Presentation to the Energy Development and Transmission Committee

Progress of the Water Use in Energy Study Required By House Bill 1322

August 19, 2009

Chairman Wardner and members of the Energy Development and Transmission Committee. My name is Bill Schuh, State Water Commission hydrologist. I am here to report on the progress of the study of water resources for energy sectors, required by House Bill 1322 of the 2009 legislative session.

Under Section 22 of House Bill 1322, the state water commission was required to "conduct a study to: a. Determine unit water use for each sector of energy production, including: (1) Petroleum; (2) Ethanol; (3) Electrical generation; and (4) Biodiesel."

The parameters of the study were to include:

b. Identify water quality constraints for each energy sector;

c. Estimate projected water use in each energy production sector based upon growth projections provided by the energy policy commission; and

d. Provide a qualitative assessment of the state's water resources and identify specific sources that have the potential of providing significant quantities of water energy development.

The study was to be conducted in cooperation with the energy policy council. The findings were to be presented to the Legislative Council by September 1, 2010.

Project Initiation and Coordination

I have been assigned to coordinate the study for the Water Commission staff. The study is multifaceted, and will require the input and expertise of many of the Appropriation Division's hydrologists, the project managers of the Water Development Division, and several other state and federal agencies, including the U.S. Army Corps of Engineers and the Bureau of Reclamation, as well as representatives of the power industry.

Robert Shaver, the director of the Water Appropriation Division, and I met with the Commissioner of Commerce and some of his staff on May 26 to organize the project. A copy of the meeting agenda, with an approximate time line, is appended. We plan to provide a first draft copy of the report to the Department of Commerce by the end of February, 2009. The reason for the early draft, is to provide ample time for government and industry review, and for additions or corrections from that review.

Work In Progress

At this time, the study is in progress:

- We have reviewed a substantial body of literature pertaining to water use in the energy industry.

- The Department of Commerce has provided a list of prospective and planned projects and a list of contact personnel for each segment of the energy industry, and we have established communication with several contacts and their references, mainly in the petroleum refining, ethanol and biodiesel industries. We have yet to contact the coal and thermoelectric industries, and have made only a single initial contact with the petroleum but will make further contacts in the future.

- In July we met with the staff of the Energy and Environmental Research Center. The EERC, through the Northern Great Plains Water Consortium, is now reorienting to focus more on water use in the energy industry, and will be funded by the U.S. Department of Energy. We are and will remain in contact with them.

- We have opened discussions with the Corps of Engineers pertaining to facilitating access to the Missouri River system, and have established a meeting date for early September. Contacts have also been made with the Bureau pertaining to access to Missouri River water through facilities operated by the Bureau.

- A draft of a guide to the water appropriation process has been completed and is being internally reviewed.

- Staff hydrologists are currently compiling a map and description of ground-water sources that are most suitable for further development and use by the energy industry.

If invited, we will report to Energy Policy Council (EmPOWER) at their next meeting in September.

Issues

- Several U.S. Department of Energy publications have published maps indicating that North Dakota is one of only a few states with plenty of water, and ample ground water. This is untrue. The only truly plentiful source we have is the Missouri River. All other surface waters are nearly fully appropriated, and many of our glacial aquifers are approaching full appropriation.

- In western North Dakota the Fox Hills aquifer, a bedrock aquifer, is a common source of water for many municipalities and ranches. It should not be viewed as a routine source of water for development by the energy industry, or any other industry. The water is being mined, and recharge is not sufficient to sustain it. The water is also under pressure, providing flowing wells for ranchers in areas where power supplies for pumping wells are inaccessible. But pressures are dropping steadily and wells will likely no longer be flowing within sixty years or so. Studies have shown that municipal or industrial use will greatly increase the rate of pressure depletion. The costs of drilling new larger-diameter pumpable wells would be prohibitive for most. For this reason, the State Engineer is currently discouraging further development of the Fox Hills aquifer, except where no other alternatives can be found.

Meeting Topics / Commerce Dept. 5/26/09

RE: Implementation of H.B. 1322.

Water Commission (Lead?)

