

CONSERVATION TAX

A conservation tax of 0.24% is imposed on the taxable value of severed energy minerals. The purpose of this tax is to offset the expenditure of state funds on the regulatory functions performed by the Department of Environment and Natural Resources related to energy mineral exploration and development.[9] Revenue collected from the conservation tax averaged $256,476.58 annually during fiscal years 2007-2011.

Tax Incentives Discussion

The question is whether certain tax incentives or tax holidays will encourage additional oil exploration or development in South Dakota. In an effort to answer this question the Department of Revenue looked to the experiences of surrounding states.

In the late 1990's Montana reduced its severance tax rate from 12.5 to 9.0 percent and offered a tax holiday to the oil and gas industry. Applying to wells drilled after 1999, the holiday period was set at 12 months for vertical wells and 18 months for horizontal wells. During the holiday period, the severance tax rate is only 0.5 percent and returns to the basic rate of 9.0 percent upon expiration of the holiday period.[10]

Around the same time, Wyoming studied tax policies, tax incentives, and tax holidays. The studies concluded that tax incentives would not stimulate significant new production, but rather would cost the state millions in lost tax revenue. The studies also concluded that higher tax rates would produce additional revenue with little risk of slowing the energy economy. As a result of these studies, Wyoming chose to remove a 2 percent reduction in severance tax that had been implemented the prior year.[11]

If tax policy were a major influence in oil exploration or production it would be logical to assume that due to the more favorable tax policies, Montana would realize more benefit than Wyoming during the subsequent years. There is no evidence to support the theory that Montana's tax breaks worked. In fact, Montana stimulated less energy development than Wyoming between 2000 and 2006. According to a study by the Montana Department of Revenue in September 2008, the 1999 tax changes cost the state, and its oil and gas producing counties, $515 million in lost revenue between 2003 and 2007.[12] Approximately half of the lost revenue, $258 million, was from the tax holiday alone.[13]

Montana and North Dakota, who each have portions of the oil-rich Bakken formation, have also been compared. Each state offers certain tax incentives, but North Dakota's incentives are based on the price of oil and virtually disappeared in 2009. If tax policy were a driving factor in oil production, one would expect Montana to realize additional oil production activity over North Dakota. That simply is not the case. Since the end of 2009, oil production has more than doubled in North Dakota where the oil resource is the best, while Montana's production, even with a lower tax rate, has declined by 14 percent.[14]

Two academic studies were commissioned by the Wyoming State Legislature in the late 1990's to evaluate the likely impact of tax incentive policies. These studies may offer insight into why tax incentives offered by state governments to oil companies appear to do little to encourage new development. The key findings of the Wyoming research include: [15]

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[8] http://www.ncsl.org/issues-research/energyhome/oil-and-gas-severance-taxes.aspx#severance

[9] SDCL § 10-39B-2.

[10] The Policy Institute, *Montana's Oil and Gas Tax Holiday: Analysis and Recommendation for Change,* 2009.

[11] Headwaters Economics, *Energy Revenue in the Intermountain West,* 2008.

[12] The Policy Institute, *supra* note 10.

[13] Montana Budget & Policy Center, *Can Montana Afford an Oil and Gas Tax Holiday?* 2010.

[14] Headwaters Economics, *Do Tax Subsidies Influence Domestic Oil Production?* 2012.

[15] Headwaters Economics, *supra* note 11.

- The oil and natural gas industries are guided chiefly by the location of reserves, and are less able to relocate than are industries with mobile capital resources (such as textile mills or auto-makers).

- Production taxes are deductible from federal income tax liability so the industry does not feel the full benefit of tax incentives, or pay the full increase in tax hikes. When state production taxes are raised, revenue is shifted from the federal to the state government. Conversely, when state production taxes are lowered, revenue is shifted from the state to the federal government.

- Production taxes are "downstream" taxes, meaning they are levied only on successfully producing wells. As a result, production taxes have little effect on exploration.

- Other factors such as price, access to markets (oil and natural gas pipelines), technology, and regulations have more significant effects on industry activities. Considering tax policy alone cannot fully explain industry choices.

There has been discussion that the sales and use tax may be an impediment to additional oil exploration and development in South Dakota. As explained in an earlier section of this report, South Dakota does impose a broad-based sales and use tax that applies to many products and services in this industry. However, there appears to be a common misconception that an exorbitant amount of sales and use tax will apply to every hole drilled.

For example, a drill rig coming into South Dakota may be subject to the 4% use tax, but only if it is not more than seven years old and another state has not already imposed sales or use tax on that drill rig.[16] South Dakota does grant reciprocity for sales or use tax legally paid to another state so long as that state grants a reciprocal credit.[17] Any applicable use tax would only be due once upon entry into South Dakota, not on every hole drilled. If the drill rig only drills one hole, the applicable use tax on the rig is spread to one hole. As the number of holes drilled by that rig goes up, the proportional use tax cost per hole goes down and is not a significant contributor to the cost of drilling.

The experiences of surrounding states suggest that production and drilling tax deductions and incentives are ineffective at changing the location of oil production. The driving factors influencing drilling activity continue to be geology, technology, and the price of oil, not the severance tax rate or production tax incentives. The outcome of tax deductions and incentives will likely be lower tax revenue, making it more difficult for communities to offset the impacts resulting from energy development or production.[18]

[16] SDCL § 10-46-3.
[17] SDCL § 10-46-6.1.
[18] Headwaters Economics, *supra* note 15.

DENR Actions Addressing
Oil & Gas Split Estate Surface Owner Issues

The impact of oil and gas development to surface owners with severed mineral interests has been a major focus of the work group. This section identifies actions DENR has already undertaken to address surface owner concerns.

1. **Certification of Negotiation**: DENR will not issue a drill permit until oil & gas operators notify the affected surface owner and negotiate payments for surface damages in accordance with SDCL 45-5A. DENR recently updated the form operators use to prove they notified and negotiated with surface owners. The improved form includes a list of surface owner rights the operator is required to give to the affected surface owner.

2. **Surface Restoration Bond**: SDCL 45-9-15.1 requires operators to submit a surface restoration bond in cases where the minerals are severed from the surface estate. The amount of the bond is $2,000 per well or $10,000 for a statewide blanket bond. The bond may be used by the state to reclaim the drill site and access road if the operator fails to.

3. **Surface Owner Release Letter**: Prior to release of surety bonds, DENR sends the affected surface owner a letter asking if surface restoration has been completed to their satisfaction.

4. **Site Visits**: When surface owners communicate complaints or if a spill or environmental issue is reported, DENR sends field inspectors to assess impacts. DENR then works with operators to ensure affected sites are cleaned up or otherwise brought into compliance with applicable oil & gas, underground injection control, solid waste, surface water, and ground water regulations.

5. **Mailing List**: DENR maintains an “interested persons” mailing list, which includes a number of surface owners impacted by oil & gas development. DENR keeps interested persons informed about pending oil & gas cases, hearings, and developments.

6. **Online Information**: DENR provides online access to permit files, interactive maps of areas affected by oil & gas development, contact information for oil & gas operators, and other useful information.

7. **Field Inspection**: DENR performs new drill, routine, plugging, and final surface restoration inspections of all sites, and works with operators to ensure sites comply with state regulations.

8. **Good Working Relationships**: DENR has made an effort to communicate with split estate surface owners, understand their concerns, and include them in appropriate discussions and decisions (e.g., seeking input to help develop less destructive soil remediation standards for oil spill cleanup.).

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES
Minerals & Mining Program
2050 West Main, Suite #1, Rapid City, SD 57702-2493
Telephone: 605-773-4201, FAX: 605-394-5317

FORM 9

CERTIFICATE OF NOTIFICATION AND NEGOTIATION WITH SURFACE OWNER/SURFACE LESSEE

Surface Owner/Lessee _____

Surface Owner/Lessee Address of Record _____

Well Name/Project Description_____

Township _____ Range _____ Section _____County _____

Date Surface Owner/Lessee Notified and Served with Both Pages of this Form _____

In accordance with SDCL 45-5A, I hereby certify,

1) I notified the above listed surface owner or lessee of the proposed drilling operations, sufficiently disclosing the plan of work and operations so as to enable the surface owner to evaluate the effect of drilling operations on the surface owner's use of the property;
2) I included with this notice a copy of both pages of this form, advising the surface owner of his or her rights and options under SDCL 45-5A; and
3) That to the best of my knowledge and belief, an agreement regarding compensation for damages to livestock and surface land resulting from drilling operations on the described property has been or is being negotiated with the surface landowners or lessees, as listed above.

Operator Name: _____

_____ _____ _____
Signature Title Date

FORM 9, Page 1—submit to DENR with permit application, furnish copy to Surface Owner/Lessee

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES
Minerals & Mining Program
2050 West Main, Suite #1, Rapid City, SD 57702-2493
Telephone: 605-773-4201, FAX: 605-394-5317

RIGHTS OF SURFACE OWNERS AFFECTED BY OIL & GAS OPERATIONS

(Taken from SD Codified Law Chapter 45-5A)

45-5A-4. Compensation to surface owner for losses—Determining damages--Payment. The mineral developer shall pay the surface owner a sum of money equal to the amount of damages sustained by the surface owner for loss of agricultural production, lost land value, and lost value of improvements caused by mineral development. The amount of damages may be determined by any formula mutually agreeable between the surface owner and the mineral developer. In determining damages, consideration shall be given to the period of time during which the loss occurs and the surface owner may elect to be paid damages in annual installments over a period of time. However, the surface owner shall be compensated for harm caused by exploration only by a single sum payment. The payments contemplated by this section shall only cover land directly affected by mineral development. Payments under this section for lost land value shall be paid only to the title holder of such land. Any reservation or assignment of such compensation apart from the surface estate except to a lessee of the surface estate is prohibited.

45-5A-5. Notice to surface owner of proposed development and rights under chapter. The mineral developer shall give the surface owner written notice of proposed mineral development, other than exploration activities, at least thirty days before the date operations are commenced. This notice shall be given to the record surface owner at the surface owner's address as shown by the records of the county register of deeds at the time the notice is given. This notice shall sufficiently disclose the plan of work and operations to enable the surface owner to evaluate the effect of drilling operations on the surface owner's use of the property. Included with this notice shall be a form prepared by the Department of Environment and Natural Resources advising the surface owner of his or her rights and options under this chapter.

45-5A-6. Responsibilities of developer. The mineral developer is responsible for all damages to property, real or personal, resulting from the lack of ordinary care by the mineral developer. The mineral developer is also responsible for all damages to property, real or personal, resulting from an interference caused by mineral development.

45-5A-7. Time for notice of damages to developer. The affected surface owner, to receive compensation, pursuant to §§ 45-5A-8 and 45-5A-9, shall notify the mineral developer, in writing, of the damages sustained by the affected surface owner within two years after the injury becomes apparent or should have become apparent to a reasonable person.

45-5A-8. Offer of settlement by developer. Unless both parties provide otherwise by written agreement, within sixty days after the mineral developer receives notice of damages the mineral developer shall make a written offer of settlement to the person seeking compensation for the damages. The person seeking compensation may accept or reject any offer so made within sixty days of receipt.

45-5A-9. Action for compensation. If the person seeking compensation receives a written rejection, rejects the offer of the mineral developer, or receives no reply, that person may bring an action for compensation in the court of proper jurisdiction.

45-5A-10. Other remedies not precluded. Any remedy provided by this chapter does not preclude any person from seeking other remedies allowed by law.

FORM 9, Page 2—include with surface owner's notification of proposed drilling or development

Harding County Site Visit
May 2, 2012

In response to concerns by some landowners over surface impacts due to oil and gas development, several work group members traveled to Harding County in May 2012 to see the impacts firsthand.

This photo was taken in the South Buffalo Red River Unit facing southwest. The green swath in the background is the site of a recent fire, apparently caused by problems with the power line servicing an oil well (also visible in the background).

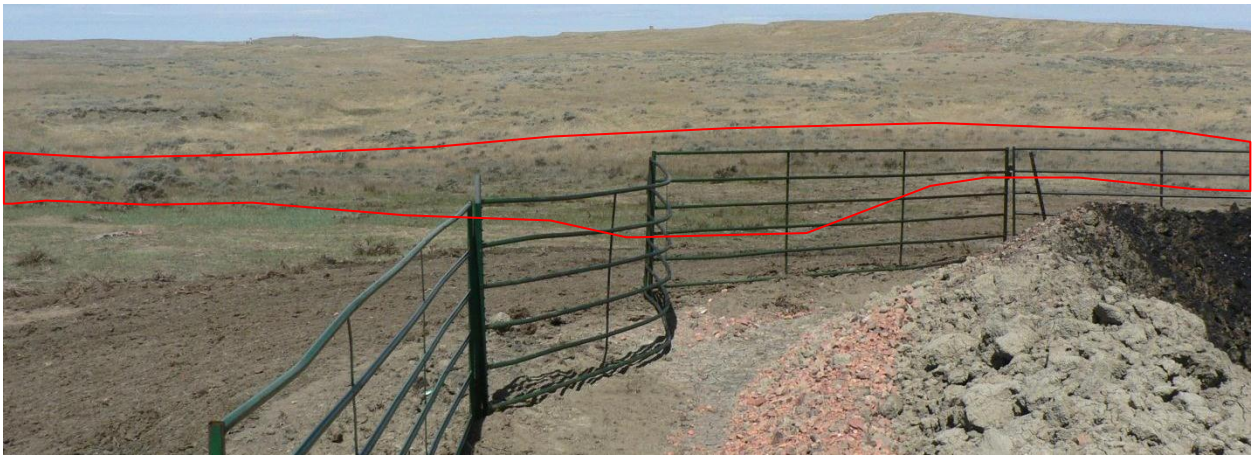
A central tank battery for oil collection. Approximate footprint is 2.5 acres.

A partially restored drill pad area on a ranch owned by David Niemi (right). The original (vertical) well was drilled in 1983, and then reentered (horizontal lateral added) in 2007. The disturbed area in the background behind the red berm has been re-sloped, but not re-vegetated.

The site of a recently drilled well on the Niemi ranch, including the excavation completed for the pad. The work-over rig present on site was installing production tubing.

A new drill site on the Niemi ranch.

A flare pit associated with a well in the West Buffalo Red River Unit on the Niemi ranch. This well was drilled in November 2011. The black residue is from gas produced by the well, which was venting from the pipe in the flare pit. Note the discoloration of the grass downwind from the flare pipe.



Another view of the flare pit associated with the above well, with the discolored area outlined in red.

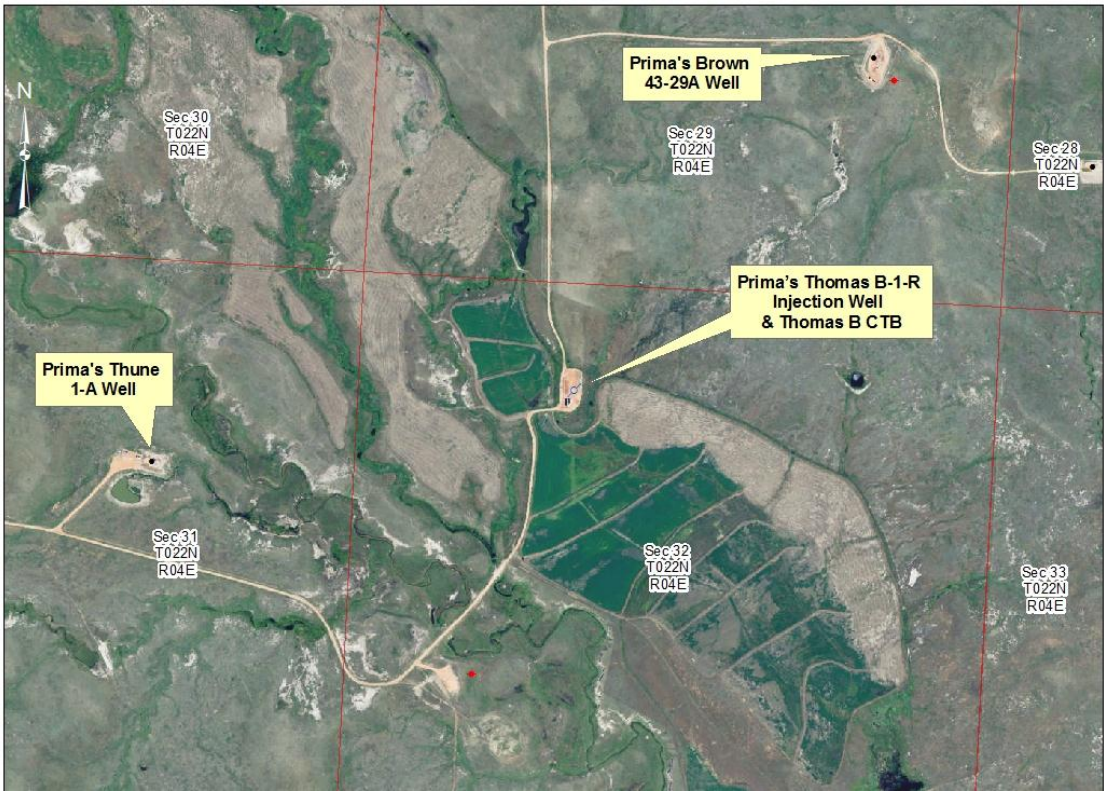
A well on the Jim Clarkson ranch in Harding County. This vertical well was drilled in 1991 and produced oil until 2004. It is currently in Temporarily Abandoned (TA) status pending final plugging and abandonment.

The site of another well on the Clarkson ranch. The nearby vertical well was drilled in 1982. In 2007, the well was reentered, and two horizontal laterals were drilled off of the original hole. The fenced area (roughly 125' X 60') was impacted by an oil spill that occurred approximately four years ago. A thermal oxidizer used to burn nitrogen-rich production gas from air-injection enhanced recovery units is visible in the background.

A well on the Clarkson Ranch. The drill permit was approved in August 2010, with an intended drill date of October 2010. Equipment was moved on site that fall. In September 2011 the company requested and was granted a one-year permit extension, valid through August 2012. In November 2011 the company again notified Mr. Clarkson of their intent to drill. The well was drilled in January 2012; in May 2012 the well was in “completion” phase and pumping water in preparation for oil production.

