FINAL

ENVIRONMENTAL IMPACT STATEMENT

LINCOLN-PIPESTONE RURAL WATER

Lake Benton, Minnesota

Existing System North/Lyon County Phase
Northeast Phase Expansion

United States Department of Agriculture

RURAL UTILITIES SERVICE

(THE LEAD AGENCY)
and

U. S. ENVIRONMENTAL PROTECTION AGENCY REGION 8

(A COOPERATING AGENCY)

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EXECUTIVE SUMMARY

This Environmental Impact Statement (EIS) is being prepared by the U.S. Department of Agriculture (USDA), Rural Utilities Service (RUS) in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321-4347), Council on Environmental Quality's, 40 CFR Part 1500-1508, Regulations for Implementing the Procedural Procedures of NEPA, and the RUS's implementing regulations, 7 CFR Part 1794, Environmental Policies and Procedures. The purpose of the EIS is to evaluate the potential environmental impacts of a project proposal located in southwestern Minnesota. The proposal to which RUS is responding involves providing financial assistance for the development and expansion of a public rural water system. The applicant for this proposal is a public body named Lincoln-Pipestone Rural Water (LPRW). LPRW's main office is located in Lake Benton, Minnesota. Specific project activities are and have included the development of groundwater sources and production well fields and the construction of water treatment facilities and water distribution networks. The counties in Minnesota affected by this proposal include Yellow Medicine, Lincoln, and Lyon Counties and Deuel County in South Dakota

This document is a final EIS (FEIS) prepared subsequent to the preparation of a draft EIS (DEIS). On February 23, 1998 the RUS announced the availability of the DEIS in the Federal Register (63 FR 8901) for the previously constructed LPRW, Existing System North/Lyon County Phase project and the Northeast Expansion Phase project proposal. In addition to the Federal Register, public notices were published in the following newspapers: Ivanhoe Times, Marshall Independent, Canby News, and the Lincoln County Valley Journal in Minnesota; and the Gary International, Clear Lake Courier, and Brookings Register in South Dakota. The DEIS was also made available for public review at a number of locations throughout the area in both Minnesota and South Dakota and was available over the Internet at RUS's website (http://www.usda.gov/rus/water/ees/eis.htm). Subsequent to a 60-day public review period, RUS sponsored a public meeting to solicit additional comments from the public. The meeting was held on July 30, 1998 in Canby, Minnesota. The public meeting was announced in the Federal Register (63 FR 3461) on June 24, 1998 and in the above newspapers.

In total RUS received comments from 26 Federal and State agencies, Congressional representatives, public bodies, individuals, and environmental interest and industry groups. The number of comments totaled 79 pages. The following table outlines the commenters, commenter affiliation, and the number of pages of comments received:

Table ES-1 Summary of Public Comments

Commenter	Affiliation	Number of Pages
Minnesota Department of Natural Resources	State Environmental Regulatory Agency	17
South Dakota Department of Environment and Natural Resources	State Environmental Regulatory Agency	4
Minnesota Historical Society	State Agency	1
Subtotal State Agencies	**3**	**22**
U. S. Environmental Protection Agency, Region 8	Federal Environmental Regulatory Agency	3
U. S. Department of Interior	Federal Natural Resource Mgmt. Agency	7
U.S. Army Corps of Engineers, Omaha District	U. S. Army	2
U.S. Army Corps of Engineers, St. Paul District	U.S. Army	1
Subtotal Federal Agencies	**4**	**13**
East Dakota Water Development District (2 letters)	Public Body	9
Lincoln-Pipestone Rural Water	Public Body	7
City of Minneota, Minnesota	Public Body	1
City of Hazel Run, Minnesota	Public Body	2
Marshall Municipal Utilities (2 letters)	Public Body	3
Minnesota Southwest Regional Development Commission	Public Body	3
Subtotal Public Bodies	**6**	**25**
U. S. Senator Paul Wellstone, D-MN/U. S. Congressman David Minge, D-MN	U.S. Congress	1
State Senator Bernie Hunhoff	South Dakota State Legislature	1
Subtotal Congressional	**2**	**2**
Natural Audubon Society	Environmental Interest Group	2
Marshall Industries	Industry Interest Group	1
Subtotal Environmental and Industry Interest Groups	**2**	**3**
Minnesota Corn Processor	Industry	1
Industry	**1**	**1**
Private Citizens	**8**	**13**

RUS has determined that the comments, while extensive on a few issues, do not warrant a revision to the DEIS. In accordance with 40 CFR §1503.4, Response to Comments, the CEQ's procedures, where substantive comments were determined to merit individual responses, RUS responded directly to the commenter. All other comments were considered as appropriate in the preparation of the FEIS. Copies of all comments received as part of the DEIS's public comment period and submitted at the July 30, 1998 public meeting are included in Appendix A (Appendix A-1 to A-26).

Since the publication of the DEIS additional data has been collected from observation wells in aquifers utilized by the Burr Well Field and in piezometers from selected fens. This monitoring data has been compiled on graphs and hydrographs and is included in Appendix B. In addition, further groundwater exploration efforts have been performed by the Minnesota Department of Natural Resources (MDNR), South Dakota Department of Environment and Natural Resources (SDDENR) and LPRW. These efforts include test holes and Burr area seismic reflection surveys in Yellow Medicine and Lincoln County, MN and Deuel County, SD and a MDNR summary of Burr Well Field monitoring through 1998. These analyses and reports are included in Appendix C.

In general, the substantive comments received on the DEIS fell into six general areas. The six areas include the following:

1. Projected Water Needs

Within the context of establishing the purpose and need of the proposed action, numerous comments requested clarification and substantiation of projected water needs for the service area supplied by the Burr Well Field, hereinafter referred to as the Burr Source service area. The Burr Source includes groundwater withdrawals from 2 aquifers - the Burr Unit of the Prairie Coteau aquifer (Burr Unit) and the Altamont aquifer. See Figure ES-1 for a map of the entire LPRW system. This figure is a revision of Figure ES-1 and 1-1 in the DEIS.

Data regarding projected water needs was found primarily in Tables 1-8 and 1-11 of the DEIS. This data was provided by LPRW's engineering consulting firm, Dewild Grant Reckert and Associates, Incorporated (DGR). Since one of the sources of confusion in these tables was from the presentation of primary and secondary service areas and how they relate to estimating projected water needs, DGR was asked to revise and resubmit the tables. Previously defined secondary service areas are now referred to in the FEIS as "reserve capacities" and will be discussed below.

Table ES-2 includes LPRW's revised summary of water needs for the entire LPRW system, source capacities, and volume of water pumped between 1993 to 1998 from its various sources.

Insert Figure ES-1

TABLE ES- 2 SUMMARY OF LPRW
WATER NEEDS AND SOURCE CAPACITY

LPRW Source Needs	Annual Use Mgpy	Ave. Day kgpd	Peak Day Kgpd	DNR Permit Mgpy	Total Water Pumped					
					1993 Mgpy	1994 Mgpy	1995 Mgpy	1996 Mgpy	1997 Mgpy	1998 Mgpy
System Demand										
Rural connections	618	1,694	2,880							
City Use	408	1,118	1,981							
Total Water Sold	1,026	2,812	4,861							
Estimated Unmetered or Water Loss	220	604	1,044							
Estimated Drought Demand	103	281	486							
Total Projected Water Needs	1,350	3,697	6,391							
Source of Supply										
Verdi	500	1,371	2,530	683	403	403	425	425	383	403
Holland	306	838	1,475	500	172	244	287	333	355	374
Edgerton Well				26	0	0	0	0	0	0
Burr - Existing System	282	773	1,429	400	0	9	145	215	274	314
Burr - NE Phase*	210	575	709	130	0	0	27	2	55	116
Canby (Now provided from Burr)	51	140	248	0						
Total Design Capacity	1,350	3,697	6,391	1,739	574	656	885	975	1,067	1,206

Note: LPRW has a permit for 26.3 MG/year at Edgerton, however, they do not use that source.
* Includes an estimate of 109 Mgpy for MMU/MCP

Source: Madden, J., Dewild Grant Reckert and Associates, personal communication, 1999.

This table estimates annual water need projections for the Burr Source as 492 million gallon per year (Mgpy). This volume includes a planning figure of 109 Mgpy for the City of Marshall, Marshall Municipal Utilities (MMU) and is included in the Burr - NE Phase line item.

In order to estimate Burr Source service area annual water needs a number of factors need to be considered. The Burr Source service area includes the previous Existing System North/Lyon County (ESN/LC) Phase and the proposed Northeast Phase Expansion. The pertinent factors considered include water use for rural connections, rural area municipal users, drought demand, water loss, reserve capacity, and future growth projections.

RUS examined the data supplied by LPRW and negotiated the following engineering design factors. These factors were agreed upon by both parties as being reasonable and, as a result, met RUS guidelines that facilities financed by the Agency be modest in size, design, and cost.

Table ES- 3 Water Needs Engineering Design Factors for Water Need Projections

Engineering Design Factors	Rate
Rural Water Use per connection	236,000 gpy[1]
Municipal Water Use per capita	36,500 gpy[2]
Drought Demand Estimates	10% of Annual Use[3]
Water Loss	15% of Annual Use[3]
Future Growth Projections (rural)	20% of Total Users or 200 rural users[4]
Emergency or Reserve Capacity	33 Mgpy[5]

[1] Estimated average use per rural connection (for entire LPRW system) is derived from 1997 and 1998 average use data. Average use is 204,949 and 222,544 gallons, respectively. Use of 236,000 gallons is to incorporate a conservative factor for planning purposes, particularly for a system that "matures" whereby additional users connect to the system and water use increases slightly over time.

[2] Assumes 100 gallons/capita/day. Extrapolated water use rates on a per capita per day rate from LPRW billing data were approximately 70 gallons per capita per day. This factor is considered to be very conservative for planning purposes.

[3] RUS agrees with LPRW estimates for and the use of a 10% Drought Demand and 15% Water Loss as being "reasonable" estimates for engineering design purposes.

[4] RUS agrees with LPRW's projection of a future growth projection (20%) of an additional 200 rural users as being a "reasonably foreseeable growth need". The determination of reasonably foreseeable growth needs is in the context of 7 CFR 1780.7 (c), Eligible Projects.

[5] Reserve or emergency capacity is defined as that volume of water necessary to provide "back-up" service for one of the other well fields if the well field was to experience production problems or scheduled maintenance. For the purposes of this EIS, RUS has calculated a reasonable or modest reserve capacity for the Burr Well Field as 33 Mgpy. This estimate was derived by calculating the volume of water necessary for a 30-day total production loss at the Verdi Well Field. The Verdi Well Field's annual water appropriation for the last 5 years is approximately 400 Mgpy; this calculates to a 33 Mgpy estimate. The term "reserve capacity" replaces the secondary capacity term used in the DEIS.

Using LPRW supplied data from Table ES-2 and the design factors agreed upon in Table ES-3, LPRW re-submitted the following table.

Table ES- 4 Summary of Water Need Projections For the Burr Source Service Area

Existing System North/Lyon County Phase	Estimated Water Use (gpy)	Mgpy
664 Rural Connections (includes Green Valley)	236,000	156.0
4 Municipalities (Population - 2,126) Taunton (174) Minneota (1,428) Ghent (312) Porter (212)	36,500	77.6
Subtotal		**234.0**
Engineering Estimates for 10% Drought Demand and 15% Water Loss[3]		58.4
Subtotal ESN/LC Phase Water Needs		**292.0**
Northeast Phase Expansion		
170 Rural Connections	236,000	40.1
2 Municipalities (Population - 385) Echo (304) Hazel Run (81)	36,500	14.1
Subtotal		**54.2**
Engineering Estimates for 10%Drought Demand and 15% Water Loss		13.5
Subtotal Northeast Phase Expansion Water Needs		**67.7**
Future Growth Projections[4] - 200 Rural Connections plus 10% Drought Demand and 15% Water Loss	236,000	**59.0**
Subtotal Burr Source Service Area		**418.7**
Emergency or Reserve Capacity		**33.0**
Total Burr Source Service Area Projected Needs		**451.7**

Source: Madden, J., Dewild Grant Reckert and Associates, personal communication, April 6, 1999.

Many of the comments regarding projected water needs were received with respect to the volume of LPRW's 5-year water sale contract to MMU. The primary concern of this contract was 1) MMU is an ineligible recipient of RUS programs because it has a population in excess of 10,000 inhabitants and 2) how was the delivery of this water contributing to potential adverse impacts to the surface water resources hydraulically connected to the Burr Unit. Since the revised Tables 1-8, 1-11 and ES-4 contained a planning volume of 109 Mgpy for MMU, RUS had to determine what were the projected water needs for the Burr Source service area without factoring in any water sales to MMU.

To evaluate this projection, RUS used actual water use data of the current ESN/LC phase rural area (rural connections and municipal) users (199 Mpgy) including agreed upon design factors for drought demand (10%), water loss (15%) (199 x 1.25 = 249 Mgpy); water use projections for the Northeast Phase Expansion (68 Mgpy); future growth projections (59 Mgpy); and reserve capacity (33 Mgpy). Based on these estimates, RUS has concluded that the projected water needs for the Burr Source service area excluding water sales to MMU is approximately 409 Mgpy.

Currently, the MDNR Water Appropriation Permit for the Burr Well Field allows annual withdrawals of 400 Mgpy. There is some controversy over the permit regarding whether the 400 Mpgy relates to the Burr Unit only or whether it is a combined total with the Altamont aquifer. According to the MDNR, this volume includes total appropriations from the Burr Unit and Altamont aquifers. At the present time, the Burr Well Field's Water Appropriation Permit is under consideration for an increase to 450 Mgpy with a reduction in withdrawals from the Burr Unit and an increase in the Altamont Aqiufer.

Based on current and projected water use needs supplied by LPRW, RUS concludes that the Burr Source service area's projected water needs is 409 Mgpy; LPRW's projection is 452 Mpgy. LPRW's projection may be more accurate with regard to long-range water needs; RUS used actual water use data from the a portion of the Burr Source service area that is not yet mature in terms of total user connections. At present permitted capacity (400 Mgpy) and until the Northeast Phase Expansion users are connected, LPRW has adequate production and treatment capacity to serve the rural area users and municipalities in the Burr Source service area. Once the Northeast Phase Expansion rural area users are connected it appears that the Burr Well Field's Water Appropriation Permit may need to be increased to account for reserve capacity and future growth potential. This may only be necessary at some future date. Until these future users are realized and connected, LPRW has some excess capacity in its Burr Well Field and Water Treatment Plant (facilities).

2. LPRW Relationship with and Eligibility of the City of Marshall, Marshall Municipal Utilities (MMU) and Minnesota Corn Processor (MCP) for RUS Programs.

A significant number of comments were received regarding water sales to MMU and MCP and whether MMU or MCP met eligibility requirements for RUS financial assistance. Eligibility requirements for RUS's programs are defined for applicants and the areas to be served. The following citations state RUS program regulations, 7 CFR 1780 PART 1780, Water and Waste Loans and Grants:

> §1780.7 Eligibility. Facilities financed by water and waste disposal loans or grants must serve **rural areas**.
> (a) Eligible applicant. An applicant must be:
> (1) A public body, such as a municipality, county, district, authority, or other political subdivision of a state, territory or commonwealth;
>
> §1780.3 (a) **Rural and rural areas** means any area not in a city or town with a population in excess of 10,000 inhabitants, according to the latest decennial census of the United States.

Therefore based on the above citations, the City of Marshall, while a rural community, is not an eligible applicant for RUS programs because it has a population in excess of 10,000 inhabitants. The MCP is located within the incorporated area of Marshall and therefore, by definition, is located in a non-rural area.

While RUS does not oppose or prohibit its borrowers from supplying water to non-rural users, the Agency's loan and grant funds may not be used to finance any portion of the cost of a facility which serves those areas. If users in non-rural areas are proposed during facility planning, those users must contribute a proportionate share of facility costs in accordance with RUS regulations.

As discussed above, LPRW and MMU negotiated and signed a 5-year water sales contract for the delivery of 300,000 gpd or 109 Mgpy, largely for delivery to MCP. This volume of water is being supplied from current excess capacity at the Burr facilities. This excess capacity is being drawn from current reserve and projected future growth capacities built into the Burr facilities.

From existing documentation and RUS case files, it is clear that LPRW and MMU and/or MCP were considering and having discussions regarding water sale contracts throughout the planning and engineering design activities of the two phases (ESN/LC and Northeast Phase Expansion) being considered in this EIS. Despite LPRW's repeated propositions to MMU and MCP for service, a water sales contract was not signed until 1997.

Whether LPRW (452 Mgpy) or RUS's (409 Mgpy) projected water needs for rural Burr Source service area users are used, the Burr facilities' production and treatment capacities exceed those needs. Based on LPRW's original Water Appropriation Permit request, the Burr facilities were apparently designed for annual appropriations of at least 800 Mgpy. Upon subsequent review, RUS has determined that a portion of the design capacity built into the Burr facilities does not meet RUS's criteria that the facility be modest in size, design, and cost. All future RUS funding decisions will consider this fact.

3. Contingency Plan

Numerous comments were received regarding the inclusion of a contingency plan in the proposed Water Resource Management Plan (WRMP). The WRMP was developed as a mitigation measure in the DEIS. The primary purposes of the WRMP are to:

- formalize well field operational and management activities designed to minimize reductions in the potentiometric surface in the Burr Unit of the Prairie Coteau aquifer; and
- establish monitoring protocols in Minnesota and South Dakota to evaluate effects to the surface water resources hydraulically connected to the Burr Unit.

RUS agrees with the inclusion of a Contingency Plan into the WRMP. The contents, components, and appropriateness of the Contingency Plan will conform to standards developed by the MDNR with technical assistance from the U.S. Environmental Protection Agency, if desired.

In the event of a determination of significant adverse impacts to surface water resources hydraulically connected to the Burr Unit, comments received propose that possible contingencies could include:

- discontinuing water sales to MMU;
- securing water supplies from adjacent water utilities, such as the Big Sioux Community Water System which has reported excess capacity or the City of Canby; and
- developing a supplemental well field, as discussed in the EIS as RUS's preferred alternative. The exploration and development of a supplemental well field is not dependent upon a determination of a significant adverse impact to surface water features (see item 5 below).

4. Water Budget for Lake Cochrane

Commenters from South Dakota requested that RUS undertake additional efforts to quantify groundwater contributions to Lake Cochrane. In the DEIS RUS concluded that the information that would be necessary to quantify the overall percentage of groundwater contribution in relation to surface water inputs to the Lake Cochrane water budget and the percentage of the contribution from shallow aquifers versus the Burr Unit is incomplete and unavailable. The cost and technical difficulty of obtaining such information for evaluating reasonably foreseeable impacts by the Agency has been determined to exorbitant and unreasonable, particularly in light of the work already accomplished by the SDDENR. RUS concurs and does not dispute the SDDENR's Lake Cochrane water budget. While RUS agrees that the data would be beneficial if available, RUS also believes enough information is available to make reasonable natural resource decisions regarding groundwater appropriations in the area. Therefore, RUS will not supplement SDDENR's existing data regarding Lake Cochrane water budget.

5. Supplemental Well Field and Exploration Efforts

Many comments were received regarding one component of RUS's preferred alternative. The primary issue of concern related to the proposal of a supplemental well field. The DEIS recommended that LPRW develop a supplemental well field to assist in meeting the water supply needs of the Burr Source service area. At the time of this recommendation, the water needs analysis projected that the water needs of the Burr Source service area was 628 Mgpy. Based on closer examination and using engineering design criteria agreed upon between LPRW and RUS engineers, the range of projected water needs for rural area users and municipalities of the Burr Source service area is 409 Mgpy (RUS) to 452 Mgpy (LPRW). These estimated volumes exclude water sales to MMU.

Given that LPRW has sufficient production and treatment capacity to meet the needs of the rural area users in the Burr Source service area as originally designed, particularly if

MDNR grants the permit currently under consideration (450 Mgpy), and if LPRW discontinues water sales to MMU after the 5-year contract is concluded, then the immediate development of the supplemental well field is less critical. While RUS still believes that the supplemental well field is necessary and will consider financing its proportionate share of developmental costs, the immediacy of developing the well field is reduced if water supply to MMU is discontinued. If LPRW continues to provide water to MMU on a long-term basis then the time for developing a supplemental well field should be expedited with MMU providing its proportionate share of capital costs in accordance with RUS regulations.

Comments were received regarding the necessity of additional exploration efforts to locate the supplemental well field. Subsequent to publishing the DEIS, the MDNR, SDDENR, and LPRW conducted additional groundwater exploration efforts to help identify potential well development sites for the Altamont aquifer. These efforts consisted of additional test holes (see Appendix C-3) and seismic reflection surveys (see Appendix C-1)

The two test holes that were drilled in the area south of the Burr Well Field did not find similar Altamont sand layers found in borings drilled in adjacent areas. MDNR concluded that the wide variation of sand thickness within a relatively small area suggest depositional and stratigraphic complexities that require additional test drilling to define.

In addition to the above test holes, during the 1998 field season the MDNR performed 17 seismic lines in Yellow Medicine and Lincoln County, Minnesota and Deuel County, South Dakota near the Burr Well Field. The purpose of the seismic survey, as stated in the report, was to better define the Quaternary stratigraphy in the area around the Burr Well Field and to explore for a sand aquifer that is deeper than and not connected to the Prairie Coteau aquifer. Lower Quaternary sand units correlate to the aquifer referred in the EIS as the Altamont aquifer. Of the seismic surveys performed by the MDNR, the report recommended that an area north of the Burr Well Field may be the most promising area for test drilling for lower Quaternary sands.

6. Speculative Nature of Conclusions

Numerous comments were received that challenged the Agency with regard to its conclusions concerning the evaluation of potential effects to surface water resources from groundwater appropriations at the Burr Well Field. Of particular concern was that the current period of record has occurred during a period of relatively high precipitation and that this limited duration of observations reduces the Agency conclusions to speculation. Given the limited amount of data available to all reviewers, RUS agrees that drawing definitive conclusions either asserting or rejecting potential effects to surface water resources is speculative. However, RUS believes that enough data is available at this time to draw reasonable conclusions and to support making informed natural resource decisions regarding groundwater appropriations at the Burr Well Field.

In order to avoid or minimize the potential for any significant adverse environmental impacts to surface water resources in the area, the most significant parameter appears to be minimizing reductions of the potentiometric surface in the Burr Unit. Data collected before and after the DEIS's publication (see Appendix B) indicate that continued appropriation of groundwater at the Burr Well Field (see graphs B-3 through B-10) has caused steady declines in the potentiometric surface in observation wells (see B-11 through B-23). While these declines correlate with continued pumping from the Burr Unit, it is unknown whether these effects are causing significant adverse environmental impacts to the surface water resources hydraulically connected to the Burr Unit. With regard to the fens, the MDNR reports concerns to these resources (Appendix C-2, page 17) from current pumping rates which have ranged between 400 - 800 gpm since April 1997 to the present (Appendix B-4). The MDNR recommended in their February 19, 1999 interoffice memorandum (Appendix C-2) that impact thresholds established in fen monitoring points be re-evaluated with consideration be given to transferring these thresholds to potentiometric surface elevations. RUS supports MDNR on this proposal.

Reductions of the potentiometric surface in and around Lake Cochrane have also occurred. These reductions are on the order of less than 1 foot (Appendix B-22) at the west of the lake with minimal effect in an observation well 2.5 miles west of the lake (Appendix B-23). Whether these relatively minor reductions are adversely impacting Lake Cochrane is unknown at this time.

As stated on page 113 in the DEIS "Lake Cochrane's ecological system is today a product of several natural factors and many human activities that affect it either intentionally or unintentionally. And these activities are themselves changing, e.g., changes are and have been frequently made in the natural inflow and the outflow characteristics of the lake either through engineering structures or by the filling in of the natural drainage channel between Lake Oliver and Lake Cochrane. Therefore, it is not possible, nor would it be meaningful, to predict specific potential effects on the lake caused by a decrease in groundwater inflow.

Furthermore, even if it were certain that Burr Well Field pumping would cause a decrease in the groundwater inflow into Lake Cochrane, the ecological effects of that [pumping] cannot be reliably distinguished from the ecological effects of human management actions or activities."

RUS's preferred alternative and one of the proposed mitigation measures recommends that MDNR limit production pumping rates in wells developed in the Burr Unit and also formalizes well field operational procedures that minimizes reductions in the potentiometric surface. Implementing these recommendations and mitigation measures along with the collection of longer term monitoring data covering an entire climatic cycle will allow all parties to evaluate on an on-going basis any effects to surface water resources. Once more definitive monitoring data is collected, the alleged speculative

nature of today's conclusions regarding environmental impacts will be reduced and more informed natural resource decisions can be made. If it is determined that significant adverse environmental impacts are occurring to these resources, then appropriate actions could be taken by the MDNR, SDDENR or USEPA in accordance with established statutory and regulatory procedures. If conditions warrant modifying the permit conditions at the Burr Well Field, the MDNR could make any changes they determine to be appropriate.

Preferred Alternative and Conclusions

After carefully considering all of the comments received from the public and Federal and State environmental regulatory agencies, RUS continues to support the preferred alternative as outlined in the DEIS with slight modifications. The preferred alternative is as follows:

- Finance the Northeast Phase Expansion.

- Continue to maintain the Burr Well Field as a primary water source. To minimize reductions in the potentiometric surface, RUS supports limiting pumping rates from wells developed in the Burr Unit of the Prairie Coteau aquifer to 400-525 gpm with a corresponding annual appropriation rate.

- At some future date, supplement existing wells at the Burr Well Field with a new well field in an area south-southeast or north-northeast of the current Burr Well Field or where sufficient aquifer materials can be found. This new well field could utilize both the Burr Unit and Altamont aquifers in a configuration similar to that at the Burr Well Field or any other configuration determined by the MDNR as appropriate. Raw water from this well field could be transported to the Burr Water Treatment Plant for treatment and distribution to LPRW customers.

- RUS recommends that the MDNR consider integrating the proposed Water Resource Management Plan into the Burr Well Field's Water Appropriation Permit.

Mitigation Measures

In order to avoid or minimize any significant adverse environmental impacts to the surface water resources that are hydraulically connected to the Burr Unit, RUS believes that it is necessary to formalize and establish a comprehensive methodology to monitor on-going groundwater appropriations and effects to surface water resources. In addition, it would be appropriate to enable all concerned parties to provide input into evaluating these activities. Therefore, to accomplish these goals RUS will establish as a mitigation measure and as a condition of financing the Northeast Phase Expansion a requirement that LPRW prepare a Water Resource Management Plan (WRMP).

The WRMP should formalize all procedures, protocols, and methodologies to monitor in a comprehensive fashion groundwater appropriations at the Burr Well Field and effects to the surface water resources hydraulically connected to the Burr Unit. The following components should be included in the WRMP:

1. Contingency Plan - the plan should document impact thresholds established by MDNR and outline what procedures LPRW will take in the event water appropriations from the Burr Unit are restricted.
2. Well Field Operation and Management Plan - this plan should be designed to minimize reductions in the potentiometric surface in the Burr Unit.
3. Supplemental Well Field Exploration Plan
4. Monitoring Plan - formalize monitoring well locations; establish standard methodologies or procedures for data collection, documentation, and information sharing.

While RUS recommends that the MDNR consider integrating the WRMP into the Burr Well Field's Water Appropriation Permit, it can not require that it do so. RUS will evaluate the technical sufficiency of the WRMP through consultations with hydrogeologists at the USEPA, Region 8. The mechanism for this consultation will be provided for through RUS's cooperating agency agreement with USEPA, Region 8. RUS will condition its concurrence with the WRMP and the release of funds for the Northeast Phase Expansion area subject to consultations with the MDNR and the USEPA and LPRW being able to obtain the appropriate Water Appropriation Permit(s) from the MDNR.

In the DEIS, RUS proposed that LPRW formalize an agreement with South Dakota to establish monitoring procedures and protocols to evaluate the effects of groundwater appropriations from the Burr Unit on surface water resources in South Dakota. The purpose of this agreement was to formalize monitoring input to the WRMP from South Dakota officials. RUS has decided to remove this requirement for the following reasons:

1. Governors from both South Dakota and Minnesota have already formally pledged in writing to cooperate on evaluating the effects of groundwater appropriations to the surface water resources hydraulically connected to the Burr Unit.
2. RUS believes that the MDNR has the appropriate statutory and regulatory procedures in-place to allow for South Dakota's input into their Water Appropriation Permitting process.
3. All regulatory issues, concerns, or conditions related to MDNR's Water Appropriation Permit at the Burr Well Field from South Dakota should be directed at MDNR not LPRW.

Provided all of the above conditions are met, RUS is prepared to approve LPRW's application for the Northeast Phase Expansion proposal. In addition, RUS is willing to consider in accordance with RUS regulations and subject to the availability of funding

development costs for a supplemental well field.

While RUS supports the development of a supplemental well field, based on monitoring compiled to date it does not appear that surface water resources around the Burr Well Field are being significantly impacted at this time. However, until more definitive conclusions can be drawn from longer term monitoring data, exploration and possible development of the supplemental well field should continue. It does not appear however, that an immediate sense of urgency is justified, rather supplemental well field development should be a long-term goal with exploration being the short-term goal.

INTRODUCTION

On February 23, 1998 the Rural Utilities Service announced the availability of the Draft Environmental Impact Statement (DEIS) in the Federal Register (63 FR 8901) for the Lincoln-Pipestone Rural Water Existing System North/Lyon County Phase project and Northeast Expansion Phase project proposal. In addition to the Federal Register, public notices were published in the following newspapers in Minnesota: Ivanhoe Times (February 26 and March 5, 1998); Marshall Independent (February 27-29, 1998); Canby News (February 25 and March 4, 1998); and the Lincoln County Valley Journal (February 25 and March 4, 1998); and in South Dakota: Gary International (February 25 and March 4, 1998); Clear Lake Courier (February 25 and March 4, 1998); and the Brookings Register (February 26-28, 1998). The DEIS was also made available for public review at a number of locations throughout the area in both Minnesota and South Dakota and was available over the Internet at RUS's website (http://www.usda.gov/rus/water/ees/eis.htm). Subsequent to a 60-day public review period, RUS sponsored a public meeting to solicit comments from the public. This meeting was held on July 30, 1998 in Canby Minnesota. The public meeting was announced in the Federal Register (63 FR 3461) on June 24, 1998 and in the above newspapers.