1. Identify sources with available supplies
2. Evaluate the nature and supply limitations of the available waters.
3. Evaluate the water quality limitations of available waters.

Time Schedule:

June-July 09– familiarize with the industry and its needs: industry contacts, available literature.

August-October 09– Analysis

November 09 -February 10– Write draft report

March – July 10 - Review and modification

August 10– Publish and present to the legislative council

Commerce Department (Cooperator / Responsibilities?)

1. For each energy sector need information on:

    a) Water use.
    b) Water quality constraints.
    c) Energy expansion projections.
    d) Special requirements

This is base information – needed in the beginning of the study in order to proceed. This part should be mostly complete by the end of July.

2. Need a Commerce Department contact – a responsible party assigned to assist on a timely basis.

3. Can't wait for an Energy Policy Commission to form. Need contacts and assistance for making contacts in the energy industry.

Preliminary Outline

A. Overview of the Water Appropriation Process: Familiarize industry applicants with the process, time scales, and potential pitfalls.

B. Evaluate water needs by industry.

C. Evaluate available sources, their locations, supplies, and limitations.

D. Evaluate water quality of potential supplies.

E. Integrate needs and supplies.

F. Discuss water reuse potential: municipal wastes etc.

Product:

Water Resource Investigations Report, including an Executive Summary, Analysis, appropriate tables and maps.

Plan to have a draft available to the Commerce Department by the end of February 2010. Ready for Legislative Council by August.

Aquifer Potential for Development

- Good*
- Conditional*
- Poor

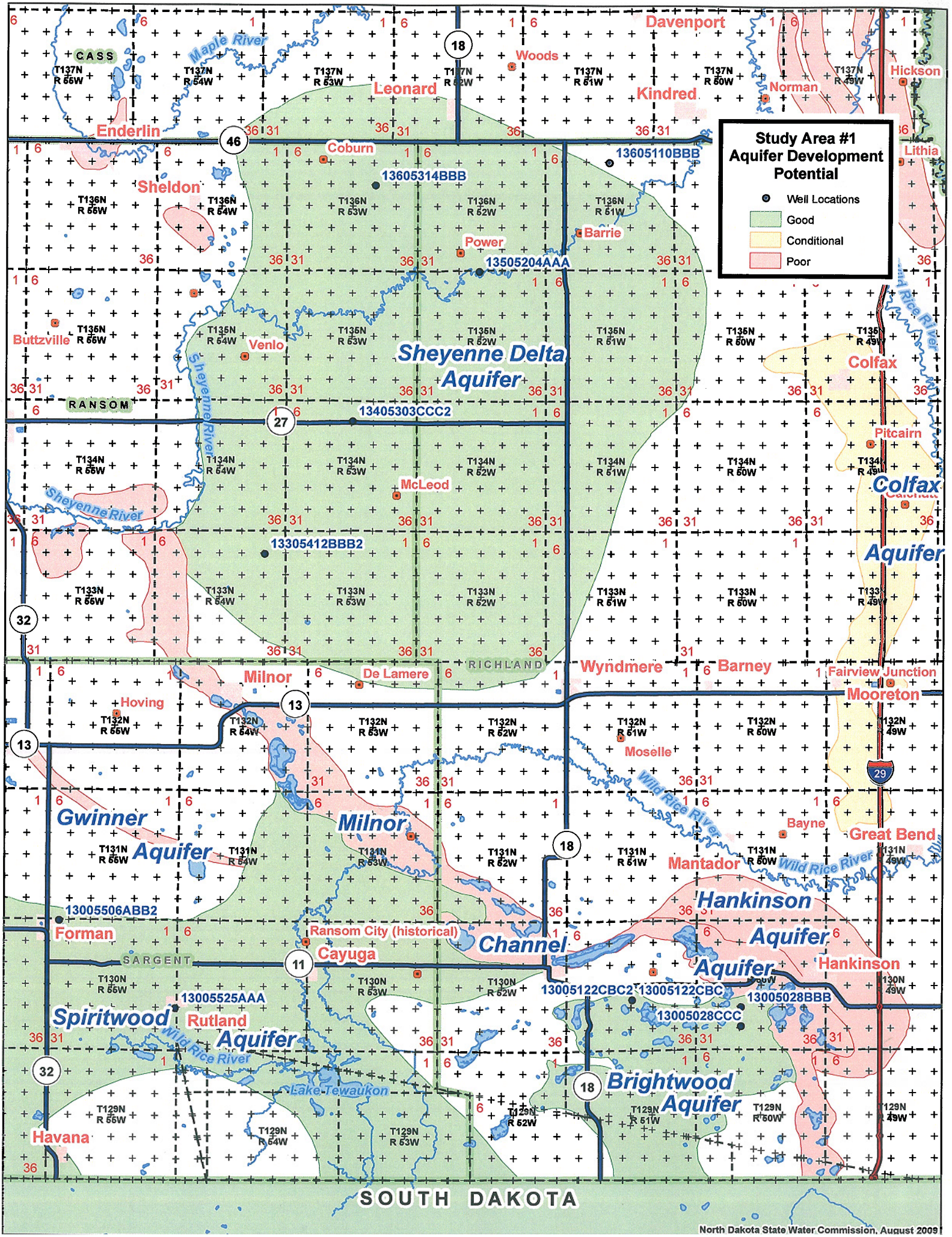
*Note - Good with limitations. Contact the ND State Water Commission's Appropriation Division for additional details on any area classified as "Good" or "Conditional". Ph. 701-328-2754