This well on a ranch owned by Tim Brown (center-right in blue shirt) was orginally drilled in 1973. The company reentered the well in 2005, adding a horizontal lateral. Mr. Brown is concerned about the scrap material pictured, which the company has been storing in the grassy area adjacent to the graveled well pad. Other concerns associated with this site included the size of the pad (~2 acres according to 2010 FSA imagery) and erosion impacts immediately east of the pad berm, where a drainage cut in the berm allows standing water to drain from the well pad.

An access road and well pad associated with an injection well and tank battery on the Brown ranch. The access road appears to impair the operation of a passive irrigation system (a canal and dike spreader system) used to irrigate several alfalfa fields (see aerial image below). Since construction of the access road, maintaining a constant elevation of irrigation water across the fields has proven difficult, which impacts the yield.

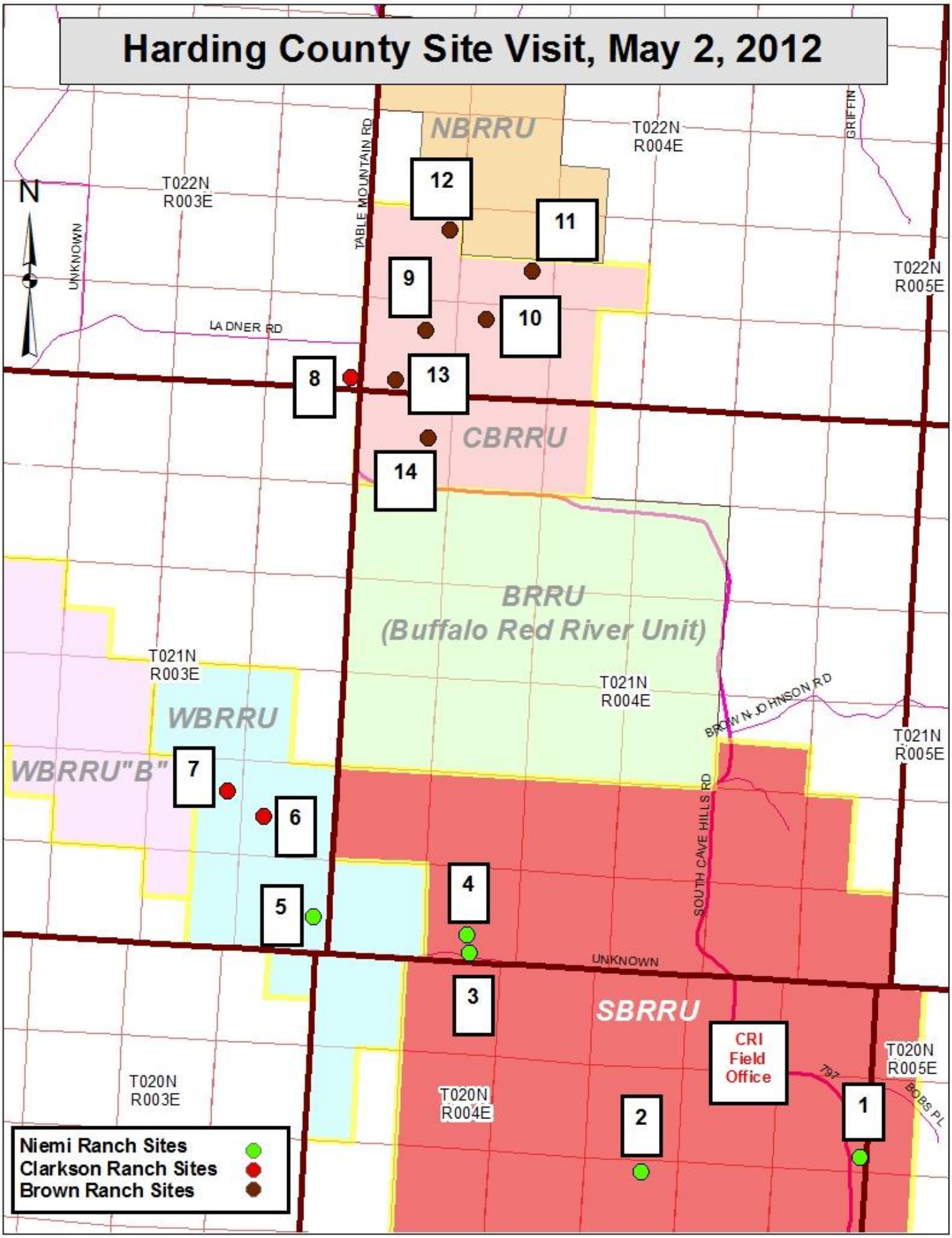


An aerial photo (2010 FSA image) of Mr. Brown's passive irrigation system on his ranch in Harding County. The irrigated area in green is bisected by a series of dikes. The access road intersects the alfalfa irrigation area immediately east and southeast of the "Thomas B" central tank battery.

A berm along the west side of a well on the Brown ranch. The photo shows a cut in the berm used to drain standing water from the well pad. A small portion of the field immediately west of the berm has been impacted by drainage from the well pad. Drainage impacts include erosion, loss of grass, and weed growth across a 20' x 30' area.

A well on the Brown ranch. The photo shows a resloped area of drill pad. This well was drilled in November 2010. Mr. Brown applied manure to the graded area, but revegetation generally proves to be a long process.

Overall, the site visit identified several issues related to surface owner impacts, particularly reclamation and revegetation of disturbed areas.


Harding County Site Visit, May 2, 2012
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NBRRU
CBRRU
BRRU
(Buffalo Red River Unit)
WBRRU
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GRIFFIN
UNKNOWN
LA DNER RD
BROWN JOHNSON RD
SOUTH CAVE HILLS RD
UNKNOWN
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CRI
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Niemi Ranch Sites
Clarkson Ranch Sites
Brown Ranch Sites

Review of Surface Owner Statutes in South Dakota, Wyoming, North Dakota, Montana and Colorado

The Governor's Office reviewed statutes in several surrounding states to gauge how South Dakota compared in addressing issues related to surface owners.

SOUTH DAKOTA

Notice and Negotiation

Before an oil and gas operator is allowed to drill on any proposed site they must provide the surface owner with notice 30 days in advance. The notice must "sufficiently disclose the plan of work and operations to enable the surface owner to evaluate the effect of drilling operations on the surface owner's use of the property." The notice shall include a form prepared by the Department of Environment and Natural Resources.[1] South Dakota law also requires that the operator negotiate in good faith for compensation of "damages to livestock and surface land resulting from drilling operations," before a permit is issued.[2] The drilling operator must certify that negotiations have commenced in order to receive a drilling permit.[3]

Responsibility for Damages

The developer is responsible for any damage to real or personal property related to mineral development and for any failure to use ordinary care while operating on the site.[4] The landowner can be compensated for lost agricultural production, lost land value, or the lost value of improvements. Compensation is limited to the land that is "directly affected" by mineral development. The form of compensation is determined by any formula mutually agreed upon by the developer and the landowner, if an agreement exists. Payments can be made in a lump sum or in annual installments if the damage is a result of the drilling operation. If the damage is related to exploration activities, the payment can only be made in the form of one lump sum.[5]

Settlement of Claims for Damages

When the developer is notified of damages to the property as a result of drilling operations, the developer has 60 days from receipt of the notice to make a settlement offer to the landowner.[6] If the landowner does not receive a reply, rejects the offer, or receives a rejection of a counter offer or rejects a counter offer, the surface owner may bring the matter to court.[7] The surface owner must notify the developer of damages within two years of the time which those damages either became apparent or should have become apparent to a reasonable person.[8]

Bonds

In South Dakota, two different types of bonds are required for oil and gas developers to operate. Surface restoration bonds, designed to provide money to restore the land to its original state after the drilling operations are complete, are set at $2,000 per well or $10,000 blanket. Surface restoration bonds are only required in the case of severed mineral interests. Plugging and performance bonds, used to pay for capping dry or abandoned wells and restoring the premises,

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[1] *SDCL 45-5A-5*
[2] *SDCL 45-9-4*
[3] *ARSD 74:12:02:01*
[4] *SDCL 45-5A-6*
[5] *SDCL 45-5A-4*
[6] *SDCL 45-5A-8*
[7] *SDCL 45-5A-9*
[8] *SDCL 45-5A-7*

are set at $5,000 per well or $20,000 blanket.[9] Bonding requirements can be waived if the landowner and developer reach a compensation agreement.

WYOMING

Notice and Negotiation

Wyoming also requires notice of no fewer than 30 days before drilling operations commence, but that notice must not to exceed 180 days.[10] The notice must include dates the operations will commence, approximate locations of well pads, roads, pits reservoirs, power lines, and etc., as reasonably known by the operator. In addition, the notice is required to include the name, address, and telephone number of the operator and an offer to discuss and negotiate in good faith any changes to the proposed plan prior to the commencement of oil and gas operations.[11] Notice is required five days in advance for non-surface disrupting activities such as surveying and flagging.[12] The surface owner and oil and gas operator are required to engage in good faith negotiations after the notice is received. At any time during the negotiations, both parties can agree to use alternate dispute resolution, mediation, or informal dispute resolution. A request for resolving the dispute through alternate methods can be made to the Wyoming Agriculture and Natural Resources Dispute Resolution Board.[13] An operator cannot enter the land to drill until it has either secured consent or a waiver from the landowner and negotiated a surface use agreement or posted sufficient bond to protect against surface damages.[14] Before a permit is issued, it must be certified that notice was given to the landowner and that the parties attempted good faith negotiations to reach a surface agreement. Any agreement reached by the parties is not required to be filed and filing of the terms is not a condition of approval for a permit.[15]

Responsibility for damages

Payments for damages in Wyoming are made for the amount of damage sustained for the loss of production and income, loss of land value, and loss of value of improvements caused by oil and gas operations.[16] Payments may only cover losses sustained on land directly affected by oil and gas operations.

Settlement of claims for damages

A landowner must provide notice of damages to the operator within 2 years of the date the damages were discovered or should have been discovered by a reasonable person. The operator must make an offer to settle within 60 days upon notice of receipt of the notice of damages from the landowner.[17] If the surface owner receives no reply, receives a written objection or counteroffer, or rejects the offer or counteroffer, the landowner can sue for damages in the court of proper jurisdiction.[18] Wyoming statutes specifically provide that there is a two year statute of limitations for any remedy sought by the surface owner related to oil and gas development from the time that condition was discovered or should have been discovered through due diligence.[19]

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[9] *SDCL 45-9-15, ARSD 74:12:02:01*
[10] *WS 30-5-402 (e)*
[11] *WS 30-5-402 (e)(i-iv)*
[12] *WS 30-5-402 (b)*
[13] *WS 30-5-402 (f)*
[14] *WS 30-5-402 (c) (i-iv)*
[15] *WS 30-5-403 (a) (i-iii) and (b)*
[16] *WS 30-5-405*
[17] *WS 30-5-405 (a) (iii)*
[18] *WS 30-5-406*
[19] *WS 40-5-409*

Bonds

Wyoming requires a bond set at a minimum of $2,000 per well site. The commission may also order a blanket bond covering operations on the surface owner's land.[20] The landowner must be notified by the board within 7 days that the bond has been received, the amount of the bond, and the type of the bond. The landowner then has 30 days to object to the amount or form of the bond. If no objection is made within 30 days, the bond is approved by the commission. If an objection is made, the commission (WY Oil and Gas commission) must then make a final determination as to whether the bond is sufficient. If the landowner is dissatisfied with the decision by the board, they may appeal the decision to district court.[21]

NORTH DAKOTA

Notice and Negotiation

For activities that "do not disturb the surface" such as inspections, staking, surveys, measurements and general evaluation of the site, notice must be given to the landowner seven days in advance by registered mail or hand delivery.[22] The notice must include the name, address, telephone number, and, if available, email address of the mineral developer or designee, an offer to discuss and agree to consider accommodating changes to the proposed plan of operations before drilling commences, and a sketch of the approximate location of the proposed drilling site.[23]

The developer must provide notice 20 days before drilling operations commence. Notice must also be provided by registered mail or hand delivery and the notice can be waived by the landowner. The notice must include sufficient disclosure of the plan of work and operations to enable the surface owner to evaluate the effect of drilling operations on the surface owner's use of the property, a plot map showing the location of the proposed well, and a form prepared by the director of the oil and gas division advising the surface owner of their rights.[24]

Responsibility for Damages

The mineral developer is responsible for paying the landowner for any damages sustained resulting in lost land value, lost use of and access to the surface owner's land, and the lost value of improvements caused by drilling operations.[25] Damages for loss of agricultural production and income caused by oil and gas production and completion are also the responsibility of the mineral developer. The amount of damages can be determined by any formula mutually agreeable by the surface owner and mineral developer. The payments only cover land directly affected by mining operations. Exploration damages must only be paid in single, lump sum payments.[26]

Under North Dakota law, developers can also be responsible for damages related to the disruption or diminishment in the quality of the water supply used for domestic livestock or irrigation of land located with one mile of a well site. The diminishment or disruption must be caused by drilling operations. In order to recover damages, a water quality and quantity test must have been performed within one year before drilling began. The developer is responsible for the costs of repairs, alteration, or construction to ensure the surface owner is delivered "the same quality and

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[20] *WS 30-5-404 (b)*
[21] *WS 30-5-404 (c)*
[22] *NDCC 38-11.1-04.1*
[23] *NDCC 38.11.1-04.1 (1) (a-c)*
[24] *NDCC 38.11.1-04.1 (2) (a-c)*
[25] *NDCC 38-11.1-04*
[26] *NDCC 38.11.1-08.1*

quantity of water available prior to oil and gas development."[27] The North Dakota code also addresses the rights of a tenant to receive compensation for damages related to agricultural production. In the absence of an agreement between any tenant and the landowner, the tenant of the landowner is entitled to recover their proportion of loss of agricultural production or income.[28]

North Dakota requires that a well site be reclaimed within one year after the well is plugged, the permit expires, or the permit has been cancelled or revoked. A reclamation plan must be filed with the director of the commission and a copy of the proposed reclamation plan must be given to the surface owner 10 days prior to commencing work.[29] The notice must include the name and address of the reclamation contractor, name and address of the surface owner and the date a copy of the plan was given to them, a description of the proposed work including topsoil redistribution and plans for access roads and other facilities, and reseeding plans.[30] The plan must be filed with the commission 30 days after work is completed and the director of the commission can waive the reclamation of the site and access road after the well is plugged.[31]

Settlement of claims for damages

In order to receive compensation, the damages must be reported within two years after the damage occurred or would become apparent to a reasonable person.[32] If the person seeking compensation rejects the offer of the mineral developer, that person may bring an action for compensation in the court of proper jurisdiction.[33] If the amount of compensation awarded is greater than the amount offered by the developer, then the person suing is entitled to attorney's fees, costs, and interest on the amount of final compensation awarded from the day drilling begins.[34] The developer is required to make a written offer of settlement at the time the developer gives the landowner notice that drilling operations will be commenced.[35]

Bonds

Before drilling operations can begin, an oil and gas operator must provide a $50,000 bond for a single well operation executed by a surety licensed to do business in North Dakota. A blanket bond for more than one well on a landowner's property is set at $100,000. The commission can require higher bonds upon notice and a hearing.[36] The $100,000 bond is good for up to six well sites that are not properly reclaimed, dry holes that are not properly plugged, or abandoned wells not properly plugged or reclaimed. Once any operator has six unused wells that are not properly reclaimed or cleaned up, all the operator's drilling permits are suspended until the number of unused wells that are not properly reclaimed is fewer than six.[37]

MONTANA

Notice and Negotiation

Montana requires that the developer furnish three different written notices to the surface owner for surveying, seismic exploration, or drilling.

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[27] *NDCC 38-11.1-06*
[28] *NDCC 38-11.1-08.1*
[29] *NDCC 43-02-03-34.1*
[30] *NDCC 43-01-03-34.1 (1) (a-c)*
[31] *NDCC 43-01-03-34.1 (4 and 5)*
[32] *NDCC 38.11.1-07*
[33] *NDCC 38-11.1-09*
[34] *NDCC 38-11.1-09*
[35] *NDCC 38-11.1-08*
[36] *NDCC 43-02-03-15 (2)*
[37] *NDCC 43-02-03-15 (2) (a-c)*

Surveying - the developer must provide 15 days' notice, delivered by certified mail (return receipt requested to the surface owner), before entering the property for any surveying unless the notice requirement is waived by the surface owner.[38] If the surface owner does not reply within 15 days, the surveyor can enter the property for the purposes outlined in the notice.[39] If the surface owner acknowledges the notice within 15 days the surface owner may modify the access provisions of the notice, as long as modifications do not unreasonably restrict the completion of the survey.[40]

Seismic exploration - prior to commencing seismic exploration activity, the developer shall notify the surface owner of the approximate time schedule of the planned activity, provide copies of MCA 82-10-5 and MCA 82-1-107, and, if available, provide a current publication of "A Guide to Split Estates in Oil and Gas Development."[41]

Drilling - before commencing drilling activities, the developer must provide the surface owner with a written notice given no more than 180 days and no fewer than 20 days before commencement of any activity that disturbs the land surface. The notice must be delivered to the owner's address on file with the county clerk and include: (1) a copy of the codified law outlining the landowner notification requirements, (2) a copy of "A Guide to Split Oil and Gas Development" published by the Environmental Quality Council, and (3) a sufficient disclosure of the plan of work and operations in order for the surface owner to adequately assess the effect of drilling operations on the surface owner's use of the property. The surface owner may waive the notice requirement.[42] Furthermore, the surface owner may request a written surface use agreement.[43]

Responsibility for Damages

The developer or operator is responsible for all damages to real or personal property resulting from a lack of ordinary care or caused by gas and oil operations and production.[44]

Settlement of Claims for Damages

The surface owner and the oil and gas developer or operator shall attempt to negotiate an agreement on damages. The oil and gas developer or operator shall pay the surface owner a sum of money or other compensation equal to the amount of damages sustained by the surface owner for loss of agricultural production and income, lost land value, and lost value of improvements caused by oil and gas operations.[45] The amount of the compensation may be determined by any formula agreed upon by the surface owner and developer.[46] The surface owner may elect to receive annual damage payments over a period of time, unless the damage is solely the result of exploration, in which case the damages must be paid in a single lump sum.[47]

To receive compensation for damages, the surface owner must give written notice to the developer of damages sustained by the surface owner within two years after the injury occurs or would

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[38] *MCA 70-16-111 (3-a)*
[39] *MCA 70-16-111 (4-a)*
[40] *MCA 70-16-111 (4-b)*
[41] *MCA 82-1-107*
[42] *MCA 82-10-503 (1-3)*
[43] *A Guide to Split Estates in Oil and Gas Development (Environmental Quality Council)*
[44] *MDA 82-10-505*
[45] *MCA 82-10-504 (1-a,b)*
[46] *MCA 82-10-504 (1-b)*
[47] *MCA 82-10-504 (d)*

become apparent to a reasonable person.[48] Unless both parties agree otherwise in writing, the developer has 60 days to make a written offer to settle for damages, which the surface owner may accept or reject.[49] If the surface owner receives a written rejection, rejects the settlement proposed by the developer, or receives no reply, the surface owner can seek restitution in the district court of the county in which the damage occurred.[50]

Bonds

Montana requires two separate bonds for either seismic exploration or drilling.