RUS received comments from 26 Federal and State agencies, Congressional representatives, public bodies, individuals, and environmental interest and industry groups. The following table outlines the commenters, commenter affiliations, and the number of pages of comments received:

Table 1 - Summary of Comments

Commenter	Affiliation	Number of Pages
Minnesota Department of Natural Resources	State Environmental Regulatory Agency	17
South Dakota Department of Environment and Natural Resources	State Environmental Regulatory Agency	4
Minnesota Historical Society		1
	3	**22**
Region 8	Federal Environmental	3
U. S. Department of Interior	Federal Natural Resource Mgmt. Agency	7
U.S. Army Corps of Engineers, Omaha District	U. S. Army	2
U.S. Army Corps of Engineers, St. Paul District	U.S. Army	1
Subtotal Federal Agencies	**4**	**13**
East Dakota Water Development District (2 letters)	Public Body	9
Lincoln-Pipestone Rural Water	Public Body	7
City of Minneota, Minnesota	Public Body	1
City of Hazel Run	Public Body	2
Marshall Municipal Utilities (2 letters)	Public Body	3
Minnesota Southwest Regional Development Commission	Public Body	3
Subtotal Public Bodies	**6**	**25**
U. S. Senator Paul Wellstone/U. S. Congressman David Minge	U.S. Congress	1
State Senator Bernie Hunhoff	South Dakota State Legislature	1
Subtotal Congressional	**2**	**2**
Natural Audubon Society	Environmental Interest Group	2
Marshall Industries	Industry Interest Group	1
Subtotal Environmental and Industry Interest Groups	**2**	**3**
Minnesota Corn Processor	Industry	1
Subtotal Industry	**1**	**1**
Jim Thompson	Citizen	3
Lyle Tobin, Lake Cochrane Improvement Association	Citizen	3
Clayton Holt	Citizen	2
Eugene Eiler	Citizen	1
John Lentz	Citizen	1
Charlotte Baum	Citizen	1
Jim and Sheryl Irvine	Citizen	1
Bob and Joyce Otkin	Citizen	1
Subtotal Private Citizens	**8**	**13**

The following table summarizes the type of commenter and the total number of pages received from the DEIS's public comment period and subsequent to the public meeting:

Table 2 - Summary of Commenter Affiliations

Commenter	Type	Number of Pages
State Agencies	3	22
Federal Agencies	4	13
Public Bodies	6	25
Congressional	2	2
Environmental and Industry Interest Groups	2	3
Industry		1
	8	13
Total	**26**	

RUS has determined that the comments, while extensive on a few issues, does not warrant a revision to the DEIS. RUS proposes, where comments where determined to

each commenter. Where similar comments are raised by more than one commenter, later comments will be referenced to the first time the comment is responded to. In

observation wells in aquifers utilized by the Burr Well Field and in piezometers from selected fens and this information will be referenced as appropriate in general or in

Copies of all comments received as part of the DEIS's public comment period and

to A-26)

In Appendix E of the DEIS, RUS included comments from the MDNR from a preliminary

from the South Dakota Department of Environment and Natural Resources (SDDENR) were inadvertently excluded. For those interested parties, the
are now included in Appendix A-27.

Graphs and hydrographs from recent data collection efforts can be found in Appendix B.

Table 3 - Summary of Appendix B Documents

Document No.	Document
	Annual Precipitation 1988-98, Canby, MN
B-2	Long-Term Precipitation Records, Canby, MN (1917-1998)
B-3	Cumulative Burr Aquifer Pumpage
B-4	Average Daily Burr Aquifer Pumpage
B-5	1998 LPRW Use at Burr Water Treatment Plant, Total Water Supplied From All Wells
B-6	1998 LPRW Use at Burr WTP, Individual Well Production
B-7	LPRW Total System Use Per Month
B-8	Omitted
B-9	Omitted
B-10	Water Elevation Trends for Observation and Production Wells
B-11	Observation Well (OW) 3-90 Water Elevations
B-12	OW 1-93 Water Elevations
B-13	OW 2-93 Water Elevations
B-14	OW 3-93 Water Elevations
B-15	OW 4-93 Water Elevations (B.A. Liesch Data)
B-16	OW 4-93 Water Elevations (MDNR Data)
B-17	OW 5-93 Water Elevations (B.A. Liesch Data)
B-18	OW 5-93 Water Elevations (MDNR Data)
B-19	Sioux Nation - Deep Steel OW Water Elevations
B-20	Comparison of Sioux Nation Deep Steel OW and OW 5-93
B-21	OW R2 93-10 Water Elevation, SD/MN State Line OW
B-22	OW R2 94-26 Water Elevation, West End of Lake Cochrane
B-23	OW R2 94-33 Water Elevation, 2.25 Miles West of Lake Cochrane
B-24	Fairchild Fen Water Table Well
B-25	Fairchild Fen Deep Well, Hand Readings

RUS RESPONSES TO PUBLIC COMMENTS

In accordance with 40 CFR 1503.4, Response to Comments, RUS has individually and collectively assessed and considered all of the comments received from all parties. As mentioned earlier, where substantive comments were determined by the Agency to merit individual responses, RUS will provide a direct response. Where applicable, for issues determined to be outside the scope of the EIS or not particularly relevant to the decisions regarding the proposed action, RUS will briefly state the reasons why the issue does not warrant further agency response. All other comments were considered, as appropriate.

Readers are reminded that the only issue subject to a RUS decision at this time is whether or not to provide financial assistance to LPRW for the construction of the Northeast Phase Expansion. All decisions regarding the disposition of LPRW's Water Appropriation Permit at the Burr Well Field are subject to the approval of the MDNR, Division of Water. Based on analyses performed in this EIS, RUS will make recommendations to the MDNR but all decisions regarding LPRW's permit are subject to MDNR's regulatory authority.

Again to remind readers, the objective and purpose of the EIS as stated in the DEIS's Executive Summary (page iv) was:

> Therefore, the primary issues to be evaluated in the EIS include the outstanding concerns from the earlier 1992 EA [Environmental Assessment], that is, the environmental effects on fens and Lake Cochrane (herein referred to as surface water resources) from groundwater appropriations at the Burr Well Field, and the potential environment impacts from the construction of the Northeast Phase Expansion proposal. The primary objective of the Northeast Phase Expansion proposal is to provide rural water service to rural residents (240 rural users) [corrected - 170 rural users] who have requested service and to the rural communities of Hazel Run and Echo, Minnesota. The proposal includes the installation of 170 miles of 2- to 8-in pipelines, an elevated water storage tank near Minneota, and a booster station near Green Valley.

Table 4 is an index to all of the comments submitted to RUS on the DEIS from the public and after the public meeting. Each document will be assigned a number for identification in Appendix A. For example, the first document included in Appendix A is from the MDNR; this document will be identified as A-1. Each comment that RUS selected for responses will be identified by a number affixed to the left of the comment in each applicable document. For example, the first response to comments in the first document will be assigned a 1-1 number and so on throughout the document. Accordingly, the first comment on the second document will be assigned a 2-1 number and so on depending on the number of comments RUS is responding to.

Table 4 - Appendix A and Organization of Responses to Comments

Document Number	Commenter	Date	No. of Pages (without attachments)
A-1	Minnesota Department of Natural Resources	4/23/98	17
A-2	South Dakota Department of Environment and Natural Resources	4/22/98	4
A-3	U. S. Environmental Protection Agency	4/24/98	3
A-4	East Dakota Water Development District	4/24/98	6
A-5	Jim Thompson, Thompson Engineering Company	4/23/98	3
A-6	Lincoln-Pipestone Rural Water	4/22/98	7
A-7	U. S. Department of Interior	6/10/98	5
A-8	U. S. Department of Interior	6/17/98	2
A-9	National Audubon Society	4/16/98	2
A-10	City of Hazel Run, Walter Wilson, Clerk and David Esp, Mayor		2
A-11	Lake Cochrane Improvement Association, Lyle Tobin	6/30/98	3
A-12	Clayton Holt	4/20/98	2
A-13	Eugene P. Eilers	3/4/98	1
A-14	John Lentz	Undated	1
A-15	U. S. Army Corps of Engineers, Omaha District	4/14/98	2
A-16	U. S. Army Corps of Engineers, Omaha District	3/23/98	1
A-17	Minnesota Historical Society	5/18/98	1
A-18	Senator Paul Wellstone and Congressmen David Minge	4/28/98	1
A-19	South Dakota State Senator Bernie Hunhoff	3/24/98	1
A-20	East Dakota Water Development District	7/31/98	1
A-21	Marshall Municipal Utilities	8/1/98	2
A-22	Marshall Industries Foundation	9/1/98	1
A-23	Southwest Regional Development Commission	3/20/98	5
A-24	Charlotte Baum	4/1/97	2
A-25	Jim and Sheryl Irvine	3/17/98	1
A-26	Bob and Joyce Otkin	3/10/98	1

Discussions and responses to the comments will reference several U.S. Department of Agriculture (USDA) agencies. During the course of this project, USDA has undergone several reorganizations. In order to minimize confusion, readers are reminded that the original loan and grants provided to LPRW were made by the Farmers Home Administration (FmHA). During and prior to the decision to prepare an EIS, the Water and Waste program previously administered by the FmHA was transferred to the Rural Development Administration (RDA). As part of the another USDA reorganization, RDA programs were then transferred along with the Rural Electrification Administration to the RUS. It was RUS's decision to prepare this EIS. RUS programs are administered by USDA, Rural Development (RD) staff in Minnesota.

Individual Responses to Comments

1. Minnesota Department of Natural Resources

Comment No.	Comment
1-1	RUS agrees with the need to develop an appropriate contingency plan. LPRW currently has a contingency plan (see reference, (Krause, 1994) Krause, Gorden, Burr Water Source Contingency Plan, July 1994, Dewild, Grant, Reckert, and Associates Company). While this plan will need to be revised to more effectively address the water resource management issues raised by Burr Well Field appropriations, it is a start. As part of its preferred alternative and as a condition for approval of financial assistance for the Northeast Phase Expansion proposal to LPRW, RUS will require that LPRW prepare a Water Resource Management Plan (WRMP) that will document in a comprehensive manner all water resources issues related to the Burr Well Field and the surface water resources hydraulically connected to the Burr Unit of the Prairie Coteau. As outlined in the DEIS, this plan should include operational protocols and standard operating procedures for groundwater appropriations at the existing Burr Well Field and any other supplemental well fields developed so as to minimize reductions in the potentiometric surface and a monitoring plan establishing monitoring protocols and documenting impact thresholds for surface water resources in the area. In addition to these requirements, RUS, as recommended by numerous commenters, will require integrating a contingency plan and an exploration plan for the development of a supplemental well field in the Prairie Coteau or Altamont aquifers into the WRMP. RUS continues to recommend that the MDNR integrate this WRMP into its water appropriation permitting process. With regard to a contingency plan, RUS does not agree with the assertion that the EIS should develop and dictate the elements of a contingency plan. RUS does not have the technical capabilities or wherewithal to establish such a plan. RUS believes that an appropriate contingency plan that meets the needs of LPRW and the MDNR should be negotiated and developed between these parties. If appropriate this plan could be established a condition of the Burr Well Field's Water Appropriation Permit. If desirable or necessary, technical staff from the U. S. Environmental Protection Agency, Region 8 has offered to assist in developing the technical and managerial components of such a plan. RUS's role with regard to a contingency plan and the overall WRMP is to require, as a condition of financial assistance, the preparation of such plans. Successful completion and technical sufficiency of such plans could

be linked to the issuance of the MNDR's Water Appropriation Permit and will be linked to the release of RUS's funding for the Northeast Phase Expansion proposal. It is assumed that as stated formally in writing between the Governors of South Dakota and Minnesota, MDNR will seek and consider input from South Dakota prior to the issuance of the Burr Well Field Water Appropriation Permit. In order to establish technical sufficiency of the WRMP and prior to the release of financial assistance to LPRW, RUS will consult with the USEPA's, Region 8 technical staff. Consultation with the USEPA will be on-going as part of its continuing role of providing technical assistance to RUS through the cooperating agency agreement adopted as part of this EIS.

RUS agrees with MDNR in the need for LPRW to develop a comprehensive plan to define their long-range operational and financial goals. As mentioned in and during the preparation of the DEIS, LPRW had a funding request pending with RUS to finance a nitrate reduction treatment process at the Holland Well Field. In conjunction with this funding request and the Northeast Phase Expansion funding application, Minnesota Rural Development staff requested that LPRW formalize their long-range operational, managerial, and financial plans and to prioritize its funding needs. The goal of these plans is to include input from state regulatory agencies and to encourage LPRW to seek out additional funding sources to leverage RUS's limited funding. At this time, these plans are be negotiated and developed.

RUS acknowledges MDNR's support for the development of a well field and water treatment facility on the east side of the system (the Wood Lake Alternative), however, as stated in DEIS this alternative is not considered economically feasible at this time. If or when LPRW expands to service areas beyond those envisioned by the Northeast Phase Expansion, that alternative may prove more economically viable. Until that time, however, RUS continues to support its preferred alternative.

1-2 Comments regarding project water needs at the Burr Well Field will be addressed in the comments on Section 1.1, Purpose and Need.

1-3 MDNR's concern for the expansion of the LPRW system is noted. The Northeast Phase Expansion phase ($4.33 million dollars) represents a modest expansion effort with regard to the system as a whole. As addressed in this comment, the expansion phase does include construction proposals to address storage capacities. System improvements to address nitrate problems were identified in various tables of the DEIS (Tables ES-4, 1-4, 2-4, 2-5). In response to a Minnesota Department of Health's compliance agreement regarding high nitrate levels, RUS approved an application from LPRW to upgrade the Holland Water Treatment Plant.

This facility upgrade will reduce nitrate levels to levels less than the regulatory maximum contaminant levels.

The second portion of this paragraph deals with LPRW's relationship with the City of Marshall. The relationship between the City of Marshall, Marshall Municipal Utilities (MMU), Minnesota Corn Processors (MCP), and LPRW was the subject of numerous comments received by the Agency. The issue raised in this comment relates to the participation cost of providing service to MMU and MCP in relation to the "rural" users of the LPRW system and the eligibility of MMU/MCP for RUS funding. These concerns as well as the overall issue of MMU/MCP will be addressed in this response. The DEIS addressed LPRW's relationship and the status of the water purchase contract with the City of Marshal on page 34.

Eligibility requirements for RUS's programs are defined for applicants and the areas to be served. The following citations state RUS program regulations, 7 CFR 1780 PART 1780, Water and Waste Loans and Grants:

> §1780.7 Eligibility. Facilities financed by water and waste disposal loans or grants must serve **rural areas**.
> (a) Eligible applicant. An applicant must be:
> (1) A public body, such as a municipality, county, district, authority, or other political subdivision of a state, territory or commonwealth;
>
> §1780.3 (a) **Rural and rural areas** means any area not in a city or town with a population in excess of 10,000 inhabitants, according to the latest decennial census of the United States.

Therefore based on the above citations, the City of Marshall, while a rural community, is not an eligible applicant for RUS programs because it has a population in excess of 10,000 inhabitants. The MCP is located within the incorporated area of Marshall and therefore, by definition, is located in a non-rural area.

While RUS does not oppose or prohibit its borrowers from supplying water to non-rural users, the Agency's loan and grant funds may not be used to finance any portion of the cost of a facility which serves those areas. If users in non-rural areas are proposed during facility planning, those users must contribute a proportionate share of facility costs in accordance with RUS regulations.

It is apparent that confusion remains regarding the relationship between LPRW and MMU and the MCP. The following will attempt to outline the facts of the matter as documented in RUS case files and from information provided by LPRW.

Preliminary engineering reports prepared during the early planning phases

of the Existing System North/Lyon County (ESN/LC) phase and provided to RUS and the MDNR demonstrated that LPRW was considering the potential to include MMU and/or the MCP as part of the original planning area proposed to be served by the Burr Well Field. Notwithstanding these discussions and continuing service proposal discussions between the parties (most likely initiated in 1990), MMU, MCP, and LPRW did not agree and sign a water purchase contract until early 1997. The parties to this water sales contract are LPRW and MMU. As stated in the DEIS (p. 35), LPRW installed 3.5 miles of 10-inch pipeline from a portion of the distribution network utility lines installed as part of the ESN/LC phase construction activities. The installation cost of this line has been amortized over this 5-year water service contract.

The following is a chronology of events as documented in the LPRW case file maintained by Rural Development (RD):

1/91 Pre-application with the Preliminary Engineering Report (PER) submitted to the Farmer Home Administration (predecessor to RUS) by LPRW. The PER included MMU/MCP in the scope of the potential service area.

3/91 Notice of eligibility determination by RD to LPRW.

4/91 Full application submitted to RD by LPRW.

1/92 Environmental Assessment (EA) completed. City of MMU and MCP was not included in EA because LPRW submitted information stating that the proposed system was sized for only the new rural users and small communities.

2/92 Finding of No Significant Impact published.

3/92 RD approved loan and grant for ESN/LC phase.

10/92 LPRW requested design changes due to increased rural customer demand for water.

2/93 Bid opening for construction activities of project.

3/93 LPRW submitted a subsequent loan request to cover cost overruns due to high construction bids and additional customers requesting service. Loan approved by RD.

LPRW's loan request discusses the potential for water sales to MCP. Estimated construction costs for installing pipelines for proposed MCP service connection would result in change order of $800,000. LPRW offers service proposal to MCP for the cost of the change order. MCP declines proposal.

Subsequent to MCP's decline of LPRW's proposal, the case file contains no additional notes regarding the sharing of capital costs for the Burr Water Treatment Plant and MCP.

4/93 Construction begins.

4/94 RD initiates an amendment to the earlier prepared EA.

7/94 LPRW again offers MCP chance to connect for the $800,000 change order cost and again MCP declines proposal.

1/95 LPRW begins water appropriations at the Burr Well Field.

3/97 LPRW and City of MMU negotiate and sign a 5-year water service contract. Contract includes a capital cost reimbursement of $229,000 payable over the life of the contract. Water sold from LPRW to MMU will supplement MMU's water delivery to MCP.

In addition to the above, LPRW, through its engineering consulting firm, Dewild Grant Reckert and Associates, was asked to respond to the MMU/MCP issue. Below is a portion of their response:

> "The need of additional water by MMU/MCP existed well before the construction of the project [ESN/LC phase] and various contact and discussions took place [between LPRW and MMU/MCP]. LPRW, with the assistance of their engineer, evaluated a number of options and addressed some of them in the formal reports used to plan the project. It is not unusual however, for communities that are included in a preliminary planning study to decide not to become part of the project. For example, on the Nobles County phase of the project, the cities of Rushmore, Adrian, Wilmont and others were included in the study phase but did not accept a service proposal and the facilities that were built did not include capacity for them. The fact that there is capacity available at this time is because the NE phase has not yet been built, nor has the per connection water use for the

rural customers in the North [ESN/LC] phase grown to the amounts used to design the system's facilities. Again this is the reason the MMU/MCP service agreement is limited to five years - it is expected that the capacity currently used by MMU/MCP will be needed by the NE phase and the current and future rural customers on the system.

At various stages during the development of the Existing System North/Lyon County [ESN/LC] phase cost of service proposals were made to MMU/MCP for full-time service. The proposals were similar to those made to communities that are now part of the LPRWS [LPRW system] and include a share of treatment, storage, booster pumps, etc. However, implicit on those proposals is a commitment by LPRW to provide permanent service. Essentially, the communities paid for a portion of the system, to reserve that capacity for their present and future needs. Because of the concerns raised during the construction of the project, it was not clear if the DNR Water Appropriation Permit could be increased to provide the needs of MMU/MCP and therefore the permanent service proposal was no longer felt to be appropriate by LPRW.

After initial construction of a rural water system such as this, usage by members increase slowly as they convert their operations to rural water and as more members sign up for service. As a result, after the system was put into operation, it was apparent that some unused capacity existed in the well, treatment, and distribution system. At the same time MMU/MCP's need for water continued. It was therefore decided that if MMU/MCP would pay for any new facilities needed to provide service that LPRW would commit to a five-year service contract. Five years was selected because it was felt that sufficient excess capacity existed to service the current users and initial NE Phase users for that period of time. The arrangement has proven to be of benefit to MMU/MCP as well as LPRW and will be reviewed at the end of the five-year period. The key distinction in the arrangement with MMU/MCP versus the other communities is that no long-term commitment for service has been made. If a long-term commitment is made in the future, it will be similar to those currently in effect with other communities on the system" (Madden, personal communication, 1999).

This and many other commenters are concerned that LPRW providing water to MMU/MCP is creating water demands that may be overburdening an aquifer (Burr Unit) that is supporting delicate, little understood fen ecosystems and other surface water resources such as Lake Cochrane. Concern is expressed regarding developing contingencies to meet the water needs not only of MMU/MCP, but LPRW rural customers and

municipalities. As will be discussed later, LPRW has sufficient capacity to supply all rural area users and municipalities in the service area designed to served by the Burr Well Field (herein referred to as the Burr Source service area). One of the primary questions posed by commenters is what if significant adverse environmental impacts are detected in the surface water resources under consideration in this EIS and LPRW is required to reduce or restrict water supplies to MMU/MCP what would be the resulting ability of MMU/MCP to meet its existing needs?

At the present time, the MDNR reports the following Water Appropriation Permits for MMU, MCP, and the City of Canby (Canby information is provided in that it affects the availability of potable water in the region).

TABLE 5 - SUMMARY OF WATER APPROPRIATION PERMITS FOR CITIES OF CANBY AND MARSHALL AND THE MINNESOTA CORN PROCESSOR

Municipality/ Industry	MDNR Permit Number	No. of Wells	Well Capacities	Use Record	
				Year	Gallons (millions)
City of Canby	80-4157	4 (2 standby)	1,350 gpm 120 Mgpy	1994	113.3
				1995	106.6
				1996	96.5
				1997	83.1
				1998	88.4
Marshall Municipal Utilities	77-4305	13	6,025 gpm 1,400 Mgpy	1996	1,247
				1997	1,318
				1998	1,289
Minnesota Corn Processors	99-4042 (issued 9/11/98)	2	12" - 700 gpm 6" - 300 gpm Total - 315 Mgpy	1998	0
	96-4207	8	1005 gpm 382 Mgpy	1996	85.1
				1997	219.5
				1998	228.0
	92-4024	4	140 gpm 74 Mgpy	1993	24.0
				1994	7.0
				1995 -98	No reported use

Source: Japs, J., MDNR, Division of Waters, personal communication, 1999.

While the above table demonstrates that even though the MMU and MCP both have a series of well fields and permitted water appropriations, MMU have signed a water service contract with LPRW in 1997. Taking into account their existing well fields, the primary reason for MMU/MCP's desire to purchase water from LPRW relates to water quality, cost of water treatment, and LPRW's availability of excess capacity prior to construction of the Northeast Phase Expansion. The water provided by LPRW from the Burr Well Field (both Burr Unit and Altamont aquifers) is reported to be better quality water and is cheaper to treat than the groundwater in the Marshall area.

If groundwater supplies had to be reduced from the Burr Unit under emergency conditions or during conditions where significant adverse environmental impacts to surface water resources were occurring, MMU/MCP would appear likely to be able to use their existing well fields and treatment capacities to supply their immediate or emergency needs.

Subsequent to the City of Canby updating its water treatment plant and in an emergency capacity, Canby could be potentially able to provide service to its previous customers in the Yellow Medicine phase. These customers are now served by LPRW.

The information related to the existing well fields and capacities in the Cities of Canby and Marshall and MCP could be included in the proposed contingency plan discussed in response 1-1.

1-4 Because of a compliance agreement between LPRW and the Minnesota Department of Health concerning high nitrate levels at the Holland Well Field, RUS approved a loan to finance an upgrade to the Holland Water Treatment Plant to address these contaminants. The added costs for the Holland treatment plant upgrade ($3,056,000), EIS participation costs ($476,000), and Existing System North Bond Retirement ($1,500,000) are the reasons the No Action alternative has a cost impact. These are costs that LPRW was facing at the time the DEIS was published and was a factor in determining the economic feasibility of the alternatives considered.

1-5 Comment noted - concerns regarding potential effects to surface water resources from the development of the Burr Well Field were conveyed by the MDNR to LPRW prior to the construction of the Burr Well Field.

1-6 Within the context of the overall discussion regarding potential effects to surface water resources from a limited appropriation rate at the Burr Well Field, RUS stands by this statement. While we agree significant effects are possible, particularly during period of low precipitation, they appear to be unlikely at the appropriation rate recommended in the EIS. This

comment's issue of concern appears to relate to the use of the word "significant." The term "significant" is used in the context of the National Environmental Policy Act and the Council on Environmental Quality's definition in 40 CFR 1508.27 Significantly.

"Significantly" as used in NEPA requires considerations of both context and intensity:

(a) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

(b) Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.
2. The degree to which the proposed action affects public health or safety.
3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.
5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

If proposed mitigation measures are implemented, RUS believes that potentially "significant" adverse environmental impacts to surface water resources could be avoided or minimized.

1-7 MDNR's concern is noted regarding the "wet spell" through which the record of data exists. Only long-term observations and monitoring will verify the accuracy of the hypothesis contained in this comment. RUS, however, has clearly asserted that the present data set is incomplete with

regard to the climatic fluctuations this area invariably experiences. See graphs in Exhibit A-1 and A-2 concerning annual precipitation and long-term precipitation records from Canby, Minnesota.

1-8 Purpose and Need

This section received a significant number of comments. A comprehensive review of the public comments received by RUS regarding the issue of projected water needs for the Burr Source service area illustrates the overwhelming magnitude of details and data surrounding the developmental and construction phases of the LPRW system covered in the EIS. While these details are important from a regulatory perspective, NEPA instructs Federal agencies to "concentrate on the issues that are truly significant to the action in question." Therefore, RUS believes that the most significant issue related to decisions facing the Agency is to verify the projected water needs of the Burr Source service area. This determination is necessary to substantiate the area's projected water needs in order to advance an aquifer management scheme that will attempt to balance the area's citizens' public health and economic needs and to avoid or minimize adverse environmental impacts to the surface water resources that are being effected by the Burr Well Field's groundwater withdrawals.

No substantive comments were received regarding the data proposed for the Holland and Verdi well fields. It is agreed that the Holland and Verdi well fields in their present configurations are already at or near capacity, therefore all discussions hereafter will relate to the Burr Well Field.

The primary concerns raised by the comments included the accuracy of current and projected water needs in the Burr Source service area. Confusion related to projections based on primary versus secondary source demands and capacities. To facilitate a succinct discussion of LPRW's water needs, RUS requested that LPRW and its engineering consulting firm - Dewild Grant Reckert and Associates (DGR) working through the Minnesota Rural Development State Engineer re-submit revisions to Tables 1-8 and 1-11. RUS's response will attempt to focus on and answer the question regarding the critical issue at hand and that is - what are the projected water needs of the Burr Source service area which includes the Northeast Phase Expansion area. The revised Tables are included below.

The following discussion will attempt to establish projected water needs for the Burr Source service area from actual use data in the Existing System North/Lyon County Phase and projections for the Northeast Phase Expansion. This discussion will exclude all consideration of water sales to MMU. This is necessary because the water delivered to MMU for the

record of review exceeds the original design rate of 109 Mgpy as specified in the Table 1-6 (see Burr - NE Phase line item). In addition, MMU is receiving excess capacity originally designed for the Northeast Phase Expansion and a portion of the reserve capacity and future growth projections built into the system.

TABLE 6 (REVISED DEIS TABLE 1-8) - SUMMARY OF WATER NEEDS AND SOURCE CAPACITY

LPRW Source Needs	Average Day gpd	Peak Day gpd	Annual Use gal	Ave. Day kgpd	Peak Day kgpd	Annual Use MGal	DNR Permitted Capacity MGal/Yr	DNR Permit No.	Total Water Pumped 1993 MGal/Yr	1994 MGal/Yr	1995 MGal/Yr	1996 MGal/Yr	1997 MGal/Yr	1998 MGal/Yr
System Demand														
Rural connections	1,693,855	2,879,554	618,257,153	1,694	2,880	618								
City Use	1,118,171	1,980,985	408,132,497	1,118	1,981	408								
Total Water Sold	2,812,026	4,860,539	1,026,389,650	2,812	4,861	1,026								
Estimated Unmetered	604,234	1,044,408	220,545,362	604	1,044	221								
Estimated Drought Demand	281,203	486,054	102,638,965	281	486	103								
Total Projected Water Needs	3,697,463	6,391,001	1,349,573,977	3,697	6,391	1,350								
Source of Supply														
Verdi	1,371,073	2,529,791	500,441,801	1,371	2,530	500	683	794114	403	403	425	425	383	403
Holland	837,923	1,474,504	305,841,996	838	1,475	306	500	904140	172	244	287	333	355	374
Edgerton Well							26	794195	0	0	0	0	0	0
Burr - Existing System	772,913	1,429,049	282,113,311	773	1,429	282	400	914159 Prairie Coteau	0	9	145	215	274	314
Burr - NE Phase*	575,135	709,467	209,924,365	575	709	210	130	954171 Altamont	0	0	27	2	55	116
Canby (Now provided from Burr)	140,418	248,189	51,252,504	140	248	51	0							
Total Firm Design Capacity	3,697,462	6,391,000	1,349,573,977	3,697	6,391	1,350	1,739		574	656	885	975	1,067	1,206
Note: LPRW has a permit for 26.3 MG/year at Edgerton, however, they do not us that source. * Includes an estimate of 109 Mgpy for MMU/MCP														

Source: Madden, J., Dewild Grant Reckert and Associates, personal communication, 1999.

TABLE 7 (REVISED DEIS TABLE 1-11) SUMMARY OF LPRW WATER NEEDS AND RECENT ANNUAL USE

LPRW Water Source	Annual Needs MGal/Yr	DNR Permitted Capacity MGal/Yr	DNR Permit Number	Total Water Pumped					
				1993 MGal/Yr	1994 MGal/Yr	1995 MGal/Yr	1996 MGal/Yr	1997 MGal/Yr	1998 Mgal/Yr
Verdi	500	683	794114	403	403	425	424	383	403
Holland	306	500	904140	172	244	287	333	355	374
Edgerton Well (Backup)	0	26	794195		0	0	0	0	0
Burr Service area	492								
Burr Wells		400	914159		9	145	215	274	314
Altamont Wells		130	954171			27	2	55	116
Canby (Served from Burr)	51	0							
Total Design Capacity	1,350	1,583		574	656	884	975	1067	1,206
Notes: 1. LPRW has a permit for 26.3 MG/year at Edgerton, however, they do not us that source.									
2. Total annual needs are 1,350 MG, each source has the ability to deliver water outside of its Primary Service area.									
That capability is used to increase system reliability and does not increase the total system needs.									

Source: Madden, J., Dewild Grant Reckert and Associates, personal communication, 1999.

TABLE 8 - LPRW AVERAGE RURAL CONNECTION WATER USE

Month Used	1997 (gallons)	1998 (gallons)
Jan	15,353	16,694
Feb	15,375	15,947
Mar	14,914	15,015
Apr	16,545	16,612
May		24,729
Jun	19,137	20,339
Jul	21,364	20,952
Aug		20,503
Sep	18,899	18,604
Oct		18,990
Nov	16,342	16,965
Dec	15,783	17,194
Minimum	14,914	15,015
Average	17,079	18,545
Maximum	21,364	24,729
Gallons/year		
Minimum	178,968	180,180
Average	204,949	222,544
Maximum	256,368	296,748

Source: Madden, J., Dewild Grant Reckert and Associates, personal communication, 1999.

Tables 6-8 were submitted by LPRW. These tables project annual water needs for the Burr Source as 492 Mgpy. This volume includes a planning figure of 109 Mgpy for the City of Marshall, Marshall Municipal Utilities (MMU). The projected water needs represent and are based on the water needs identified for areas of the LPRW system that have been in operation for more than 20 years, future service areas that are yet to be designed and constructed, and service areas that are built but have not matured as of yet to the ultimate number of users. LPRW's engineers consider these values to be based on the best available data and accurately represent LPRW's long-term needs (Madden, personal communication, 1999).