DIVIDE
BURKE
RENVILLE
BOTTINEAU
ROLETTE
TOWNER
CAVALIER
PEMBINA
WILLIAMS
MOUNTRAIL
WARD
MCHENRY
PIERCE
RAMSEY
WALSH
BENSON
NELSON
GRAND FORKS
MCKENZIE
MCLEAN
SHERIDAN
WELLS
EDDY
FOSTER
GRIGGS
STEELE
TRAILL
DUNN
MERCER
OLIVER
BILLINGS
GOLDEN VALLEY
STARK
MORTON
BURLEIGH
KIDDER
STUTSMAN
BARNES
CASS
SLOPE
HETTINGER
GRANT
EMMONS
LOGAN
LAMOURE
RANSOM
RICHLAND
BOWMAN
ADAMS
SIOUX
MCINTOSH
DICKEY
SARGENT

Souris River
Missouri River
Lake Sakakawea
Lake Audubon
Knife River
Heart River
Little Missouri River
Lake Oahe
Cannonball River
Cedar Creek
Devils Lake
Sheyenne River
James River
Red River
Elm River

Study Area #1

North Dakota State Water Commission, August 2008


Study Area #1
Aquifer Development
Potential
Well Locations
Good
Conditional
Poor
Sheyenne Delta
Aquifer
Colfax
Aquifer
Gwinner
Aquifer
Milnor
Channel
Aquifer
Hankinson
Aquifer
Spiritwood
Aquifer
Rutland
Aquifer
Brightwood
Aquifer
13605110BBB
13605314BBB
13505204AAA
13405303CCC2
13305412BBB2
13005506ABB2
13005525AAA
13005122CBC2
13005122CBC
13005028BBB
13005028CCC
Davenport
Woods
Leonard
Kindred
Norman
Hickson
Enderlin
Coburn
Lithia
Sheldon
Barrie
Power
Buttzville
Venlo
Colfax
Pitcairn
McLeod
Wyndmere
Barney
Fairview Junction
Mooreton
Hoving
Milnor
De Lamere
Moselle
Bayne
Great Bend
Mantador
Forman
Ransom City (historical)
Cayuga
Hankinson
Lake Tewaukon
Havana
CASS
RANSOM
SARGENT
RICHLAND
SOUTH DAKOTA
Maple River
Sheyenne River
Wild Rice River
Rice River
T137N R 65W
T137N R 64W
T137N R 63W
T137N R 62W
T137N R 61W
T137N R 60W
T137N R 49W
T136N R 65W
T136N R 64W
T136N R 63W
T136N R 62W
T136N R 61W
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North Dakota State Water Commission, August 2009