Exploration - a developer wishing to conduct seismic activity must file with the secretary of state a surety bond (or other acceptable form of security) of $10,000 for a single seismic crew or a blanket bond (or other acceptable form of security) of $25,000 that covers all seismic crews working in the state on behalf of the developer conducting the exploration.[51] It is the responsibility of the exploratory entity to plug and cap all shot holes in a manner specified by the board of oil and gas conservation, remove all equipment and debris used, and restore the surface to as near as original condition as practically possible.[52] The bond is to be kept on file by the secretary of state for five years after the conclusion of the exploration. Partial or full forfeiture of the bond due to damage caused to the property owner's land is to be determined by the appropriate judicial court.[53] The aggregate liability for the exploration activities may not exceed the amount of the surety bond (or other acceptable form of security).[54]

Drilling – developers intending to drill in Montana (within the jurisdiction of the Montana Board of Oil and Gas Development) must file a bond of $1,500 to $50,000 (depending on the number and depth of wells) to cover plugging and surface restoration. The bond is to remain on file until plugging and restoration is approved by the board.[55]

COLORADO

Notice and Negotiation

Colorado requires oil and gas developers to mail or deliver a 30 days' advance notice to the surface owner and local government before commencing drilling activities. The purpose of this notice is to inform the surface owner about when and where the oil and gas operations are to take place so the surface owner tenants can make plans to coordinate their own land use with the oil and gas operations. An additional 14 day notice is required for drilling on irrigated crop land during irrigation season.[56] Prior to beginning drilling operations, the oil and gas developer is required to conduct a good faith consultation with the surface owner in order to allow the surface owner to express preference for the timing of oil and gas operations and preferred locations for wells and associated facilities.[57] The surface owner may waive the requirement for consultation by submitting to the operator in writing.[58]

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[48] *MCA 82-10-506*
[49] *MCA 82-10-507*
[50] *MCA 82-10-508*
[51] *MCA 82-1-104 (1)*
[52] *MCA 82-1-104 (2-3)*
[53] *MCA 82-1-104 (1,4)*
[54] *MCA 82-1-104 (4)*
[55] *ARM 36.22.1308*
[56] *COGCC Rule 305*
[57] *COGCC Rule 306 (a)*
[58] *COGCC Rule 306 (a-3)*

Responsibility for Damages

Colorado statutes concerning surface owner rights are based upon the accommodation doctrine. Under this arrangement, an operator shall conduct oil and gas operations in a manner that accommodates the surface owner by minimizing intrusion upon and damage to the surface of the land. "Minimizing intrusion upon and damage to the surface" means selecting alternate locations for wells, roads, pipelines, or facilities, or employing alternative means of operation, that prevent, reduce, or mitigate the impacts of the oil and gas operations on the surface, where such alternatives are technologically sound, economically practicable, and reasonably available to the operation.[59]

Settlement of Claims for Damages

The Colorado Oil and Gas Conservation Commission (COGCC) encourages surface owners with a complaint against an operator to attempt to contact the operator and work out a mutually-agreeable solution. If no solution can be found, the surface owner may file a complaint with the COGCC which will investigate on behalf of the surface owner and determine whether a violation has been made and the penalty for said violation.

If the surface owner believes that the operator has violated the provisions of reasonable accommodation as outlined in *C.R.S. 34-60-127* or the regulatory requirements of the Commission, the surface owner may sue for and recover such damages as they otherwise may be entitled to receive.[60] The surface owner may notify the Commission in writing of the violation and request the Commission to bring suit against the operator. If the Commission does not file suit, the surface owner can sue the operator to prevent further violation. If injunctive relief is granted to the surface owner by the court, the Commission shall be made a party and substituted for the person who brought suit and the injunction shall be issued as if the Commission had at all times been the complaining party.[61]

Bonds

Oil and gas operators wishing to conduct seismic exploration must provide a statewide blanket surety bond in the amount of $25,000 to ensure the proper plugging and abandonment of any shot holes and any necessary surface reclamation.[62] Before commencing operations with heavy equipment, the oil and gas developer is required to provide financial assurance in the form of a surety bond to the Colorado Commission to protect the surface owner from unreasonable crop loss or land damage. The bond shall be $2,000 per well for non-irrigated land, $5,000 per well for irrigated land, or $25,000 for statewide blanket assurance.[63]

Furthermore, before commencing the drilling of a well, an operator shall provide financial assurance to the Commission to ensure the protection of the soil, the proper plugging and abandonment of the well, and the reclamation of the site. The operator must provide $10,000 to $20,000 (depending upon the depth of the well) of financial assurance for each well, or a statewide blanket assurance in the amount of $60,000 to $100,000 (depending on the number of wells).[64]

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[59] *C.R.S. 34-60-127*
[60] *C.R.S. 34-60-114*
[61] *C.R.S. 34-60-114*
[62] *COGCC Rule 705*
[63] *COGCC Rule 703*
[64] *COGCC Rule 706*

	South Dakota	Wyoming	North Dakota	Montana	Colorado
Notice to drill	30 days	Minimum 30 days and maximum 180 days	20 days	Minimum 20 days and maximum 180 days	30 days. Additional 14 day notice for drilling on irrigated land.
Good faith negotiation attempt required	Yes	Yes	No	Both shall attempt to negotiate an agreement on damages (no mention of good faith)	Food faith consultation with surface owner required prior to drilling to allow surface owner to state preferences concerning operations. COGCC also recommends that surface owners first try to negotiate damages or violations with producer before filing a suit or formal complaint.
Alternate dispute resolution available	No	Yes - good faith "consultation" required to allow surface owner to express preferences for operation details.	Yes, if agreed upon by both parties through the ND Department of Ag Mediation Service (contract with a private attorney for oil and gas mediation)	Both parties entitled to mediation and can seek other remedial action not prohibited by law	Surface owner can request COGCC to sue on their behalf or investigate a potential violation by producer.
Bonds	Surface restoration $2,000 per well or $10,000 blanket (only if minerals severed) Plugging and production $5,000 per well or $20,000 blanket	$2,000 per well site or blanket amount set by Oil and Gas Commission	$50,000 for one well, $100,000 blanket, the commission can set a higher bond, if the operator has more than six wells that are not properly claimed its permit is revoked (Oil and Gas of the Industrial Commission)	Exploration - $10,000 for each seismic crew, or blanket $25,000 that covers all seismic crews working in the state. Drilling - $1,500 to $50,000 (depending upon number and depth of wells) bond on file with Board of Oil and Gas.	$2,000 per well (non-irritated land), $5,000 (irrigated land), or $25,000 statewide blanket bond (covers unreasonable crop loss and land damage). Exploration - $25,000 statewide blanket covering proper plugging and abandonment of shot holes and necessary surface reclamation. Drilling - $10,000 to $20,000 bond (depending on well depth) to cover plugging, soil protection, and reclamation.

	South Dakota	Wyoming	North Dakota	Montana	Colorado
Bonds can be waived	Yes, by surface use agreement	Yes, by surface use agreement	No, commission can accept other forms of security	No, other forms of security accepted by secretary of state	Crop loss and land damage bond can be waived by a surface use agreement.
Notice of bond receipt to landowner and opportunity to contest bond amount	No	Yes, 30 days to respond and can sue in court if dissatisfied with amount set by commission	No	No	No
Definition of damages	Agricultural production, lost land value, lost value of improvements to land directly affected by development	Loss of production and income, loss of land value, lost value of improvements on land directly affected by operations	Lost land value, lost use of and access to surface owner's land, and lost value of improvements, loss of agricultural production and income, certain ground water damages within 1 mile of well. Land must be directly affected by development.	Agricultural production and income, lost land value, and lost value of improvements	Unreasonable crop loss or land damage caused by operations
Mention of tenant rights to compensation	No	No	Yes, for the tenant's portion of lost agricultural production or income	Yes, tenant can receive damage or disruption compensation	No
Settlement offer for damages	Yes, within 60 days of receipt of notice of damages	Yes, within 60 days of receipt of notice of damages	Yes, an offer must be made when the developer provides initial notice of drilling to landowner	Yes, within 60 days of receipt of notice of damages.	No
Right to sue if no settlement reached	Yes	Yes	Yes	Yes	Yes
Statutory right to attorney's fees, costs, and interest if settlement offer is lower than amount awarded by court	No	No	Yes	No	No

Summary of Oil & Gas Environmental Protections
South Dakota DENR

Environmental protections are a key consideration for oil and gas development in South Dakota. This section outlines some of the protective measures DENR has undertaken to protect public health and the environment. Several subsections, including those on bonding, Harding County Water Resources, and casing requirements were included in direct response to questions by the South Dakota Legislature. Note the tables and figures near the end of this section.

Ground Water (SDCL 45-9-14)

Concerns Addressed: Oil and gas bearing strata generally occur deep underground, below freshwater aquifers. Deep ground water associated with oil bearing strata is generally very saline. Environmental protections are necessary to ensure freshwater aquifers overlying production zones are not contaminated by deep (saline) aquifers and petroleum or otherwise impacted by oil & gas drilling and production.

Key Protective Requirements

- Well Construction (ARSD 74:12:02): Operators may only use fresh water fluids when drilling through shallow freshwater aquifers. Operators must construct wells with adequate casing, and use cement to seal around the casing to preclude migration of poor quality ground water into shallower freshwater aquifers. The DENR reviews and approves the casing and cementing plan for each well prior to granting a permit to drill. Operators must demonstrate that wells are adequately sealed at the appropriate depths by submitting a cement bond log for each new well.

- Well Plugging (ARSD 74:12:03): Requires operators to plug all wells in a manner that will permanently confine all oil, gas, water, and other fluids to the strata in which they originally occurred.

- Pit Construction (ARSD 74:12:02): Pits associated with oil and gas development must lie above the water table and must be lined with a synthetic liner.

Surface Water (SDCL 45-9-14)

Concerns Addressed: Oil or other substances may contaminate surface water near oil & gas operations.

Key Protective Requirements

- Pit Construction (ARSD 74:12:02): Pits cannot be constructed in streambeds or other established drainages and they must be constructed so that no surface water enters the pit.

- Storage Tanks (ARSD 74:12:04): Berms must be maintained around all oil storage tanks.

- Discharge Permit (ARSD 74:52): Although the DENR discourages evaporative disposal of production water, a few disposal ponds are utilized in the state. Any water discharged from ponds must meet permitted water quality standards.

Spills (SDCL 34A-12)

Concerns Addressed: Crude oil spills or discharge of other substances related to oil & gas operations.

Key Protective Requirements

- Reporting (ARSD 74:34:01): Operators are required to report oil spills and discharge of other regulated substances.

- Corrective Action (SDCL 34A-12-10): DENR issues cleanup order and monitors case to ensure the spill site is restored.

Underground Injection (SDCL 45-9-11, 45-9-13 and 45-9-73)

Concerns Addressed: Oil producers often inject water, air or gas into oil bearing strata to increase reservoir pressure or otherwise enhance recovery. Operators also typically dispose of saline water produced from oil wells by injecting it into deep saline aquifers. Environmental protections are necessary to ensure injected liquids and gases do not degrade the freshwater aquifers overlying injection zones.

Key Protective Requirements

•Permit to Inject (ARSD 74:12:07): The Federal Safe Drinking Water Act regulates underground injection related to oil and gas activities through EPA's Underground Injection Control (UIC) Class II program. DENR has obtained primary enforcement authority of this program from EPA. To operate a Class II injection well, operators must apply for and obtain a permit to inject that outlines the approved injection pressures and volumes.

•Well Integrity Testing (ARSD 74:12:07): Operators are required to perform periodic mechanical integrity tests (MIT) on injection wells to ensure well casings adequately protect freshwater aquifers.

Air Quality (SDCL 34A-1)

Concerns Addressed: Although some oil production in South Dakota involves use of engines (generators, large air compressors, etc.) subject to air quality standards, the major source of emissions consists of gas produced from oil wells in enhanced recovery units where air is injected underground to stimulate recovery. Each of these oil wells produce, on average, several hundred tons of volatile organic compounds (VOC's) per year.

Key Protective Requirements

•Air Quality Permit (ARSD 74:36): The Federal Clean Air Act is the legal foundation for the national air pollution control program, requiring each state to produce and regularly update a State Implementation Plan. The South Dakota Air Pollution Control Program has developed a permitting program for sources that emit more than 25 tons of air emissions per year. Permits for emission sources that exceed established volumes, such as oil wells in air injection enhanced recovery units, require the operator to implement emission controls. For example, permits for approximately 60 oil wells in Harding County require the operator to pipe produced gas to special treatment facilities prior to atmospheric release.

Hydraulic Fracturing (SDCL 45-9-11)

Concerns Addressed (Potential): High-pressure, high-volume multi-stage hydraulic fracturing (such as the type used in North Dakota Bakken wells) is not utilized in South Dakota, although SDCL 45-9 provides for this type of well completion activity. Discovery of an unconventional (e.g., tight shale) oil resource may foster use of high-pressure high-volume hydraulic fracturing in South Dakota. If this occurs, hydraulic communication between fractured (oil bearing) strata and overlying freshwater aquifers will probably not be a concern due to the thousands of feet of impermeable sediments separating potential oil bearing strata from freshwater aquifers. The only significant environmental concerns associated with possible future hydraulic fracturing involve the potential for migration of fluids via the well bore, or impacts from fracturing fluids stored in pits.

Concerns Addressed (Current): Around two percent of South Dakota's oil & gas wells (mostly gas wells) are hydraulically fractured, but the volume of fluids injected and the extent of fracturing associated with these small fracturing jobs is insignificant compared with large-scale, high-volume hydraulic fracturing. Environmental concerns associated with small scale fracturing are the same as for large scale fracturing.

Key Protective Requirements

•Well Construction (ARSD 74:12:02): Operators must construct wells with adequate casing and use cement to seal around the casing to preclude migration of poor quality ground water or hydraulic fracturing fluids into shallower freshwater aquifers. The DENR reviews and approves the casing and cementing plan for each well prior to granting a permit to drill. Operators must demonstrate that wells are adequately sealed at the appropriate depths by submitting a cement bond log for each new well.

•Pit Construction (ARSD 74:12:02): Pits associated with oil and gas development must lie above the water table and must be lined with a synthetic liner.

Bonding & Reclamation (SDCL 45-9-15 and 45-9-15.1)

Concerns Addressed: Unauthorized abandonment of wells without proper plugging or surface reclamation.

Key Protective Requirements

•Plugging and Performance Bond (SDCL 45-9-15, ARSD 74:12:02): The operator must submit a plugging and performance bond in the amount of $5,000 per well drilled, or $20,000 blanket conditioned for the performance of the duty to plug each dry or abandoned well, and to restore the premises, insofar as possible, to the condition that existed before the filing of the application to drill.

•Surface Restoration Bond (SDCL 45-9-15.1, ARSD 74:12:02): The operator must furnish a surface restoration bond if the landowner or lessee is not a party to the oil or gas leasing agreement in the amount of $2,000 per well drilled, or $10,000 blanket conditioned for the performance of the duty to restore the surface property of the landowner or lessee, both real and personal, and the ingress to and the egress from the real property.