In order to estimate Burr Source service area annual water needs a number of factors need to be considered. The Burr Source service area includes the previous Existing System North/Lyon County (ESN/LC) Phase and the proposed Northeast Phase Expansion. The pertinent factors considered include water use for rural connections, rural area municipal users, drought demand, water loss, reserve capacity, and future growth projections.

RUS examined the data supplied by LPRW and negotiated the following engineering design factors to establish that the design factors met RUS guidelines that facilities financed by the Agency be modest in size, design, and cost. The following factors were agreed upon by both parties as being modest.

Table 9 - Engineering Design Factors for Water Need Projections

Engineering Design Factors	Rate
Rural Water Use per connection	236,000 gpy[1]
Municipal Water Use per capita	36,500 gpy[2]
Drought Demand Estimates	10% of Annual Use[3]
Water Loss	15% of Annual Use[3]
Future Growth Projections (rural)	20% of Total Users or 200 rural users[4]
Emergency or Reserve Capacity	33 Mgpy[5]

[1] Estimated average use per rural connection (for entire LPRW system) is derived from 1997 and 1998 average use data. Average use is 204,949 and 222,544 gallons, respectively (see Table 8). Use of 236,000 gallons is to incorporate a conservative factor for planning purposes, particularly for a system that "matures" whereby additional users connect to the system and water use increases slightly over time.

[2] Assumes 100 gallons/capita/day. Extrapolated water use rates on a per capita per day rate from LPRW billing data were approximately 70 gallons per capita per day. This factor is considered to be very conservative for planning purposes.

[3] RUS agrees with LPRW estimates for and the use of a 10% Drought Demand and 15% Water Loss as being "reasonable" estimates for engineering design purposes.

[4] RUS agrees with LPRW's projection of a future growth projection (20%) of an additional 200 rural users as being a "reasonably foreseeable growth need". The determination of reasonably foreseeable growth needs is in the context of 7 CFR 1780.7 (c), Eligible Projects.

[5] Reserve or emergency capacity is defined as that volume of water necessary to provide "back-up" service for one of the other well fields if the well field were to experience production problems or scheduled maintenance. For the purposes of this EIS, RUS has calculated a reasonable or modest reserve capacity for the Burr Well Field as 33 Mgpy. This estimate was derived by calculating the volume of water necessary for a 30-day total production loss at the Verdi Well Field. The Verdi Well Field's annual water appropriation for the last 5 years is approximately 400 Mgpy; this calculates to a 33 Mgpy estimate. The term "reserve capacity" replaces the secondary capacity term used in the DEIS.

Using data from Tables 6-7 and the "modest" design factors negotiated and defined in Table 9, LPRW submitted the information contained in Table 10.

TABLE 10 - SUMMARY OF PROJECTED WATER NEEDS FOR BURR SOURCE SERVICE AREA

Existing System North/Lyon County Phase		Projected Water Use (gallons per year)	kgals/year
	664 Rural Connections (includes Green Valley)	236,000	156,000
	4 Municipalities (Population - 2,126) Taunton (174) Minneota (1,428) Ghent (312) Porter (212)	36,500	77,599
Subtotal			**233,599**
	Engineering Estimates for 10% Drought Demand and 15% Water Loss		58,400
Subtotal ESN/LC Phase Water Needs			**292,000**
Northeast Phase Expansion			
	170 Rural Connections	236,000	40,120
	2 Municipalities (Population - 385) Echo (304) Hazel Run (81)	36,500	14,052
Subtotal			**54,172**
	Engineering Estimates for 10%Drought Demand and 15% Water Loss		13,543
Subtotal Northeast Phase Expansion Water Needs			**67,715**
Future Growth Projections - 200 Rural Connections plus 10% Drought Demand and 15% Water Loss		236,000	**59,000**
Subtotal Burr Source Service Area			**418,715**
Emergency or Reserve Capacity			**33,000**
Total Burr Source Service Area Projected Water Needs			**451,715**

Source: Madden, J., Dewild Grant Reckert and Associates, personal communication, April 6, 1999.

To evaluate these figures, RUS obtained actual water use data compiled for the existing Burr Source service area users. Table 11 outlines the record of actual water use from LPRW's billing records received between December 1, 1997 - November 30, 1998.

TABLE 11 - BURR SOURCE SERVICE AREA
RECORD OF WATER USAGE FROM BILLING RECORDS[1]
DECEMBER 1997 - NOVEMBER 1998

Month Used	Total Water Use kgal	Marshall Municipal Utilities (MMU) kgal	Water Use/ Non-MMU kgal	Rural User Water Use kgal	LPRW Town Usage for the period, kgal.					
					St. Leo	Minneota	Ghent	Taunton	Porter	Total Municipal Use
Dec-97	27,397	13,307	14,090	10,056	185	2,758	693	218	180	4,034
Jan-98	27,468	13,770	13,698	9,506	208	2,915	679	210	180	4,192
Feb-98	26,575	13,905	12,670	8,654	221	2,609	614	342	230	4,016
Mar-98	36,572	21,687	14,885	10,441	259	2,993	712	230	250	4,444
Apr-98	36,750	20,567	16,183	11,399	236	3,004	968	246	330	4,784
May-98	37,350	18,799	18,551	13,131	239	3,488	1,170	293	230	5,420
Jun-98	39,797	21,198	18,599	12,900	342	3,808	1,040	279	230	5,699
Jul-98	38,953	20,330	18,623	13,332	238	3,347	1,060	336	310	5,291
Aug-98	39,346	20,937	18,409	12,947	236	3,506	1,050	255	415	5,462
Sep-98	36,544	20,240	16,304	11,412	187	3,174	837	424	270	4,892
Oct-98	40,057	19,790	20,267	15,858	174	2,871	750	261	353	4,409
Nov-98	37,304	20,889	16,415	11,623	240	3,112	895	245	300	4,792
Totals	424,113	225,419	198,694	141,259	2,765	37,585	10,468	3,339	3,278	57,435

Source: Madden, J, Dewild Grant Reckert and Associates, Personal Communication, 1999.
[1] Number of Users as of 1/99 - 694 (6 municipal users and the rest are rural users)

Billing records for the period of review indicate water use of non-MMU rural (141 Mgpy) and municipal (57 Mgpy) users in the current Burr Source service area as 199 Mgpy. Adding design factors for drought demand (10%) and water loss (15%) to this volume, the resulting volume is 249 Mgpy. As stated in Table 10, the projected water needs for the rural and municipal users in the Northeast Phase Expansion proposal are 68 Mgpy. Adding, future growth capacity (59 Mgpy), and reserve capacity estimates (33 Mgpy) to all of the non-MMU Burr Source service area rural users, projected water needs are estimated as 409 Mgpy.

Currently, the MDNR Water Appropriation Permit for the Burr Well Field allows annual withdrawals of 400 Mgpy. There is some controversy over the permit regarding whether the 400 Mpgy relates to the Burr Unit only or whether it is a combined total with the Altamont aquifer. According to the MDNR, this volume includes total appropriations from the Burr Unit and Altamont aquifers. At the present time, the Burr Well Field's Water Appropriation Permit is under consideration for an increase to 450 Mgpy with a reduction in withdrawals from the Burr Unit and an increase in the Altamont Aqiufer.

Based on current and projected water use data supplied by LPRW, RUS concludes that the Burr Source service area's projected water needs is 409 Mgpy; LPRW's projection is 452 Mpgy. LPRW's projection may be more accurate with regard to long-range water needs; RUS used actual water use data from the a portion of the Burr Source service

area that is not yet mature in terms of total user connections. At present permitted capacity (400 Mgpy) and until the Northeast Phase Expansion users are connected, LPRW has adequate production and treatment capacity to serve the rural area users and municipalities in the Burr Source service area. Once the Northeast Phase Expansion rural area users are connected it appears that the Burr Well Field's Water Appropriation Permit may need to be increased to account for reserve capacity and future growth potential. This may only be necessary at some future date. Until these future users are realized and connected, LPRW has some excess capacity in its Burr Well Field and Water Treatment Plant (facilities).

One of the points of confusion in the DEIS's presentation of projected water needs was the use of data regarding primary and secondary service areas. The purpose for secondary service areas are described in the DEIS on page 40 is - "In addition, the system is designed to permit the delivery of some water to adjoining service areas and they are called secondary service areas. The reasons for the delivery of water to secondary service areas will vary from short-term equipment maintenance to longer-term water shortages from adjacent sources". The term " secondary service areas" will be replaced in the FEIS as "reserve capacity". This was done to minimize confusion.

While planning for emergency or reserve capacity for secondary service areas is critical in designing rural water systems, the secondary service area originally stated in the DEIS as 136 Mgpy (628 minus 492 Mgpy) is now considered by RUS as not meeting the modest criteria the Agency uses to determine project eligibility. In Table 1-11 of the DEIS, the total projected water needs for the Burr Source service area's primary and secondary needs was stated as 628 Mgpy, whereas the revised Table 1-11 projects these needs as 492 Mgpy. Again, the 492 Mgpy annual use projection represents LPRW's position as to the Burr Source service area's needs. The 40 Mgpy difference between the 492 Mgpy and the 452 Mgpy figure presented in Table 10 is largely based on the estimate of reserve capacity. In the context of determining project eligibility, RUS believes that a reserve capacity of 33 Mgpy is reasonable and modest.

1-9 The purpose of Section 1.2 was not to present information to enable specific natural resource decisions but to present in a general fashion the documented water quality and quantity problems citizens of southwestern Minnesota have historically faced over the years. These problems have created the conditions whereby the development of regional rural water systems have been a primary focus of the citizens to solve their water supply problems.

While RUS agrees that providing discussions on the Lac Qui Parle watershed would be desirable, the geologic conditions of the watershed are not sufficiently different from the areas presented to compel additional discussions nor would it affect the conclusions regarding the area's problems in securing adequate water supplies at reasonable costs.

1-10 The documented water quality problems related to livestock production are correctly stated and RUS does not agree that it contradicts the conclusions of Section 3.4. The conclusions drawn from the analyses of Section 3.4, state that the availability of rural water does not by itself create conditions for the expansion of livestock production facilities or operations. Based on the analyses, the most important factors appear to be availability of land, close proximity to slaughterhouses, and general meat consumption in the general population. While RUS does not deny that the availability of higher quality rural water allows the diversification of agricultural operations where they were limited, it clearly is not the only or even the primary factor driving such expansion decisions. In addition, the availability of higher quality water has beneficial human health implications as well.

1-11 This comment requests a discussion of the financial viability of the LPRW system as a whole. While financial issues are factors that need to considered in an EIS, these concerns are not a particularly relevant issue to the purpose of the EIS. The purpose of the EIS is two-fold. The primary issue is to evaluate outstanding environmental concerns from the earlier 1992 Environmental Assessment, that is what are the potential environmental effects to surface water resources from groundwater withdrawals at the Burr Well Field, and, secondly, what are the potential environmental impacts from the construction of the Northeast Phase Expansion proposal.

1-12 RUS agrees with this comment. In the revised Table 1-11 (Table 7), LPRW still maintains the annual needs for the entire LPRW system is 1,350 Mgpy. In the table, LPRW lists a 51 Mgpy water need for a service area that is being served by the City of Canby. As discussed in the DEIS (p. 36), the City of Canby has successfully financed an upgrade to its water treatment facility, therefore it not reasonable for LPRW to maintain the 51 Mgpy as part of its need calculation. The annual needs should be reduced by this amount.

1-13 As stated in Table 10, the Northeast Phase Expansion proposal consists of 170 rural users and two communities - Hazel Run and Echo (385 population totals). All projected water needs for the Northeast Phase Expansion proposal can be found in the response at 1-8.

1-14 The cost estimates for the point-of-use treatment are based on generalized information and may be over or understated, but well within the range of reasonable costs. Additional research and documentation is not likely to significantly change the costs presented and will not change the conclusion that point-of-use treatment is more costly than a rural water system, particularly in an area such as southwestern Minnesota with its water quality problems. The EIS will not consider the issue any further.

1-15 The LPRW official policy on future growth was approved by the LPRW Board of Commissioners and provided in writing to RUS through its engineering consultant, DGR.

1-16 The booster station referenced in the attachment has not yet been built. The construction of this booster station and storage facilities are proposed to be built as part of the Northeast Phase Expansion proposal.

1-17 The DEIS was in error. The percentages stated in this section represented a portion of the total LPRW system needs rather than from the Burr Well Field.

1-18 As stated in the responses at 1-3 and 1-8, MMU/MCP was considered throughout the planning process for the period of time covered by this EIS to include planning for the Existing System North/Lyon County Phase. RUS has re-evaluated LPRW's relationship with MMU/MCP in terms to its future funding decisions. It is clear from the discussion in response 1-8, that without MMU/MCP LPRW has adequate production and treatment capacity to service all rural users in the Burr Source service area. As discussed in response 1-3, if LPRW chooses to continue providing water to MMU/MCP then all future RUS funding decisions will be evaluated upon MMU/MCP providing a proportionate share of capital improvement costs in accordance with RUS regulations.

1-19 As stated in response 1-8, RUS has re-evaluated the "modest" design of the Burr Well Field. All future RUS funding decisions will reflect this evaluation.

1-20 RUS stands by its discussion regarding the MMU/MCP issue. MDNR is correct in its interpretation of when LPRW provided documentation to the Farmers Home Administration regarding the consideration of MMU/MCP in its planning for the Existing System North/Lyon County Phase.

The information regarding MMU/MCP was not in the original Environmental Assessment, as stated in response 1-3, because LPRW notified FmHA that even though it was part of planning considerations, MMU/MCP was not part of the ultimate design considerations of the Burr Well Field. As previously stated, RUS has re-evaluated the design capacity of the Burr water treatment facility and determined that the resulting capacity does not meet RUS's "modest" design criteria. All future funding decisions will reflect this determination.

1-21 See revised Tables 1-8 and 1-11 in response 1-8. Responses to comments in this section are included in response 1-8.

1-22 Most of the issues brought out in this comment are valid concerns, however, they are not particularly relevant to the primary issues discussed in the EIS and will not be considered any further.

1-23 The requested information in this comment is not particularly relevant to the primary issues discussed in the EIS and will not be considered any further. However, costs for providing engineering services and environmental analyses and surveys are eligible loan expenses as outlined in 7 CFR 1780.9 (e). Itemized costs will be submitted to RUS for approval at the appropriate time. Determination of whether the costs are reasonable and eligible for reimbursement are or will be made at the time of loan approval.

1-24 The number of rural users projected for the Northeast Phase Expansion is 170. As discussed in response 1-8, future growth projections have been estimated at 200 rural users. This figure represents approximately 20% of the existing users in the Burr Source service area. RUS has concluded that this figure represents a reasonably foreseeable growth need in the context of its regulatory eligibility requirements.

1-25 See response 1-8.

1-26 RUS agrees with MDNR concerning potential sources of water from the Big Sioux Community Water System in South Dakota and City of Canby. Both of these systems represent potential sources of water for inclusion into the Contingency Plan that RUS will require LPRW to develop as a condition of financing the Northeast Phase Expansion proposal.

1-27 RUS stands by its conclusion that funding Alternative 4 is not economically feasible at this time. Perhaps as stated in the DEIS, if LPRW extends its service areas further northward in the future this alternative may become more economically attractive.

1-28 As stated in response 1-16, the elevated storage tank planned for the Northeast Phase Expansion was not replaced with the booster station referenced in this comment. The elevated storage tank and the associated booster station remain as part of the Northeast Phase Expansion proposal.

1-29 RUS believes that the MDNR has sufficient statutory authority to regulate groundwater appropriations through its existing permitting authority.

1-30 In response to all of the comments regarding Section 2.2.3. RUS simply offers these points as recommendations. Developing multiple well fields in the same aquifer can be used as an effective aquifer management tool.

Without specifying exact well field locations it is difficult to identify specific aquifer responses. The point of the recommendation is to minimize the drawdown of the potentiometric surface. For example, assuming the same withdrawal volume in the Burr Unit using two wells versus one could potentially minimize reductions in the overall potentiometric surface. MDNR may through their permitting authority choose the most appropriate well field configuration for minimizing effects to surface water resources from Burr Unit appropriations.

1-31 Yes.

1-32 Correct figure should be Figure 3-1.

1-33 RUS agrees.

1-34 RUS agrees.

1-35 RUS agrees and stands corrected.

1-36 RUS agrees.

1-37 RUS will agree with any reasonable proposal to address monitoring concerns, subject of course to the availability of funding. RUS will entertain funding proposals through the proposed Water Resource Management Plan LPRW will be required to develop as a condition for funding of the Northeast Phase Expansion proposal.

1-38 See response 1-35.

1-39 RUS agrees.

1-40 See response 1-6.

1-41 See response 1-10. RUS disagrees with the proposed mitigation measure - "a mitigation measure that requires proof of compliance with feedlot regulations should be required for customers benefiting from federally funded rural water systems." RUS has not been delegated the authority to impose such a mitigation measure on recipients of its programs.

2. South Dakota Department of Environment and Natural Resources

2-1 RUS agrees that to quantify groundwater input and a water budget for Lake Cochrane would be valuable information, however, as stated in the DEIS on page xii - "The information that would be necessary to quantify the overall percentage of groundwater contribution in relation to surface water

inputs to Lake Cochrane's water budget and the percentage of the contribution from shallow aquifers versus the Burr Unit is incomplete and unavailable. The cost and technical difficulty of obtaining such information for evaluating reasonably foreseeable impacts by the Agency has been determined to exorbitant and unreasonable." See also 40 CFR 1502.22, Incomplete or unavailable information. In addition as stated in the DEIS on page 111, RUS agrees with the work already completed by the DENR regarding Lake Cochrane and does not dispute its findings. While RUS agrees that the data would be beneficial if available, RUS also believes enough information is available to make reasonable natural resource decisions regarding groundwater appropriations in the area. Consequently, RUS will not supplement the work already accomplished by DENR.

RUS and most commenters agree that to minimize reductions in the potentiometric surface will protect or minimize any significant adverse environmental impacts to Lake Cochrane and all surface water resources hydraulically connected to the Burr Unit of the Prairie Coteau aquifer. RUS continues to believe that the implementation of the preferred alternative and the mitigation measure outlined in the DEIS will be protective of all surface water resources in the area.

2-2 RUS agrees that pumping at 400-525 gpm at the Burr Well Field could cause effects to surface water resources in the area. Whether these effects are significant can only be determined by long-term monitoring. To avoid or minimize these effects as the preferred alternative states, RUS supports the development of a supplemental well field to utilize the Altamont aquifer and a Water Resource Management Plan to develop, among other issues, a comprehensive aquifer management scheme to minimize reductions in the potentiometric surface while meeting the water needs of the area's citizens.

2-3 RUS agrees and supports such limitations. RUS believes that these limitations could be formalized and implemented within of the MDNR's Water Appropriation Permit.

2-4 To minimize potential effects on all surface water resources in the area, RUS supports the development of a supplemental well field.

The key parameter that will allow monitoring for the effects of pumping on surface water resources will be the potentiometric surface. It is RUS's understanding that the MDNR is considering establishing impact thresholds using pre-determined potentiometric surface elevations as a means to monitor effects to surface water resources in the area (see Appendix C-2, p. 17). RUS supports this effort. RUS encourages the DENR to provide

technical input to the MDNR during the development of these impact thresholds.

As part of its involvement in this EIS and in order to ensure the sufficiency of the proposed WRMP, the USEPA, Region 8, has agreed to provide technical assistance to all parties in the development of this plan.

Therefore, the methodology to measure impacts to all surface water resources in the areas will be developed during the preparation of the proposed WRMP. South Dakota will be offered the opportunity to participate in the development of this plan. In addition, impact thresholds will be established as condition of the Burr Well Field as they presently are by the MDNR. These threshold could be included and documented in the WRMP

RUS has agreed to include a contingency plan in the proposed WRMP. All RUS funding decisions will be contingent upon LPRW's ability to successfully obtain the proper Water Appropriation Permit from the MDNR. South Dakota should work through its existing agreement with Minnesota to participate in Minnesota's permitting decisions at the Burr Well Field.

2-6 See response 1-30.

2-7 RUS stands corrected on this matter. Proper comparisons between the elevation of the potentiometric surface of the Burr Unit should be the lake level not the ordinary high water mark.

2-8 RUS agrees conceptually with this comment as it is within the range of water appropriation rates recommended in the DEIS. RUS also agrees with the need to develop a contingency plan as part of the proposed Water Resource Management Plan.

3. U. S. Environmental Protection Agency

3-1 See response 1-8

3-2 Subsequent to publishing the DEIS, the MDNR and LPRW conducted additional ground water exploration efforts to help identify potential well development sites for the Altamont aquifer. MDNR supplied RUS with the following information (see Appendix C-3):

"During September 1998, two deep test holes were drilled in an area located approximately 3 - 4 miles south of the Lincoln-Pipestone Burr Well Field by the South Dakota Geological Survey (SDGS) and the Minnesota Department of Natural Resources (DNR). Test holes R2-98-38 and R2-98-

39 (Figure 1) were drilled into the top of the Cretaceous Shale to depths of 549 feet and 541 feet respectively. The purpose of these test holes was to define the northwestern extent of the Altamont aquifer equivalent sand layers that were discovered in test holes DNR 41-1 and DNR 87-7 in 1996.

Both of the 1998 test holes were gamma logged by the SDGS. The logs of these test holes are shown on cross section E-E'. The location of this cross section is shown on Figure 2. Approximately 12 feet of the Altamont sand was found in test hole R2-98-38. No Altamont sand was found in test hole R2-98-39. The previously drilled test holes nearest R2-98-38 and R2-98-39 encountered Altamont sand layers with a thickness range of 35 feet (DNR 41-1 and DNR 87-7) to 100 feet (DU-73A). These wide variation of sand thickness within a relatively small area suggest depositional and stratigraphic complexities that require additional test drilling to define."

In addition to the above test holes, during the 1998 field season the MDNR performed 17 seismic lines in Yellow Medicine and Lincoln County, Minnesota and Deuel County, South Dakota near the Burr Well Field (see Appendix C-1). The purpose of the seismic survey as stated in the report was to better define the Quaternary stratigraphy in the area around the Burr Well Field and to explore for a sand aquifer that is deeper than and not connected to the Prairie Coteau aquifer. Lower Quaternary sand units correlate to the aquifer referred to in the EIS as the Altamont aquifer.

Of the seismic survey performed by the MDNR, the report recommended that an area north of the Burr Well Field may be the most promising area for test drilling for lower Quaternary sands (Altamont aquifer)(MNDNR, 1999, Peterson and Berg).

The information presented above is the most current information available regarding the Altamont aquifer. As discussed, the area to the south of the Burr Well Field has sand layers identified as the Altamont aquifer. In addition, an area north of the Burr Well Field have been identified as having promising potential for locating the Altamont aquifer.

As discussed in the DEIS the Altamont is the most promising aquifer for utilization by LPRW to supplement the Burr Well Field. The Altamont aquifer is most likely hydraulically isolated from the Burr Unit of the Prairie Coteau aquifer (see page 63 of the DEIS; Berg, 1997a). Well fields developed in this aquifer should have no effect on surface water resources in the area. Specific questions raised by this comment will be addressed during the exploration efforts and permitting process necessary for any new well fields.

3-3 RUS agrees to integrate a Contingency Plan into the proposed Water

Resource Management Plan.

3-4 See response 1-8. Reasonable foreseeable rural growth in the Burr Source service area has been projected as 200 rural users for a 59 Mgpy estimate. This estimate is approximately 20% of current LPRW rural users and is considered to be very conservative. This growth factor does not take into account potential population growth by the City of Marshall, which is ineligible for RUS financial assistance.

Determining and evaluating cumulative effects on groundwater resources in southwestern Minnesota is a continuing struggle for all parties. The MMU is continuing to explore additional groundwater supplies. As discussed, on-going groundwater exploration efforts are continuing by the MDNR as part of its grid drilling program and specific technical assistance to LPRW in the Burr Well Field area. A component of the proposed Water Resource Management Plan will include an exploration plan for the proposed supplemental well field. All of these efforts are contributing to exploring technical and economically feasible options for providing safe drinking supplies to the citizens of southwestern Minnesota.

4. East Dakota Water Development District

4-1 Commenter is correct. LPRW's water supply contract is with the MMU who in turns provides the water to the Minnesota Corn Processor.

4-2 While it is understood that the MNDR did raise the issue with LPRW, the comment was made within the context of the National Environmental Policy Act (NEPA) (see 40 CFR 1502.16, Environmental Consequences) and the original published by the then Farmers Home Administration's Finding of No Significant Impact (FONSI). The other term at issue here is the word "significant"; again, this word is used in the NEPA context (see response 1-6). In this case, publishing a FONSI does not indicate no "effect" or impact to environmental resources it means no "significant" impact.

4-3 The commenter should focus on the word "significant". At current appropriation rates it is unlikely surface water resources will be significantly impacted. Only long-term monitoring will determine the overall effect on the surface water resources. The purpose of the proposed mitigation measures as outlined in the DEIS is to avoid or minimize any significant adverse environmental impacts.

4-4 The objective of the calculation on page 63 was to determine what would be the remaining demand if MMU and the Yellow Medicine Phase (originally served by the Canby system) would be discontinued. The number to start this calculation is the 628 Mgpy as shown in Table 1-8 of

the DEIS. This value was calculated as follow:

Burr - Existing System	282 Mgpy
Burr - NE Phase	210 Mgpy
Burr - Secondary (187 Verdi, 161 rural Canby, Ivanhoe, St. Leo)	136 Mgpy
Total	628 Mgpy

MMU is included in the NE Phase with an annual use projection of 109 Mgpy (see Table 1-6) and the Yellow Medicine Phase includes 161 rural Canby (35.7 Mgpy) and St. Leo (3.3 Mgpy). The total is 148.5 Mgpy. Therefore subtracting 148 Mgpy from 628 Mgpy equals 480 Mgpy. Added to this as stated earlier is RUS's determination that the proposed "secondary" capacity of 136 is not "modest" by Agency standards. RUS calculated that a 33 Mgpy "reserve" factor is more reasonable, see response 1-8.

4-5 Point noted concerning the Big Sioux Community Water System. Perhaps the Big Sioux could be considered in a Contingency Plan as a source of water.

John Madden works for Dewild Grant Reckert and Associates (DGR). DGR designed the portions of the LPRW system being evaluated in the EIS. RUS prepared the DEIS with data supplied by LPRW and John Madden and others. A conflict of interest as stated in 40 CFR 1506.5 9 (c) is as follows:

> (c) Environmental impact statements. Except as provided in Secs. 1506.2 and 1506.3 any environmental impact statement prepared pursuant to the requirements of NEPA shall be prepared directly by or by a contractor selected by the lead agency or where appropriate under Sec. 1501.6(b), a cooperating agency. It is the intent of these regulations that the contractor be chosen solely by the lead agency, or by the lead agency in cooperation with cooperating agencies, or where appropriate by a cooperating agency to avoid any conflict of interest. Contractors shall execute a disclosure statement prepared by the lead agency, or where appropriate the cooperating agency, specifying that they have no financial or other interest in the outcome of the project. If the document is prepared by contract, the responsible Federal official shall furnish guidance and participate in the preparation and shall independently evaluate the statement prior to its approval and take responsibility for its scope and contents. Nothing in this section is intended to prohibit any agency from requesting any person to submit information to it or to prohibit any person from submitting information to any agency.

A conflict of interest would exist if DGR prepared the EIS, which they did not. The original contractor used by RUS was Vista Technology, Inc. RUS terminated the contract with Vista because it was having financial difficulties and loss of critical staff members. RUS then had to prepare the

EIS internally. While information was obtained from John Madden and DGR, RUS is responsible for verifying the accuracy of the information supplied to it.

4-6 The information presented in the DEIS is correctly stated.

4-7 MDNR has the authority to compel compliance with its Water Appropriation Permit. Comment was made with the assumption that as a condition of RUS's loan, LPRW will be required to develop Water Resource Management Plan which will include an operation plan designed to minimize drawdowns in the Burr Unit's potentiometric surface.

4-8 RUS disagrees with this comment. The USEPA and SDDENR have also stated a pumping rate recommendation. In order to avoid or minimize significant adverse environmental impacts to surface water resources, it appears the critical factor to accomplish this goal is related to minimizing the drawdown of the potentiometric surface. Therefore stating a recommended pumping rate until more definitive information can be gathered through long-term monitoring is a responsible and prudent course of action.

Establishing water appropriation rates within its permitting authority is the jurisdiction of the MDNR not RUS. RUS is making a recommendation to the MDNR not dictating permit conditions.

4-9 The Governors of both South Dakota and Minnesota have agreed in writing to cooperate on decisions regarding groundwater appropriation at the Burr Well Field. This arrangement should be formalized in the proposed Water Resource Management Plan.

4-10 Both statements are true.

4-11 Correction noted.

4-12 RUS disagrees with this comment. RUS has not stated the appropriations rates of 400 - 525 gpm are safe, the statement says - "appear to be having little or minimal effects on any surface water resources." This statement is made with the repeated caveat regarding the high precipitation the area is receiving (see pages xii, xiii, and 54).

The point of the last comment in predicting effects to surface water resources is that it is relatively straight forward if one applies Darcy's law (Groundwater flow (Q) is proportional to Hydraulic Conductivity (K), Head Gradient (I) and Area (A) through which flow occurs. Q=KIA), which is the purpose of the statement in the DEIS. Reduction in the potentiometric

surface will cause a proportional reduction in the groundwater flow to the affected resource.

4-13 This comment was raised by the MDNR and SDDENR, RUS stands corrected.

4-14 RUS stands corrected. The Farmers Home Administration, predecessor to the RUS helped finance the wastewater system used by Lake Cochrane residents.

5. Jim Thompson

5-1 RUS disagrees with comment. The purpose of NEPA as stated in 40 CFR 1500.1, Purpose:

> The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.

In addition the purpose of an EIS as stated in 40 CFR 1502.1, Purpose, is:

> The primary purpose of an environmental impact statement is to serve as an action-forcing device to insure that the policies and goals defined in the Act are infused into the ongoing programs and actions of the Federal Government. It shall provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. Agencies shall focus on significant environmental issues and alternatives and shall reduce paperwork and the accumulation of extraneous background data. Statements shall be concise, clear, and to the point, and shall be supported by evidence that the agency has made the necessary environmental analyses. An environmental impact statement is more than a disclosure document. It shall be used by Federal officials in conjunction with other relevant material to plan actions and make decisions.

In order to further the policies and goals of the NEPA, agencies may develop and implement mitigation measures that include the following from 40 CFR 1508.20, Mitigation:

> "Mitigation" includes:
> (a) Avoiding the impact altogether by not taking a certain action or parts of an action.
> (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
> (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
> (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
> (e) Compensating for the impact by replacing or providing substitute

resources or environments.

It is not RUS's responsibility to do as the commenter states - "NEPA regulations require that the RUS establish monitoring requirements and thresholds of protection for these lakes and wetlands, and locate an alternative that avoids the impact to the lakes and wetlands."