South Dakota Plugging and Performance Bond (SDCL 45-9-15)

- Individual well - $5,000
- Statewide blanket - $20,000
- Purpose is to provide funds to plug wells and reclaim well sites that are abandoned by the operator
- Statute allows the board to require more bond if necessary (has not been done to our knowledge)
- Bond amounts established more than 30 years ago
- If the construction cost index (inflation factor) is applied , bond amounts would be $12,000 for individual well bonds and $48,000 for statewide blanket bonds in today's dollars
- To our knowledge, a plugging and performance bond for oil and gas has not been called in South Dakota

South Dakota Surface Restoration Bond (SDCL 45-9-15.1)

- Individual well - $2,000
- Statewide blanket - $10,000
- Purpose is to provide funds to reclaim well sites and access roads that are abandoned by the operator
- Only required when the landowner or lessee is not a party to the oil or gas leasing agreement (split estate)
- Bond amounts established more than 30 years ago
- If the construction cost index (inflation factor) is applied, bond amounts would be $4,800 for individual well bonds and $24,000 for statewide blanket bonds in today's dollars
- To our knowledge, a surface restoration bond for oil and gas has not been called in South Dakota
- Only Colorado and Wyoming have a comparable surface restoration bond **(Table 1)**

South Dakota Bond Release

- Bonds required – Plugging and Performance and Surface Restoration as noted above
- Bonds must be submitted before drilling permits are issued
- Plugging and performance bond covers plugging wells **(Figures 2 & 3)** and reclaiming drill sites
- Surface restoration bond covers surface restoration including access roads - only required in cases of split estate/ severed minerals
- Bonds stay in place until all obligations are met
- Operator requests bond release
- Staff reviews file and abandonment report
- Staff conducts site inspections before release
- If there are site reclamation issues, the operator is notified and asked to remedy
- Surface owners are notified by letter asking if reclamation is acceptable
- If all requirements are met and there are no landowner complaints, bond is released **(Figure 4)**

Other States Well Plugging Bond Requirements **(Table 1)**

- States reviewed - Nebraska, North Dakota, Wyoming, Colorado, Montana
- All have individual well bonds and blanket statewide bonds, just as South Dakota does
- All but Nebraska base individual well bonds on shallow vs. deep wells with the break ranging from 2,000 to 3,500 feet
- Shallow well bonds range from $1,500 in Montana to $50,000 in North Dakota (it can be lowered)
- Deep well bonds range from $5,000 in Montana to $50,000 in North Dakota
- Nebraska's individual well bond is $10,000 – they just changed it; was previously $5,000
- Statewide blanket bonds range from $50,000 in Montana to $100,000 in Nebraska and North Dakota
- The number of wells that can be covered by a statewide bond is limited in North Dakota and Colorado
    - North Dakota limits the number of improperly plugged or reclaimed wells to six (the statewide bond can cover any number of wells as long as an operator doesn't have more than six problem wells)
    - Colorado requires $60,000 for less than 100 wells and $100,000 for more than 100 wells
- Colorado and Wyoming also authorize increased bonds for temporarily abandoned wells
- Bond forfeitures:
    - North Dakota, Montana, and Wyoming report about two to three forfeitures per year
    - Nebraska has not had to call a bond in about ten years

Well Plugging Costs **(Table 2)**

- Cost estimates come from state orphan well programs, other state regulators, and one operator
- Plugging costs vary by state, but it is generally linked to depth of typical wells plugged
- Plugging costs are for normal circumstances and no down hole problems – mechanical or hole integrity issues can cause well plugging costs to soar
- A number of states have orphan well plugging programs, usually funded through surcharges on oil and gas production – the number of orphan wells in these states range from hundreds to thousands
- Average orphan well plugging costs range from $4,500 per well in Texas and Kansas to more than $18,000 in California and $22,000 in Pennsylvania
- Nebraska regulators report well plugging costs of $15,000 per well for wells ranging in depth from 4,000 to 5,000 feet
- Montana regulators report well plugging costs of $10,000 to $12,000 for wells ranging in depth from 1,400 to 1,700 feet
- North Dakota regulators report well plugging costs of $50,000 to $80,000 for wells at around 9,000 feet in depth
- An operator reported costs to plug two 9,000 foot Red River wells in North Dakota at about $120,000 each

Bonding Options – Some Legislative Policy Options

- **Option 1**: Retain the current bond amounts and rely on existing authority to increase bonds if needed
    - Plugging and performance - $5,000 per well and $20,000 statewide
    - Surface restoration - $2,000 per well and $10,000 statewide
- **Option 2**: Increase current bond amounts to account for 30 years of inflation
    - Plugging and performance - $12,000 per well and $48,000 statewide
    - Surface restoration - $4,800 per well and $24,000 statewide
- **Option 3**: To provide consistency for operators moving south from North Dakota, adopt North Dakota's $50,000 or less per well for wells less than 2,000 feet deep; $50,000 per well for wells greater than 2,000 feet deep; and $100,000 statewide well plugging bond approach
- **Option 4**: Eliminate the statewide well plugging bond or limit the number of wells that can be covered under the statewide bond to limit the liability to landowners and the state
- **Option 5**: Streamline bonding by eliminating the surface restoration bond
- **Option 6**: Require the bond for each well to be equal to the estimated cost of plugging and reclamation
- **Option 7**: Revise the existing statute to allow requiring additional well plugging bonds for wells that have been temporarily abandoned for more than two years
    - South Dakota currently has 77 temporarily abandoned wells; 13 have been temporarily abandoned for less than a year; 5 for one to two years; and 59 for more than two years

Some Bonding Considerations

- Increasing bond amounts will likely have a negative economic impact on oil and gas operators, especially the smaller and less capitalized oil and gas drilling companies, and may be a disincentive to wildcat exploration

- Given the costs to plug wells delineated above, it is clear that no state requires bonds to fully cover the cost of plugging wells in all cases, especially under the statewide blanket bonds

- If the bond for each well is required to cover the estimated cost of plugging and reclamation, this will drive up costs for both the state and the industry - estimating the plugging and reclamation costs of each well will increase permitting workloads for the state, and bonding costs for the industry will rise significantly

Harding County Water Resources

Ground Water

• Shallow Aquifers — Shallow aquifers provide most water for municipal and domestic use in Harding County. Shallow wells produce from alluvial aquifers (~ 20 - 50 feet deep), the Hell Creek Aquifer (~ 200 - 400 feet deep), or the Fox Hills Aquifer (~ 300 - 600 feet deep). Wells completed in these units generally produce relatively modest volumes of potable water (~ 10 - 100 gallons per minute). When an oil well is drilled, operators are required to protect these shallow aquifers by installing a cement-sealed surface casing. In terms of identifying water resources for use in possible future oil development activities, the question of whether unappropriated ground water is available in these aquifers becomes somewhat irrelevant. It is probably not feasible to utilize these shallow aquifers for large-scale industrial use given the low production-yield associated shallow wells in Harding County.

• Intermediate Aquifers — Oil producers in Harding County currently utilize three deeper aquifers, the Inyan Kara, Minnelusa, and Newcastle, which are characterized by marginal water quality. These aquifers generally qualify as “freshwater resources”, and are afforded protection under oil and gas rules. However, the water in these relatively deep aquifers is generally too high in total dissolved solids (TDS) to use as a potable water source. Water is produced from the Inyan Kara, Minnelusa, and Newcastle aquifers, and then injected into the even deeper oil bearing strata (the Red River Formation) to increase oil reservoir pressure and oil production (**Figure 1**). Harding County’s intermediate-depth aquifers may hold enough unappropriated ground water to meet water requirements associated with possible increases in oil development. However, the intermediate aquifers, like the shallower potable aquifers, generally yield only modest volumes of water (~ 40 - 140 gallons per minute) in Harding County. However, utilizing these resources would likely prove uneconomical given the low production-yield associated with available aquifers.

Surface Water

• Local Resources — Harding County SD contains portions of three major watersheds, the Little Missouri, the Grand and the Moreau River basins. There are only two larger tributaries that flow out of the county. First is the larger of the two, the Little Missouri River, which flows out of southeastern Montana through the western third of Harding County up into North Dakota. Typical of prairie streams, the flow pattern in this river is cyclical with high flows of a few hundred cubic feet per second (cfs) on average occurring from March into early June and dropping off to less than 20 cfs in late August. There is some irrigation development along this river but during dry periods the Little Missouri is not a reliable source of water. The second major tributary located in Harding County is the South Fork of the Grand River. This tributary headwaters in central Harding County and flows east towards Shadehill reservoir located in eastern Perkins County. Again this is a prairie stream with a cyclical flow pattern corresponding to the time of year. There is little irrigation development on this stream which is not likely to change since the US Bureau of Reclamation holds a senior water right to capture flow from the South Fork of the Grand River as storage in Shadehill Reservoir. The remainder of the minor tributaries in Harding County are usually dry a significant portion of the year, only flowing during the spring snow melt and following large thunderstorms. Surface water resources in Harding County are extremely limited and do not meet existing water use needs for ongoing oil development.

• Missouri River — In the unlikely event of a dramatic increase in oil field water use in Harding County, operators may have to utilize the Missouri River to meet water needs. Piping Missouri River water to Harding County would be quite costly and involve coordination with the US Army Corps of Engineers as well as the Standing Rock Sioux Tribe and/or the Cheyenne River Sioux Tribe.

Oil & Gas Inspections

New Drill Inspections (~ 10 - 15 per year): DENR inspects all wells as they are drilled to ensure the pits are appropriately constructed and lined, the drill site does not communicate with surface water resources, a blowout preventer is in place, and drilling complies with all applicable rules and permit conditions.

Routine Inspections (~ 100 per year): DENR performs routine inspections of all producing and temporarily abandoned oil & gas wells at least biennially. Most wells change very little from year to year. Inspectors check for evidence of spills and compliance with waste disposal requirements. Inspectors also ensure well sites are not in communication with surface water resources, and verify storage tanks are adequately bermed.

Complaint Response (~ 30 - 40 inspections per year): DENR inspectors respond to surface owners or others with complaints regarding oil & gas operations.

Mechanical Integrity Tests (~ 50 per year): DENR inspectors routinely witness mechanical integrity tests of injection wells to ensure well casings adequately protect freshwater aquifers from injected fluids and gases. Inspectors also witness mechanical integrity tests performed on oil & gas wells which are temporarily abandoned for more than one year.

Plugging Inspections (~ 2 - 5 per year): DENR reviews and approves well plugging plans prior to plugging. Inspectors observe plugging operators to ensure they plug the appropriate strata in accordance with permit conditions and their approved plugging plan.

Final Inspection (~ 5 per year): Prior to release of reclamation liability, DENR inspectors visit well sites to ensure surface restoration is complete.

Casing Requirements (Figure 5)

ARSD 74:12:02:11. Oil, gas, and water strata required to be sealed**:** During construction of oil, gas, and injection wells all oil and gas bearing strata and freshwater resources must be sealed to preclude vertical migration of fluids or gas between strata. Freshwater or freshwater muds must be used from the surface to no less than 50 feet below the base of all locally utilized freshwater resources when drilling.

ARSD 74:12:02:12. Procedures for setting surface casing and production casing**:** The procedure for setting surface and production casing must meet the following conditions:

(1) The surface hole must be drilled with fresh water. Surface casing must be set to protect freshwater resources as determined by the secretary. Cement must be used in the annulus to circulate to the surface. Unless otherwise waived by the secretary, no less than 100 feet of surface casing may be set under any circumstances; and

(2) Freshwater resources not presently utilized must be protected by production casing and cement. Cementing in stages, if necessary, must be done for the purpose of sealing or separating aquifers with cement that circulates in the annulus.

The secretary shall prescribe variations in the casing and cementing procedures from area to area. The operator shall file a cement bond log within 60 days after completion of a well.

Table 1. 2012 Oil & Gas Bond Requirement Comparison							
Bond Type	**Bond Sub Type**	**North Dakota**	**Montana**	**Colorado**	**Nebraska**	**Wyoming**	**South Dakota**
Oil and Gas Well Plugging and Performance Bond	Single Well ("shallow")	$50,000 or less if approved by Director (for depths less than 2,000')	$1,500 (for depths less than 2,000')	$10,000 (for depths 3,000' or less)	$10,000	$10,000 (for depths less than 2,000')	$5,000
	Single Well ("deep")	$50,000 (for depths greater than 2,000')	$5,000 (for depths 2,000' to 3,500') $10,000 (for depths 3,501' or more)	$20,000 (for depths 3,000' or more)	$10,000	$20,000 (for depths greater than 2,000')	$5,000
	Blanket Bond	[A]$100,000 (Covers limited number of wells)	$50,000	$60,000 for less than 100 wells, $100,000 for 100 or more wells	$100,000	$75,000	$20,000
Surface Restoration Bond	General (per well)	NA	NA	NA	NA	[D]$2,000	[C]$2,000
	Irrigated Lands (per well)	NA	NA	[B]$5,000	NA	NA	NA
	Non-Irrigated Lands (per well)	NA	NA	[B]$2,000	NA	NA	NA
	Blanket Bond	NA	NA	[B]$25,000	NA	[E]Supervisor may approve a bond to cover all oil & gas operations on the surface owner's land	[C]$10,000
Bond for Temporarily Abandoned Oil and Gas Wells	NA	NA	NA	[G]Bond increased by $10,000/excessive inactive well for less than 3,000' of inactive wells, and $20,000/excessive inactive well for greater than 3,000' of inactive wells	NA	[F]Up to $10.00 per foot of idle well on fee or patented lands	NA

[A] Provided the bond shall be limited to no more than 6 of the following in aggregate: A well that is a dry hole and is not properly plugged; a well that is plugged and the site is not properly reclaimed; and a well that is abandoned pursuant to section 43-02-03-55 and is not properly plugged and the site is not properly reclaimed.

[B] Operators shall provide financial assurance to the Commission, prior to commencing any operations with heavy equipment, to protect surface owners who are not parties to a lease, surface use or other relevant agreement with the operator from unreasonable crop loss or land damage caused by such operations.

[C] The Board of Minerals and Environment shall require the furnishing of a surface restoration bond if the landowner or lessee is not a party to the oil or gas leasing agreement […]

[D] In lieu of [securing written consent or waiver of the surface owner or obtaining an executed surface use agreement providing for compensation to the surface owner for damages to the land and improvements] executing a good and sufficient surety bond or other guaranty to the commission for the use and benefit of the surface owner to secure damages

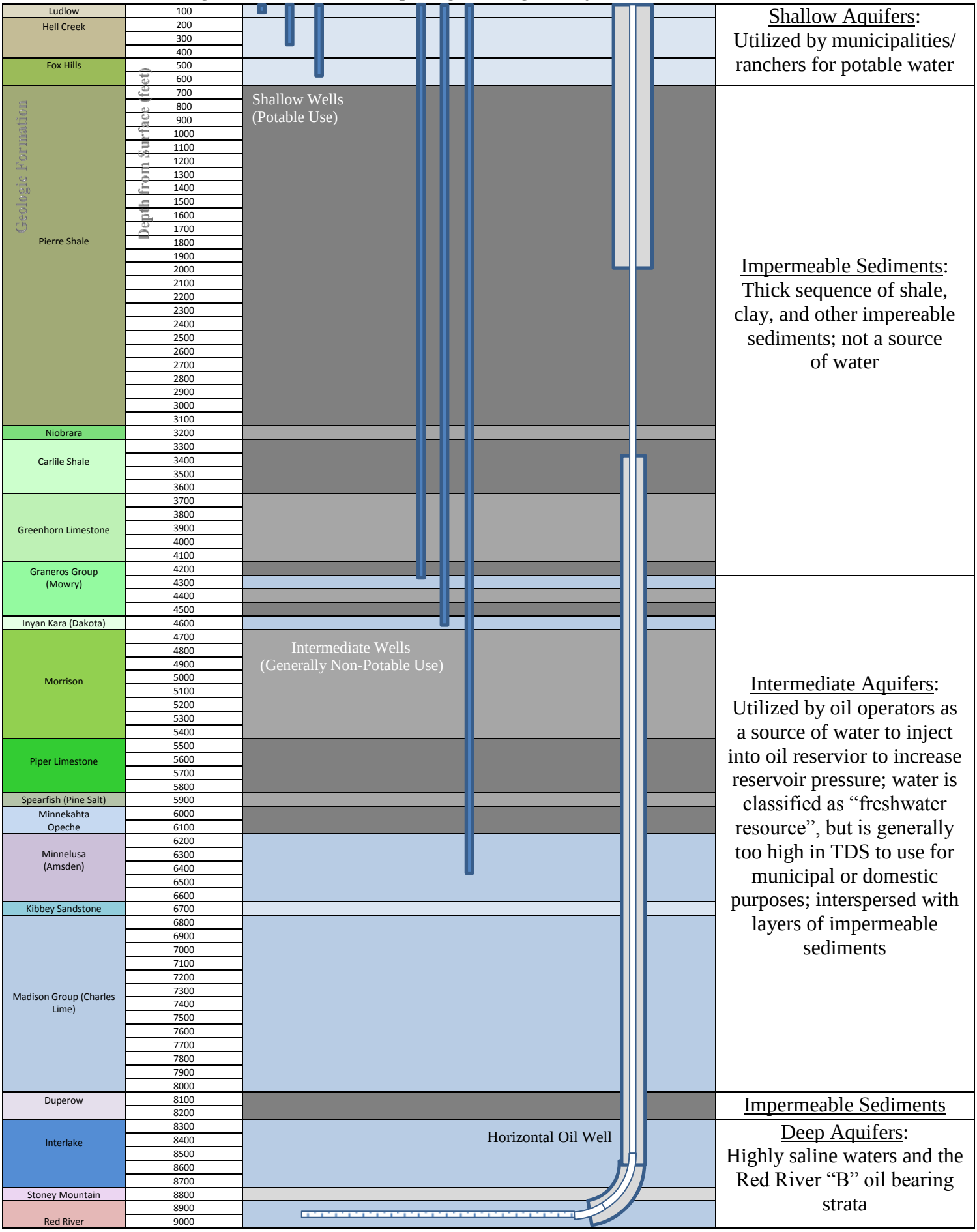
[E] Upon approval of the Supervisor, after attempted good faith negotiations with the surface owner, the Owner/Operator may submit a bond or other guaranty to cover all oil and gas operations on the surface owner's land […] in an amount determined by the supervisor. The surface owner may object to this amount and a hearing will be held.

[F] In the event an Owner/Operator has a blanket bond covering wells on fee or patented lands, the Commission will normally not ask for additional coverage if the wells are [active]. Wells which are not [active] are deemed to be idle. The Supervisor may require an increased bonding level up to $10.00 per foot for each idle well as soon as the Operator's total footage of idle wells exceeds 2,500' or 7,500' depending upon which level of blanket bond is in place. An Owner/operator may request the Supervisor to set a different bonding level based on an evaluation of the specific well conditions and circumstances. The Operator shall submit a written cost estimate to provide plugging, abandonment, and site remediation, prepared by a Wyoming contractor with expertise in well plugging, abandonment, and site remediation.

[G] To the extent that an operator's inactive well count exceeds such operator's financial assurance amount divided by $10,000 for inactive wells less than 3,000' in total measured depth or $20,000 for inactive wells greater than or equal to 3,000' in total measured depth, such additional wells shall be considered "excess inactive wells." For each excess inactive well, an operator's required financial assurance amount under Rule 706 shall be increased by $10,000 for inactive wells less than 3,000' in total measured depth or $20,000 for inactive wells greater than or equal to 3,000' in total measured depth. This requirement shall be modified or waived if the Commission approves a plan submitted by the operator for reducing such additional financial assurance requirement, for returning wells to production in a timely manner, or for plugging and abandoning such wells on an acceptable schedule.

Table 2. Well Plugging Cost Comparison				
State	**Dates**	**Number of Wells**	**Depth (ft)**	**Cost**
Pennsylvania Orphan Well Plugging Program	2007-2009	790	Unspecified	$9,650/well average
Pennsylvania Orphan Well Plugging Program	1992-2000	108	Unspecified	$22,222/ well average
New York Department of Environmental Conservation		Agency Estimate	Unspecified	$3,000-$7,500
Railroad Commission of Texas-Oil & Gas Division		257,000	Unspecified	$4,500/well average
Kansas Orphan Well Plugging Program	2011	359	Unspecified	$4,500/well average
California Orphan Well Plugging Program	1977-2010	1,307	Unspecified	$18,133/well average
Nebraska Oil and Gas Commission		Agency Estimate	4,000-5,000	$15,000/well
Montana Board of Oil and Gas Conservation		Agency Estimate	1,400-1,700	$10,000-$12,000/well
North Dakota Industrial Commission-Oil & Gas Division		Agency Estimate	~ 9,000	$50,000-$80,000/ well
North Dakota Oil and Gas Operator		Operator Estimate	~ 9,000	$116,000-$127,500/well

Figure 1. Cross Section Depicting Harding County Ground Water Resources



Figures 2 & 3. Photos of a Harding County Red River Well Plugging – Plugged September 10, 2012

Plugging Crew at Continental Resources, Inc.'s Beer Mug Ranch Well, Harding County

Plugging Crew Preparing Cement for Plugging at Beer Mug Ranch Well, Harding County

Figure 4. South Dakota DENR Bond Release Checklist

Well: TOTAL 1-16 CUSTER FEDERAL Location: 22N-5E-16 NENE

API #: 40 063 20446 Permit #: 1391

Bond Release Checklist

1. **Plugging & Performance Bond**: ☐ $5,000 Bond (Individual Well) ☒ $20,000 Bond (Multiple Wells)

- ☒ Well Logs
- ☒ Geologist's Report
- ☐ NA ☒ DST Chart and Reports
- ☒ NA ☐ Results of Coring & Core Analyses
- ☒ Set of 10-foot Sample Cuttings to SDGS
- ☐ Completion/Recompletion Report (Form 4)
- ☒ Plugging Record (Form 7)
- ☒ NA ☐ Horizontal Survey
- ☐ NA ☒ Approved Letter from Surface Owner

2. **Surface Restoration Bond:** ☐ $2,000 Bond (Individual Well) ☐ $10,000 Bond (Multiple Wells)

- ☐ Approved Scout Report
- ☐ Approved Letter from Surface Owner

3. **Notification:**

- ☒ Certified release letter and financial instrument sent to operator.
- ☐ Enter information in Bond Lists (O:\O&G\Reports) and database.

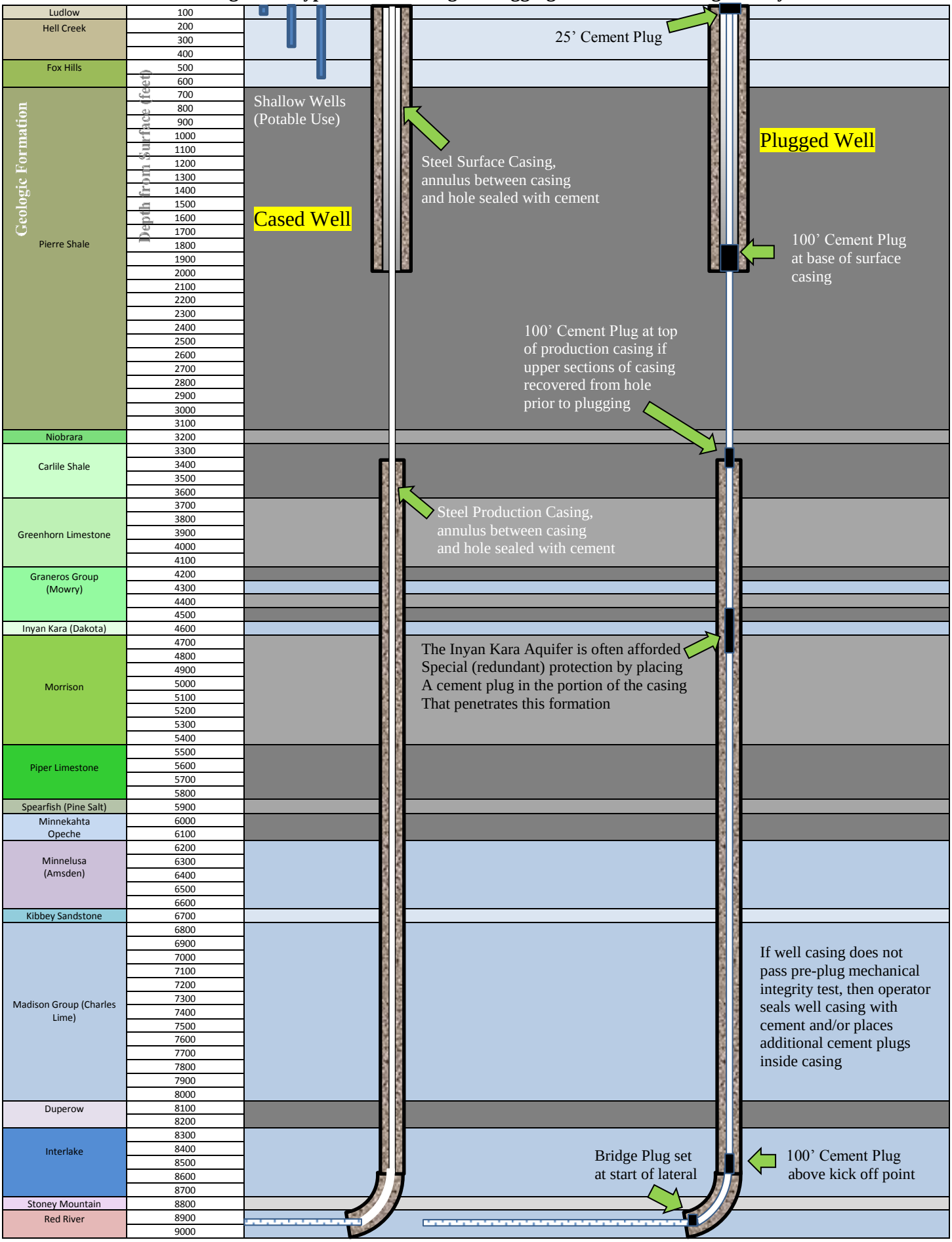
Comments

Plugging Report = federal form 9-2006. See letter dated March 1, 2012 from Sioux District Ranger, Kurt Hansen--includes photos of the reclaimed site and approval of surface restoration.

Signature of Reviewer: Signed Michael Lees

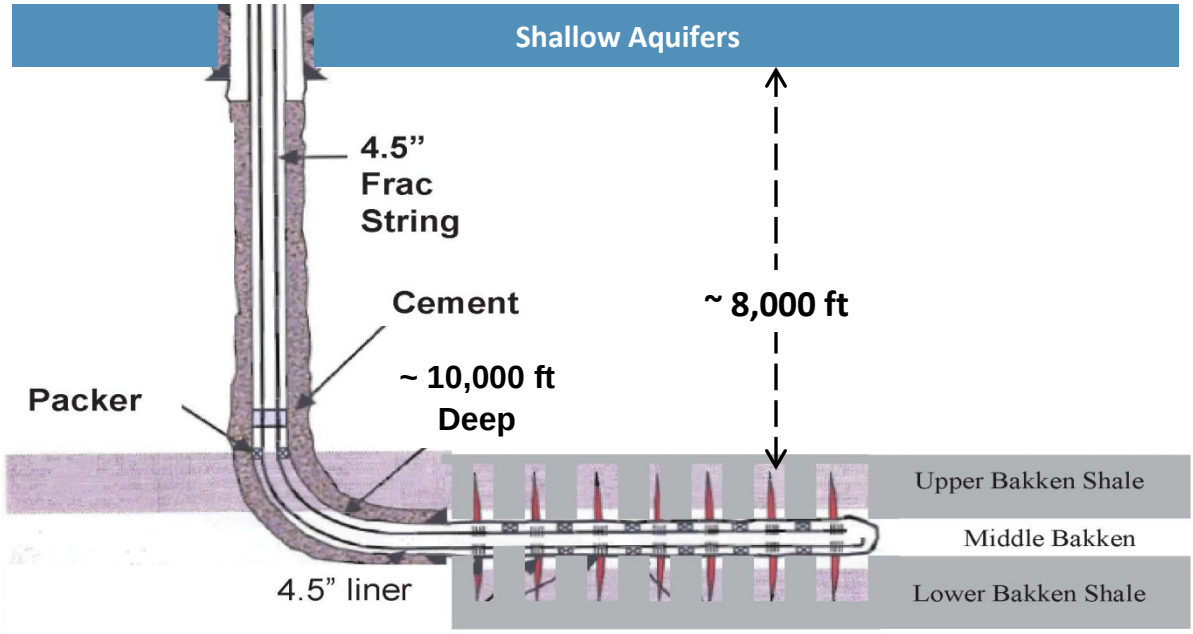
Date Review Completed: Apr 5, 2012

Figure 5. Typical Well Casing & Plugging Features – Harding County



Oil & Gas Hydraulic Fracturing Fact Sheet

Typical Horizontal Oil Well in North Dakota—High-Pressure Multi-Stage Fracing



What is fracing? Hydraulic fracturing, also known as fracing, is a mechanical technique used to increase the permeability of rock to increase oil and gas production. The process involves injecting water, a propping agent such as sand, and a small percentage of chemicals into an oil or gas reservoir under high pressure. This creates small fractures in the rock which are held open by the proppant, thus allowing oil and gas to flow to the well bore.

What materials are used to frac a well and how much does it cost? Fracing a typical Bakken well in North Dakota involves 2-4 million gallons of water, 3-5 million pounds of proppant (usually sand or ceramic beads), and less than 0.5% other chemicals (examples include rust inhibitors, biocides, thickeners, salts, emulsifiers, acids and anti scalents). The cost to frac a Bakken well is in the range of $2 to $5 million.

Why is fracing used? Fracing is used primarily in cases where the rock is very tight and does not have adequate permeability to economically produce the contained oil or gas (such as shale). The process along with horizontal drilling has made very large but tight oil and gas resources economic to produce such as the Bakken formation in North Dakota.

Does fracing affect shallow aquifers? High-pressure fracing typically affects rock within a several hundred foot radius of the point where injection fluids leave the well casing. Since the producing formations in North Dakota are typically around 10,000 feet deep, shallow aquifers are not impacted by fracing because there are thousands of feet of rock separating them from the fractured producing formation.

Is fracing used in South Dakota? High-pressure multi-stage fracing as used in the Bakken Formation in North Dakota has not been used in South Dakota to produce oil. Most of South Dakota's existing oil production comes from the Red River "B" formation, but this unit is more permeable than the Bakken, so fracing is not necessary. If low permeability oil and gas resources are discovered in South Dakota, high-pressure multi-stage fracing may become a necessary practice in the state to produce them.

Is fracing allowed in South Dakota? Currently, the state oil and gas rules allow fracing as long as it is reported to DENR. At the national level there is a move to regulate fracing under the Federal Safe Drinking Water Act. EPA is conducting studies to determine whether fracing warrants regulation at the federal level with results expected in a year or two. If EPA determines fracing should be regulated under the Safe Drinking Water Act, South Dakota's rules will likely need to be changed to reflect federal rules because the program is delegated to us by EPA.

Core and Cuttings Repository - Geological Survey Program (DENR)

Core and cuttings produced from drilling in South Dakota are housed at the Geological Survey Program's Core and Cuttings Repository on the west side of Vermillion **(Figure 6)**. Industry submits core and cuttings from drilling related to oil and gas exploration/development. The Geological Survey Program keeps core and cuttings from drilling it performs when the scientific value is thought to merit storage and future availability. The building in which the core and cuttings are housed is 50 ft. x 100 ft. pole-barn style Morton building **(Figure 7)** that contains shelves on which the core and cuttings are stored **(Figures 8 & 9)**.

The Geological Survey Program is charged with management of the Core and Cuttings Repository. Viewing and limited sampling and testing of the core and cuttings is allowed at the discretion of the Geological Survey Program. The protocol for sampling and testing of the core is presented at the end of this document.

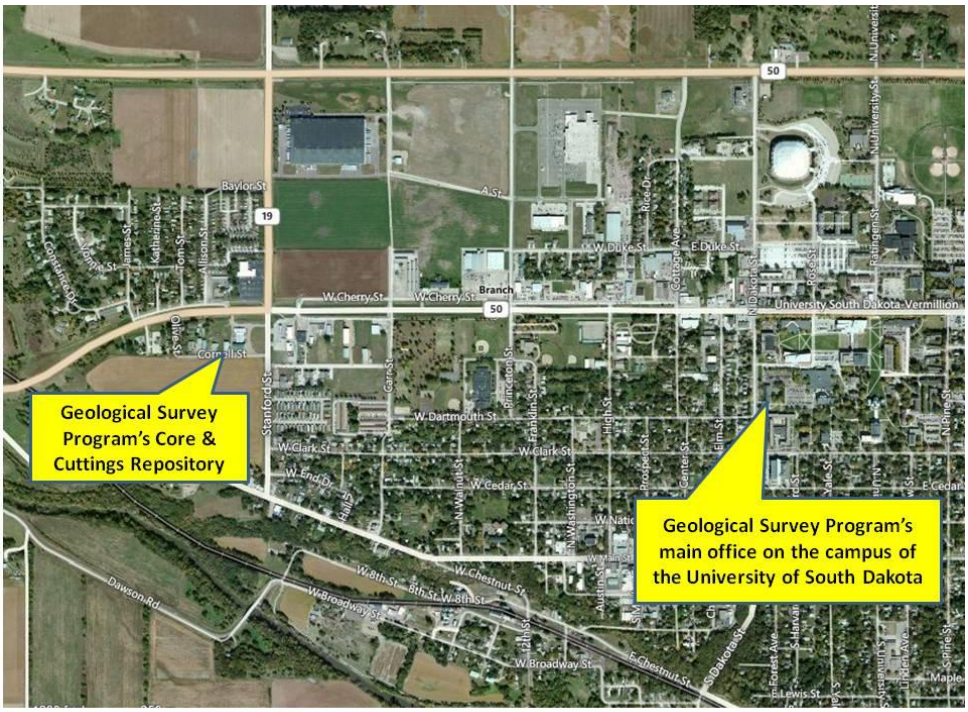


Figure 6. Aerial view showing the locations of the Core and Cuttings Repository and the Geological Survey Program's main office in Vermillion.

Figure 7. Building on the west side of Vermillion where the core and cuttings are stored.

Figures 8 & 9. Shelving containing boxes of core and cuttings.

Statewide, there are approximately 550 drill holes for which the Geological Survey Program has core and approximately 1,910 holes for which the Geological Survey Program has cuttings. Figure 10 illustrates the number of drill holes in each county for which there is core and/or cuttings in the repository.

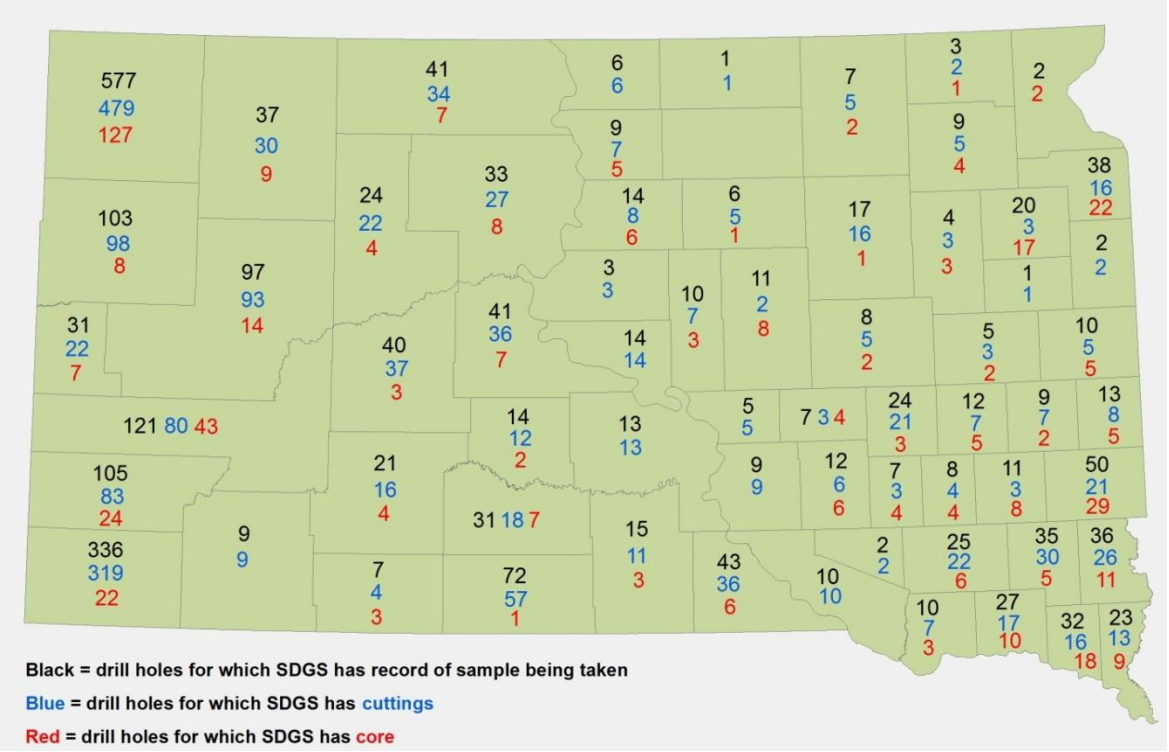


Figure 10. Map showing the number of drill holes in each county for which the Geological Survey Program has core and/or cuttings.