As stated earlier the only decision facing RUS at this time is whether to finance the Northeast Phase Expansion. Through the EIS, RUS has evaluated the potential environmental effects of the proposed action and stated its conclusions and recommendations. As a condition of funding the Northeast Phase Expansion proposal, RUS will require LPRW, as a mitigation measure, to prepare in consultation with the MDNR, a Water Resource Management Plan. The goal of this plan is to minimize any significant adverse environmental impacts to the surface water resources in the area and provide the monitoring protocols that will allow all parties to cooperatively share information and through consensus evaluate on an on-going basis effects to surface water resources from pumping at the Burr Well Field.

RUS does not have the authority to dictate to state regulatory agencies, as in this case, conditions or elements to a Water Appropriation Permit. RUS may make recommendations to the MDNR as they have done, but the State of Minnesota has jurisdiction over waters in its state. Based on the analyses performed and conclusions drawn in the EIS, RUS has conditionally agreed to proceed with financing the Northeast Phase Expansion provided LPRW satisfy the mitigation measures outlined in the EIS. If these conditions are met, RUS will release the funds approved for the proposal.

5-2 RUS made, as part of its preferred alternative, a recommendation for a supplemental well field. The DEIS and response 3-2 states the available information regarding the Altamont aquifer. Subject to MDNR approval, RUS is willing to assist in financing the development of a well field in this aquifer. Specific well field configurations are subject to MDNR's authorization.

5-3 The commenter is correct in that RUS decided to prepare an EIS after reviewing the significant issues related to the previous Environmental Assessment and the pending application for the Northeast Phase Expansion. The form the commenter is referring to - the FmHA 1940-20, Request for Environmental Information - is a form the agency uses to solicit information from applicants to its programs. The information provided by LPRW on this form was in retrospect incorrect, but the Agency is responsible for verifying the accuracy of the information. This fact was a contributing factor in RUS's decision to prepare an EIS.

While patterned calcareous fens are classified as "wetlands" in terms of the U. S. Army Corps of Engineer, Wetland Delineation Manual, Technical Report Y-87-1, 1987, not all of the wetlands listed in this comment are fens. The fens in the area around the Burr Well Field exist due to the unique geologic and topographic conditions that occur in this area and are dependent on groundwater contributions from the Burr Unit of the Prairie Coteau aquifer. Many of the wetlands in the area are not dependent on groundwater recharge from the Burr Unit and consequently are unaffected by Burr Well Field activities.

6. Lincoln-Pipestone Rural Water

6-1 RUS did in fact rely on the technical input from all qualified parties prior to making its conclusions and recommendations. As stated in 40 CFR 1500.1, Purpose: "The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment." The conclusions drawn are an attempt to balance a stated statutory goal of NEPA to "achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities", such access to high quality drinking water at a reasonable cost.

It is readily apparent and documented that conclusive data regarding potential significant adverse environmental impacts to surface water resources in the area are limited, however, the analyses performed and information supplied to the Agency indicate that in all likelihood Lake Cochrane is receiving a yet undetermined and unquantified groundwater contribution from the Burr Unit of the Prairie Coteau aquifer. In addition, it has been established that the Burr Unit and the fens are hydraulically connected and that at some volume groundwater appropriations from the Burr Unit have the potential for adversely affecting these resources. Until longer-term data is available to managers of the natural resources in their respective states, it is prudent and RUS's opinion that groundwater appropriations from the Burr Unit be managed in a conservative fashion.

6-2 RUS agrees with this comment, impact thresholds for surface water resources should be based on the potentiometric surface elevations caused by groundwater appropriations. RUS agrees that impact thresholds need to be established by the MDNR through its Water Appropriation Permit process. RUS also agrees that since the potential exists to adversely affect surface water resources in South Dakota, South Dakota officials should be consulted regarding Water Appropriation Permit decisions at the Burr Well Field.

Conclusions drawn by RUS were based on information provided to and reviewed by all parties. Recommendations were based on consultations with state regulatory agencies, cooperating agencies (USEPA) and technical consultants hired by the Agency.

6-3 RUS agrees that attempting to predict the effect drought may have on surface water resources from groundwater appropriations from the Burr Unit is highly speculative. However, until longer term data can be gathered and analyzed within the documented climatic cycles (see Appendix B-1 and 2), RUS believes it is prudent and responsible to manage the aquifer system in a conservative manner

6-4 Commenter is correct in their interpretation. Again these pumping rates are recommendations, MDNR has the authority to establish whatever pumping rates they deem appropriate in the issuance of their Water Appropriation Permit. It appears that the recommendation to limit pumping rates in the Altamont is unnecessary since the Altamont aquifer is not hydraulically connected to the surface water resources of concern.

6-5 RUS has expressed a willingness to provide financial resources to LPRW provided they are willing to abide by the loan conditions established by the analyses and conclusions drawn in the EIS.

6-6 As demonstrated in response 1-8, LPRW has sufficient capacity to serve all of the rural and rural area municipal users in the present and proposed Burr Source service area from the Burr Well Field provided they restrict or discontinue providing water to MMU. If MMU wishes to continue purchasing water from LPRW on a long-term basis, they should contribute proportional financial resources to LPRW in accordance with RUS regulations.

6-7 1. RUS believes it has a responsibility to present recommendations on appropriate pumping rates from the Burr Unit in the EIS. These recommendations are generally consistent with the USEPA , SDDENR, and MDNR. RUS acknowledges that MDNR has the authority to establish whatever pumping rates they deem appropriate through its Water Appropriation Permit process.

2. All financial issues will be negotiated in detail upon completion of the EIS environmental review process.

3. RUS agrees to delete this previous requirement. The purpose of this agreement was to formalize monitoring input to the WRMP from South Dakota officials. RUS has decided to remove this requirement for the

following reasons:

- Governors from both South Dakota and Minnesota have already formally pledged in writing to cooperate on evaluating the effects of groundwater appropriations to the surface water resources hydraulically connected to the Burr Unit.
- RUS believes that the MDNR has the appropriate statutory and regulatory procedures in-place to allow for South Dakota's input into their Water Appropriation Permitting process.
- All regulatory issues, concerns, or conditions related to MDNR's Water Appropriation Permit at the Burr Well Field from South Dakota should be directed at MDNR not LPRW.

7. Department of the Interior

7-1 RUS consulted with the local Fish and Wildlife Services' offices regarding threatened and endangered species and the results of those consultations are contained in the EIS. The only surface water resources that appear to be affected by groundwater withdrawals from the Burr Unit of the Prairie Coteau aquifer are those that are hydraulically connected to the aquifer - that is, the patterned calcareous fens and likely, Lake Cochrane. These are the surface water resources identified as those sustained by the artesian nature of the Burr Unit in that area surrounding the Burr Well Field. It is assumed that all surface water resources that are sustained by these groundwater inputs will response in a similar fashion, therefore predicting effects from groundwater withdrawals were focused on those resources. It was concluded that to describe other fish and wildlife resources in the Minnesota portion of the project area, as suggested in this comment, was to not focus on the significant issues and would be an accumulation of extraneous background data. See 40 CFR §§1500.2, Policy and 1502.1, Purpose.

> 40 CFR Sec. 1500.2, Policy. Federal agencies shall to the fullest extent possible:
> (b) Implement procedures to make the NEPA process more useful to decisionmakers and the public; to **reduce paperwork and the accumulation of extraneous background data**; and to emphasize real environmental issues and alternatives. Environmental impact statements shall be concise, clear, and to the point, and shall be supported by evidence that agencies have made the necessary environmental analyses.

> Sec. 1502.1 Purpose. The primary purpose of an environmental impact statement is to serve as an action-forcing device to insure that the policies and goals defined in the Act are infused into the ongoing programs and actions of the Federal Government. It shall provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the

quality of the human environment. **Agencies shall focus on significant environmental issues and alternatives and shall reduce paperwork and the accumulation of extraneous background data.**

As stated on page 45 in the DEIS, it was not economically feasible to catalog all fens in the area influenced by Burr Well Field appropriations. While this information would be highly desirable it is not available nor is the information available regarding all possible points of Burr Unit surface discharges whether in lakes, fens or streams.

Consistent with 40 CFR 1502.22, Incomplete or Unavailable Information, and on page 114 in the DEIS, RUS clearly stated that all decisions and statement regarding Lake Cochrane (and can be extended to the fens) are being made on incomplete or unavailable information.

Because of the cost of data collection and monitoring, the amount of observation wells and monitoring points available to all interested parties will have to suffice in making reasonably informed natural resource decisions. RUS believes that the monitoring data collected to date, while not perfect, is sufficient to make reasonable interpretations and to drawn conclusions. The East Dakota Water Development District submitted an article with its comments (see Appendix A-4). The article was titled "Managing Water Resources Systems: Why "Safe Yield" is Not Sustainable"; in this article published in Groundwater, July-August 1997, the author, Marios Sophocleous, stated "Science will never know all there is there is to know. Rather than allowing the unknown or uncertain to paralyze us, we must apply the best of what we know today, and at the same time, be flexible enough to allow for change and for what we do not yet know. Instead of determining a fixed sustainable yield, managers should recognize that yield varies over time as environmental conditions vary." RUS agrees with this statement and also believes that its conclusions are reasonable given the amount of information available to it at the time of its analyses.

7-2 Cost estimates and projections for a supplemental well field were stated in Table 2-4 as $1.4 million. Cost estimates for the two options in Wood Lake alternative ranged from $3.7 to 4.9 million based on the size of the water treatment plant proposed. As is the case of any cost estimate, cost of a supplemental well field will vary based on the exact location and depth of the well developed and the length of the pipe necessary to transmit the raw water to the treatment plant. The cost estimate was provided for the area projected in the DEIS as the most likely site for a well field that would be able to utilize the Altamont aquifer - southwestern Yellow Medicine or northwestern Lincoln County. As stated in response 3-2, seismic surveys performed recently by the MDNR indicated that an area just north of the Burr Well Field held promising prospects for the Altamont aquifer (see

Appendix C-1). If LPRW can successfully locate an Altamont well in this location the cost of the supplemental well field could very well be less than the cost estimate projected in the DEIS.

As stated in response 1-8, LPRW currently has sufficient capacity to serve all of the rural and rural area municipal users if they were to discontinue water sales to MMU. If MMU and MCP utilized the wells currently permitted by the MDNR, then LPRW may not have to develop a supplemental well field at all. RUS still believes that a supplemental well field is the most reasonable alternative from both a resource management issue and cost feasibility standpoint; RUS will continue to support the preferred alternative.

7-3 Notwithstanding past legal actions as listed, MDNR has the authority to regulate groundwater appropriations at the Burr Well Field. RUS has no reason to question MDNR's resolve to assert its jurisdiction over its Water Appropriation Permit with LPRW and its fen protection statue - Minnesota Wetland Conservation Act of 1991 (Minn. Stat. 103G).

7-4 RUS agrees, see response 1-12.

7-5 All water sold to customers is metered. The footnote attempts to explain that the volume of water that is "unmetered" is the difference between total volume produced and that metered through all users' meters. Unmetered water is used for flushing lines, backwashing filters at the water treatment plants, and consists of leaks in utility lines. Unmetered water is sometimes reported as "unaccounted for water" and is typically less than 15% rather than 10% on a system of this type.

7-6 According to the MDNR Final Report, Southwestern Minnesota Groundwater Exploration Project 1996-97, page 7 - "The hydraulic conductivities values from the City of Cottonwood and Berg aquifer tests are in the middle to upper range for clean sand (Freeze and Cherry, 1979) which indicates that Wood Lake is a good aquifer."

7-7 South Dakota #2 is also referred to as the South Slough Fen and South Dakota #5 is the Lynch Fen.

7-8 Any factor that reduces groundwater flow to the fens can be described by the discussion in the DEIS on pages 96-98.

8. Department of the Interior

8-1 Since the publication of the DEIS in February 1998, monitoring and data collection has continued in observation wells and piezometer nests

installed in selected fens. Hydrographs of these monitoring points can be found in Appendix B. In addition, rainfall data was plotted on graphs from the period between 1988 to 1998 and from 1917 - 1998 (see Appendix B-1 and 2).

The commenter uses the term "ground-water levels" which may be confusing to some readers. The Burr Unit of the Prairie Coteau aquifer is a confined aquifer in the eastern portion of its range and also under water table conditions in the western portion (see Figure 3-4). Water levels in the confined portion of the aquifer is measured by the potentiometric surface (see DEIS page 81). During the period LPRW has been pumping from the Burr Unit at the Burr Well Field, the potentiometric surface in the confined portion of its extent has dropped on the average approximately 0.5' (9/94 - 12/98, OW R2 94-26 - West End of Lake Cochrane (Appendix B-22)); 3.5' (9/94 - 12/98, OW R2 93-10 - State Line OW (Appendix B-21)); and 1.4' (4/97 - 12/98, Deep Steel OW, Sioux Nation area (Appendix B-20). In the water table portion of the Burr Unit the water elevation has declined 0.2' (9/84 - 12/98, OW R2 94-33 - 2.25 miles west of Lake Cochrane (Appendix B-23)).

8-2 Information regarding the Altamont aquifer can be found in the DEIS on page 60 and 63 which uses information from references Kume 1985 and Berg, 1997a. Based on exploration efforts by the MDNR (Berg), the Altamont aquifer appears to hydraulically isolated from the Burr Unit of the Prairie Coteau aquifer, therefore it is unlikely that declines in water levels in the Altamont would affect the water levels or the potentiometric surface in the Burr Unit. In addition, Appendix C in the DEIS contains four cross sections (Fig 7.4 through 7.7) which depict the till sequences and depth information requested in this comment. The Altamont aquifer is designated as BQ.

9. National Audubon Society

9-1 RUS disagrees with this statement. The MDNR has the statutory jurisdiction and regulatory authority to regulate groundwater appropriations in Minnesota through its permit program. RUS has no reason to believe that they will not exercise their authority if on-going monitoring determines significant adverse environmental impacts to surface water resources are occurring. In order to minimize the fears the commenter speaks of where human needs are pitted against the long-term viability of lakes and fens, RUS supports actions outlined in the preferred alternative that minimizes an over-reliance on the Burr Unit. This could be accomplished by developing a supplemental well field, particularly one that utilizes the Altamont aquifer. In addition, Table 5 outlines the permitted capacities of the well fields owned by MMU and MCP. These wells, particularly those

owned by MCP, are available for use.

10. Hazel Run City Council

10-1 The EIS that is being prepared is required by the National Environmental Policy Act (NEPA). One of the goals of NEPA is to "achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities (42 USC 4331, Section 101 (b)(5)." RUS believes its preferred alternative will go a long way in helping to achieve this balance.

11. L. W. Tobin, Lake Cochrane Improvement Association

11-1 See response 1-30. The commenter's analogy may be appropriate for an aquifer that is not receiving recharge, however, it is likely that the Burr Unit of the Prairie Coteau is receiving some recharge. The point of the recommendation was assuming that the annual volume appropriated from the Burr Unit would not appreciably change, therefore two point withdrawals from the Burr Unit could potentially minimize reductions in the potentiometric surface and the resulting cone of depression thus potentially minimizing effects to surface water resources. MDNR will determine through its permitting authority any and all well field configurations, pumping rates, and annual volumes.

11-2 RUS accepts and does not dispute the work performed by the SDDENR regarding Lake Cochrane (see DEIS page 109). See response 2-1.

11-3 The DEIS on page xiii states that - "Based on a systematic and objective evaluation of the environmental and economic issues related to the remaining alternatives, the Agency has concluded that the proposed action (to appropriate groundwater at 1,500 gpm/800 Mgpy from the Burr Unit at the Burr Well Field) poses an unreasonable environmental risk to surface water resources in the area.

12. Clayton Holt

Comments noted; RUS has no additional responses.

13. Eugene Eilers

13-1 RUS regrets that it does not have funding available to meet the needs of all of the rural areas. RUS was informed by the MDNR that Canby was able to secure funding from the revolving loan funds being made available to

State governments through revisions in the Safe Drinking Water Act.

Perhaps the upgraded City of Canby's Water Department could serve as a contingency supply for citizens that were previously served prior to LPRW's service in the Yellow Medicine phase area.

14. John Lentz

Comments noted; RUS has no additional responses.

15. U. S. Army Corps of Engineers, Omaha District

Comments noted; RUS has no additional responses.

16. U. S. Army Corps of Engineers, St. Paul District

Comments noted; RUS has no additional responses.

17. Minnesota Historical Society

Comments noted; RUS has no additional responses.

18. Senator Paul Wellstone and Congressman David Minge

Comments noted; RUS has no additional responses.

19. South Dakota State Senator Bernie Hunoff

Comments noted; RUS has no additional responses.

20. East Dakota Water Development District

Comments noted; RUS has no additional responses.

21. Marshall Municipal Utilities

Comments noted; RUS has no additional responses.

Appendix A

Minnesota Department of Natural Resources

500 Lafayette Road
St. Paul, Minnesota 55155-40__

April 23, 1998

Mark S. Plank
USDA Rural Utilties Service
Engineering and Environmental Staff
Stop 1571
1400 Independence Avenue
Washington, D.C. 20250

Re: Comments on Draft Environmental Impact Statement for the Lincoln-Pipestone Rural Water, Existing System North/Lyon County Phase, Northeast Phase Expansion

Dear Mr. Plank:

The Minnesota Department of Natural Resources has reviewed the above-referenced document and provides the attached comments for your consideration.

If you have any questions regarding these comments, please call Ken Wald of my staff at (612) 296-4790 or Jim Japs of our Division of Waters at (612) 297-2835.

Thank you for the opportunity to review this document. We will be looking forward to receiving the Final EIS and working with Lincoln-Pipestone Rural Water to address regional needs in an environmentally compatible manner.

Sincerely,

Thomas W. Balcom

Thomas W. Balcom, Supervisor
Enviromental Review and Assistance Unit
Office of Management and Budget Services

c:

Kent Lokkesmoe	Cheryl Heide
Jim Japs	Mike North
Bret Anderson	Dave Leuthe
Con Christianson	Don Evers, LPRW

980101-2, lprwdeis.wpd

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

Comments on
Lincoln-Pipestone Rural Water (LPRW)
Draft Environmental Impact Statement (DEIS)

Executive Summary

The Minnesota Department of Natural Resources (MDNR) agrees with the conclusion of the Rural Utility Service (RUS) that the proposed action to increase authorized pumping rates and volumes of water at the Burr Well Field poses an unreasonable environmental risk and that another well field is needed to provide reliable water service for Lincoln-Pipestone customers. We also support a reduction in pumping rates and volumes from wells at the Burr Well Field completed in the "Burr Unit" of the Prairie Coteau aquifer, but do not support the recommendation that another well field with more wells be completed in the Burr Unit. Based on available pumping volumes and recovery data from last year, the Altamont well at the Burr Well Field appears to be able to support higher water withdrawals than previously thought when the well was constructed. Recently reported appropriations from the existing 8" well indicate this well can produce over 500,000 gallons per day, and the proposer's consultant believes the Altamont well could possibly produce 180 million gallons per year (MGY) or double the current authorized volume for this well. Attachments 1, 2, and 3 provide pumping rate and water level data. Continued water level monitoring is still needed to determine the sustainable limit for this resource.

Currently the Altamont well is authorized for up to 90 MGY and any appropriation from this source reduces the 400 MGY authorized from the Burr Unit. Lincoln-Pipestone Rural Water (LPRW) representatives met with MDNR staff on March 13, 1998 to discuss the potential for increases in the authorized volume for the Altamont well and the total authorized volume from the Burr Well Field. The MDNR indicated a willingness to consider a request to increase Altamont appropriations if appropriations were reduced from the Burr Unit consistent with recommendations in the DEIS. If the existing Altamont well can sustain appropriations of 180 MGY, this would result in a total potential volume of 452 MGY from current sources at the Burr Water Treatment Plant. The MDNR also supports exploration and development of another well field that would utilize the Altamont aquifer as the primary source of water, as recommended in Section 3.2.1.3 of the DEIS. The MDNR would like to see further reductions in appropriations from the Burr Unit, especially during drought periods, if an adequate water supply from a well field completed in the Altamont aquifer or another source can be developed. The MDNR can help provide technical assistance for locating an alternative water supply.

The DEIS recommends development of a comprehensive water resource management plan for monitoring resources and impacts from pumping as a mitigation measure. A feasible contingency plan would also be an appropriate mitigation measure, and specific contingency actions should be defined in the DEIS. The MDNR also strongly recommends development of a
1-1 comprehensive plan that defines the ultimate extent of the system so that existing water resources can be evaluated within the ultimate service area to meet future demands. Water sources are available in the proposed expansion area that are capable of supporting moderate size service areas, and the MDNR continues to support construction of a treatment plant on the east side of the system to improve reliability.

The DEIS lacks adequate documentation on projected water demands, which are significantly different than previous projections provided by LPRW. The projected demand of 628 MGY for the Burr Well Field is based on continuous service to both primary and secondary service areas for an entire year. The logic used to justify water demands for the Burr Well Field indicates that a much larger deficiency exists in the 892 MGY demand for the Verdi Well Field primary and
1-2 secondary service areas. The consultant that provided water demand projections also states that the Verdi and Holland Well Fields are at or nearing safe capacity with a total combined appropriation of 737-757 MGY, so it is not likely that the Verdi Well Field could supply 892 MGY. The method used in the DEIS (Tables 1-8, 1-10, and 1-11) to define the purpose and need for annual demands would justify an additional well field similar in size to the current Verdi Well Field. Additional capacity for the Verdi Well Field primary and secondary service areas would appear to be a higher priority to protect existing customers on the system, especially due to current nitrate problems, before proceeding with new expansion proposals.

The Executive Summary includes a statement often quoted by LPRW regarding their broad statutory powers to do all things necessary to establish, construct, operate and maintain a rural water system. The MDNR is concerned about continued expansion of this system, when system improvements are required for existing customers to address nitrate levels at the Holland and Verdi Well Fields, and that LPRW may not have adequate funds available for contingencies or system improvements. Additional funding from Rural Development or other sources will continue to be needed to address system problems for existing service areas impacted by lack of adequate storage capacity, and with nitrate levels that have exceeded maximum contaminant
1-3 levels (MCLs). The DEIS does not indicate if future participation costs for rural users will be impacted by LPRW's agreement to provide a minimum of 300,000 gallons per day to the City of Marshall, which is not eligible for Rural Development funds. The City of Marshall is receiving a large share of the water produced at the Burr water treatment plant, and the EIS should discuss impacts on future participation costs for rural users that may be caused by the benefits the City of Marshall is receiving from federal funds that paid for the treatment plant, storage, booster stations and other system costs. Again, we do not deny the importance of the water supply for the City of Marshall, but question whether this increased demand should be putting additional pressure on the aquifer and limiting the supply or reducing benefits for existing and future rural water users in the total system.

The no action alternative (#6) in the DEIS indicates that rates will increase 11% even if the NE Expansion is not constructed. The reason for this cost increase is not clear, but appears to be
1-4 related to the $476,000 LPRW has requested for EIS participation costs. These participation costs and the costs for the NE Expansion should be itemized in the DEIS. It should be noted that Minnesota, South Dakota and the federal government have also expended a lot of resources for pump tests, monitoring and studies related to the EIS.

Attachment 4 is a copy of LPRW's February 1996 amendment request to increase pumping rates and volumes as described in the proposed action evaluated in the DEIS. The amendment request simply states that "Permit No. 91-4159 needs to be increased to 1,500 GPM and 800,000,000 per year. The wells are in and are on line so we need to increase the volume. You have all the information that is required." Clearly, additional information is needed to support water management decisions that will protect LPRW customers and environmental resources. We appreciate the effort RUS has taken in the development of the EIS to identify potential adverse environmental impacts and alternative water sources.

1-5 *Page iii, first paragraph:* "During construction..." should state "Prior to construction...".

Page vi, Table ES-1: The MDNR permitted capacity for Canby is listed as "0", which implies Canby can not serve water to LPRW because of MDNR permit authority, when in fact it was LPRW's decision to no longer use Canby as a source.

Page xiii: "In consultation with experts in the field of hydrology and geology, it is the Agency's opinion that Lake Cochrane...would not have significant environmental impacts." While this
1-6 statement may be the opinion of some unnamed experts, staff at MDNR and the South Dakota Department of Energy and Natural Resources (DENR) agree that significant impacts are possible, because data show that reductions in groundwater input occur even with pumping at current rates (of about 500 gpm) and that this reduction would be significant during a "dry spell".

Page ix, Table ES-3, Alternative 3: should read "750 gpm/400 Mgpy".

Page xiv: "At no time did the hydraulic head or water table elevations in the fens or potentiometric surface fall close to or below the surface elevations of the peat domes." The
1-7 water levels in the deep well at the Sioux Nation fen dome started out "close to" the surface of the peat, less than 2 feet above the surface of the dome. A decline of almost ten percent was observed during the 1996 test. Concern is heightened because the period of observation is a "wet spell". The remaining head above the elevation of the fen dome does not appear to be sufficient to sustain adequate ground water discharge through the peat when pumping stress coincides with climatic stress.

1.1 Purpose and Need.

This section states that MDNR permitted volumes are adequate for immediate needs, but there is a deficiency to meet needs at the Burr source. Deficiencies at the Burr source are self imposed by LPRW's decision to supply the City of Marshall with 200 MGY and the decision to terminate
1-8 the agreement with the City of Canby to supply the Yellow Medicine Phase. The deficiency is based on a minimum need of 628 MGY, but Table 1-8 indicates a total need of 492 MGY (282 MGY for the existing service area, 210 MGY for the proposed NE Expansion). The 136 MGY (21%) difference between the 492 MGY (Table 1-8) and 628 MGY is assumed to be unaccounted-for water. If Canby serviced the Yellow Medicine/St. Leo service area, water demands would be reduced approximately 39 MGY.

MDNR comments provided on the Preliminary DEIS regarding the 210 MGY projected for the proposed NE Expansion have not been addressed and documentation should be added to justify this volume of water. The 210 MGY need conflicts with Attachment 5, which is a January 22, 1997 letter from LPRW attorney David Watson (Exhibit A), which states that a pumping rate of 175 gpm is required for the "300 rural users that have petitioned for service" in the NE Expansion. Pumping 175 gpm, twenty four hours per day, 365 days per year equals 91.9 MGY, and applying the 1.7 peaking factor for the entire year equals 156.3 MGY. This letter indicates that the "real" numbers for the existing Burr customers, the customers that have been assessed but are not using water, the City of Marshall, and the NE Expansion, total 892 gpm (annual average, not peak) or 468.8 MGY. Defining water requirements is important for identifying supply alternatives, but projections in the DEIS appear inflated based on actual use and don't always add up. Obtaining accurate and consistent data has been a general problem with this project and the EIS should carefully explain and verify data included in the document.

Page 13, first paragraph: "...Previous requests to increase appropriation rates at the Burr Well Field have not been acted on by the MNDNR because of concerns that groundwater withdrawals

at the well field may have..." The MDNR wanted the EIS to be completed before taking final action on the permit request.

1.2 Groundwater Availability and Quality in Southwestern Minnesota

A 1997 memorandum prepared from a file memorandum developed by LPRW's consultant in 1995 gives a nice history, using sources that for the most part were published more than twenty
1-9 years ago, and provides general conclusions that may not be appropriate for specific resource decisions in southwestern Minnesota. As stated in Section 2.2.2.2.5, "Specific exploration efforts undertaken by local municipalities, various units of Minnesota State Government and the USGS are not comprehensive nor specific enough for the Agency to evaluate conclusively other alternative sources aquifers that could potentially serve LPRW's needs."

Page 20-22: The document states that five USGS Hydrologic Atlases cover the LPRW service area and yet the document does not specifically reference HA-269 (Lac qui Parle) which covers the watershed that includes the Burr Well Field. It may be appropriate to discuss the data specific to the Lac qui Parle watershed.

Page 22, paragraph 3: "...showed that the average nitrate-nitrogen levels...were above 10 mg/L." How many of the wells with NO_3-N levels above 10 mg/L have problems due to poor well construction instead of aquifer wide contamination as the document implies? The DEIS cites a 1991 MPCA publication which states that 37.5% of the Sioux Quartzite wells sampled exceeded the 10 mg/l nitrate-nitrogen standard, which indicates most wells do not have nitrate problems.

This section states that with availability of treated water, farmers have been able to diversify
1-10 farming operations to include raising of livestock, and lower sulfate levels reduce mortality problems with immature animals. New livestock operations and lower animal mortality are positive benefits provided by rural water service that would increase livestock numbers and operations contrary to the conclusions in Section 3.4.

Consolidating community water systems can be beneficial for helping small systems comply with water quality standards, but can increase the potential for environmental impacts by reducing the number of water sources that supply much larger service areas. Cooperative arrangements to assist with improvements to community water treatment plants, and the purchase of water from these systems to supply moderately sized service areas, can improve reliability for a rural water system and the sustainability of water resources.

While the purpose of the LPRW is to provide a consistent and reliable supply of high quality, affordable water, it has continued to expand service areas that lack adequate storage capacity and are supplied by sources that are near capacity and have high nitrate levels close to or exceeding safe drinking water standards. As indicated in the 1994 U.S. EPA testimony, the number of
1-11 "non-viable" systems that lack financial, managerial, and technical capacities to meet drinking water standards continues to grow. The EIS should include information on the financial viability of LPRW to address system improvements that are necessary for current water quality and storage problems. High debt and low reserves may increase eligibility for Rural Development grants and loans, but the need for RUS to provide financial resources to the region through loans and grants will continue unless changes are made so systems become less dependent on grants for funding contingencies and system improvements.

1.3.1 System History and Summary

The City of Canby has almost completed construction of a new water treatment plant, so it does not appear that Canby has a need to purchase water from LPRW. The City of Canby should be
1-12 contacted to determine if they are interested in obtaining water service from LPRW and paying assessments. The 1,349 MGY projected annual demand in Tables 1-8 and 1-11 could be reduced by 51 MGY if Canby intends to supply its own water needs.

On page 25, the DEIS states that the NE Phase consists of 170 rural customers and two communities. Other sections of the DEIS indicate there will be 240 rural customers, and the
1-13 January 22, 1997 letter (Attachment 5) from LPRW's attorney states that 300 rural customers have petitioned for service. The actual number of rural customers that have signed up for service in the proposed NE Expansion should be verified and documentation provided for the 210 MGY projected demand for this service area.

Table 1-3 indicates that the Burr Water Source is softened to 460 mg/l, and Table 1-4 states it is treated to 360 mg/l. At either 360 or 460 mg/l the water supplied from the Burr water treatment plant would be considered very hard according to Table 1-2, and customers may prefer additional water softening. Please note our comments on the Preliminary DEIS regarding point of use (POU) water softening costs.

1.3.1.1 Regional Rural Water Development

In Table 1-5, POU costs include water softening equipment, but water softening equipment is not identified as a cost for LPRW customers even though softened water provided from the Burr water treatment plant is considered "very hard" according to Table 1-2. The EIS should respond to the following questions to clarify cost data provided in Table 1-5:

1) Do LPRW customers require water softening equipment for water supplied from the Burr Water Treatment Plant?
2) Do LPRW customer costs include Rural Development grant funding?
1-14 3) Will the benefits received by the City of Marshall impact Rural Development grant and loan funding for NE Expansion participation costs and, if so, are these costs reflected in Table 1-5?
4) Do customer costs reflect the 11% rate increase for the no action alternative or the 21% increase for the preferred alternative?
5) Do individual well systems require $1,500 TDS reduction equipment in addition to water softening equipment, and if so, why?

Including costs for water softening and TDS reduction does not appear to be appropriate for comparison purposes; an explanation justifying these costs would be helpful. Any cost impacts due to Marshall's benefits from utilizing a significant share of the Burr water treatment plant should also be clarified.

1.3.1.2 LPRW Growth

This section states that LPRW had difficulty supplying demands in 1988 and 1989. LPRW added the Holland Well Field and continued expansion of both Holland and Verdi service areas, but did not construct additional storage which is identified as a critical need in the DEIS. The Holland Well Field exceeded drinking water standards for nitrates, and LPRW has requested Rural Development funding for a treatment plant to reduce nitrates. Additional water will be

needed for the treatment process, and since this well field is already at or near capacity, modifications in the size of the Holland and Verdi service areas may be necessary. The Verdi Well Field also has elevated nitrate levels, and the lack of adequate storage along with the water quality problems could result in a need for increased pumping from the Burr Well Field. To protect existing customers, priorities for locating additional storage and other system improvements should be evaluated along with the proposed NE Expansion and the storage tank near Minneota.

The LPRW "official policy" on future growth is based on a personal communication by LPRW's consultant John Madden of Dewild, Grant and Reckert and Associates (DGR). Use of a personal communication from a consultant to document an apparently unwritten policy is not credible or appropriate. It is clear from the "official policy" included in the DEIS that LPRW
1-15 does not have a detailed comprehensive plan for system expansions and that a very large potential service area exists which includes Lac Qui Parle and Redwood Counties and the northeastern part of Yellow Medicine County. Without a comprehensive plan that defines the ultimate size of the system, it is difficult to evaluate treatment plant requirements and water supply alternatives appropriate for the NE Expansion or future expansions of the system. The MDNR recommends that the plan for the ultimate size of the system be developed so that potential water source alternatives can be evaluated in a comprehensive approach that will best serve the long-term needs for LPRW customers while protecting environmental resources.

1.3.2 Existing System North/Lyon County Phase History

This section indicates that the elevated storage tank near Minneota was part of this expansion effort, but does not explain why it was decided to postpone the storage tank and replace it with a
1-16 booster pump. It appears the $395,000 booster pump (Attachment 6) was needed primarily to supply the City of Marshall, and the EIS should clarify why this decision was made if additional storage capacity is so critical to the system as stated in Alternative 6.

Projections from Table 1-8 are used to indicate that 300,000 gallons per day for the City of Marshall account for 8.1% of the average day and 4.7% of the peak day needs for the Burr Well Field. It is not clear how these averages were calculated. Table 1-8 states that 773,000 gallons is the average demand for the Burr Existing System, so the minimum volume of 300,000 gallons
1-17 per day (109.5 MGY) supplied to Marshall equals 38.8%, and the 200 MGY volume (548,000 gallons per day) currently supplied equals 70.8%. Using the 628 MGY projected demand for the Burr primary and secondary service areas, the minimum volume is 17.4% and the current volume is 31.8%. The percentage numbers used in the DEIS distort actual water volumes supplied to Marshall from the Burr Well Field.

As indicated above, Marshall currently benefits by receiving at least 30% or more of the water produced by the Burr water treatment plant, but will pay only $229,000 for pipeline construction costs. However, the DGR 1991 Engineering report (Attachment 7) reflects itemized costs for treatment, storage, wells, engineering, legal and other costs that total $2,500,000. This figure
1-18 would not include any cost overruns identified in Attachment 6. Attachments 8 and 9, from the FmHA and from LPRW's attorney, reference the need to pay up-front costs of $800,000 for up to 300,000 gallons per day. The EIS should indicate why costs for treatment, storage, booster pumps, wells, engineering, legal and other cost schedules are not included as a cost of service for Marshall. Impacts on future participation costs for rural users due to the benefits Marshall is receiving from the federally funded project should be discussed in the EIS.

The Rural Development funding request for the City of Canby did not meet the criteria that facilities be modest in size, design, and cost. It is hard to understand how the LPRW system
1-19 expansion that included the Burr Well Field and treatment plant met these criteria based on actual demands for the system, unless water service to Marshall was included in the demand projections.

Page 35, paragraph 2: The text references a January 1991 DGR report (Attachment 7) which states that LPRW, the City of Marshall and Minnesota Corn Processors (MCP) discussed water service agreement alternatives of 500,000 and 2,000,000 gallons per day. Attachment 10 is part of LPRW's March 14, 1991 MDNR permit application requesting 325 MGY for Marshall/MCP. However, a November 8, 1993 letter from LPRW's attorney to Bill Dempsey (Attachment 9) states that the first contact with MCP occurred after receiving a permit from MDNR in 1992, and a September 8, 1993 FmHA memorandum (Attachment 11) states MCP was not included in the
1-20 original Environmental Assessment because it was not a consideration at that time. Attachments 7 and 10 appear to contradict statements made by LPRW's attorney and FmHA in Attachments 9 and 11. Part of the controversy about this project has been due to perceptions that the Burr water treatment plant was originally designed with intentions to serve Marshall/MCP, and these perceptions are supported by the DGR report and LPRW's water appropriation permit application, which were used to secure federal funding of the project. To help resolve any controversy and contradiction regarding water service to Marshall/MCP, the EIS should explain the reason for these conflicting statements and the lack of information in the original Environmental Assessment on this issue.

Section 1.4 System Needs

Comments on other sections of the DEIS identify inconsistencies, need for supporting documentation, and problems with data provided in Tables 1-8, 1-10 and 1-11, and these items will not be repeated in detail with the hope that projected demands will be modified or justified
1-21 in the Final EIS. What must be repeated is that it is not reasonable to justify projected annual demands based on continuously supplying both primary and secondary service areas. As shown in Table 1-10, the projected average demand for the Verdi Well Field is 892 MGY, and this well field is at or near capacity at volumes less than 500 MGY.

Table 1-8 on page 38 states that the source capacity for the Burr Well Field is 1,720 thousand gallons per day (kgpd) (628 MGY). Please include supporting documentation and an explanation on how this number is derived.

The text at the bottom of page 39 states that for planning purposes the system has been designed to meet averaged day and peak day demands, which are estimated as 70% above average daily use. This does not appear to be modest in size or design, but data in peak day columns in Tables 1-8 and 1-9 reflect average demands that do not exceed 58% of peak demands. The Burr NE Phase is the one exception, with average demands equal to 81% of the peak day demand, and again we request documentation to support projected demands for the proposed NE Expansion.

The total projected demand of 1,349 MGY includes 221 MGY (16.4%) of unaccounted-for water. Table 1-9 states that unaccounted-for water is typically reported under 10%. A history of unaccounted-for water should be added to the plan along with a description of the method for determining the "water loss adjust" used to calculate reported water loss. Attachment 12 shows volumes of water pumped and sold and an adjustment that is used to estimate unmetered uses such as leaks, line flushing, and treatment backwash. Water sold has ranged between 17.6% and

25.6% of water pumped since 1994, but applying the water loss adjustment reduces this volume considerably and has even reduced water losses to the point of showing a net gain of up to 16% more water than actually pumped.

Page 43, top of page: The text states that the Verdi and Holland Well Fields are at or near safe capacity and that minimum annual needs from the Burr Well Field are 628 MGY based on existing and long-term future needs. The total combined volume pumped from the Verdi and Holland Well Fields was 757 MGY in 1996, while combined total annual needs (Table 1-11) are 806 MGY for the primary service area and 1,238 MGY for the primary and secondary service areas. The primary and secondary combined total of 1,238 MGY is 432 to 481 MGY (35-38%) above the actual use and capacity for these well fields. The Verdi and Holland Well Fields are not capable of supplying combined demands for primary and secondary service areas based on these theoretical calculations, and the use of similar logic to justify the 628 MGY average day demands for the Burr Well Field is questionable at best.

1-22 While the DEIS includes data on projected water demands, there are no data or projections in the DEIS regarding demand reduction measures, improvements in water use efficiencies or reductions in water losses. An evaluation of the demand reduction potential for the system should be added to the EIS.

Section 2.1 Alternatives

Page 46, paragraph 2: "...When the FONSI was issued in 1992, there were no indications, nor could it be substantiated, that appropriations from the Prairie Coteau aquifer would irreversibly or irretrievably destroy the resources that were of concern..." While it is true that it was not until the aquifer testing, conducted in June 1993, confirmed the connection between the Sioux Nation fen and the Burr Unit, LPRW was notified in early 1991 that there was a likely connection between the aquifer and fen. If the well had been tested at the time, as requested by MDNR, the connection would have been confirmed much earlier in the process.

Page 46, paragraph 4: "...In previous years, the City of Granite Falls was using the Minnesota River (as) a source of drinking water for its citizens and because of reliability and public health concerns related to water quality Minnesota State officials required the City to switch to a groundwater source..." The City of Granite Falls was forced to switch drinking water sources because federal standards became more stringent and their water treatment plant is physically too small to accommodate the necessary resident time for treatment.

Section 2.2 Description of Alternatives Considered

1-23 Tables 2-3 and 2-4 include $476,000 for LPRW EIS participation costs which are not itemized in the EIS. This funding request accounts for 10% of the costs for the proposed action and 7.6% of the costs for the preferred alternative. The EIS should itemize costs and the purpose for the requested federal funds.

1-24 Please clarify the actual number of rural users in the proposed NE Expansion. The executive summary and several other sections state the proposed NE Phase includes 240 rural users, but Section 1.3.1 (page 25) indicates there will be a total of 170 rural users. Attachment 5 states there are 300 petitions for service in the Northeast Expansion, and the LPRW CEO recently stated there are 1,000 people interested in receiving rural water service.

2.2.1 Proposed Action

The MDNR agrees that the proposed action poses unreasonable environmental risks to natural resources and supports a reduction in pumping rates and volumes from the Burr Unit.

A statement in the last paragraph on page 55 indicates that the MDNR is involved with decisions to abandoned water sources previously used by communities now served by LPRW. These decisions were made by the communities, and along with the reasons cited in the DEIS the availability of federal funding is another major reason for choosing rural water. Rural Development funding decisions have even dictated water sources that can be used for community needs based primarily on economics. A recent example is the City of Canby Rural Development funding request during the preparation of this DEIS. As indicated on page 36, the application was not processed because it was economically cheaper to connect to the LPRW Burr Well Field service area. The MDNR and Rural Development have started working on early coordination procedures to help identify potential resource issues and help prevent future problems.

DEIS page 57, paragraph 2: "...additional geologic exploration efforts near the Holland Well Field has not produced any formations of sufficient thickness that would be able to supplement supplies to the Holland field (Berg, 1997b)." LPRW CEO Don Evers reports that test drilling conducted by LPRW in July 1997, approximately two miles north of the Holland Well Field, had identified a potential source to augment the Holland Field (personal communication, July 1997).

2.2.2.1 Alternative 1

We agree with the conclusion that Verdi and Holland Well Fields are operating near capacity (combined total of 737-806 MGY) and are not adequate to supply the Burr service area, let alone the 1,238 MGY indicated for primary and secondary service areas (Tables 1-8 and 1-11).

Tables 1-8 and 1-11 indicate that an estimated 1,349 MGY are required for the system, including 221 MGY of unaccounted-for water, 103 MGY for drought demand, 492 MGY for the Burr service area, and 51 MGY for Canby. Eliminating the approximately 200 MGY currently supplied to the City of Marshall would leave a total system demand of 1,150 MGY, according to
1-25 the DEIS. It is not clear why the total system demand is used to subtract the City of Marshall's demands, which are supplied by the Burr Well Field. However, subtracting 200 MGY from the 492 MGY for the Burr service area would reduce demands in the primary service area to 292 MGY. Subtracting the 200 MGY from the 628 MGY for the primary and secondary Burr service areas would reduce demands to 428 MGY, and this figure is actually close to the 413 MGY obtained by subtracting the 1997 combined total for the Verdi and Holland service areas from the 1,150 MGY calculation in the DEIS.

If Canby supplied the LPRW Yellow Medicine Phase with 39 MGY, the potential decrease would be 90 MGY, because the 51 MGY for Canby is included in the total system demand of 1,349 MGY (Tables 1-8 and 1-11). This option would appear to reduce Burr Well Field demands to 202 MGY for the primary service area and 338 MGY for primary and secondary service areas.

2.2.2.2.2 Adjacent Rural Water Systems

Page 59, paragraph 3: "...The surrounding rural water systems in Minnesota include ... None of these systems have any excess capacity that could be utilized by LPRW (Madden, personal communication, 1997)..." Attachment 13 is a letter from Jay Gilbertson to Jay Frischman describing a phone conversation between Gilbertson and Martin Jarrett of the Big Sioux Community Water System that indicates a potential to provide LPRW with 300 gpm.

2.2.2.2.4 Canby Aquifer

The City of Canby is appropriating approximately 50 MGY and in addition supplied 39 MGY to the LPRW St. Leo service area until 1996. If Canby continued to supply the St. Leo service area, the annual water demands for the Burr Well Field in Tables 1-8 and 1-11 should be reduced by about 90 MGY.

2.2.2.3 Alternative 3

Purchasing water from Canby or other community systems located near the proposed NE Expansion service area should be considered as an alternative.

The minimum volume of water supplied to the City of Marshall is 300,000 gallons per day or 110 MGY, and approximately 548,000 gallons per day or 200 MGY are currently being supplied (page 57). It is inconsistent to use the annual demand for both primary and secondary service areas (628 MGY), while using the minimum amount of water supplied to the City of Marshall instead of the 200 MGY currently being supplied. Subtracting the 110 MGY minimum service amount from the 492 MGY for the primary service area would equate to 382 MGY. Subtracting the current volume of 200 MGY from the primary and secondary service area demand would equate to 428 MGY. Utilizing Canby water to supply the St. Leo service area should provide additional reductions in annual appropriations.

2.2.2.4 Alternative 4

1-27 Construction of a water treatment plant and well field in the proposed NE Expansion is MDNR's preferred alternative.

Page 64, paragraph 3: "B.A. Liesch and Associates completed the only pump test that has been performed in this aquifer...(Berg, 1997b)". The Berg document referenced in the DEIS was actually a draft copy of the report. The final version of Berg 1997b contains data collected from two aquifer tests completed in the Wood Lake aquifer, one conducted by B. A. Liesch and one by the USGS. See Southwestern Minnesota Groundwater Exploration Project 1996-1997, Final Report, Berg 1997 (Attachment 14).

The DEIS states that water quality for the Wood Lake aquifer is not as good as that for the Burr or Altamont aquifers, but the data provided indicate the range of total hardness and TDS may be lower (better quality), while sulfates levels are higher.

The January 1991 Engineering Report and Feasibility Study for the System Expansion by DGR (Attachment 7) indicates that use of up to 2 MGD from a water source by Hanley Falls was evaluated as a source of water for the Minnesota Corn Processors and the City of Marshall. The potential for a good water supply exists in the Hanley Falls/Wood Lake area, and development of

a comprehensive plan that defines the ultimate size of the system may justify a new water source and treatment plant in the proposed NE Expansion.

The DEIS states that if this is the only alternative available, LPRW would not pursue the proposed expansion or a well field and treatment plant at this location. Another alternative worth consideration is funding the upgrade of a community water system in this area and selling water to LPRW for the proposed expansion. The City of Canby is one example where this potential alternative could have worked.

2.2.2.6 Alternative 6

The storage tank proposed near Minneota is critical to meet the hydraulic needs of not only the proposed NE Expansion but all of the East and most of the West Phase of the Existing System North/Lyon County Phase (Krause, 1993, 3). This elevated storage tank was part of the North Phase, but was replaced with a $395,000 booster station (Attachment 6). The DEIS states that
1-28 "One of the shortcomings of the LPRW system is the lack of sufficient water storage capacity to meet its peak daily demands (Jacobsen); therefore, this storage facility is critical to maintain the proper hydraulic integrity and storage capacity of the system. Certainly if this project were not to be built it would create system-wide management problems but these would not be insurmountable." If this storage tank was part of the North Phase and is so critical to the system, why was it replaced with a booster station? MDNR supports the need for additional storage, but it appears the storage was postponed so that a booster station could be constructed, primarily to provide service to the City of Marshall.

RUS concludes that it would be unreasonable to not fund the NE Expansion proposal, and that "it appears likely" that resources will be protected with regulatory oversight "and a willingness of LPRW to closely monitor and manage groundwater appropriations in such a fashion that minimizes the drawdown or reduction in the potentiometric surface of the Burr Unit...". However, LPRW sued MDNR to circumvent MDNR's regulatory authority, and has spent a
1-29 considerable amount of money to lobby for a statutory exemption from developing a fen management plan and to prevent completion of the EIS. Up to this point there has not been a lot of willingness by LPRW to protect surface water resources, and the MDNR hopes this situation will improve. We are also concerned about the potential use of federal funds for legal, consulting and other costs related to activities intended to prevent environmental assessments or contest laws and permits that protect environmental resources.

2.2.3 Preferred Alternative

Page 68, paragraph 3: "Supplement existing wells at the Burr Well Field with a new well field in an area south-southeast of the current Burr Well Field. This new well field could utilize both the Burr Unit and Altamont aquifers in a configuration similar to that at the Burr Well Field..." The MDNR does not find the recommendation to install additional wells in the Burr Unit to be
1-30 prudent. The artesian conditions south-southeast of the Burr Well at the proposed test well site are expected to be similar to that at the well field. These artesian conditions result in a high probability that known fens, as well as any presently unidentified ones, will be impacted just as the fens near the current well field are impacted.

Page 68, paragraph 5: "The Agency recommends that the appropriation rates of the supplemental wells be similar to those permitted at the Burr Well Field or higher in the case of the Altamont aquifer....This recommendation would likely 'spread out' the effects or reductions

in the potentiometric surface of the Burr Unit caused by production pumping, thus potentially avoiding or minimizing any adverse effects to surface water resources in the area." The MDNR can support the recommendation to pump more from the Altamont aquifer because the Altamont appears to be separated from the system which provides the head to move ground water up to the fens. The MDNR does not, however, support the premise that pumping from the Burr in two locations will necessarily 'spread out' the pumping effects. There can only be a benefit in the area around the current well field if pumping from that well field is reduced and the added drawdowns from the supplemental wells are too small to negate the impact of the reduction. In fact, since the recommended drilling locations are located farther from the suspected recharge area west of Lake Cochrane, it is possible that the drawdown effects may be greater at the new site than at the Burr Well field.

3.2.1.1 Burr Unit

1-31 *Page 72, last paragraph:* "...Burr Well Field Aquifer Test Analysis, April 1995;..." Is this actually the MDNR report entitled Burr Well Field Aquifer Test Analysis, April 1994 ?

1-32 *Page 73, paragraph 2:* The text references a Figure 1-6, but there does not appear to be such a figure in the document.

Page 78, paragraph 1: "...A till sequence consisting mostly of sandy clay with a rocky zone from 82 to 102 ft overlies and confines the Burr Unit." The till sequence at the Burr Well Field is actually much thicker. The log for PW-1 (unique #440325) shows top soil from 0-2 feet, clay from 2-98 feet and sandy clay from 98-113 feet. The log for PW-3 (unique #527475), at the highest elevation in the well field, shows top soil from 0-3 feet, sandy clay from 3-30 feet, clay from 30-61 feet and sandy clay from 61 to 106 feet.

Page 82, Table 3-2: What is listed as well 93-9 is indicated as having a water elevation of 1692.8. However, 93-9 is a boring, not a well. MDNR believes this water level belongs to well 93-10. If indeed this is a reference to a water level recorded in a boring, then the reference should be accompanied by the caveat that water levels measured in borings are less reproducible and less reliable than water levels measured in wells (i.e., borings can cave in, cannot be kept open long enough to record water levels over time, and usually can't be developed).

Page 84, paragraph 2: "...potentiometric surface decline in OW-90 was 15.28..." Should read OW3-90.

Page 84, paragraph 2: "Although pump tests are a valuable tool in determining aquifer characteristics, they do not emulate the normal operation of production pumping. ...it is difficult to use the results of pump tests to predict the effects that ground water withdrawal will have on surface water resources..." This is true, but at a certain distance from the pumping well, the effects of pumping an average of X amount from the well field will be adequately approximated
1-33 by a pump test at a rate of X. Then those drawdowns can be used to make predictions about changes in gradient which will induce changes in surface water resources. Our analysis of these gradient changes reveals that the Fairchild and Sioux Nation fens will receive less water because of pumping at the Burr Well Field. The same analysis shows that ground water inputs to Lake Cochrane will be reduced by pumping at the Burr Well Field. Other surface water resources within the impacted area will also be affected if they have a ground water component. The importance of any ground water component is accentuated during dry periods. Ground water is what sustains the obligate wetland plants in fens regardless of the current climatic regime.

3.2.1.2 Other Portions of the Burr Unit

Page 87, paragraph 3: The document discusses the installation of a test production well and observation wells, and includes a recommendation "...If the well field is not developed the borings could be plugged in a few days,..." Even if a new well field is not developed at a test site, any observation wells that are installed should be left in place for long term monitoring.

3.2.2.1.1 Fens

Page 91, figure 3-5, Generalized Schematic of Calcareous Fens: This depiction leads to misconceptions about the nature of the connection to the aquifer, which is by no means
1-34 comparable to a pipe, nor should it be suggested that there really is a pocket of free water within the dome. It is possible that peat-water slurry is what one sees after the disturbance and liquefaction of the peat by sampling. It should not be thought of as the natural condition.

Page 98, paragraph 2: "...Before pumping, the potentiometric surface stood about 10 ft above the OHWM of this lake. After pumping the Burr Well Field at 1,500 gpm continuously for 7 days, the potentiometric surface was still 6 ft above the lake surface along the eastern margin and
1-35 more than 8 ft above the lake surface at the western margin of the lake." There appears to be confusion regarding 'OHWM' and 'lake level'. These are two different levels which only coincide rarely. The document should be comparing the water level in the aquifer to the actual water elevation of the lake at the time of the pump test. It is probable, since the lake outlet is at an elevation of 1682.8, that the water elevation of the lake is multiple feet lower than the OHWM.

Page 98, paragraph 2: "Because the Fairchild and Sioux Nation Fens are situated more than 30 ft below the potentiometric surface of the Burr Well Field, it seems unlikely that production pumping at current rates of 400-525 gpm will have other than minimal effects on these resources." This makes it sound as though 30 feet of head is available to move water through the peat domes to sustain them. That isn't a useful model of how the fens function. At present, after a series of wet years which has caused the potentiometric surface on the Burr aquifer to rise, only about 1.6 feet of head is available beneath the Sioux Nation fen dome. Because ground water must move through the peat continuously and at amounts above evapotranspiration (ET), all of that head may be necessary to sustain the fen in its current condition. During the pump test in 1996, ground water discharge from the Sioux Nation fen dome was reduced below ET. This indicates that there is little if any room to reduce heads without consequences.

Page 105, paragraph 3: "The information provided concerning the pools is not consistent with the measured hydraulic conditions during the test...the Canby area received 0.72 inches of rain. Rainfall was measured in 5 out of 7 days during the test." Under normal conditions, rainfall is irrelevant to fens, because the peat is already saturated. Rainfall is thus "rejected" and flows away with the discharging ground water. It is important to the health of calcareous fens to maintain the dominance of ground water and the ability of the peat to "reject" the precipitation,
1-36 because the rainwater has the potential to change the chemistry of the surface of the peat, and thus change the growing environment for the plants. During the test at the end of June 1996, it appeared that ground water discharge was reduced below the amount required for evapotranspiration -- thus not enough water was available to keep the surface of the fen saturated. An estimate of daily ET for this area is from 0.16 to 0.18 inches per day (Hydrology Guide for Minnesota, USDA Soil Conservation Service). Ground water supply must constantly exceed this amount for the fen to remain saturated.

Rain data were collected on site, as follows:

6/23/96	0.01"
6/24/96	0.35"
6/30/96	0.01"
7/2/96	0.01"
7/4/96	0.05"
7/12/96	0.04"
7/14/96	0.02"

The total rainfall was 0.49", with rain on 7 of 22 days, whereas the ET equals 3.6 to 3.9".

Evapotranspiration and initial abstraction were exceeded on only 6/24/96, and the impact of that 0.35" of rain could not be expected to persist past the day it occurred, because the side slopes of the fen are a flow-through system, as mentioned above -- any excess is "rejected" and flows away. If precipitation had any significant effect on the fen, it would only be further proof that harm is being done.

Page 106, paragraph 4: "To determine the natural...cone of depression..." While the idea of establishing a "control fen" is a very good idea, it has not yet been acted upon for three reasons: 1) It would cost about $30-35,000 for the baseline vegetation survey and an additional $20,000 to instrument the fen. Upkeep and servicing of the instrumentation would be approximately $5,000 per year. Subsequent vegetation surveys would cost about $10,000. 2) The fragile nature of fens make them susceptible to damage from the installation and on-going servicing of the instrumentation. 3) MDNR has not had the money, the staff, or an ideally located calcareous fen. However, given money and staff time, a location could be found.

Page 106, paragraph 5: "It is assumed that the MNDNR will continue to monitor and update the evaluations based on this study to assess any changes in the calciphile populations at the fens...." Under current budget and staff constraints, there are no dedicated fen funds nor fen staff. This
1-37 means that monitoring tasks are slighted when staff respond to flood, drought, and other higher priority tasks. The MDNR has borne the majority of the monitoring costs. LPRW, the beneficiary of the water withdrawals, or RUS, which underwrote the construction of the project, should be called upon to finance more of the monitoring costs. Adequate dedicated funding would insure that monitoring tasks are completed.

3.2.2.1.2 Lake Cochrane

Page 109, paragraph 2: "...the potentiometric surface of the Burr Unit (as recorded in observation wells around Lake Cochrane) stood 10 to 12 ft above the OHWM of Lake Cochrane. Drawdown at Lake Cochrane during this test ranged from over 3 ft at the Christenson well on the eastern margin of the lake to about 1 ft in Well 94-15 at its western margin...." First, there is no well 94-15; there was a boring 93-15 on the western margin of Lake Cochrane. The document
1-38 should be referencing well 94-27, which is located on the western edge of the lake. Second, to more accurately describe the impacts of pumping on the lake, the discussion should compare water levels of the lake at the time of the pumping vs. the potentiometric surface, not potentiometric vs. OHWM.

Plots 1 and 2 (Attachment 15) depict water elevations recorded in, from west to east, wells 94-27, 93-14, Christenson, and 93-13, in July 1996. Plot 1 illustrates the static water elevation in the wells; the first water level measurement taken in the Christenson well is below the static

level in the remaining wells. However, this measurement was recorded some 300 minutes after pumping had started and after drawdowns had been recorded in another nearby well – and which cannot actually be considered to be a static water level. An additional reason for this discrepancy in water elevation is the existence of small leaks in the Christenson well's waterline (Stan Pence, personal communication) which cause the well to flow at a small but constant discharge. If the initial water level in the Christenson well is "corrected" to fit with the potentiometric levels of the other wells, the estimated static level in the well would be approximately 1692.6 (MSL) or 8.3 feet above the OHWM. Plot 2 shows the potentiometric surface at maximum drawdown. We note that the water surface plots as a smooth line, indicating that the influences of the leaks is minimized and therefore the water level recorded in the well is quite representative of the actual potentiometric surface. From this plot it is clear that the water elevation in the Christenson well at the end of the test was less than 2 feet above the OHWM. This represents a decrease in head relative to that reference point at the eastern edge of the lake of almost 80%!

Page 114, paragraph 1: "...If the potentiometric surface were lowered below the OHWM, surface water flow from Lake Cochrane to the Burr could happen." It is true that if the potentiometric surface falls below the OHWM, discharge into the lake would decrease and may
1-39 even stop, but it is not until the potentiometric surface falls below the lake water surface elevation that water could potentially flow from the lake into the Burr Aquifer (i.e., when the lake water surface elevation is higher than the potentiometric surface, water can move from the surface water body to the aquifer).

Page 114, paragraph 2: "...in consultation with experts in the field of hydrology and geology, it is the Agency's opinion that effects to Lake Cochrane...would not have significant environmental
1-40 impacts." While this statement may be the opinion of unnamed experts, staff at MDNR and DENR agree that significant impacts are possible, because data show that reductions in groundwater input occur even with pumping at current rates (of about 500 gpm) and that this reduction would be significant during a "dry spell".

Page 116, paragraph 3: "It is reasonably logical to state that as long as the fens remain saturated, minimal impacts to their ecological integrity would be expected even if the hydraulic head in the peat dome fluctuating (sic) but did not drop below the surface of the dome." We have seen that an estimated minimum of 1.6 feet of head is necessary to drive enough water through the peat to meet midsummer ET demands. Reductions or fluctuations will lead to changes in the water chemistry, including changes in the location of the zone of carbonate deposition, which could have drastic impacts on the rooting zone.

3.4 Systemwide Socio-economic Effects

MDNR supports agricultural operations, but the conclusion that the availability of potable water
1-41 supplied by LPRW will not cause an increase in large scale livestock operations is not consistent with the statements summarized in the following documents:

> January 31, 1991, Farmers Home Administration Form 1940-20. "It will allow those farm residences to have a dependable supply of water for their domestic use, along with allowing expansion of livestock enterprises."

September 16, 1994, Affidavit by Gordon B. Krause. "Many (new Burr Well Field customers) have invested in newer or larger facilities that will allow them to feed more livestock ..."

May 27, 1997, LPRW Board of Commissioners Meeting Minutes. "A group of gentleman from the Marshall/Green Valley area spoke to the commissioners regarding their need for water. They are looking at expanding hog operations and dairy set-ups and rural water is necessary for this to happen."

Preliminary DEIS, page 23, paragraph 3: "Therefore prior to the availability of treated water, many farmers were unable to diversify their farming operations to include the raising of livestock."

Even members of LPRW's Board of Directors have commented in the past that, but for the availability of rural water, they themselves could not raise hogs in the numbers that they now can. Rural water systems have had a positive impact on growth of livestock operations and this has led to increased use of water from centralized water sources in southwestern Minnesota. Even if rural water systems do not increase the number of livestock operations or numbers of animals, they have eliminated the use of individual well systems and have concentrated water demands on fewer resources which increases the potential for impacts on environmental resources.

To help protect existing water resources and address potential water quality impacts, a mitigation measure that requires proof of compliance with feedlot regulations should be required for customers benefiting from federally funded rural water systems.

References

The DEIS references a source, "MNDNR, Burr Well Field Aquifer Test Analysis, April 1994", several times in the document, however the document is not included in the references section. This document should be added to the list of references and fully be referenced in the body of the document.

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES
JOE FOSS BUILDING
523 EAST CAPITOL
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April 22, 1998

Mark S. Plank
Rural Utilities Service
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Washington, DC 20250

Dear Mr. Plank:

I am writing to provide comments on the February 1998 Draft Environmental Impact Statement (DEIS) for the Lincoln-Pipestone Rural Water (LPRW) project. Please consider and incorporate our comments and suggestions as you prepare the final Environmental Impact Statement.