South Dakota is presently producing natural gas from the Shannon Sandstone in southern Harding County from a depth of approximately 1,000 feet. This is the shallowest depth of hydrocarbon production in South Dakota. Any core that the Geological Survey Program has from a depth of greater than 1,000 below land surface will be most relevant to the exploration for oil and gas and will be the first core/cuttings studied in the near future. Figure 11 shows the location of drill holes in which the Geological Survey Program has ***core*** that was collected from depths greater than 1,000 feet. The depth of the core and cuttings, and the amount collected from these drill sites, varies from hole to hole.

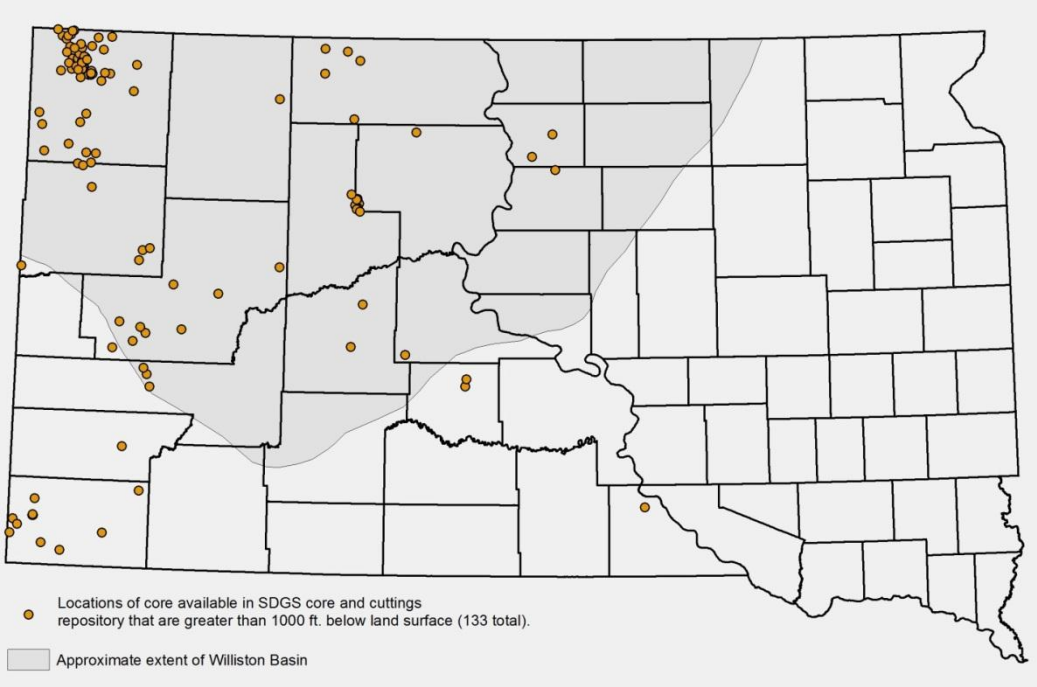


Figure 11. Map showing the locations of drill holes for which the Geological Survey Program has core collected from a depth of greater than 1,000 feet.

The role of the Department of Environment and Natural Resources is not to explore for oil and gas resources. Rather, its role is to make available all pertinent state-held information in a user-friendly format so that industry may decide to invest further in South Dakota and perform exploratory activities. DENR's Geological Survey Program will continue to compile and evaluate available geologic information and present the results of those evaluations in reports, maps, and cross sections that will be used to promote South Dakota's oil and gas potential. The Geological Survey Program will in the future enhance the information related to the core and cuttings housed in the Geological Survey Program's Core and Cuttings Repository by providing (1) detailed descriptions of relevant core and cuttings and (2) photographs of relevant segments of core.

GEOLOGICAL SURVEY PROGRAM CORE AND CUTTINGS REPOSITORY

General Requirements and Procedures

- Individuals wanting to view core and/or cuttings from the repository should submit a request to the Geological Survey Program in advance so materials and viewing space can be adequately prepared.

- For information regarding viewing or sampling of archived samples or submission of sample requests, please contact Darren Johnson at Darren.J.Johnson@state.sd.us or by telephone at 605-677-5227.

- Geological Survey Program staff will retrieve core and cuttings from shelves, provide supervision while samples are being viewed, re-shelve the samples, and will be available to answer questions.

- Unsupervised sampling or viewing will not be permitted at the core and cuttings facility unless approved by Geological Survey Program staff.

- An examination area will be provided by the Geological Survey Program. Its use will be limited to the following:
    - Monday-Friday, except for holidays.
    - 8:00 AM – Noon, 1:00 PM-5:00 PM

- Hours may be limited depending on availability of personnel. Please schedule viewing times in advance.

- Special requests (including on-site or impromptu requests) may be accommodated depending on the availability of personnel.

- The core examination area will contain the following for use by visiting researchers:
  - Table/bench areas for laying out core and cuttings boxes
  - Binocular microscope and light source

- A rock saw for cutting samples is available for use by Geological Survey Program personnel only.

Sampling Protocol

- Viewing and limited sampling of core and cuttings for research purposes is allowed at the discretion of the Geological Survey Program.

- Researchers must request core and cuttings in advance so that Geological Survey Program staff can verify that requested samples are present in the archive.

- Researchers must submit a brief description of the intended use of sampled core and cuttings and the types of analyses to be performed.

- Removal, or not, of core from boxes is contingent upon the condition of the core.

- Core must be returned to boxes exactly as it was found. Researchers must use extreme care when handling core to avoid spilling or breakage and so the sequence of core is not disturbed. If core is spilled or dropped, SDGS staff must be notified immediately and they will determine whether core placed back in the box is in sequence.

- At the discretion of the Geological Survey Program, if circumstances require analyses that cannot be accommodated on site, core and cuttings may be loaned to researchers for off-site analyses.

- Length of loan time will be determined by the Geological Survey Program.

- Failure to return samples to the Geological Survey Program in the agreed upon timeframe may result in suspension of core and cuttings access privileges.

- Samples are not to be loaned from one researcher to another without express written permission by the Geological Survey Program and the submittal of acceptable documentation.

- Core and cuttings representing formation contacts and unique features, especially those of scientific value, must be preserved.

- Destructive analyses must be pre-approved by the Geological Survey Program and noted on spacers/labels placed in the core and cuttings boxes at the time of sample removal. Spacers/labels must identify the researcher's name, affiliation, date of core removal, and interval removed.

- Approval for destructive sampling is contingent upon the quantity of core and cuttings present, its scientific value, and the value of the proposed analyses to the scientific community. If the Geological Survey Program determines that insufficient material is present, permission will not be granted to conduct destructive sampling.

- Permission from the Geological Survey Program to sample particular intervals of scientific value will be based on the quantity and quality of that particular interval of core or cuttings.

- If destructive sampling of core has not been approved by the Geological Survey Program, at least one continuous face of ½ of all cores must be preserved.

- If less than ½ of the full diameter core exists, no sampling will be allowed.

- Dissection of lengths of core is only allowed if cut with a rock saw. In the case of poorly consolidated materials, unconsolidated materials, or those that may be damaged by the saw, alternatives may be discussed with the Geological Survey Program.

- To preserve core and cuttings for future use, no more material is to be removed than what is reasonably needed.

- Researchers are required to properly label and return any unused portions of sampled material to the Geological Survey Program. Labels must include the core and cuttings name and interval. Labels must also include an indication of top versus bottom (if core or core fragment).

- To avoid duplication, preserve remaining core and cuttings, and contribute to the public record, researchers are required to provide copies of generated data to the Geological Survey Program. Expectations to this requirement may be discussed with the Geological Survey Program.

- Upon request, the Geological Survey Program will hold generated data confidential for a predetermined length of time. If confidentiality is an issue, please discuss this in advance with the Geological Survey Program.

- Generated data and associated samples are to be returned to the Geological Survey Program in a mutually agreed upon time frame.

- As a courtesy, the Geological Survey Program requests that hard copies of generated data and the associated properly labeled samples and thin sections will also be submitted.

- All parties that view or remove samples will be held to these standards.

Oil & Gas Preparedness

Since northwest South Dakota will likely be the primary area impacted by oil development (by potential new development in South Dakota and existing development in North Dakota), the work group focused its efforts on issues related to Harding, Perkins, Corson, Dewey, Butte, Meade, and Ziebach counties.

Housing

Due to its low population, any development that leads to a substantial increase in population will create housing challenges in northwest South Dakota. The total population of SD is about 814,000 people who live in 363,438 households.[1] Only about 52,000 people (about 6% of the state's population) live in the seven counties comprising northwest South Dakota.[2] The area has only 22,338 households, of which there are only about 900 for rent or sale.[3]

2010 U.S. Census Data for Housing in South Dakota

County	Population	Total Housing	Housing for Rent	Housing For Sale
Harding	1,255	731	9	4
Perkins	2,982	1,729	37	25
Corson	4,050	1,540	61	4
Dewey	5,301	1,730	77	5
Butte	10,110	4,621	152	50
Meade	25,434	11,000	367	101
Ziebach	2,801	987	26	2

The housing shortage has been one of the most difficult challenges in North Dakota resulting from oil and gas development. Rents and home prices have skyrocketed while new housing development struggles to meet demand. Developers have built innovative housing, often referred to as "crew camps" or "man camps," to house large numbers of people in a confined area. Other solutions have included mobile or modular homes, RV parks, and new apartment complexes.

Williams and Mountrail counties in North Dakota imposed moratoriums on "man camp" development in the fall of 2011.[4] In Mountrail County it was estimated that one-third of the population was living in temporary housing.[5] Some counties in North Dakota are now considering enacting zoning rules as a result of unregulated housing development.

While oil and gas development in South Dakota is not expected to be anywhere near the magnitude of development in North Dakota, any amount of development will create

[1] 2010 US Census Data
[2] 2010 US Census Data
[3] 2010 US Census Data
[4] Oil Rigs Bring Camps of Men to the Prairie, New York Times, Nov. 25, 2011
[5] Oil Rigs Bring Camps of Men to the Prairie, New York Times, Nov. 25, 2011

housing challenges. Preparing for housing demands is very difficult because no one knows exactly where oil and gas development will occur, if at all, and developers won't build until there is a clear long-term demand.

South Dakota Housing Development Authority Programs

The South Dakota Housing Development Authority (SDHDA) has the following housing programs available, however they primarily benefit low-income families and most people working in the oil industry will not be eligible. Nonetheless, they may be an option for many families in the area.

HOME Program: The primary purpose of the HOME Program is to expand the supply of decent, safe, sanitary, and affordable housing for very low-income and low-income households as determined by HUD provided income limits. For rental units, HOME will serve families and individuals at 60% or below the area median income limit. Rents on the units are restricted for an affordability period. The HOME Program provides funds to developers and/or owners for acquisition, new construction, and rehabilitation of affordable housing. The typical financing package would consist of 10% owner equity, 40% conventional loan and 50% HOME funds. The HOME funds are loaned at a 0% interest rate with variable repayment terms. For 2012, there was $4,780,000 in General Pool funds available for HOME applications. The 2012 per project limit is $956,000; per developer, sponsor, or owner limit is $1,195,000; the per community limit is $2,390,000.

Housing Tax Credit Program: The Housing Tax Credit Program was designed as an incentive for construction and rehabilitation of housing for low-income households. Created by the Internal Revenue Code of 1986, the Housing Tax Credit Program offers a reduction in tax liability to owners, subject to restrictions. The maximum allowable credit amount is determined by multiplying the annual percentage rate (approximately 4% to 9%) by the qualified costs attributed to the designated low-income units in the project. Developers of housing tax credit projects typically raise equity capital for their projects by syndicating the tax credits to investors who are willing to invest in the project. The investors' return is the annual tax credit and other economic benefits generated by the project. The U.S. Department of Treasury annually allocates in excess of $2 million to South Dakota. SDHDA, as the credit-issuing agency, is responsible for the administration of the tax credits. For rental units, the Housing Tax Credit Program will serve families and individuals at 60% or below the area median income limit. Rents on the units are restricted for an affordability period.

First-time Homebuyer Program: The First-time Homebuyer Program provides low interest mortgage loans to eligible homebuyers purchasing a home in the state of South Dakota. There are several interest rate options available.

> **Step Rate*: The interest rate starts at a predetermined affordable rate and increases one-half of one percent per year for the first four years and then becomes fixed at the beginning of the fifth year, where it stays for the remaining term of the loan.

**Fixed Rate*: The interest rate is fixed for 30 years.

**Fixed Rate Plus*: This is the newest rate option offered by SDHDA. The interest rate is fixed for 30 years and it provides a 3% gift for down payment and closing costs.

Governors' House Program - The Governor's House program was created as a way to provide reasonably sized, affordable homes to income-qualified individuals and families. More than 1,900 Governor's Houses have been sold to elderly, persons with disabilities, and income-qualified families in South Dakota. These South Dakota residents have a quality, low-cost, low-maintenance, energy efficient place to call home. The homes cost $35,500 plus excise and sales tax. Income limits apply and household income cannot exceed $42,280 for couples or individuals and $48,320 for families of three or more.

For families and individuals under the age of 62, net worth must be less than $90,000 and less than $70,000 in liquid assets. For families and individuals age 62 and older, net worth must be less than $175,000 and less than $100,000 in liquid assets. The house must be used as the homebuyer's only residence. In addition, the house must be placed within South Dakota and be owned by the individual(s) living in the home.

Community Home Improvement Program (CHIP): The Community Home Improvement Program (CHIP) provides low interest loans for eligible borrowers to improve or repair the borrower's present single family home. The interest rates for CHIP Loans are 1.9%, 3.9% and 5.9%, depending on the county in which the home is located and the total gross annual household income. CHIP Loans have level monthly payments and terms up to seven years. The loan amounts range between $500 and $15,000. There are no loan-to-value requirements and minimal costs associated with obtaining a CHIP Loan.

Community Housing Development Program: The objective of the Community Housing Development Program (CHD) is to provide a financial resource to help address the housing needs of South Dakota communities. Based on the needs identified by community housing studies, SDHDA can provide financial assistance for development of rental housing opportunities. Funds may be used for households at or below 120% of the Area Median Income. Public or private nonprofits or profit-oriented individual(s), corporations, partnerships, limited partnerships or organizations can apply.

Road Infrastructure

Road infrastructure will be another major challenge that coincides with oil and gas development. The South Dakota highway system is already being impacted by development in North Dakota. Any additional development in South Dakota will further impact the state highway system and have a detrimental impact on county roads. Current traffic volumes in western South Dakota are well within the capacity of the existing highway system, and there is room for increased capacity.

Impact on South Dakota State Highways

The ongoing oil exploration and development occurring in western North Dakota has resulted in significant increases in traffic volumes on some state highways in western South Dakota. The most noticeable increases are on segments of U.S. Highway 85 where truck traffic in some locations has increased approximately 50% over the last 5 years, with overall traffic volumes increasing by close to the same amount. The map on page 78 shows both current and historic average daily traffic (ADT) data for various segments of the state highway system in western South Dakota.

However, even with these increases, the volumes of traffic experienced on South Dakota state highways in the western half of the state are well within the capacity of the existing state highway system, and there is room for increased capacity.

Level of Service

The functioning and capacity of highways is graded according to Level of Service which is a qualitative measure (from A to F) describing the traffic conditions in terms of speed, travel time, comfort, convenience, traffic interruptions and safety. Traffic volumes on a rural two-lane undivided highway would need to be approaching 15,000 ADT before the Level of Service on the road would decline to a level that additional capacity (i.e. adding lanes) would be warranted or necessary.

Based on existing traffic volumes, US Highway 85 is currently functioning at a Level of Service A. Information regarding future oil development in North Dakota indicates steady growth for the next five years, followed by approximately 10 years of steady but not increasing activity. Based on these projections, heaviest traffic volumes on US Highway 85 could double to nearly 3,000 ADT. At these levels, the highway would not be near the level of reaching its traffic handling capacity.

Surface Condition

The surface condition of state highways is measured and tracked according to a Surface Condition Index (SCI) rating from 0 (worst) to 5 (best/new). The current condition of US Highway 85 from the North Dakota state line to Belle Fourche is very good, with nearly all the pavement having a SCI rating above 4 and is currently showing the same wearing characteristics of other state highways. The current roadway is structurally adequate to handle the current and expected increases in traffic volumes, including truck traffic. The South Dakota Department of Transportation (SDDOT) is

beginning to experience the need for additional maintenance activities, primarily as a result of the increased truck traffic. It can be expected the trend for increased maintenance will continue as the volume of truck and other traffic continues to rise.

The SDDOT will need to continue to monitor the amount of truck traffic on state highways, along with the impact that these volumes have on state highway surfaces. With an increase in truck loading, the highway surfaces may deteriorate at an accelerated rate, which could expedite the need to resurface sections of our state highway system (especially U.S. HWY 85) sooner.

The design of our state highway facilities is based on projected future traffic volumes. When these volumes are significantly more than anticipated, especially with increases in truck traffic, the expected and actual life of our pavement structures may be less than originally anticipated. Further, the pavement design of a highway is based on the amount of loading (weight) the pavement will see for the design life (typically 20 years).

If a section of highway experiences larger highway loads then the design of the pavement structure called for then either the existing section will need to be strengthened or a new surfacing section will need to replace the old surfacing. This additional thickness will cost more to construct than the design of a thinner surfacing section. Thus, resurfacing these sections may need to be completed sooner in order to preserve our highway infrastructure investment.