My staff has reviewed this document and found the February 1998 DEIS contains changes that reflect some of South Dakota's concerns. I want to thank you for including those changes. We are, however, disappointed that not all of our previous comments were adequately addressed. We also note that comments from the State of South Dakota were not included at the end of the DEIS. Comments from the State of South Dakota, dated November 6, 1997, were hand delivered at a November 7, 1997, meeting in Minneapolis, Minnesota. They should have been included in a manner similar to the comments from the Minnesota Department of Natural Resources (MNDNR). We trust that the Final Environmental Impact Statement will include complete comments from the State of South Dakota.

As you are well aware, our interest in the environmental impact statement process is to ensure any potential adverse impacts to the water resources of South Dakota are identified, as well as alternatives that will either eliminate or reduce those impacts. Therefore, we appreciate the acknowledgment in the DEIS that Lake Cochrane is hydraulically connected to the "Burr Unit"
2-1 and is receiving ground water input. However, the DEIS makes no attempt to quantify these ground water inputs to the lake, nor was an attempt presented to provide an estimated water budget for the lake. Even though we understand that these will be estimates subject to professional judgements and opinions, we believe these are critical components of the DEIS, and consequently the omissions are major deficiencies in the DEIS.

To attempt to quantify ground water inputs to the lake and estimate a water budget for Lake Cochrane, all available information needs to be considered. For example, at the top of page xiii it states that "Pumping from the "Burr Unit" at the Burr Well Field reduces the potentiometric

surface in the aquifer and would cause proportional reductions in discharges to fens and Lake Cochrane." While we agree with that statement, we believe there is enough information to estimate that the ground water contributions to the lake from shallow sources and the "Burr Unit" are significant to the lake.

Part of that information is already in the DEIS. For example, the reference provided in the DEIS on page 156 [(SCS, undated) Soil Conservation Service, U. S. Department of Agriculture, June 1988, *Ponds—Planning, Design, Construction. AG Handbook #590*] and a newer version of that report dated September 1997, indicate a minimum ratio of watershed area to lake area of 16 to 1 is necessary to maintain a lake in this region of the country. The ratio of the watershed area to the lake area for Lake Cochrane is 2.4 to 1. This ratio indicates the drainage basin is inadequate to sustain Lake Cochrane at normal lake levels, unless the lake is likely receiving appreciable amounts of ground water contributions.

Information concerning the water levels in Lake Cochrane shows there is a certain amount of fluctuation in lake levels. Aerial photos taken in the late 1930's show that Lake Cochrane water levels dropped considerably (estimated up to 10 feet) during the 1930's when precipitation was abnormally low. However, the point is the lake never went dry. DENR began measuring actual water levels in Lake Cochrane during 1981. Measurements to date show a fluctuation of five feet through a period of below normal to above normal precipitation. However, the DEIS does not contain this information, nor is there any comparison made between fluctuations in the lake level with the potentiometric surface of the "Burr Unit." In order to attempt to quantify ground water inputs to the lake and estimate a water budget for Lake Cochrane, this information needs to be included.

The final piece of information in the DEIS linking the importance of ground water contributions to Lake Cochrane is contained on page 111. It states that the observance of a reddish cast in the water as the ice is melting in the spring is indicative of ground water recharge to the lake from a deeper aquifer such as the "Burr Unit." DENR personnel observed such a reddish cast or precipitate on April 6, 1998, in four distinct areas along the shoreline. The reddish cast or precipitate was found to be most prevalent along the northeastern portion of the lake, and again supports that ground water contributions to the lake are significant Therefore, these reports need to included in the DEIS, and considered as an attempt is made to quantify the ground water inputs, and estimate a water budget for Lake Cochrane.

However, even without ground water contributions to the lake being quantified and without a water budget to the lake, the DEIS states on pages 53 and 54 that the proposed action of pumping at a rate of 1,500 gallons per minute under drought conditions poses unreasonable
2-2 environmental risks to surface water resources of the area. Several reasons to support this conclusion are presented in the DEIS, and we fully agree with those reasons. But it needs to be pointed out that these same reasons also directly apply to the preferred alternative that proposes to pump water at a rate of 400-525 gallons per minute.

The DEIS states on pages xii and 54 that "Long-term impacts to surface water resources from
2-3 groundwater appropriations are unknown" and the "Magnitude of existing or future impacts are

not accurately known or understood." Because the DEIS identifies the potential for adverse impacts to Lake Cochrane, and the potential magnitude of these impacts is unknown, a reduction of present pumping rates by LPRW in the "Burr Unit" is warranted.

However, our concern is that the DEIS acknowledges there is insufficient information on how the aquifer will be affected during years with normal precipitation amounts, and especially during drought periods. Therefore, there still is a very real potential that pumping at 400-525 gallons per minute may have an adverse impact on Lake Cochrane during dry years. For this reason, a methodology to measure the impact of pumping by LPRW on Lake Cochrane water levels should be developed and included in the Final Environmental Impact Statement.

2-4

If pumping is allowed to continue, even at the reduced rates suggested in the DEIS, then it is also imperative that the preferred alternative require a contingency plan to mitigate any impacts to Lake Cochrane. The State of South Dakota should agree to this contingency plan before any Rural Utilities Service funds are released for construction of a LPRW expansion.

2-5

Because of all the uncertainties, we fully agree that developing an alternative water source is necessary. However, additional pumping of water from the same "Burr Unit" at a location a few miles southeast of the present wellfield, as suggested in the preferred alternative on page 68 of the DEIS, will only shift these same questions to another location. All available information suggests recharge to the Burr Unit occurs near Cobb Creek in South Dakota. Hydrogeologic conditions in this possible recharge area indicate appreciable additional recharge cannot be induced regardless of the amount of water pumped from the "Burr Unit" in Minnesota.

2-6

The DEIS states on page 114 that "Certainly the most critical elevation for Lake Cochrane would be the ordinary high water mark (OHWM) and its relationship to the potentiometric surface." The ordinary high water mark is also referred to at the top of page 115 and the third paragraph on page 116. The use of the ordinary high water mark in the context presented in the DEIS is incorrect. The ordinary high water mark has been set by the South Dakota Board of Water Management, and does not change. However, as we pointed out above, there are fluctuations in the water levels in the lake. It is the difference between the elevation of the potentiometric surface of the "Burr Unit" and the lake level that determines the flow rate and the direction of flow between the aquifer and the lake. Therefore, the correct reference point is the Lake Cochrane water level itself, and not the ordinary high water mark. This error should be corrected.

2-7

This letter has addressed only the major issues and concerns in the DEIS. There are other technical errors, inconsistencies, and contradictions throughout the DEIS. My staff would be glad to meet with you to discuss these other technical items.

In summary, we believe additional work is needed to attempt to quantify ground water inputs to the lake and estimate a water budget for Lake Cochrane. In the end, if pumping the "Burr Unit" is allowed, we recommend that pumping be limited to no more than the lower part of the range presented in the DEIS, which is an average of 400 gallons per minute for a maximum allowable pumpage of 210,000,000 gallons per year. However, even with reduced pumping, the preferred

2-8

alternative described on pages 67-69 is inadequate because it does not require a contingency plan to mitigate negative environmental impacts to Lake Cochrane should those occur. To avoid any long term negative impacts, contingency plans must be made now. Finally, we fully concur with the need for LPRW to develop a new supplemental water supply; however, this should occur in an aquifer other than the "Burr Unit."

My final request involves the large amount of high public interest in this project by South Dakota citizens. Because of that interest, I strongly believe a public meeting on the DEIS should be held in South Dakota to allow for additional public input to the process before the DEIS is finalized, and hereby request that the Rural Utilities Service sponsor and hold such a public meeting.

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement. I look forward to your favorable consideration of our comments, suggestions, and requests. South Dakota will continue to cooperate with the Rural Utilities Service, Minnesota Department of Natural Resources, U.S. Environmental Protection Agency, and others to resolve issues related to the impacts of pumping of water from the "Burr Unit." However, please be assured that South Dakota will take all necessary steps to protect Lake Cochrane.

Sincerely,

Nettie H. Myers

Nettie H. Myers
Secretary

cc: Governor William J. Janklow
Senator Tom Daschle
Senator Tim Johnson
Representative John Thune
Harold Halverson, State Senator, Milbank
Larry Diedrich, State Representative, Elkton
Robert Weber, State Representative, Strandburg
John Cooper, Secretary, S.D. Department of Game, Fish and Parks
Carol Tobin, President Lake Cochrane Improvement Association
Bill Yellowtail, Administrator, EPA Region VIII

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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8EPR-EP

APR 24 1998

VIA E-MAIL AND SURFACE MAIL

Mark Plank
USDA, Rural Utilities Service
Engineering and Environmental Staff
Mail Stop 1571
1400 Independence Ave
Washington, DC 20250

Re: EPA Comments on DEIS for Lincoln-Pipestone Rural Water System

Dear Mr. Plank;

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act (CAA), Region VIII of the Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the Lincoln-Pipestone Rural Water System.

This DEIS analyzes the potential environmental impacts of expanding the Lincoln-Pipestone Rural Water System(LPRW) including the use of ground water for supply and the construction of production fields and distribution networks. LPRW is established as a water supply district in southwestern Minnesota. The aquifer being use for the system extends into South Dakota. Consequently, there could be adverse impact to wetlands, called calcareous fens, in both South Dakota and Minnesota, and to a lake in South Dakota, Lake Cochrane.

EPA, Region VIII has participated as a Cooperating Agency in the preparation of the ground water impact analysis and has provided written comments to RUS during scoping and review of the Preliminary DEIS. In general, EPA supports the Preferred Alternative identified in the DEIS and the mitigation measures which must be implemented for approval of financial assistance by RUS. However, we offer the following comments and concerns that should be addressed in the Final Environmental Impact Statement (FEIS)

EPA strongly recommends that the pumping rate for the Burr Unit at the Burr Well field be limited to 400-450 gpm with a corresponding annual appropriation.

EPA is concerned that the total annual need deficiency identified by LPRW at the Burr Well Field is self imposed. LPRW has negotiated an agreement to provide water to the communities of Canby and Marshall even though they both have their own source of municipal water. Providing water supply to these communities seems to exceed the original purpose and need for the Proposed Action. Given the clear hydraulic connection between the Burr Well Field, the fens, and Lake Cochrane, it is prudent to limit the total yield from the Burr Well Field in order to avoid adverse impacts rather than expand the customer base for LPRW system.

3-1

EPA strongly supports the development of a new well field (as proposed in the Preferred Alternative) to offset the demand on the Burr Well Field. However, the DEIS does not include sufficient information regarding the potential location of the new well field. Since this proposed new well field will develop water from the Burr Unit, it is necessary to provide detailed information on the Burr Unit at the proposed location of the new well field. Are there fens or other important water resources nearby? Will the cones of depression from the proposed new Burr wells overlap with those from the existing wells? It should be noted that any further withdrawal from the Burr Unit in this area could result in significant cumulative impacts to the sensitive wetlands resources. EPA recommends that RUS further investigate the Altamont and other glacial drift aquifers to determine their suitability for water supply.

3-2

EPA concurs with the mitigation measures that RUS has established in the preferred alternative with two important exceptions: (1) the location of a new well field and the aquifer to be used should be carefully evaluated to avoid adverse environmental impacts; and (2) the formal water resource management plan should include contingency measures to avoid any adverse impacts to fens and Lake Cochrane. Monitoring does not constitute a mitigation measure. It is necessary to develop specific contingency measures to be implemented based on monitoring results. EPA recommends that MDNR, SDDENR and LPRW collaborate on the development and implementation of the formal monitoring, mitigation and contingency plan.

3-3

EPA recommends that RUS hold public meetings on the DEIS in both Minnesota and South Dakota. Since this project has been controversial, it would give the interested and involved publics an opportunity to fully express their concerns to the decision-makers.

EPA is concerned about the possible impacts of further water supply development in this area of Minnesota and South Dakota. While the DEIS analysis is based on the total needs for the LPRW System, there is no clear statement of reasonable foreseeable development (RFD) and cumulative impact of ground water use in this area. It could be assumed that since LPRW is the only organized

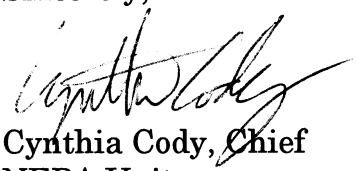
3-4

supplier of water in this area and the DEIS considers total needs of the district both RFD and cumulative impacts have been considered. However, since this information is critical to full disclosure of potential environmental impacts of this water supply project, EPA recommends that a discussion of RFD and cumulative impacts of ground water use in this area of South Dakota and Minnesota be included in the Final EIS. The full implementation of the mitigation measures outlined in the DEIS on pages 68-69 and in Chapter 3, especially the recommendations on pages 116-117, seem adequate to avoid or minimize any adverse environmental impacts from this project.

Based on the procedures EPA used to evaluate the DEIS and the potential environmental impacts of this water supply development project, the DEIS will be listed in the **Federal Register** as category **EC-2** (Environmental Concerns, Insufficient Information). This rating indicates that EPA is concerned that if the project is not approved as indicated under the Preferred Alternative and the Conditions of Approval not implemented as part of the funding process, then there could be adverse environmental impacts to wetlands and other surface water resources. As noted above, the DEIS does not contain a clear discussion of RFD and cumulative impacts. Consequently, there is insufficient information to full assess the potential impacts of this project.

If you have any questions about EPA's comments, please call Mike Wireman at (303) 312-6719, or Mike Strieby at (303) 312-6002.

Sincerely,



Cynthia Cody, Chief
NEPA Unit
Ecosystem Protection Program

cc: Mike MacMullen, EPA, Region V
Mike Wireman, EPA, Region VIII
Mike Strieby, EPA, Region VIII

East Dakota Water Development District
307 Sixth Street
City Plaza Mall
Brookings, SD 57006

(605) 688-6741 **(605) 688-6744 Fax**

April 24, 1998

Mark S. Plank
Rural Utilities Service
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Washington, D. C. 20250

Dear Mr. Plank:

Enclosed you will find my comments on the Draft Environmental Impact Statement (DEIS) for the Lincoln-Pipestone Rural Water Existing System North/Lyon County Phase and Northeast Phase Expansion Project. The section of the report and the page and paragraph reference is provided with each comment.

In general, I was quite pleased to see that the Agency has recognized the potential for adverse impact to area surface water resources from continued utilization of the Burr Unit aquifer. However, I am concerned about the recommended plan of action, particularly the pumping rates. As noted in the comments, I do not believe that there is sufficient evidence to support this action. There is also the matter of how such a recommendation might be interpreted when the Minnesota Department of Natural Resources, Division of Waters, is asked to revisit Lincoln-Pipestone Rural Water's pumping permit(s).

If you have any questions about my comments, please let me know. I plan to be in Washington the first week of May. Time permitting, I may contact you for a personal visit on this issue. I am looking forward to receiving the final version of this report.

Sincerely,

Jay P. Gilbertson
Manager/Treasurer

cc: Senator Tom Daschle
Senator Tim Johnson
Representative John Thune
State Senator Harold Halverson
State Representative Robert Weber
State Representative Larry Diedrich
Secretary Nettie Myers, SD DENR

East Dakota Water Development District Comments April 24, 1998

USDA Draft Environmental Impact Statement (DEIS) for the
Lincoln-Pipestone Rural Water Existing System North/Lyon County Phase
and Northeast Phase Expansion Project

1. Section 1.3.2, page 35, 4th paragraph. The statement is made that LPRW can "..reduce water deliveries to MCP.." Prior statements indicate that LPRW does not have a direct agreement with MCP for water delivery. The system provides water to the City of Marshall, which then provides it to MCP. Does LPRW have a water delivery agreement with MCP? 4-1

2. Section 2.1, page 46, 2nd paragraph. The statement is made that "When the FONSI was issued in 1992, there were no indications, nor could it be substantiated, that appropriations from the Prairie Coteau aquifer would irreversibly or irretrievably destroy the resources that were of concern." According to the comments presented by the Minnesota Department of Natural Resources (MNDNR) in Appendix E, page 192, 2nd paragraph, MNDNR did raise this issue at that time. How does the statement in the DEIS reconcile with MNDNR's comment and documentation? 4-2

3. Section 2.2.1, page 54, last paragraph. The statement is made that "..at current appropriation rates (400-525 gpm from the Burr Unit) it is unlikely surface water resources will be significantly impacted.." Immediately prior to this statement, a number of points are made that clearly preclude such a statement. How can the Agency contend that long-term pumping at these rates will not be a detriment to local water resources when so many critical factors are poorly understood or unknown? As noted on the same page, the sustainable yield of the aquifer is unknown, recharge to the aquifer is not clearly understood, and all recent evaluations of the aquifer and pumping impacts have taken place during a period of abnormally high precipitation. Add to this the list of Significant Data Gaps/Uncertainties and the basis for the Agency's conclusion has to be strongly questioned. 4-3

4. Section 2.2.1, page 55, 3rd paragraph. The statement is made that during 1997 LPRW withdrew water from the Burr Unit at "..rates between 400-525 gpm (average rate 521 gpm).." It would seem to me that if the annual average rate was 521 and they did not exceed 525 gpm, then LPRW rarely pumped in the lower part of this range. A more appropriate and accurate representation is to use the annual average pumping rate.

5. Section 2.2.2.1, page 57, last paragraph. It is stated that currently LPRW is supplying 200 million gallons per year (Mgpy) to the City of Marshall and 39 Mgpy to the City of Canby - a total of 239 Mgpy. However, in Section 2.2.2.3, page 63, 2nd paragraph, these same sources are said to consume from 78 to 160 Mgpy. 4-4

6. Section 2.2.2.2.2, page 59. In this section, it is stated that as none of the adjacent rural water systems have excess capacity, they do not represent a viable alternative to address LPRW's water needs. I contacted the managers of the Big Sioux Community Water System and the Brookings-Deuel Rural Water System on this matter. I was informed that Brookings-Deuel does not have excess capacity, but that Big Sioux would in fact be able to provide up to 300 4-5

gpm from their system, without jeopardizing current users or future plans. The Agency should reconsider this alternative in light of the actual situation. The rejection of this alternative in the DEIS may be premature.

The source of the information in this section (2.2.2.2.2) is given as Madden (personal communication, 1997). Throughout much of the DEIS, Mr. Madden appears to be a primary reference. I feel that it is important to note that Mr. Madden and his engineering firm have been, and continue to be, the primary engineers for LPRW during the many phases of the current expansion. As such, there exists a conflict of interest regarding the outcome of the EIS.

7. Section 2.2.2.2.3, page 60, 2nd paragraph. Either the county listed in this paragraph should be Deuel County, SD or the range should be R. 46 W. T114N-R47W is in South Dakota, T114N-R46W is in Minnesota.

8. Section 2.2.2.4, page 64, 2nd paragraph. Reference is made to the "..**limited** *(my emphasis)* number of test borings.." in the Berg (1997b) investigation of the aquifer near Wood Lake. As I reviewed the reports of Berg's investigation, I could find no significant difference between the amount of information available for the aquifer in the Wood Lake area (MNDNR's preferred alternate source) and the Altamont aquifer south of the Burr water treatment plant (the Agency's choice). Use of the qualifier "limited" in the description of information on the Wood Lake area aquifer is prejudicial and should be dropped.

9. Section 2.2.2.4. page 65, 2nd paragraph. Reference is made to the potential increase of 27-31% in user rates for this option as part of the reasoning for rejecting it. It should be noted
4-6 that even with the No Action option, rates rise by 10%. Presentation of the rate increases needs to be presented in proper context.

10. Section 2.2.2.6 and 2.2.3, page 67. As noted in comment 4 above, the information needed to support the statements that pumping at rates of 400-525 gpm will not result in adverse impact is not supported. As demonstrated by the bullet points on page 54, the required data to make such a sweeping statement does not exist.

11. Section 2.2.2.6, page 67, 4th paragraph. Reference is made to ".. a willingness of LPRW to closely monitor and manage groundwater appropriations in such a fashion that minimizes the drawdown or reduction of the potentiometric surface of the Burr Unit,.." However, in
4-7 Appendix E, page 204 - 3rd paragraph, MNDNR questions this type of commitment, and lists examples of past LPRW actions in support of their position. How is the DEIS statement justified in light of this behavior?

12. Section 2.2.3, pages 68 & 69, Agency mitigation measures.

Bullet 1 - see previous comments on basis for 400-525 gpm pumping rate.

Bullet 3 - While this action would definitely "spread out" the impacts to the aquifer, all of the uncertainties regarding impacts to the aquifer and surface water resources remain. The net

result will still be an increased withdrawal of water from an aquifer about which very little is known.

Bullet 4 - This is in direct conflict with the Agency's Preferred Alternative recommendation. The action calls for MNDNR to establish pumping rates (and other protocols and operations) to minimize drawdown of the potentiometric surface. However, the Agency has already stated (in the DEIS) that a pumping rate of between 400 and 525 gpm is acceptable and won't cause problems. Any Agency recommendation as to a "safe" pumping rate should be withdrawn from the DEIS.

4-8

Bullet 5 - The call for a cooperative, cross-border plan to monitor the impacts of production pumping (if that occurs) on the aquifer and surface water resources in the area is a supportable position. However, it should also be noted, at this point that LPRW, as the primary benefactor of the withdrawals, should incur the majority of the costs of the proposed monitoring. Also, how will the results of monitoring in South Dakota be included in water appropriation decisions made in Minnesota?

4-9

13. Section 3.2.1.1, page 77, 3rd paragraph. What is the reference for the statement that the Altamont aquifer "..is estimated to cover over 500,000 acres."?

14. Section 3.2.1.1, page 81, 2nd paragraph. The statement is made that "..most groundwater recharge is made during the period that coincides with snowmelt and spring runoff." This is presented in the context of describing long-term concerns for the area. However, on page 54, under the heading of Sustainable Yield of the Burr Unit, it is stated that "Recharge mechanics are not clearly understood." Which statement is correct?

4-10

15. Section 3.2.1.1, page 81, 3rd paragraph. Cobb Creek is located north and west of Lake Cochrane, not south and east as listed.

4-11

16. Section 3.2.1.1, page 82, last paragraph. The statement is made that "..recharge to and discharge from the aquifer are closely balanced." If this is the case under current (natural) conditions, it would seem that the Agency proposal to allow withdrawal of up to 1,050 gpm would seriously upset an otherwise balanced system. This increased discharge would then result in long-term lowering of water levels in the aquifer. See the attached editorial (Sophocleous, 1997) for additional comments on this subject.

17. Section 3.2.1.1, page 84, 2nd paragraph. The intent of this paragraph is apparently to discredit the applicability of aquifer pumping test results in the prediction of aquifer response to production-level pumping. In support of this notion, it is noted that when the aquifer was pumped at a high rate (1,500 gpm) during a pumping test, water level in an observation well declined 15.28 feet, but when pumped at a lower production rate of 650 gpm, the decline was less than 8 feet. Such a response is exactly what would be expected (that is, lowering of the potentiometric surface is a function of the pumping rate). Aquifer pumping tests may not be identical reproductions of actual production activities, but they serve a very useful and valid role in prediction aquifer response.

18. Section 3.2.1.1, page 85, 3rd & 4th paragraphs. Both paragraphs are filled with conflicting statements. In the 3rd, it is stated unequivocally that the recharge/discharge characteristics of the Burr Unit aquifer are not understood. This is immediately followed, however, with a statement that municipal level withdrawals can be safely made.

In the 4th paragraph, it is said that because the unit has been pumped at between 400-525 gpm (see comment 5 above) and no adverse impacts have been noted, continued long-term
4-12 pumping at this rate is expected to be safe. This ignores points raised elsewhere in the document concerning the abnormal nature of precipitation over the same time period. Finally, while recognizing the limited amount of information available and the general lack of understanding of the true relationship between the aquifer and surface water resources, the statement is made that predicting impacts to these resources is reasonably straightforward.

19. Section 3.2.1.2, page 87, 3rd paragraph. Use of the word "advantageous" is unwarranted. There is no advantage gained by the aquifer under the scenario described. Any advantage would be to LPRW by reducing impacts in a given area.

20. Section 3.2.2.1.1, page 96, 1st paragraph. First, the elevation of the potentiometric surface is given for the Burr Unit aquifer. What is the source for this information and are these average values or spot occurrences? Second, reference is made to the Ordinary High Water
4-13 Mark (OHWM) of Lake Cochrane. Of what significance is the OHWM to this discussion? It is an artificial elevation set by the State of South Dakota and has no apparent bearing on this discussion. The important factor is the difference between the potentiometric surface and the actual lake level at any given point in time.

21. Section 3.2.2.1.1, page 97, 4th paragraph. The statement is made that long-term continuous pumping at a rate of 1,500 gpm would cause a gradual lowering and widening of the cone of depression in the potentiometric surface, but that it would not be dramatically different from that shown on the map in Appendix A. If in fact this is the case, then this would indicate that the aquifer is not capable of supporting this level of withdrawal. If it was, the only changes in the "cone" would be the result of climatic variations, not pumping impacts. Any increase in the size of the cone indicates that withdrawals are being made at an unsustainable rate. This effectively results in the mining of the water resource; that is, extraction at rates greater than recharge.

22. Section 3.2.2.1.1, page 98, 1st and 2nd paragraphs. The drawdown at the Christenson well is listed at 3.24 feet and 3.74 feet for the same event.

23. Section 3.2.2.1.1, page 98, 3rd paragraph. The second and third sentences in this paragraph are contradictory. If there is insufficient data available to predict long-term response of the aquifer, then it is not possible to establish safe pumping rates based on the same information. Also, I read the final sentence as an endorsement of mining the water in the aquifer during periods of drought. In South Dakota this is prohibited by law. Extraction can not exceed recharge.

24. Section 3.2.2.1.2, page 108, 3rd paragraph. The Lake Oliver outlet referred to has been

completed.

25. Section 3.2.2.1.2, page 109, 2nd paragraph. In the last sentence, the percentage of head pressure reduction, relative to the surface of the lake, is given as 33%. A 3-foot decline would be a 30% reduction from the 10-foot reference mark, not 33%.

26. Section 3.2.2.1.2, page 109, last paragraph, and page 110, 1st paragraph. First, the range of values from 0.8 in/yr to 1.5 in/yr **does not** include the value of 0.55 in/yr as stated in the text. Second, the 0.55 in/yr value provided by NRCS was a value determined based on relevant, local information, not generalizations. Finally, the really important point to this whole discussion is the fact that no matter what runoff parameter was used, the water budget for the lake could not be balanced without a significant ground water component.

27. Section 3.2.2.1.2, page 111, 2nd, 3rd and 5th paragraphs. There is repeated mention of "shallow" sources (aquifers) as a source of groundwater to the lake. However, there is no reference or other information that would establish the existence of these shallow aquifers, other than broad speculation. Without substantiating evidence, these references should be dropped.

28. Section 3.2.2.1.2, page 113, 1st paragraph. Reference is made here and in other parts of the text to leachate from septic fields being a source of water quality degradation in Lake Cochrane. All permanent and non-permanent homes, cabins and businesses around the lake are hooked to a contained waste water treatment system operated by the Lake Cochrane Sanitary District. The system has been operational for nine years. It is unlikely that any waste water remains in the unused septic tanks that would contribute to water quality degradation.

4-14

29. Section 3.2.2.1.2, pages 114 and 115. Statements are made in the final paragraph on page 114 (continuing on page 115) regarding the relative position of the potentiometric surface to the OHWM of Lake Cochrane. Again, while the OHWM makes a handy reference point, it is the lake water level that is important. Also, the statement about groundwater contributions continuing as long as the potentiometric remains above the OHWM should be modified to reflect the reduction in input described on page 109.

30. Section 3.2.3, page 116, 3rd paragraph. The statement is made that "..reductions in the potentiometric surface below the lake's OHWM will reduce groundwater input to the lake.." It should read "..reductions in the potentiometric surface ~~below the lake's OHWM~~ will reduce groundwater input to the lake.."

31. Section 3.2.3, page 117, Mitigation requirements. The second bullet point states that MNDNR shall establish various management plans for the existing and proposed well fields in the Burr Unit and Altamont aquifers to minimize drawdown of the potentiometric surface. As noted in point 13 above, this recommendation is in conflict with the Agency statements that the pumping rates (400-525 gpm) do not cause problems.

If the Agency is going to defer the regulation of the pumping rates to MNDNR, the references to "safe" 400-525 gpm pumping of the Burr Unit should be deleted. MNDNR will determine

what constitutes an acceptable pumping rate. If the Agency wishes to promote this pumping rate as safe, they should also accept some measure of responsibility for managing the resource.

The Agency should define "minimize" in the context of the drawdown of the potentiometric surface.

32. Section 3.2.3, page 117, Mitigation requirements. The third bullet point calls for a formal agreement between LPRW and SDDENR regarding monitoring and impact determination on surface water resources in South Dakota. This should also include some statement and/or requirement as to how this information will be utilized by MNDNR in their control of ground water withdrawals. If nothing is to be done with this information, why collect it?

33. Section 3.2.3, page 118, 1st paragraph. The Agency recommendation is that the costs of all monitoring be divided up between LPRW, MNDNR and SDDENR. As noted earlier, this does not seem appropriate. While both state agencies do maintain monitoring programs as part of their general mission, some of which may be in this vicinity, the detailed monitoring proposed goes well beyond this. Given that the reason the monitoring is required is the desire by the Agency and LPRW to continue to utilize the Burr Unit aquifer as a water source, these entities should shoulder the majority of the monitoring costs.

34. Section 6, page 161. The proper street address for the East Dakota Water Development District is 307 Sixth Street, City Plaza Mall, Brookings, South Dakota 57006.

EDITORIAL

MANAGING WATER RESOURCES SYSTEMS: WHY "SAFE YIELD" IS NOT SUSTAINABLE

by Marios Sophocleous[a]

Although major gaps in our understanding of soil and water ecosystems still exist, of more importance are the gaps between what is known and what is applied. One such gap is in the use of the concept of "safe yield" (SY) in ground-water management. Despite being repeatedly discredited in the literature, SY continues to be used as the basis of state and local water-management policies, leading to continued ground-water depletion, stream dewatering, and loss of wetland and riparian ecosystems.

Traditionally, "safe yield" has been defined as the attainment and maintenance of a long-term balance between the amount of ground water withdrawn annually and the annual amount of recharge. Thus, SY limits ground-water pumping to the amount that is replenished naturally. Unfortunately, this concept of SY ignores discharge from the system. Under natural or equilibrium conditions, recharge is balanced, in the long term, by discharge from the aquifer into a stream, spring, or seep. Consequently, if pumping equals recharge, eventually streams, marshes, and springs dry up. Continued pumping in excess of recharge also eventually depletes the aquifer. This has happened in various locations across the Great Plains. Maps comparing the perennial streams in Kansas in the 1960s to those of the 1990s show a marked decrease in miles of streamflow in the western third of the state. (For more information on SY, see the edited volume by Sophocleous, 1997, "Perspectives on Sustainable Development of Water Resources in Kansas," Kansas Geological Survey, Bulletin 239, in press.) Policymakers are primarily concerned about aquifer drawdown and surface-water depletion, both unrelated to the natural recharge rate. Despite its irrelevance, natural recharge is often used in ground-water policy to balance ground-water use under the banner of SY. Adopting such an attractive fallacy does not provide scientific credibility.

To better understand why "safe yield" is not sustainable yield, a review of hydrologic principles (concisely stated by Theis in 1940) is required. Under natural conditions, prior to development by wells, aquifers are in a state of approximate dynamic equilibrium: over hundreds of years, recharge equals discharge. Discharge from wells upsets this equilibrium by producing a loss from aquifer storage. A new state of dynamic equilibrium is reached only by an increase in recharge (induced recharge), a decrease in natural discharge, or a combination of the two. Initially, ground water pumped from the aquifer comes from storage, but ultimately it comes from induced recharge. The timing of this transition, which takes a long time by human standards, is a key factor in developing sustainable water-use policies. However, it is exceedingly difficult to distinguish between natural recharge and induced recharge to ascertain possible sustained yield. This is an area that needs further research. Calibrated stream-aquifer models could provide some answers in this regard.

The concept of sustainable yield has been around for mar years, but a quantitative methodology for the estimation of suc yield has not yet been perfected. A suitable hydrologic basis f determining the magnitude of possible development would be quantification of the transition curve (from ground-water sto age depletion to full reliance on induced recharge), coupled wit a projected pattern of drawdown for the system under consider tion. The level of ground-water development would be calcu lated using specified withdrawal rates, well-field location drawdown limits, and a defined planning horizon. Stream aquifer models are capable of generating the transition curve fo most situations.

Another problem with SY is that it has often been used as single-product exploitation goal—the number of trees that ca be cut, the number of fish that can be caught, the volume of wate that can be pumped from the ground or river, year after year without destroying the resource base. But experience has repeat edly shown that other resources inevitably depend on the ex ploited product. We can maximize our SY of water by drying up our streams, but when we do, we learn that the streams were more than just containers of usable water.

A better definition of SY would address the sustainability of the system—not just the trees, but the whole forest; not just the fish, but the marine food chain; not just the ground water, but the running streams, wetlands, and all the plants and animals that depend on it. Given the dynamic connectedness of a watershed, management activities can fragment the habitat "patches" if they are not planned and implemented from an ecosystem and watershed perspective. Such a holistic approach, however, is fraught with difficulty. We cannot use a natural system without altering it, and the more intensive and efficient the use, the greater the alteration.

Science will never know all there is to know. Rather than allowing the unknown or uncertain to paralyze us, we must apply the best of what we know today, and, at the same time, be flexible enough to allow for change and for what we do not yet know. Instead of determining a fixed sustainable yield, managers should recognize that yield varies over time as environmental conditions vary.

Our understanding of the basic principles of soil and water systems is fairly good, but our ability to use this knowledge to solve problems in complex local and cultural settings is relatively weak. Communication is vital. We need people who can transfer research findings to the field and who can also communicate water-users' needs to the researchers. Delivering a journal publication to a manager's desk is not sufficient to ensure that research results are quickly put into practice. I believe this breakdown in communication accounts for the persistence of such misguided concepts as SY in ground-water management today. Researchers increasingly must cross the boundaries of their individual disciplines, and they must look to their clients—the managers and water users—for help in defining a practical context for research. A strong public education program is also needed to improve understanding of the nature and complexity of ground-water resources and to emphasize how this understanding must form the basis for operating conditions and constraints. This is the only way to positively influence, for the long term, the attitudes of the various stakeholders involved.

[a]Senior Scientist, Kansas Geological Survey, The University of Kansas, 1930 Constant Ave., Lawrence, Kansas 66047-3726. The views expressed here are the author's and not necessarily those of the AGWSE, NGWA, and/or the Ground Water Publishing Company.

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April 23, 1998

Mark S. Plank
USDA, Rural Utilities Service
Engineering and Environmental Staff, Stop 1571
1400 Independence Avenue
Washington, D.C. 20250

RE: Comments on Draft Environmental Impact Statement - Federal Register, Volume 63, Pages 8901-8905, February 23, 1998

Dear Mr. Plank:

I respectfully submit the following comments regarding the above referenced Draft Environmental Impact Statement (EIS) prepared by the U.S. Department of Agriculture, Rural Utilities Service (RUS). This EIS addresses the RUS funded Lincoln-Pipestone Rural Water System Burr Well Field in Minnesota.

This well field is about one eighth of a mile from South Dakota and presents the potential for significant adverse impacts to nearby South Dakota spring fed lakes and wetlands[1]. Some of these threatened wetlands may be calcareous fens. A calcareous fen is a unique and valuable spring fed wetland. Two of the spring fed South Dakota lakes are Lake Cochrane and South Slough Lake.

A pumping test by Vista Technologies Inc. on the Burr Well Field indicates that the the water levels in a South Dakota fen are responding to the pumping.[2] Also, the Draft EIS acknowledges that Lake Cochrane has the smallest amount of surface drainage area of any public lake in South Dakota[3]. As a result of this low amount of surface area runoff into the lake, the RUS states that it is likely that the artesian aquifer beneath Lake Cochrane contributes groundwater to the lake[4]. Since there is an indication of potential adverse impact from this federally funded project to these valuable South Dakota resources, the National Environmental Policy Act (NEPA) regulations require that the RUS establish monitoring requirements and thresholds of protection for these lakes and wetlands, and locate an alternative that avoids the impact to the lakes and wetlands.

5-1

I and other South Dakota residents are very concerned about RUS preparing this EIS in a manner that provides adequate protection to the nearby South Dakota lakes and wetlands.

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1 USEPA, Letter to Janice Daley, State Director, FmHA, St. Paul, Minnesota, September 16, 1994,(attachment No. 1).

2 Data from seven day pump test (starting on June 24, 1996), Vista Technologies, fax message dated September 11, 1996, (attachment No. 2).

3 RUS,"Draft Environmental Impact Statement,Lincoln-Pipestone Rural Water, Lake Benton, Minnesota, Existing System North/Lyon County Phase, Northeast Phase Expansion," February, 1998, pp.110.

4 Ibid., pp.111.

Therefore, I respectfully request that the RUS take the following actions in preparing the final EIS:

1. Ensure compliance with the National Environmental Protection Act (NEPA) in the protection of Lake Cochrane, South Slough Lake and the documented South Dakota fens. This includes (1) establishing monitoring at or immediately adjacent to these South Dakota lakes and documented fens and (2) establishing protection mechanisms for the South Dakota lakes and documented fens to avoid potential damage from the Burr Well Field pumping. The RUS, in granting federal funds to the project, is responsible for complying with the National Environmental Act (NEPA) and for establishing thresholds of impact.[5]

2. Find alternate sources of water, other than the aquifer feeding the Burr Well field. This solution is needed to protect South Dakota lakes and wetlands from
5-2 potential adverse impacts. Drilling more wells into the same artesian aquifer is proposed in the Draft EIS.[6] However, since this proposed well field would be in the same aquifer - there is no evidence that this proposed measure will not cause further impacts to South Dakota lakes and wetlands.

In fact, an FmHA document shows that the RUS has already been advised to find another water source. The document, entitled "Amendment to Environmental Assessment," accompanied a November 18, 1994 letter to Don Lander, Rural Development Administration, USDA. This document states that a proposed expansion project, for the service area described as the "Northeast Phase," is "no longer feasible as designed primarily because of the project's dependence on water being supplied from the Burr Well Field." The document goes on to say that "LPRW will be required to develop an alternative water source for the proposed expansion and re-submit the project reflecting required design changes. The Burr Water Treatment Plant remains a viable resource for treatment of water received from another water source."[7]

In addition, the South Dakota Department of Environment and Natural Resources has stated that, based on the hydraulic connections between the aquifer and South Dakota lakes and wetlands, it is important for RUS to find alternative water supplies[8].

Finally, the National Environmental Policy Act regulations for the Rural Utilities Service require that "the main focus of the review process must to be to locate an alternative that avoids the impact to a floodplain or wetland."[9]

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5 Farmers Home Administration NEPA Regulations,Title 7, Code of Federal Regulations, Part 1940, Subpart G, Exhibit C,Section 3(a) (2), "Threshold of Impact."

6 RUS,"Draft Environmental Impact Statement,Lincoln-Pipestone Rural Water, Lake Benton, Minnesota, Existing System North/Lyon County Phase, Northeast Phase Expansion," February, 1998, pp. xiv,xv.

7 "Amendment to Environmental Assessment, Lincoln-Pipestone Rural Water System Project Existing System North/Lyon County Expansion," attached to letter from Thurman P. Bryant, Team USDA, to Don Lander, Program Support, Rural Development Administration, Washington, D.C., November 18, 1994, page 2, (attachment No. 3)

8 SDDENR, letter to Mark S. Plank, USDA, RUS, December 6, 1996, (attachment No. 4).

9 Farmers Home Administration NEPA Regulations,Title 7, Code of Federal Regulations, Part 1940, Subpart G, Exhibit C, Section 3(c)(1), "Mitigation measures."

3. Adequately evaluate the potential damages from the original project, dating back to 1991. The first Environmental Assessment for the original project, called the Existing System North/Lyon County Expansion (ESN/LC), was amended and then abandoned in favor of an EIS[10]. The first Environmental Assessment for this original project included a FmHA form, dated January 31, 1991, that incorrectly stated that environmental resources such as wetlands and shorelines "were not to be affected by the proposal" or " were not located adjacent to the project site." [11] A 1995 estimate by Stockwell Engineers counted approximately 179 South Dakota wetlands within a two mile radius of the Burr Well Field[12]

5-3

Currently, the Draft EIS addresses the original project and an additional proposed project. The additional project is called the Northeast Phase Expansion project. The Draft EIS states that "Because all of the decisions and funding obligations have been on the previous ESN/LC Phase project, the only decision facing the Agency at this time is whether or not to provide financial assistance to LPRW for the construction of the Northeast Phase Expansion proposal."[13] I respectfully suggest that while it true that funding decisions have already been made, the RUS is still obligated to establish adequate monitoring, thresholds of impact, and mitigation in this EIS for impacts to South Dakota lakes and wetlands under NEPA and Executive order 11990.[14] I believe that these actions must be taken to protect South Dakota lakes and fens from the potential adverse impacts of this federally funded project. Your assistance in this matter is greatly appreciated. Thank you.

Sincerely,

Jim Allen Thompson, PE
Thompson Engineering Company
(605) 997-3167

cc: The Honorable Thomas A. Daschle
Shirly and Clayton Holt

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10 Federal Register, Volume No. 60, June 8, 1995, pp. 30265,30266, (attachment No 5).

11 FmHA form 1940-20 (Rev. 11-14-83), signed for the Lincoln Pipestone Rural Water System on January 31, 1991, (attachment No. 6).

12 Stockwell Engineers, Inc., letter on Wetlands count, January 27, 1995 (attachment No. 7).

13 RUS,"Draft Environmental Impact Statement,Lincoln-Pipestone Rural Water, Lake Benton, Minnesota, Existing System North/Lyon County Phase, Northeast Phase Expansion," February, 1998, Executive Summary, p. v.

14 Unites States Executive Order Number 11990, Title 40, Code of Federal Regulations, "Codification of Presidential Proclamations and Executive Orders."

Lincoln - Pipestone Rural Water
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April 22, 1998

Mark S. Plank
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Rural Utilities Service
Engineering and Environmental Staff
1400 Independence Avenue, Stop 1571
Washington, DC 20250

Re: Draft Environmental Impact Statement
Lincoln-Pipestone Rural Water

Dear Mr. Plank:

The Board of Commissioners of Lincoln-Pipestone Rural Water have reviewed the subject report and respectfully offer the attached comments.

The Agency cooperation and assistance throughout the EIS is very much appreciated. We sincerely regret the delay that this has caused for a much needed project, however, we understand the requirements placed on the Agency by the NEPA process.

Please contact our office for any questions of clarification that you may require.

Sincerely,

Joseph Weber

Joe Weber,
Chairman

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Lincoln-Pipestone RWS
Comments on Draft EIS

6-7 **EIS Recommendation:** LPRW supports the Agency's preferred alternative and supports construction of the NE Phase, with the supplemental well field on the following conditions:

1. That the recommendation to limit groundwater appropriation from the Burr Well Field to 400-525 g.p.m. be removed because it is beyond the scope and authority of the EIS and that it is not supported by the EIS findings.

2. That the financial burden to construct the supplemental well field not be assigned to existing LPRW members because the proposed alternative was not shown to have any measurable adverse environmental impacts and because they receive no direct benefit.

3. That the requirement to formalize an agreement with SDDENR as a condition of the Agency's assistance be deleted on the basis that SDDENR has no approval authority in Minnesota and that Minnesota DNR and SDDENR have the option of formalizing a cooperative agreement.

EIS Report Findings: The study represents about three years of effort that included public participation in the scoping, multi-agency representation on the study team, contracted technical resources retained by Rural Development, and extensive consultation by the participants in evaluating the findings. The primary issues to be evaluated include the environmental impacts on fens and Lake Cochrane from groundwater appropriations at the Burr Well Field and the potential impacts from the construction of the Northeast Phase Expansion proposal (See Executive Summary, page iv). A general summary the findings include:

1. No measurable effect on Lake Cochrane.

2. The Burr wells, Burr Aquifer, are hydraulically connected to fens in the area, however the impact of pumping at the maximum test rate was only a minor percentage reduction in the potentiometric surface and pumping under operating conditions for several years has had no measurable adverse impact.

3. The Burr Aquifer and the Altamont Aquifer are both of greater extend and higher yielding capacity than assumed by LPRW in their initial evaluation of potential affects.

4. There are no adverse socio-economic impacts.

5. No direct impact to threatened or endangered species is expected to occur.

EIS Preferred Alternative: The Preferred alternative includes all of the facilities in the Proposed Action and expands it by developing additional wells at another location with the objective of minimizing potential adverse environmental impacts.

1. It addresses public opinion that LPRW should develop an alternative water source and have it on line so that potential adverse impacts could be avoided. Additional wells in the Burr Aquifer are not a true alternative source, however, the remote site distributes the impact over a larger area and thereby reduces the impact at any one location. Added wells in the Altamont are truly an alternative source.

2. Supplemental wells are a significant development cost increase and result in some operating cost increases. The study has not shown that LPRW will benefit directly.

Economic Impact on LPRW: The Northeast Phase is proposed to add 170 individual users and the communities of Hazel Run and Echo. LPRW currently serves 2,619 individual users and 23 Cities. The Proposed Action would serve the Northeast Phase with an increase in cost to present users.

The Preferred Alternative represents an estimated increased cost of $1,420,000 (See Table 2-4) and a 4% increase in costs, to all members, over the Proposed Action. (Note: The cost estimates for the Preferred Alternative were made using 750 g.p.m. from the existing well at the Burr site and anticipate 750 g.p.m. from the supplemental well field. Limiting pumping at the Burr site will increase the construction and operating costs for the supplemental well field.)

Specific Report Comments:

Groundwater contribution to Lake Cochrane: The report **overstates** any evidence obtained to establish the nature of contributions to the lake. The Exec. Summary, on page xi, last paragraph states; "all lines of evidence indicate . . .," and on page xii, last paragraph states, "Multiple lines of evidence indicate that groundwater contributions or discharges from the Burr Unit to Lake Cochrane are likely."

The fact that the potentiometric surface from the Burr Unit is higher than the surface of Lake Cochrane is an established fact, however, it only establishes that flow to the lake is possible. The apparent thickness of the glacial till between the lake and the Burr Unit is a "line of evidence" that significant flows are not possible. Existing fens in the are a "line of evidence" that a similar condition "could" exist below the lake.

Section 3.2.2.1.2 Lake Cochrane, Environmental Consequences, pages 109 to 113, report discussion of both potential shallow and deep aquifer contribution to Lake Cochrane. The potential for shallow aquifer contributions is stated on page 111: "The presence of these zones around Lake Cochrane could and likely do provide additional groundwater contributions separate from the Burr Unit to the lake." That section states the following, on page 113, regarding conclusions that are to be made:

> "Therefore, it is not possible, nor would it be meaningful, to predict specific potential effects on the lake caused by a decrease in groundwater inflow."
>
> "Furthermore, even if it were certain that Burr Well Field pumping would cause a

decrease in the groundwater inflow into Lake Cochrane, the ecological effects of that cannot be reliably distinguished from the ecological effects of human management actions or activities."

6-1 It is our understanding that the conclusions stated above are those of technical experts retained by the Agency, however, it would appear that the Agency did not rely on this technical expertise in making it's conditions for providing assistance to LPRW.

Limiting groundwater appropriation from the Burr Well Field to 400-525 g.p.m.: The report states, page xiii of the Executive Summary, that "notwithstanding a lack of long-term data" the Agency is recommending a pumping rate limitation of 400-525 g.p.m. The Agency is in effect saying that, even though they do not have evidence to support their action, they and state and federal agencies have determined 400-525 g.p.m. should be the limitation at the Burr Well Field.

The report provides no data to support a limit of 400 g.p.m. A limit of 525 g.p.m. is apparently based on 1997 pumping by LPRW which averaged 521 g.p.m., 274 MG averaged over 365 days pumping 24 hours per day (page xiv). The report further states that no adverse environmental impacts have been reported to date. In making it's recommendation the Agency overlooks the fact that LPRW pumping from the Burr and Altamont wells averaged 715 g.p.m. from May 2, 1997 to March 2, 1998. The average from July thru October of 1997 exceeded 800 g.p.m. To date no adverse impacts have been reported.

The pumping limitation ignores the evidence presented in Table 3-4 and the following summary statement on page 84: "The information presented in Table 3-4 is remarkable in that the aquifer recovered to pre-pump test levels in a very short time -- 2-3 days, demonstrating the good transmissive character and the elasticity of the Burr Unit."

The Agency's recommendations for the preferred alternative include, on page xv, that MNDNR establish, as part of its permitting requirements for LPRW, protocols and standard operating

6-2 procedures for well field operations that are designed to minimize drawdowns in the potentiometric surface in the Burr Unit. An extensive network of observation wells has been developed as a result of efforts by LPRW, MNDNR, SDDENR and the EIS. Appropriation from the Burr Unit should be based on potentiometric surface thresholds established in the MNDNR permit process and not by conclusions based on the limited data reviewed in the EIS.

Purpose and Need: The Draft report presents extensive evidence (Section 1.1 thru 1.4, pages 11 thru 43) that people living in LPRW's service are using terrible water that does not meet SDWA standards. They are using this water because better quality is not otherwise available to them or because the cost of treating the water they now have is prohibitive. Their present water supplies are recognized as presenting hazards to human health and as not being good for their livestock. As a result they are exposed to potential health hazards and are realizing economic losses.

The number of members being served by LPRW depends on the point in time in which the reference is made. The report, middle of page 25, references current service to 2,800 rural customers and 24 cities. The system reported sales in February, 1998 to 2,709 rural customers

and 26 bulk users, including water delivered to MCP at Marshall. Table 1-9 lists water needs for 2,619 rural customers and 26 bulk users and is based on previous design estimates including members and cities in the NE Phase. Readers of the report need to be aware that these small differences do not represent significant differences in the estimates of total water needed.

LPRW, and other rural water systems in the region, present an alternative that has been widely accepted by the public and delivers quality water that is safe to drink. The report does not attempt to evaluate the adverse health and human impact of the "no action alternative," to not build the Northeast Phase.

Potential Effect of Drought Conditions: The Agency conditions it's findings on the uncertainty of what may occur under "drought conditions." (pages 53 and 98)

Although such condition has the appearance of being logical it is undefined and highly speculative. Drought is an undefined relative term and can vary from drier that the previous year
6-3 to a repeat of the 1930's experience in the Midwest. The report offers no evidence that weather patterns during the EIS study period in any way invalidated or changed the study results.

To condition the Agency recommendation on some undefined future event is to conclude that no conclusion can be reached until all possible variables have been experienced. This is contrary to the NEPA process that requires the Agency to undertake a study, with public participation, and to make a decision based on reasonable evidence. Such a condition is also contrary to the Agency position, stated on page 67, that: "Based on the above analysis, the Agency has concluded that it would be unreasonable to not fund the Northeast Phase Expansion Proposal."

Preferred Alternative (pages 67-69):

The first mitigation measure, page 68, is unclear. It appears to say a range of 400-525 g.p.m.
6-4 from each of the Burr and Altamont aquifers. This would allow for a total of 800-1050 with a corresponding annual appropriation rate.

LPRW is not capable of meeting the conditions without significant financial assistance. The
6-5 costs to develop the new well field and formalize the protocols and management plan cannot be accurately estimated at this time.

Impacts on the Fens: Participants in the study generally agree that the fens are the most environmentally sensitive water bodies and that the Minnesota fens are protected by state law. A preponderance of the study data collected is directly related to evaluating impacts on the fens.

The report finds, on page 85, that: "Even though the nature and magnitude of impacts to surface water resources and their relationship with pumping at the Burr Well Field are not clearly understood or quantified, predicting impacts from reductions in the volume of groundwater being supplied to these resources is reasonably straightforward (see Section 3.2.2.1)."

The study participants have discussed the "sensitivity" of the fens at length. However, it is

established that the fens survived the dry 1930's and have not always been protected from man induced impacts. The report notes, on page 94: "The Fairchild fen has also been minimally affected by past agricultural activities (installation of a livestock watering device). Drain tile records previously maintained by the USDA, Natural Resources Conservation Service indicate that a subsurface drainage tile exists at this fen location. Despite these disturbances, the fen is apparently not being adversely affected."

The impact of reduced flow to the fens was not determined in the study. Related statements in the study report include:

> Page 96: . . . fens have been shown to be hydraulically connected to the Burr Unit, . . . they (the fens) could be affected if the potentiometric surface is reduced, at a minimum, below the surface elevation of the fen dome by pumping at the Burr Well Field.
>
> Page 97: . . a 7-day pump test at a pumping rate of 1,500 g.p.m. in June 1996 clearly indicated that the Burr Unit functions as an interrelated aquifer system in an area of at least 15 square miles with the Burr Well Field on the eastern edge of the aquifer.
>
> Page 98: Because the Fairchild and Sioux Nation Fens are situated more than 30 ft below the potentiometric surface at Burr Well Field, it seems unlikely that production pumping at current rates of 400-525 g.p.m. will have other than minimal effects on these resources. (Note: Actual pumping has been higher than 525 g.p.m. See related comments.)
>
> Page 99: The only threshold that was exceeded during any of the pump tests was a shallow water table monitoring well in the Fairchild Fen. MNDNR did not consider this occurrences to have exceeded the established thresholds. (And) As long as the objective of keeping the fen dome saturated and that the water table exceeded the surface elevation of the dome, MNDNR did not consider that the threshold was exceeded (MNDNR, 1996).
>
> Page 105: During the last three pump test and production pumping for at least the last 3 years, the effects or impacts from pumping at the Burr Well Field at the Sioux Nation Fen have been extremely minor measured largely in hundredths of a foot. At no time did the hydraulic head or water table elevations fall close to or below the surface elevations of the peat domes. (Refer to Table 3-8, page 105)
>
> Page 116: It is reasonably logical to state that as long as the fens remain saturated, minimal impacts to their ecological integrity would be expected even if the hydraulic head in the peat dome fluctuating did not drop below the surface of the dome.

It can be summarized that the study did not report any evidence of adverse impacts on the fens. We agree with the Agency statement, page 107, that monitoring of the Sioux Nation and
6-6 Fairchild Fens needs to continue within the context of a comprehensive water resources monitoring plan. However, LPRW should not bear the burden of significant capital expenditures and future program expenses with no findings of adverse environmental impacts from their actions.

LPRW Burr Water Treatment Plant
Partial 1997 Water Use

Record Date	Incoming Totalizer	Period Total kGal	Avg. G.p.m. For Period	Avg. G.p.m. Since May 2,97
02-May-97	360996			
01-Jun-97	386978	25,982	601	601
01-Jul-97	423545	36,567	846	724
04-Aug-97	463885	40,340	824	760
02-Sep-97	497150	33,265	797	769
01-Oct-97	529963	32,813	786	772
01-Nov-97	562776	32,813	735	766
01-Dec-97	587769	24,993	579	739
02-Jan-98	618027	30,258	657	729
02-Feb-98	648055	30,028	673	722
02-Mar-98	674187	26,132	648	715

Note: The water source includes both the Burr and Altamont wells.

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Custom House, Room 244
200 Chestnut Street
Philadelphia, Pennsylvania 19106-2904

IN REPLY REFER TO:

June 10, 1998

ER 98/122

Mark Plank
Rural Utilities Service
Mail Stop 1571
Washington, D.C. 20250

Dear Mr. Plank:

This letter responds to your request for Department of the Interior (Department) review of the Draft Environmental Impact Statement (DEIS) for the Lincoln-Pipestone Rural Water System Existing System North/Lyon County Phase and Northeast Phase Expansion Project, Yellow Medicine, Lincoln, and Lyon Counties, Minnesota, and Deuel County, South Dakota. We have reviewed the DEIS and offer the following comments, based upon input from the U.S. Fish and Wildlife Service (Service) and the U.S. Geological Survey, for your consideration.

ENVIRONMENTAL IMPACT STATEMENT COMMENTS

General Comments

The Department concurs with the Rural Utilities Service's (RUS) decision to include in the DEIS an analysis of environmental impacts of the Existing System North/Lyon County Phase of Lincoln-Pipestone Rural Water (LPRW), in addition to the Northeast Phase Expansion (the proposed action to which RUS is currently responding). The Department also supports the inclusion, as part of the Proposed Action, of an analysis of LPRW's application to the Minnesota Department of Natural Resources (MNDNR) for a permit to increase (double) water appropriations from the Burr Well Field.

7-1 The DEIS does not fully describe fish and wildlife resources in the Minnesota portion of the project area, and the impacts to those resources associated with the various project alternatives. The DEIS rightly places much emphasis on describing surface water resources associated with calcareous fens and Lake Cochrane. However, we believe that the DEIS should also present information relative to other natural resources occurring in the area such as streams, non-fen wetlands, and Service-owned or managed lands occurring in the zones of influence of the existing Burr Well Field and the new well field as proposed in the RUS Preferred Alternative. If RUS concludes that those resources would not be impacted by continued appropriation of groundwater

at the Burr Well Field and the proposed expansion of LPRW, evidence to support that conclusion should be presented.

The DEIS should include a discussion of the extent to which surface discharges from the Burr Unit of the Prairie Coteau aquifer contribute to the water budget of local streams (e.g., via springs, hillside seeps, etc.), as well as possible impacts to those streams due to production pumping from the Burr Unit under the various alternatives considered.

In an April 24, 1994, letter to Mr. Jon Childers, Farmers Home Administration (a predecessor agency to RUS), the Service expressed concern regarding the possible adverse effects of groundwater withdrawals from the Burr Unit on wetlands in several Waterfowl Production Areas (WPA) and wetland easement areas owned and/or managed by the Service within the influence zone of the Burr Well Field. In response to those concerns, a water level monitoring plan was developed and instituted in 1994 on the Service's Dakota Waterfowl Production Area, located approximately 1.25 miles east-northeast of the Burr Well Field, to observe and record surface and ground water levels on the WPA. That plan included the installation of ground and surface water monitoring stations and collection of data from those stations on a weekly basis. The DEIS should include a discussion of data collected under that monitoring plan, and an analysis of those data as they relate to data collected from other observation wells or piezometer stations in the vicinity of the Burr Well Field. Data are available by contacting Mr. Gaylord Bober, Acting District Manager, Morris Wetland Management District, U.S. Fish and Wildlife Service, Route 1, Box 877, Morris, MN 56267.

The Department concurs with RUS's finding that the Proposed Action (fund the Northeast Phase Expansion, increase groundwater appropriations at the Bur Well Field to 1,500 gallons per minute/800 million gallons per year) would pose unreasonable environmental risks to surface water resources in the project area. However, information presented in the DEIS fails to support, in our view, an endorsement of the Preferred Alternative (fund the Northeast Phase Expansion, maintain current appropriations at the Bur Well Field, and develop an additional well field southeast of the Burr Well Field, using water appropriations from the Burr Unit and the Altamont aquifers), given the uncertainties that exist in relation to that alternative.

The DEIS speculates that the cones of influence of the Burr Well Field and the proposed Preferred Alternative well field could be offset, thereby minimizing the drawdown effect of each well field. However, the degree of separation of those cones would be a function of where the new well field is developed, which is unknown at this time due to the need for additional drilling to confirm even the presence of the Burr Unit in the desired area.

7-2 The decision to exclude Alternative 4 (fund the Northeast Phase Expansion, maintain or reduce appropriations at the Bur Well Field and construct a new well field and water treatment plant in the Wood Lake area, to utilize the Wood Lake aquifer) from the DEIS Environmental Analysis is based solely on RUS's determination that Alternative 4 is economically unfeasible. However, there appear to be more unknowns regarding developing the new well field as proposed in the Preferred Alternative than developing the Wood Lake well field. The DEIS should present a

discussion of how the cost estimates for the Preferred Alternative might change under likely scenarios of different well locations.

The DEIS fails to provide convincing evidence that the Preferred Alternative and its mitigation measures would be effective in avoiding or minimizing impacts to surface water resources of the area. The historical data is insufficient to predict with even a small degree of certainty the environmental impacts (or lack thereof) of the Preferred Alternative during drought periods. Additionally, virtually all of the "important points" presented on page 54 of the DEIS, which were considered in forming the conclusion that the Proposed Action would likely cause significant environmental impacts to surface water resources, are valid for the Preferred Alternative as well.

The DEIS should present a discussion of a course of action to be taken should exploration efforts (or other factors) prove the Preferred Alternative unfeasible (e.g., aquifers not present, or present with low yields or sustainability, etc.).

The Department supports development of supplemental water sources that would allow for a reduction in current pumping levels at the Burr Well Field. The Department also supports exploring the Altamont aquifer for additional capacity to relieve withdrawal needs from the Burr Unit of the Prairie Coteau aquifer, or development of an additional well field at a location or in an aquifer that will not harm surface water resources yet will allow a reduction in pumping at the Burr Well Field. However, given the distance of the Northeast Phase Expansion from the Burr Treatment Plant (about 45 miles), the apparent degree of uncertainty regarding the feasibility and/or environmental impacts of the Preferred Alternative, and the desire to increase flexibility and reliability of the LPRW system, we believe a more sound alternative would be Alternative 4,
7-3 particularly if LPRW conducts future expansions into northeastern Yellow Medicine County or northwestern Redwood County. Even considering the RUS's proposed mitigation features of the Preferred Alternative, past legal action and associated restraining orders by LPRW against MNDNR indicates that agreements and contingency plans may not be the most effective means to ultimately prevent impacts to the fen should agreed-upon impact thresholds be reached. A more conservative (environmentally preferable) course of action would dictate an alternative (such as Alternative 4) that would totally avoid the dependency on emergency or contingency actions such as forcing MNDNR to mandate reductions in appropriation rates. It may be unfeasible during times of drought for MNDNR to enforce actions necessary to avoid impacts to the fens and other surface water resources due to excessive pumping.

Specific Comments

There are numerous instances throughout the DEIS where a sentence begins with "the Agency...." The "t" in "the" should be capitalized.