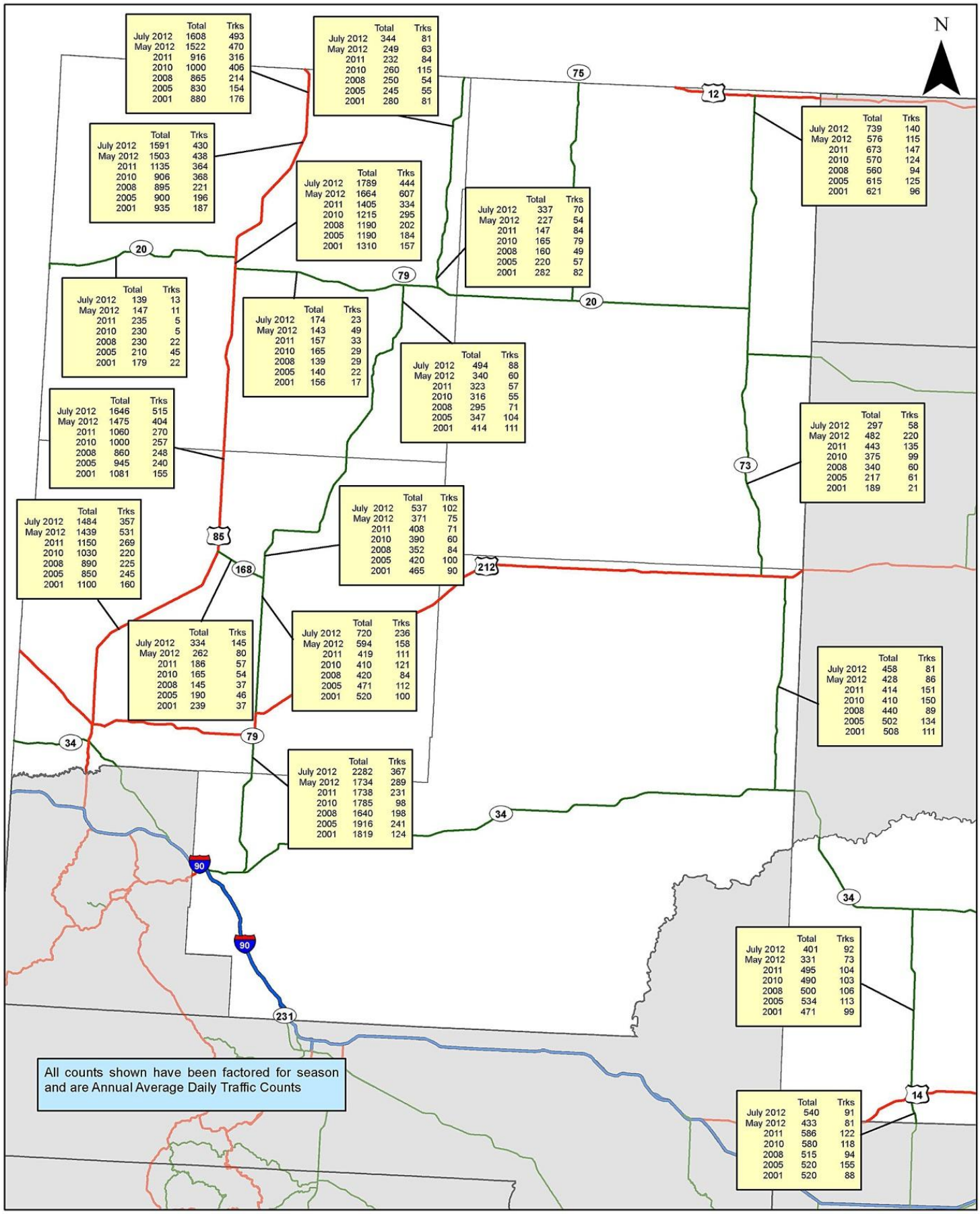
Safety

Another concern associated with increases in traffic volumes is safety. The Statewide Accident Rate is 1.5 accidents per 100 million vehicle miles traveled. In general, the accident rate on U.S. Highway 85 north of Belle Fourche is at or below the statewide average. The section of U.S. Highway 85 around Buffalo is slightly above the statewide average, but quite comparable to other small communities across the state. Most of the accidents that are occurring on U.S. Highway 85 are single vehicle accidents involving wild animal hits.

While the SDDOT continually monitors all state highways, additional study and monitoring will occur in this area due to the current and anticipated traffic growth. Ongoing monitoring of traffic volumes will help determine what, if any, additional improvements may be necessary to continue maintaining and preserving the existing system in a safe and efficient manner. Improvements that may become necessary as traffic volume continues to grow include passing lanes, turn lanes and wider shoulders.

In the event more oil activity occurs in South Dakota beyond existing levels, additional impacts to the state highway system can be expected. Along with an overall increase in traffic volumes, there will be heavier impacts on a more localized basis in the area of the future development. Based on the likely scenarios for increased oil development in South Dakota and North Dakota, the additional traffic volumes are not likely to pose an insurmountable problem for maintaining adequate state highway infrastructure.

SDDOT Oil Field Traffic Study



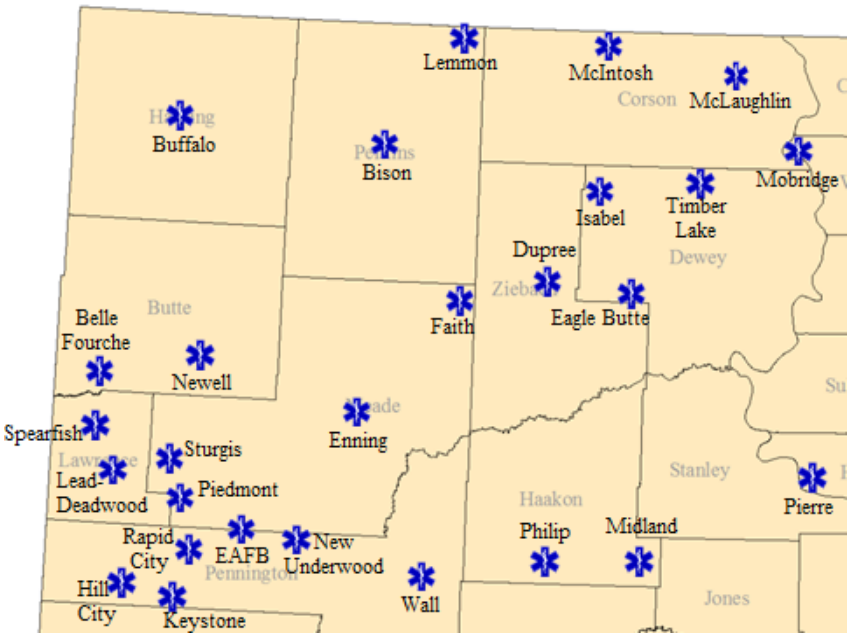
Emergency Services

Any development that results in increased population will add further stress on already burdened emergency services. Ambulance services and fire departments rely on volunteers who already have a heavy work load. If oil and gas development results in population growth (and more service calls), the workload will increase and it will likely become more difficult to retain and recruit volunteers. Services located along highways 85, 79 and 73 are already experiencing increased traffic and calls as a result of the development in North Dakota and are most likely to experience the most strain.

North Dakota emergency medical services have reported a crisis situation and cite difficulty keeping up with response demand, staffing shortages, deteriorating roads, traffic problems, growing safety concerns and lack of funding.[6] While development in South Dakota is expected to be to a much lesser degree, if development is substantial, counties could reach a point where they are not able to rely on volunteers for emergency services.

Ambulance Services

There are only fifteen ambulance services west of the Missouri River and north of Interstate 90. They are located in Lemmon, McIntosh, McLaughlin, Timber Lake, Isabel, Bison, Buffalo, Belle Fourche, Newell, Faith, Eagle Butte, Enning, Philip, Midland and Lower Brule. Others that are in this area, but located in cities on Interstate 90 area include Sturgis, Wall, Murdo, Presho, Kennebec, Spearfish, Rapid City and Kadoka.



[6] The Impact of Oil and Energy Development on Out-of-Hospital Emergency Medical Services, Report for the ND Rural EMS Improvement Project by SafeTech Solutions, LLP, June 2011.

Fire Departments

Fire Departments will also experience more strain as a result of oil development. There are currently 55 volunteer fire departments in northwestern South Dakota that utilize over 1,400 volunteers. Most rural fire departments are already short on money and manpower. Further, in many cases they have limited equipment and resources and are trying to cover a large geographic area.

Fire Departments in Northwest South Dakota

County	City	Fire Department	Volunteers/Members
Butte	Belle Fourche	Belle Fourche Fire Dept.	39
Butte	Newell	Newell Fire Dept.	22
Butte	Newell	Castle Rock Fire Dept.	21
Butte	Vale	Vale Fire Dept.	32
Butte	Nisland	Nisland Fire Dept.	10
Corson	Keldron	Grand River Fire Dept.	31
Corson	McIntosh	McIntosh Fire Dept.	21
Corson	McLaughlin	McLaughlin Fire Dept.	21
Corson	Morristown	Morristown Fire Dept.	28
Dewey	Eagle Butte	Eagle Butte Fire Dept.	33
Dewey	Isabel	Isabel Fire Dept.	30
Dewey	Timber Lake	Timber Lake Fire Dept.	26
Dewey	Trail City	Trail City Fire Dept.	55
Haakon	Midland	Midland Fire Dept.	35
Haakon	Midland	Deep Creek Fire Dept.	16
Haakon	Milesville	Milesville Fire Dept.	21
Haakon	Philip	Philip Fire Dept.	40
Harding	Buffalo	Redig Fire Dept.	16
Harding	Buffalo	Buffalo Fire Dept.	20
Harding	Buffalo	Harding County Fire Dept.	28
Harding	Camp Crook	Camp Crook Fire Dept.	20
Harding	Ludlow	Ludlow Fire Dept.	36
Harding	Ralph	Ralph Fire Dept.	12
Jones	Draper	Draper Fire Dept.	13
Jones	Murdo	Murdo Fire Dept.	20
Lawrence	Spearfish	Spearfish Fire Dept.	49
Lawrence	St. Onge	St. Onge Fire Dept.	18
Lawrence	Whitewood	Whitewood Fire Dept.	17
Lyman	Kennebec	Kennebec Fire Dept.	30
Lyman	Lower Brule	Lower Brule Fire Dept.	15
Lyman	Presho	Presho Fire Dept.	22
Lyman	Reliance	Reliance Fire Dept.	30
Lyman	Vivian	Vivian Fire Dept.	23

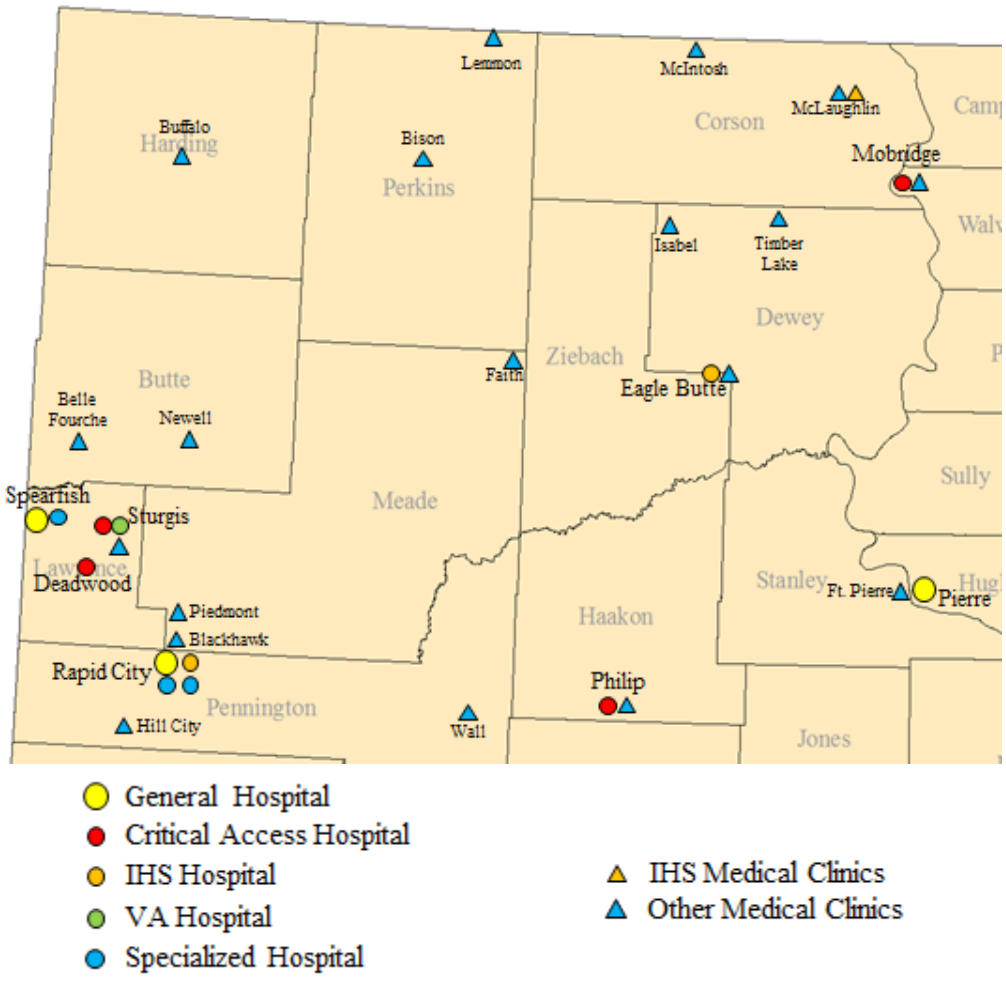
Meade	Black Hawk	Black Hawk Fire Dept.	28
Meade	Elm Springs	Elm Springs Fire Dept.	20
Meade	Faith	Faith Fire Dept.	31
Meade	Hereford	Hereford Fire Dept.	23
Meade	Newell	Mud Butte Fire Dept.	19
Meade	Opal	Opal Fire Dept.	15
Meade	Piedmont	Piedmont Fire Dept.	53
Meade	Sturgis	Sturgis Fire Dept.	43
Meade	Union Center	Enning Fire Dept.	22
Pennington	Quinn	Quinn Fire Dept.	17
Pennington	Wall	Wall Fire Dept.	21
Pennington	Wasta	Wasta Fire Dept.	23
Perkins	Bison	Bison Fire Dept.	20
Perkins	Lemmon	Lemmon Fire Dept.	25
Perkins	Lodgepole	Lodgepole Fire Dept.	31
Perkins	Meadow	Meadow Fire Dept.	24
Perkins	Prairie City	Prairie City Fire Dept.	20
Perkins	Reva	Sorum Fire Dept.	60
Stanley	Fort Pierre	Fort Pierre Fire Dept.	35
Stanley	Hayes	Four Corners Fire Dept.	65
Ziebach	Dupree	Dupree Fire Dept.	28
Ziebach	Glad Valley	Glad Valley Fire Dept.	21

Health Care Services

Health care services in northwestern South Dakota currently face significant challenges and any degree of oil and gas development will exacerbate the situation. There are no general or critical access hospitals in the region and only 11 South Dakota medical clinics providing health care to its 52,000 residents. Indian Health Services are limited and only serve the Native American population. Given the costs of serving sparsely populated areas, no additional services are likely to be offered unless the region experiences significant, long-term population increases.

North Dakota has experience health care services challenges as a result of oil development. In Williston, about 70% of patients are uninsured. Many workers and school children are unvaccinated. They have shortfalls for emergency and acute medical service as well as emergency response. Rates of infectious disease and STDs have increased, as have suicide rates. Given the current scenarios for South Dakota oil development, our state is not likely to experience these issues at anything close to the level of North Dakota. The most likely impacts will be "spill-over" due to North Dakota development, which may result in a modest increase of these issues in South Dakota.

South Dakota Healthcare Facilities in Northwestern South Dakota



Water Systems

Northwest South Dakota receives most of its drinking water from four rural water systems: Rapid- Valley Rural Water System, Perkins County Rural Water System, Standing Rock Sioux Water System and Tri-County Water Association (also known as "Mni Waste'"). The Butte- Meade Water System also supplies a small area of the region. The West River/Lyman-Jones Rural Water System also supplies part of the region, although it is less likely to be impacted by oil and gas development.

Most of the water systems supporting the northwest region of South Dakota do not currently generate enough revenue to pay for long-term infrastructure needs and any substantial growth in the region will create serious challenges for water systems. Upgrades to water systems will also likely hinge on the unpredictable availability of federal funding.

Rural Water Systems Supplying Northwestern South Dakota

The Tri-County Water Association was built in 1979. The system has a total capacity of 1.4 million gallons per day and has been at capacity since 1994. About 55 percent of the use is residential and 45 percent is commercial. The system cannot handle any more users and the waiting list for water is over 1,000 entities. In addition, current revenue sources are will not meet long-term infrastructure demands. The system has secured about $38 million in grants and loans from the U.S. Department of Agriculture, however they still need $33 million to pay for an expansion to Eagle Butte.

The Perkins County Rural Water System is already at capacity (120,000 gallons per day). It currently has 655 users and does not have the ability for any significant residential or commercial expansion without upgrading the system. Current revenue sources are not sufficient to cover long term infrastructure demands. Unless the system is able to produce more gallons per minute or put in a proposed reverse osmosis system, they will not be able to supply water to a sudden influx of users.

The Rapid Valley Rural Water System is the oldest rural water system in South Dakota. In 2008, a new water treatment plant was built for the system so it has the most up-to-date water treatment system in western South Dakota. The system's current capacity is 3 million gallons per day and, at its peak, about 70% of the capacity is utilized. The system can handle about 1,000 more residential users and has expansion capacity for approximately 750,000 gallons per day. Current maintenance and repair demands for the Rapid Valley System mostly involve treatment plant maintenance and replacement of water service lines and water mains. Long-term infrastructure needs include larger water and sewer mains and future water sources such as potential well sites.

The West River/ Lyman-Jones Rural Water System has a capacity of 7 million gallons per day and typically runs between 65 and 70% of capacity, however it reached 95% capacity in July 2012. Capacity for more users depends on the service area. Some areas can handle new users while others cannot. Current maintenance and repair demands include aging pipelines, pump stations and reservoirs. Current revenue is sufficient to meet most long-term infrastructure needs.

Electrical Systems

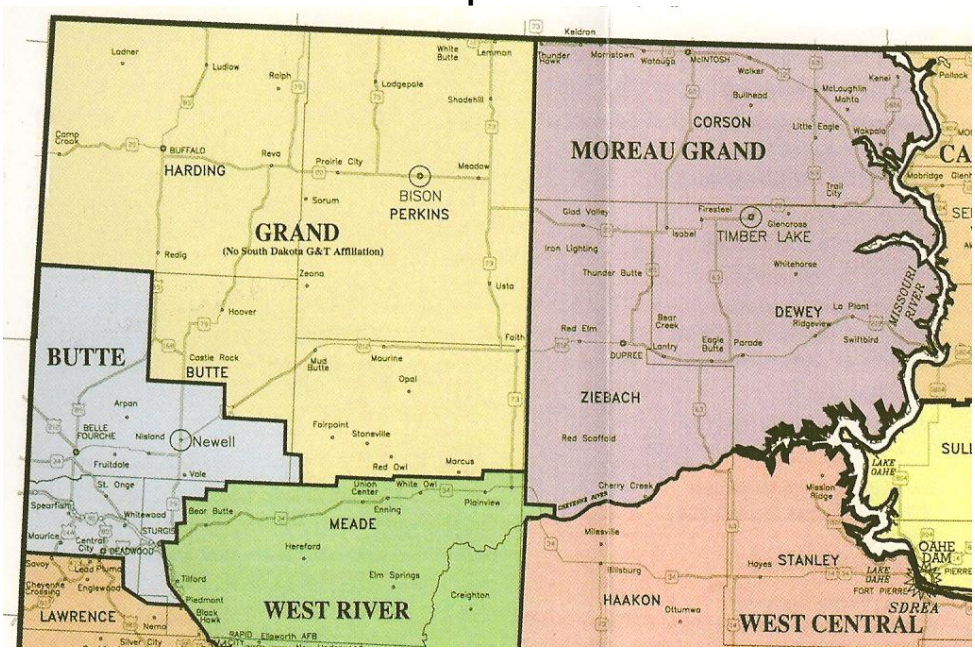
The northwestern region of South Dakota receives electricity from five electric cooperatives: Grand, Butte, West River, Moreau/Grand and West Central. The two cooperatives that will most likely be impacted by oil and gas development are the Grand and Moreau/Grand electric cooperatives.

The Belfield, North Dakota to Rhame, North Dakota electric line that was placed into service in 2010 alleviated the constraints to the southwestern North Dakota and northwestern South Dakota area. In addition to being able to reliably serve future Keystone XL pipeline pumping stations, this transmission expansion will allow for additional oilfield activity growth beyond what is currently projected.

In 2010, Grand Electric upgraded its transmission facilities from 69,000 volts to 115,000 volts from the Bowman, North Dakota substation to the area north of Buffalo where most oil activity is today. This upgrade included additions to the Bowman substation facilities and their Ladner switching station, to provide service for additional oilfield activities. In the process they added a number of new bays to their Ladner switching station that will provide facilities for a proposed TransCanada pumping station and potential future growth in the oil fields. Along with the upgrades they have already made, they also sized and designed the facilities necessary to feed proposed

TransCanada pumping stations in eastern Harding County to a level that will provide capacity for significant new growth.

Service Territories of Electric Cooperatives in Northwest South Dakota



Over the next two years Grand Electric Cooperative plans to increase capacity of their backbone distribution system in the Harding County area to meet any potential growth. While it is difficult to determine the amount and location of future growth, Grand Electric is very comfortable that they have either completed or have made plans for upgrades that will serve higher loads.

Law Enforcement

Crime statistics tend to coincide with population increases and it is difficult to attribute specific criminal activity to a certain industry. Many other factors, such as poverty rates and unemployment, influence criminal activity. Nonetheless, development in any industry that increases population will necessitate increased attention and preparation for an associated increase in criminal activity.

There have been numerous media outlets reporting increased crime as a result of the oil development in North Dakota, but it appears that many of these stories have overemphasized the increase. When North Dakota Attorney General Wayne Stenehjem released the 2011 North Dakota crime statistics he stated, “While it is certainly accurate that crime is up and up considerably in a worrisome way in some of those counties in the Oil Patch, the major reason that is happening is because the population is up.”

In North Dakota, the number of aggravated assaults reported in the oil counties increased from 180 in 2010 to 279 in 2011. However, the population of those counties

also increased from 148,515 to 180,434 between 2010 and 2011. "The chance of anybody being a victim of an aggravated assault in the Oil Patch really is about the same as it is across the rest of North Dakota," Stenehjem said. “Although women may be worried about an increased risk for rape in western North Dakota – which has seen an influx of male oil workers – the odds are statistically lower than elsewhere in the state,” he said. The statewide number of forcible rapes decreased from 222 in 2010 to 207 in 2011. “Twenty-five percent of North Dakota's population is in oil counties, and 16 percent of the rapes occurred there,” Stenehjem said.

Impact to South Dakota Highway Patrol

According to traffic count data supplied by the South Dakota Department of Transportation (SDDOT), U.S. Highway 85 from Belle Fourche to the North Dakota state line has seen an average increase of 55% in all modes of travel since 2001. Truck traffic has increased an average of 169% with areas as high as 232%. Traffic counts on SD Highway 79 and SD Highway 73 reflect similar increases.

The increased travel is noticeable to area law enforcement, including South Dakota Highway Patrol (SDHP) troopers. While fatality and injury crashes have remained fairly constant, the SDHP have experienced an increase in property-damage-only crashes. From 2008 to the end of 2011, total crashes increased by 35% in Harding County, and slightly less than 20% in Perkins County.

The biggest challenge faced by SDHP is staffing troopers to handle the increased workload of calls for service. Local law enforcement, as well as the Harding and Perkins County Sheriff’s Offices, have seen a steady increase in their work due to the population increase. They are not able to respond to as many of the crashes, driving complaints (speeding, reckless driving, intoxicated drivers, etc.), and motorists assist calls as they once were. This is primarily because of increased responsibility to provide other law enforcement services such as investigating domestic assaults, burglaries, and insufficient funds cases.

There are currently three SDHP troopers stationed in the area, two in Perkins County (Lemmon and Bison) and one in Northwestern Meade County (Faith). The Bison trooper predominately works U.S. 85 and S.D. 79, while the Lemmon trooper divides his time between U.S. 85, S.D. 79 and S.D. 73. The Faith trooper is able to assist with patrol and calls for service response on S.D. 73, but geographically U.S. 85 is too far for him to respond to or patrol. As a result, troopers from the Northern Hills area (Belle Fourche, Spearfish, Deadwood, and Sturgis) have been patrolling and responding to calls on U.S. 85 as far north as the North Dakota/South Dakota state line.

The Northern Hills area along the I-90 corridor from Sturgis to Spearfish currently accounts for the highest calls for service number per trooper in the District. Shifting area troopers to patrol and handle calls on U.S. 85 and S.D. 79 has left fewer troopers on the I-90 corridor. The burden to help cover law enforcement duties on I-90 has increasingly shifted to the Lawrence and Meade County Sheriff’s Offices.

To address the increase in traffic crashes and illegal driving issues, SDHP schedules line patrols on U.S. 85 and S.D. 79 when manpower allows it. The increased presence has helped keep the injury and fatal crash rates constant in the area even with the increase in traffic. In 2008, troopers issued a total of 53 citations and warnings on U.S. 85 from Belle Fourche to the North Dakota state line; in 2011, 336 tickets and warnings were issued on the same stretch of highway. Thus far in 2012, 542 tickets and warnings have been issued. Twenty-nine speeding violations were addressed in 2008; 457 have been addressed so far in 2012. One DUI and zero drug related arrests were made on U.S. 85 north of Belle Fourche in 2008; in 2011 there were 9 DUI arrests and 3 drug related arrests. If traffic in northwest South Dakota continues to increase, it will be more difficult for SDHP to provide adequate services without increased staffing.

Impact to South Dakota Motor Carrier Division

In response to increased truck traffic resulting from oil and gas development in North Dakota, South Dakota Motor Carrier Division (SDMCD) personnel have been tasked with working in the region more frequently. Personnel from across the state are utilized on special assignments. A week long enforcement "marathon" where troopers and motor carrier personnel from across the state are brought in was conducted this spring and more "marathon" enforcement efforts are planned in the future. In addition, the motor carrier trooper position assigned to the Mitchell area is being re-assigned to the northwest to work the Northern Black Hills region.

In 2009, SDMCD personnel inspected 121 commercial vehicles and completed a vehicle examination report (VER) on carriers operating on U.S. 85 north of Belle Fourche. Thus far in 2012, 402 VERs have been completed. With the exception of 2008, when 342 VER's were written because the I-90 port of entry was closed and truck traffic was being checked on U.S. 85, vehicle examination reports have steadily increased at an average rate of 50%.

Enforcement activity is also up. There were no motor carrier related violations on U.S. 85 north of Belle Fourche in the SDMCD database for 2008. Since January 1, 2012, there have been 94 motor carrier violations addressed. While there has been an increase in weight violations, the most significant increase has been in safety violations such as log books and equipment violations. During that same period, SDMCD personnel have been marking oilfield-related VER's statewide. Thus far 334 inspections have been performed on commercial vehicles known to be traveling to or from the oilfield. Eighty-six of those inspections (26%) were found to have a violation serious enough to put the truck or driver out of service.

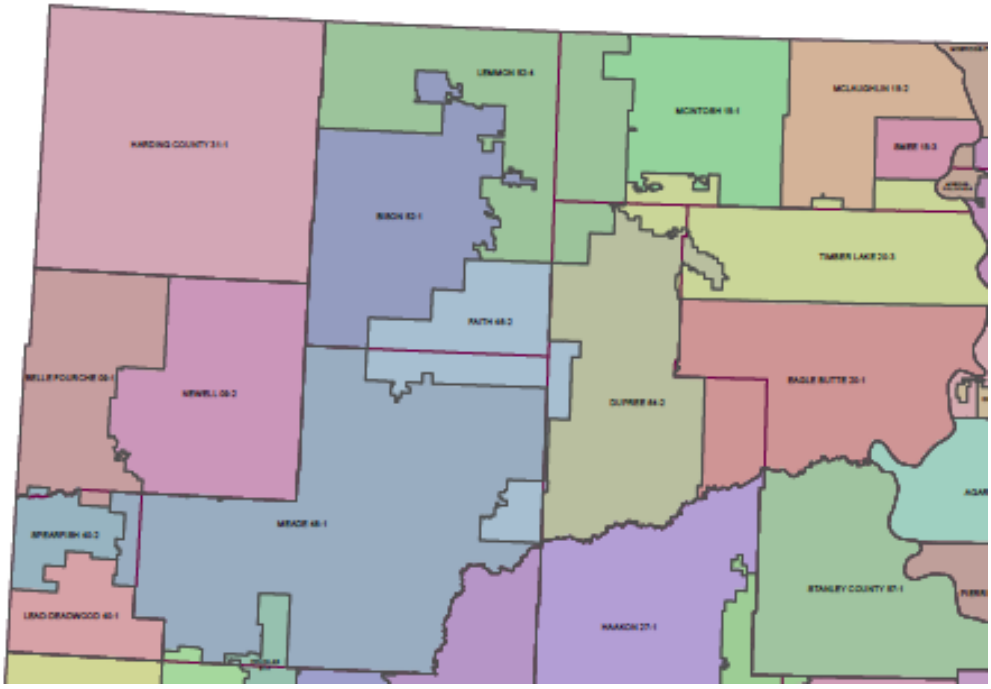
Impact to South Dakota Division of Criminal Investigation

The South Dakota Division of Criminal Investigation (DCI) has had an increase in calls for investigation in northwest South Dakota counties, however the agents stationed in the northern Black Hills (Sturgis and Spearfish) are saturated with case load and not always available to provide all the assistance needed. The DCI has experienced an increase in felony crime requests in the last year, especially within the confines of Butte County, partly attributable to the traffic increase from North Dakota.

Education

Northwest South Dakota includes fifteen school districts, most of which have adequate classroom space to accommodate more growth. Additional teachers and staff may be necessary, depending on the number of new students, and funding may be a challenge. In school districts with large geographic areas, additional students may make bussing an issue. Should these school districts experience rapid growth, portable classrooms, staggered schedules (to allow double-use of classrooms) may be necessary. Providing services for special needs students is also already a challenge for most rural school districts and could prove to be an even greater challenge with growth.

School Districts in Northwest South Dakota



The Harding County School District (the district most likely to be impacted) is very well prepared for potential growth due to oil and gas development. The district has 158 students enrolled in K-12, with an average class size of 12. A new school was constructed in 2011 and it has substantial capacity for more students. The new classrooms will accommodate 20-25 students in each grade. There are also two functioning rural schools with capacity for a total of 50 students. A third rural school could be reopened, if necessary. Further, three classrooms in the old school building could be used for high school classes. Harding County would not need to add faculty until it received a very large influx of junior or senior high school students.

The Eagle Butte School District currently has a K-12 enrollment of 1,155 and a capacity of about 1,500 in existing buildings. The district recently cut 10 teaching positions and two administrative positions; if enrollment grows additional teachers may be necessary.

The Bison School District has a current enrollment of 144 for grades K-12. Existing classroom space could accommodate about 250 students and current staff would be able to accommodate 190 students. Housing would be a significant problem in Bison, as it is already difficult to find and a large influx of new residents would exacerbate this problem. The district reports that increased housing demand could inflate housing costs, potentially making housing unaffordable for teachers and resulting in greater difficulty in attracting and retaining qualified teachers and staff.

Meade County has a K-12 enrollment of 2,385 students with a capacity for 3,500. The Lemmon School District has a K-12 enrollment of 275 students with a capacity for 500. The Belle Fourche School District has a K-12 enrollment of 1,379 with a capacity for over 1,800. The McLaughlin School District has a K-12 enrollment of 467 with a capacity for 550. In addition, McLaughlin is building a new building that will house their middle and high school students.

South Dakota's universities and technical schools offer many educational opportunities. These institutions are already implementing programs to train workers for jobs related to the energy industry. Demand for engineers, geologists, and other professional positions relating to oil and gas development is strong.

Potential Issues Facing Municipalities

Municipalities will be on the front lines of issues relating to oil and gas development. Potential issues facing municipalities in areas affected by oil exploration include:

Planning Capacity/Zoning Regulation: Municipalities would benefit by implementing planning and zoning ordinances before oil development begins, which would lay the base for growth in a more orderly fashion.

Traffic: Tremendous costs can be involved in building roads to handle, or bypass, the traffic associated with development.

Municipal Workforce: Keeping, and recruiting, municipal workers when pay and benefits are much higher with the oil industry will be a challenge.

Housing: Housing, especially affordable housing will be a major issue. The housing issue will impact areas outside the counties experiencing development, as people seek housing near the exploration area- and people seek to leave the development area if they can get out.

Workforce: Lower-paid jobs may go unfilled as workforce assets shift to the higher-paying oil industry sector. Services for the elderly and childcare would likely be most affected.

Pay it forward: Ensure that when the industry moves on, the facilities that were built up are paid for, so South Dakota residents/future residents are not left holding the bill.

Potential Issues Facing Counties

Counties have been and will continue to be in constant contact with oil companies as oil exploration and extraction takes place. Some counties, such as Harding, have a long history with oil development and have undertaken measures to address the impacts; others lack similar experiences and are not as prepared for additional development.

County Roads: Northwest South Dakota counties have very few miles of hard surface road; most roads are graded or gravel surface and built to handle low traffic and farm-to-market activity. In many areas, minimum maintenance roads are traveled regularly. Oil development could require significant road improvement and new construction.

Planning/Zoning Regulation: Harding County currently has planning and zoning ordinances in place, while Butte and Perkins counties are having discussions with the Black Hills Council of Local Government. Up-to-date planning and zoning regulations are important tools that help ensure all land development occurs in a uniform and organized manner. It also establishes a process for consulting with landowners to mitigate concerns when new development occurs.

Workforce: The oil industry, usually with higher pay and benefits packages, will enhance job markets in the counties. Industry competition could make it difficult to retain county employees, however, and the current workforce will likely be unable to satisfy demand, should additional development occur.

Revenue: Counties can impose a property tax on well casings and the pipeline. The state's 4.5% mineral severance tax is based on market value, with 50% returned to the county in which energy minerals were severed. These funds are solely designated for road and bridge purposes and education, at the County Commissioners' discretion.

Law Enforcement: The impact on county law enforcement will likely be seen in traffic enforcement/investigations, issues relating to jails, staffing, criminal investigations, civil process, mental/alcohol commitment issues, and effects on the court system. Counties have begun to see probationers seeking oilfield employment moving into northwest South Dakota. Criminal cases and civil process paperwork has increased, as North Dakota oilfield workers have taken up residence in South Dakota. Alcohol and drug-related issues have become more prevalent in North Dakota, which may cause issues in northwest South Dakota where law enforcement backup may be as much as 100 miles away.

Economic Development Opportunities

The direct economic impact of oil and gas development in South Dakota will likely be limited. As this report identifies, no large increase in South Dakota oil development is anticipated. Activities in the energy sector will create economic opportunities, however. The majority of economic development activities in South Dakota will likely not be related to oil development in South Dakota, but will most likely be secondary effects of energy development in nearby states, including North Dakota's Bakken Formation.

South Dakota is already seeing positive impacts to business as a result of energy development. From manufactured home builders in Watertown to construction firms in the Black Hills, the need for supplies, equipment, and services has presented many opportunities for South Dakota business, as discussed in a recent report sponsored by the Rapid City Economic Development Partnership and Black Hills Vision.

The report "Strategic Employment Opportunities: Harnessing New Potential in Rapid City and the Black Hills Region (2010 – 2015)" identifies the "Energy and Extractive Industries" as one of the six target industry cluster for the region. Within a 200-mile secondary trade area of Rapid City, energy sectors represent the leading opportunities for growing higher-paying jobs. These energy sector jobs relate to crude oil and natural gas extraction, natural gas liquid extraction and related support activities.

When mining and quarrying are added, the combination of these sectors emerges as the top-performers in earnings from 2006 to 2011. Earnings in these sectors grew over $386 million with an additional 4,091 jobs that had an average wage of $94,400 per year. In 2011, energy was reported to be the top cluster for total jobs (47,386) and job growth (7,045) in the 200-mile secondary trade area. That influx of jobs and wages provided huge economic opportunities to the region.

Although direct economic impacts from oil and gas exploration will likely be minimal, there is a larger opportunity for economic development activities from North Dakota oil development. Due to the pressure Bakken oilfield activities have place on the immediate area, companies are looking for alternative resources and locations outside the North Dakota oilfields. This situation creates a unique opportunity for existing and new South Dakota companies to fill product and service needs.