Page 20, paragraph 2, first sentence -- The reference to the Rock River watershed's hydrologic atlas number should read HA-555, not HA-320.

Pg. 38 - 39, Tables 1-8 and 1-9 -- Left justify numbers in cells.

Pg. 38, Table 1-8 -- The "Annual Use gal" column should be expanded in width to eliminate wrapping of the cell entry to the next line.

Pg. 38, Table 1-8 -- The listing of Canby as a source of primary supply is confusing because the portion of the LPRW system formerly supplied by the City of Canby (the Canby aquifer) is now supplied by LPRW from the Burr Well Field, as indicated in the table. It may be less confusing to the reader to describe this supply source simply as "Burr - Yellow Medicine Phase." 7-4

Pg. 38, Table 1-8 -- The peak day demand for the Verdi Source should be 2,330,824 gallons per day, calculated as 70 percent of the average daily use (pg. 39), not 2,529,791 as reported in Table 1-9. Similar errors exist for the remaining sources listed in Table 1-9.

Pg. 39, Table 1-9 -- The footnote describing unaccounted for water loss and its relation to unmetered water and metered water use is confusing and should be reworded to improve clarity. New wording should use the same terms for the various parameters as presented in Table 1-9, as appropriate. 7-5

Pg. 42, Table 1-12 -- The City of Marshall and Minnesota Corn Processors should be listed in this table as being serviced by the Burr Well field, in addition to the 660 rural connections.

Pg. 62, para. 2 -- The text description of Alternative 3 is not consistent with the description of that alternative as presented in Table 2-1 (pg. 48).

Pg. 64, para. 3 -- The DEIS presents transmissivity and hydraulic conductivity values for the Wood Lake aquifer, but does not provide a discussion of the potential of the Wood Lake aquifer to supply the needed quantities of water. That information should be included in the EIS. 7-6

Pg. 75, para. 1, first sentence -- The reference to "southeast" should be changed to "southwest".

Pg. 86, para. 1, fourth sentence -- The reference to "T. 13" should be "T. 113".

Pg. 93-94 -- It is unclear whether Fen #5 and South Slough Fen are one in the same. Also, please clarify whether Fen #2 and Lynch Fen are one in the same. 7-7

Pg. 100, para. 1, sentence 6 -- Remove "the Fall, 1996." at the end of this sentence.

Pg. 105, para. 2 -- The historical record for the period including the referenced pump tests and production pumping consistently reflects very wet years. The impact of similar pumping rates (especially production pumping) on the hydraulic head or water table in the Sioux Nation Fen during drought conditions may be significantly detrimental to the fen. 7-8

This likelihood should be discussed.

Pg. 106, para. 2 -- Establishing monitoring piezometers in a relatively undisturbed fen outside of the cone of depression of the Bur Well Field is a tool to more closely define or detect impacts, not a mitigation feature.

ENDANGERED SPECIES ACT COMMENTS

The Service would concur with a finding by RUS that construction and operation of the proposed project is not likely to adversely affect any federally listed or proposed threatened or endangered species or their critical habitat, in Minnesota. This precludes the need for further action on this project as required under Section 7 of the Endangered Species Act of 1973, as amended. However, if the project is modified or new information becomes available which indicates that listed species may be affected, consultation with this office should be reinitiated.

Thank you for the opportunity to comment. If you have any questions regarding these comments, please contact Mr. Lloyd Mitchell at Twin Cities Field Office, U.S. Fish and Wildlife Service, 4101 East 80th Street, Bloomington, Minnesota 55425-1665 (telephone 612-725-3548, ext. 202).

Sincerely,

Michael T. Chezik
Acting Regional Environmental Officer

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Custom House, Room 244
200 Chestnut Street
Philadelphia, Pennsylvania 19106-2904

IN REPLY REFER TO:

June 17, 1998

ER 98/122

Mr. Mark Plank
Rural Utilities Service
Mail Stop 1571
Washington, D.C. 20250

Dear Mr. Plank:

This letter is in further regard to the draft Environmental Impact Statement (EIS) for the Lincoln-Pipestone Rural Water System Existing System North/Lyon County Phase and Northeast Phase Expansion Project, Yellow Medicine, Lincoln, and Lyon Counties, Minnesota, and Deuel County, South Dakota. The following comments were inadvertently omitted from the Department of the Interior's letter of June 10, 1998. Please consider these additional comments in preparing the final EIS.

ENVIRONMENTAL IMPACT STATEMENT COMMENTS

General Comments

The Preferred Alternative is based on the premise that adverse affects to the fens or surface water features are unlikely at LPRW's current rates of withdrawal of between 400 to 525 gpm. The lack of adverse affects is based on the assumption that significant declines in ground-water levels will not occur. Please provide the basis for the assumption that significant declines in ground-water levels will not occur over time at withdrawal rates of 400 to 525 gpm. Also, please indicate whether water levels in observation wells have shown annual declines since the Burr well field
8-1 was established, and whether water levels in observation wells have stabilized. Lastly, please indicate whether there is a persistent cone of depression in the area of the well field and, if present, whether the area of the cone of depression is expanding or has stabilized. The only discussion in the EIS currently related to the above issues concerns aquifer tests. On page 84, it is stated that "the aquifer recovered to pre-pump test levels in a very short time 2-3 days, demonstrating the good transmissive character and elasticity of the Burr Unit." Long-term responses to a withdrawal rate of 400 to 525 gpm may include long-term ground-water level declines.

Specific Comments

Pg. 89, para. 1. -- The draft EIS states that "...no environmental impacts from the Altamont aquifer are expected from current or additional appropriations from a new field." The DEIS also states that surface water resources that are affected by discharges from the Burr Unit would be unaffected by isolation of the Altamont from the Burr Unit. An issue not mentioned or discussed
8-2 is whether declines from the Altamont aquifer could cause significant ground-water level declines in the overlying Burr Unit. The final EIS should provide information relative to the thickness of the intervening till and clay between the Altamont aquifer and the Burr Unit at the proposed new well field. The final EIS should also discuss whether existing data indicate that significant drawdown in the Burr Unit could result from withdrawals from the Altamont aquifer.

Thank you for considering these additional comments.

Sincerely,

Michael T. Chezik

Michael T. Chezik
Acting Regional Environmental Officer

National Audubon Society

Minnesota Audubon Council
26 East Exchange Street, Suite 207
St. Paul, MN 55101
(612) 225-1830
FAX: (612) 225-4686

April 16, 1998

Mark S. Plank
Rural Utilities Service
Mail Stop 1571
Washington, DC 20250

Re: Draft EIS, Lincoln-Pipestone Rural Water

Dear Sirs:

On behalf of Minnesota's 13,000 members of the National Audubon Society, I am submitting comments on the "Draft Environmental Impact Statement, Lincoln-Pipestone Rural Water, Existing System North/Lyon County Phase, Northeast Phase Expansion."

We have three specific comments to make to this draft EIS:

1) We oppose USDA funding for a project that increases dependency on the Burr aquifer;

2) We strongly disagree with assertions that monitoring will provide sufficient safeguards against serious adverse effects; and therefore,

3) We support an approach that uses a variety of sources and conservation measures to meet water supply needs in the region.

The reasoning behind the above comments follows.

1) Opposition to increased groundwater appropriations from Burr Well Field. Although the draft EIS confirms that groundwater appropriations from the Burr Well Field puts valuable surface water resources at risk, it concludes that the Burr Field should continue to be the primary water source to meet growing water demands in the region. We are very concerned that increasing the demands and reliance on Burr, particularly during dry periods, will soon pit human and agricultural water needs against the long-term viability of lakes and fens dependent on it.

This is a grave concern because the EIS acknowledges that it "has not been established what rate groundwater can be withdrawn from the Burr Unit before adverse environmental impacts would occur," (page 55). Adding to this concern are statements by MnDNR regarding the 1996 pump tests which indicate that currently permitted appropriation rates may harm the fens and thesholds, or the methods used to determine them, are being re-evaluated.

2) Disagreement that monitoring can adequately protect resources. We do not believe that the increased environmental risks to fens connected to the Burr Well Field are adequately mitigated by

monitoring. It is irresponsible to fund a project reliant on a sensitive natural resource and count on state authorities to halt its use should problems arise. Vegetative monitoring provides no margin of
9-1 safety at all, because serious damage would already be underway before any changes in plant communities are observable. Given the contentious history of this project, it is naive to expect that state authorities could expeditiously modify permit conditions even if serious problems became evident.

3) Support for expanding flexibility by developing and conserving other water sources. Because of the rarity and fragile nature of calcareous fens, Minnesota law expressly forbids activities that fill, drain, or otherwise degrade a fen unless a feasible alternative does not exist. Given the risks inherent in the existing and expanded Lincoln-Pipestone project, we believe that maximum flexibility - in the form of numerous water sources and prudent conservation measures - should be built into the system. Analysis presented by the MnDNR indicates that additional sources of water exist, some of them in or nearer to the NE Expansion area than the preferred alternative. Given this analysis, we would strongly oppose any fen management plans that allow increased pumping in the Burr Well Field before utilizing other water sources.

For the reasons stated above, we do not believe that funding the "preferred alternative" identified in the draft EIS would be in the public's best interests. We urge you to reconsider this stated preference and chose one that will better serve the long-term needs of the public for a sustainable water supply and a high-quality environment.

Thank you for considering our comments. Please keep me informed, on behalf of the Audubon membership in Minnesota, of your decisions in this matter.

Sincerely,

Cheryl Miller
Program Director

Transcribed from a hand written letter

Hazel Run, MN. 56241
August 4, 1998

Attention: Mark S. Plank
Senior Environmental Scientist
U. S. Dept of Agriculture
Washington, D.C. 20250

Dear Mr. Plank

We appreciate the fact that you are a part of a governmental agency that is working to protect a good and healthful environment for us here in S.W. Minnesota and eastern South Dakota.

This letter will not criticize any group or agency but merely explain what our concerns and needs are. We are a small city of about 77 inhabitants, 29 residences, 4 business and 1 church that are in genuine need of good quality water. At the present time there are 26 private wells of an average depth of 45 feet and 4 cisterns providing household water. The water has a hardness running the range of 40-65 grains with a great amount of iron. With a system of individual septic tanks & drain lines for each home and business we are in constant danger of contamination of our water supplies. The above facts we are sure your hydrologists are well aware of but we wish to reiterate them.

In the spring of 1992 a survey of Hazel Run was taken and a cost allocation was prepared. We then figured a monthly cost of about $30 per hook up for debt service alone. That cost plus the cost of water itself was regarded by us as pretty expensive. We thought that the fine quality of the water that L.P.R.W. promised to provide us would be worth the cost.

Now 6, and perhaps will be 7 years later we realize that perhaps our chance for water has disappeared mainly because of the increased costs to L.P.R.W. of law suits, the possible cost of finding and developing new sources of water and costs of the bureaucratic nightmare of justifying not only new expansion but their very existence.

If there is much increase in the costs of our debt service over the figure of 1992 of supplying Hazel Run with rural water we seriously believe that it will not be economically feasible focus to for us to hook on.

We hope that you do not lose sight of the fact that the balance between Flora – Fauna and the real needs of human beings must be at least a little weighed to the human side.

10-1

We were so close in 1992 and we have waited so long.

Written on behalf of Council and residents of the city of Hazel Run,

Clerk, Walter O. Wilson
Mayor, David R Esp (sp?)

Cc: Lincoln Pipestone Rural Water
State Sen., Arlene Leswiski (sp?)
State Reps,. Marty Seifert (sp?)

On Behalf of the Lake Cochrane Improvement Association (LCIA), which has 170 paid households, or 85% of the total lake property owners as members, I want to thank you for the opportunity to address concerns with regards to the Draft EIS. We, as an association, are in total agreement with the State of South Dakota's postion with regard to the DEIS.

First, I commend the researchers and authors of the DEIS for acknowledging and publishing the following items in the DEIS:

1. That the Burr Wells are hyrdaulically connected to the fens and Lake Cochrane.

2. That to appropriate ground water from the Burr wells at the rate of 1500 GPM/800MGPY poses an unreasonable environmental risk to surface water resources in the area. P53 DEIS

3. That LPRW is to develop alternative sources for water other than the Burr wells in the Coteau Aquifer.

4. That LPRW shall formalize an agreement with the SD DENR to establish monitoring procedures and protocols to evaluate the effects of pumping the Burr unit on surface water resources in South Dakota P117 DEIS

Secondly on behalf of the LCIA I would like to draw your attention to certain areas of the DEIS that need to be addressed at greater depth, revised, rethought and possibly abandon. The points are:

1. The suggestion of developing additional wells in the Burr unit to the SE of the treatment plant is absured. It does not require a hydrological genius to know that if you have a tub of water and place straws at opposite sides of the tub and

11-1

extract water at the distant end or side of the tub that water seeks it own level. It makes no difference from where it is appropriated!

2. Nowhere has there been a water budget developed for Lake Cochrane. This MUST be done. Lake Cochrane has a ratio of 2.4 acre water shed to 1 acre of lake surface. The ratio is incredibly small. Hence, it is virtually impossible for a lake to exist without huge ground water contributions or springs which IS
11-2 the case with Lake Cochrane. The fact is further illustrated by the abundant visable Iron Oxide sediment present as the ice retreats from the shore each Spring. The Iron Oxide is the trademark of springs or ground water flowing into the lake under the ice while there is no wave action to dispurse it. Again, it reinforces the fact Lake Cochrane is solely dependent upon groundwater to exist.

3. It is manditory that operations at the Burr Well unit of LPRW have rigid, strict and concise operating regulations and the regulations be continuously monitored by both South Dakota and Minnesota State officials. It CAN NOT be left to an honor system or any variation of a honor system.

4. There needs to be considerable attention on those elements that address the conditions and effects of a drought cycle. The DEIS glosses over this issue as if it is a wait and see process - - - NOT SO!!!! The water budget referred to
11-3 earlier is a start and references to the DEIS statement "pumping at the Burr Well (Coteau Aquifer) poses an unreasonable environmental risk at any rate of pumping" must be dealt with at a much greater depth.

In closing, we thank the officials of the USDA, the RUS and the USEPA for your future attention and consideration of these concerns and anticipate implementaton and action regarding these pertinent concerns of the LCIA and the State of South Dakota.

For the LCIA,

Thank You.

Prepared and presented at the DEIS hearing at Canby, MN July 30, 1998 by L. W. Tobin on behalf of the LCIA

rec'd 4/20/98

BURR WELL FIELD EIS

I am responding to the EIS that was performed on the burr well field. I am very concerned about the impact the well field will have on Lake Cochrane. Lake Cochrane is one of the top recreational lakes in South Dakota indicated by the large number of people who visit and camp at the state park on a daily basis as well as the large number of homes and cabins found on the lake. Many millions of dollars have been invested by the state of South Dakota and residents of Minnesota and South Dakota in order to develop the lake as it is today. **The EIS makes no mention of the value of Lake Cochrane as a resource or how important this lake is to the local economy.**

I support the EIS, however, I believe that the area needs to be continually monitored and that the Limits placed on pumping of the burr well are to lenient (450-500 gallons/min). It is very hard to estimate what the impact of the water resources will be when the area under goes a normal period of precipitation (it has been very wet the last few years) or even a dry period of precipitation and, most certainly these times will come. The EIS has stated that pumping from the Burr well at 450-500 gallons/min will not have an impact on Lake Cochrane or the area wetlands however, the **pressure in the aquifer continued to decrease even though they were pumping at a much lower level during a very wet period of time than the 450 limit**. What will happen to the lake and wetlands during average or dry precipitation periods. It has been stated by South Dakota Hydrologists that pumping water out of the burr well may lower the aquifer to the point were the aquifer will no longer supply the lakes or wetlands with water rather the reverse will occur where Lake Cochrane will lose water as it flows into the well very much like how a bathtub of water drains when you pull the plug. **Lowering the aquifer too far will cause irreversible damage to the areas natural resources as well as the economy**. The pumping limit of 450-500 gallons of water per min set in the EIS is sort of like playing Russian Roulette with nature, we can not predict how much precipitation the area will get in future years. Lake Cochrane was the only lake in the area that did not go dry during the great drought of the 1930s, in fact people continued to live around the lake, and many more people came great distance to Lake Cochrane to swim, fish and boat on the lake right through the 1930s. The reason Lake Cochrane did not go dry and other larger lakes did was probably due to the water that feeds Lake Cochrane from the aquifer of which Lincoln-Pipestone is pumping water from. Who will be responsible for the damage that will occur to Lake Cochrane if another drought occurs and there is no reserve left in the aquifer to supply Lake Cochrane? It is possible that during a normal year for precipitation, pumping water out of the aquifer could lower the lake level and turn Lake Cochrane into a winter kill lake. With continued pumping the lake will continue to decline. **There is no evidence in the EIS that can prove pumping 450-500 gallons per min will have no impact on Lake Cochrane or any of the wetlands during any period of time.**

I also believe that the well company: Lincoln-Pipestone Rural Water needs to be

investigated and that it is crucial that an outside source monitor their actions regarding the Burr Well Field. They have continually deceived the local residents as well as the federal government, the following are just a few of the many examples:

1)The Well company falsified documents by stating that their were no wetlands, shorelines or recreational areas near the well field in order to get funding for the project.

2)The well company also left out information to the Environmental Protection Agency that they were going to build a well at the site of the Burr well field. The leading the EPA and the department of interior that they were only going to lay water pipe through the area.

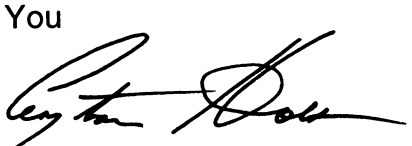
3)Rural development guidelines also state that no Rural development money can be used for a project like the Burr well field to supply water to a corn plant like the corn plant in Marshall MN. **The well company is however supplying water to the corn plant (50% of the water they pump from the well) in Marshall MN, how can this continue?**

4) The well company was told by the Mn DNR not to build until they tested the impact on the aquifer at a rate of 750 gallons per min, yet the well company continued to build the well and treatment plant before this test.

No consideration should be given to the fact that the well company built this well before the EIS due to the manner in which the well company went about this project.

I am also very concerned with why this project was started in the first place. The well company says this water is for the people of Southwest Mn yet the Mn DNR says most of the water will be used to expand commercial hog operations and as it turns out, the corn plant in Marshall MN. The towns that they are supplying water to did not need new water sources only updated water treatment plants. It appears that Lincoln-Pipestone, by pumping water out of the Burr well and supplying the water to increase production at large commercial operations (hog expansions and the Marshal corn plant) meanwhile causing potentially devastating damage to the environment (Lake Cochrane and area wetlands) is robbing from the poor (area natural resources) and giving to the rich. **I believe that no consideration should be given to Lincoln-Pipestone as to the needs of this water. Money should be spent to update the water treatment plants of communities that need it. Money should not be spent on developing new wells like the burr well field that supply water to valuable natural resources like Lake Cochrane in order to supply water expansion needs of big business.**

Thank You



Clayton Holt
Science Teacher
945 Jefferson Ln
Eagan, MN 55123

To: <mplank@rus.usda.gov>
From: Gene & Kaye Eilers <eeilers@frontiernet.net>
Cc:
Bcc:
Subject: DEIS
Attachment: Headers.822
Date: 3/4/98 7:29 PM

4 Mar 98

Dear Mark S. Plank

I am sending this message in regards to items that were stated about the City of Canby. I feel that the decision not to further investigate the potential of Canby was a bad decision. The City of Canby is now under construction of a new Water Treatment Plant with no help from USDA, which I also feel was a terrible mistake. Why does LPRW get all the grants and loans, we have a very good aquifer and only needed a filter plant and now LPRW still needs another water producing aquifer.
I hope that you can understand why the City of Canby selected to stay with their own system, how can we ever grow and depend on LPRW. Having two systems is still the best way anyway and we still could provide the Yellow Medicine Phase with good quality water. I have been employed with the Canby Water Department for 30 years and know the dependability of our aquifer. I feel some things get to political and the wrong decision are made.
As you can see the Minnesota DNR supports the City of Canby, I still do not see why USDA would not accept our request, are they covering up a mistake?? Maybe you still should reinvestigate our potential before blowing more money on LPRW, things are not fair why ??
You know as well as I do that having two systems are better, we would have to rely on one line coming into the City ten miles away to give us water while we have our own source in the City Limits. 13-1
Sure we would keep our own wells for backup but we would still need to fix our own filter plant and keep our wells operational. Why would you use a very reliable source as only a backup, it maybe more productive then LPRW at allot less cost and with no Environmental Issues stirring up trouble.
I would like to hear back from you.

Thanks
Eugene P. Eilers
Canby Water Supt.
110 Oscar Ave. N.
Canby, MN 56220
E-Mail address: eeilers@frontiernet.net

John Lentz
PO Box 395
Hayti, SD 57241
(605) 783-3226

Mark S. Plank
USDA Rural Utilities Service
1400 Independence Avenue, Stop 1571
Washington, DC 20250

Mr. Plank:

I am writing in regards to the proposed expansion of the Lincoln-Pipestone Rural Water Expansion Project. I find it unbelievable and appalling that the federal government would not only allow but also help fund a project that could jeopardize our precious natural resources.

Perhaps you have never drove around the Lake Cochrane area and seen what a truly beautiful and unique area it is. My family has farmed in that area for over 30 years and we have several of the very rare fens that I understand are now in jeopardy of being permanently altered because of the existing pumping station and the proposed expansion.

I find it preposterous that a farmer is not allowed to drain a small wetland that is less than one acre but this project could not only affect the hydrology of Lake Cochrane but also numerous other wetlands, fens, streams, and lakes.

As a citizen of the United States of America and the great state of South Dakota I implore that your department will spearhead the effort to do a thorough, unbiased scientific study of the area before continuing with this project.

Sincerely,

John Lentz

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
215 NORTH 17TH STREET
OMAHA, NEBRASKA 68102-4978

April 14, 1998

REPLY TO
ATTENTION OF

Planning Division

Mr. Mark S. Plank
USDA Rural Utilities Service
Engineering and Environmental Staff
Stop 1571
1400 Independence Avenue
Washington, DC 20250

Dear Mr Plank:

We have reviewed the Draft Environmental Impact Statement for the Lincoln-Pipestone Rural Water Expansion Project (DEIS) forwarded to us by Ben Wopat of the St. Paul District, and we offer the following comments.

As noted in the St. Paul District's March 23, 1998 letter to your office, the proposed project lies within the St. Paul District's Regulatory boundaries, and both the Omaha and St. Paul District's civil works boundaries. For this reason, The Omaha District will only comment on civil works issues.

Federal Flood Plain Management criterion basically states that construction which could be damaged by floodwaters or which could obstruct floodflows should not be located in the 100-year flood plain. If this is not practicable, any nonresidential construction that could be damaged by floodwater should be placed above or flood proofed to above the 100-year floodwater surface elevation and should be designed to minimize potential harm to or within the flood plain. Higher levels of protection are encouraged to provide added safety. If the operation of the constructed facilities is considered critical during flood periods, the facilities should be protected from at least the 500-year flood.

If construction must occur in the flood plain, it must be located outside the floodway. If a floodway has not been determined and designated, the construction should be as far from the stream channel as possible. The goal of any construction in the flood plain is to achieve the highest level of flood protection with zero impact to adjacent property.

Flood-related problems should not occur with underground water lines if the lines are buried far enough below the beds of drainageways and streams to prevent exposure due to streambed erosion during periods of high floodflows.

If you have any questions, please contact Mr. Luke Wallace of our staff at (402) 221-4885. Thank you for the opportunity to review this document.

Sincerely,

Candace Thomas

Candace M. Thomas
Chief, Environmental Analysis Branch
Planning Division

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
ARMY CORPS OF ENGINEERS CENTRE
190 FIFTH STREET EAST
ST. PAUL, MN 55101-1638

March 23, 1998

REPLY TO
ATTENTION OF
Construction-Operations
Regulatory (199305671-MMW)

Mr. Mark S. Plank
USDA Rural Utilities Service
Engineering and Environmental Staff
Stop 1571
1400 Independence Avenue
Washington, DC 20250

Dear Mr. Plank:

Thank you for providing a copy of the Draft Environmental Impact Statement for the Lincoln-Pipestone Rural Water Expansion Project (DEIS) for our review.

We have reviewed the DEIS. We concur that the proposed utility line crossings of waters of the U.S. are eligible for Clean Water Act authorization under a Department of the Army Section 404 nationwide permit, as indicated in the DEIS. This determination is contingent on effective measures being employed, such as use of anti-seepage collars, so that utility line installations do not result in any permanent wetland drainage.

Any other discharges of dredged or fill material into wetland or water areas may require additional authorization by the Corps under Section 404 of the Clean Water Act. The project proponent should obtain a jurisdictional determination from this office if any such discharges are proposed.

We have also determined that no St. Paul District real estate or current projects would be affected by the proposed work, and that no negative floodplain impacts would result.

Although the proposed project lies within the St. Paul District's Regulatory jurisdiction, it is within both the St. Paul and Omaha Districts' civil works boundaries. Therefore, we have forwarded the DEIS for review and comment to: U.S. Army Corps of Engineers, Omaha District, 215 North 17th Street, Omaha, Nebraska 68102. Mr. Steve Naylor of the Omaha District is aware of the project and may be reached at (605) 224-8531.

If you have any questions, please contact Mr. Michael Weburg in our St. Paul office at (612) 290-5367.

Sincerely,

Ben Wopat
Chief, Regulatory Branch

MINNESOTA HISTORICAL SOCIETY

May 18, 1998

Mr. Mark S. Plank
USDA, Rural Utilities Service
Engineering & Environmental Staff, Stop 1571
1400 Independence Avenue
Washington, D.C. 20250

Re: EIS; Lincoln-Pipestone Rural Water
Northeast Phase Expansion
Existing System North/Lyon County Phase
SHPO Number: 98-1911

Dear Mr. Plank:

We wrote you on 30 March 1998 regarding the above referenced project, requesting more information on the archaeological survey.

We have now received that survey report from John Madden of DGR. We appreciate the response.

Based on the survey, it appears that there are no properties listed on or eligible for listing on the National Register of Historic Places in the project area.

If you have questions, contact us at 612-296-5462.

Sincerely,

Britta L. Bloomberg
Deputy State Historic Preservation Officer

cc: John Madden, DGR

Congress of the United States

Washington, DC 20515

April 28, 1998

Mark S. Plank
U.S. Department of Agriculture
Rural Utilities Service, Engineering and Environmental Staff
1400 Independence Ave., Stop 1571
Washington, DC 20250

Re: Draft Environmental Impact Statement
Lincoln-Pipestone Rural Water

Dear Mr. Plank:

We have been provided Lincoln-Pipestone Rural Water's comments on the U.S. Department of Agriculture Rural Utilities Service Environmental Impact Statement. Said comments were dated April 22, 1998, and directed to you.

Based on information supplied to us, we support LPRW's comments and urge RUS to fund the development of the redundant supplemental well field as required in the EIS's preferred alternative. We further suggest, inasmuch as it was RUS which made the recommendation, that the funding be on a grant basis.

Please feel free to contact any of our offices for further confirmation of our support.

Sincerely,

PAUL WELLSTONE
U.S. Senator

DAVID MINGE
Member of Congress

South Dakota Legislature

State Capitol, 500 East Capitol, Pierre, South Dakota 57501-5070

Senate Chamber

March 24, 1998

Mark Plank
Rural Utilities Service
Mail Stop 1571
1400 Independence Ave.
Washington DC 20250

Dear Mr. Plank,

As a state senator in South Dakota, I am quite concerned about what I consider to be a continuing assault on the water quality of Lake Cochrane in Deuel County.

The lake and its surrounding region is a quite important natural treasure to South Dakota. I have visited the lake on several occasions in recent years, due to concerns from area residents. From my layman's perspective, it seems they have valid complaints that depletion of the aquifer from pumping in Minnesota -- and the subsequent draining of Lake Oliver into Lake Cochrane -- has already caused damage to the lake and probably threatens the entire eco-system of the area.

As I understand, an environmental impact study has also maintained that there are problems associated with the pumping.

Please do what you can to prevent further damage.

Sincerely,

Bernie Hunhoff
State Senator
Box 175
Yankton SD 57078

Bernie Hunhoff

East Dakota Water Developmen
307 Sixth Street
City Plaza Mall
Brookings, SD 57006

(605) 688-6741 (605) 688-6744 Fax

July 31, 1998

Mark S. Plank
Rural Utilities Service
Mail Stop 1571
Washington, D. C. 20250

Dear Mr. Plank:

I am writing to thank you and the Rural Utility Service for holding the public meeting on the Draft Environmental Impact Statement (DEIS) for the Lincoln-Pipestone Rural Water Existing System North/Lyon County Phase and Northeast Phase Expansion Project yesterday (July 30, 1998) in Canby, Minnesota. I am certain all the participants (local residents, elected officials and agency representatives) appreciated the opportunity to learn about the DEIS and share their comments and concerns.

I would also like to support the comments made by South Dakota Department of Environment and Natural Resources Secretary Nettie Myers and Mike Wireman of the United States Environmental Protection Agency regarding the need to restrict pumping rates from the "Burr unit" aquifer. With all the uncertainty regarding even the most basic characteristics of this aquifer, caution in this area is clearly warranted. I also strongly endorse Mr. Wireman's call for the prompt development and implementation of a contingency water supply plan for the rural water system if the "Burr unit" is to continue to be used. Failure to do so would place an unreasonable burden on the users of the rural water system if monitoring required the "Burr unit" well field to be temporarily or permanently shut down.

Once again, thank you for your efforts in Canby. I am looking forward to the issuance of the next (final?) version of the Environmental Impact Statement later this year.

Sincerely,

Jay P. Gilbertson
Manager/Treasurer

cc: Senator Tom Daschle
Senator Tim Johnson
Secretary Nettie Myers, SD DENR
Mike Wireman, US EPA

MARSHALL MUNICIPAL UTILITIES

113 South Fourth Street
Marshall, Minnesota 56258-1223
Telephone: 507-537-7005
FAX 507-537-6836

GREG SHERMAN
General Manager
MAURICE A. CHAPLIN
Water Superintendent
WILLIAM LARSON
Finance Officer
JONI LIVINGSTON
Office Manager
STEPHEN SWANSON
Plant/Properties
STEVE JOHNSON
Electrical Superintendent

1 August 1998

TO: MARK S. PLANK
USDA, RURAL UTILITIES SERVICE
MAIL STOP 1571
WASHINGTON, DC 20250

FROM: MARSHALL MUNICIPAL UTILITIES

RE: ENVIRONMENTAL IMPACT STATEMENT
LINCOLN-PIPESTONE RURAL WATER
Existing System North/Lyon County Phase
Northeast Phase Expansion

Marshall Municipal Utilities wishes to submit the following written comments in regard to the Environmental Impact Statement for Lincoln-Pipestone's Existing System North/ Lyon County Phase and Northeast Phase Expansion.

Marshall Municipal Utilities (MMU) is a municipal utility serving the city of Marshall with water and electricity. Securing a plentiful supply of water for our community has been an ongoing challenge for MMU because of the lack of abundant supply in southwest Minnesota. To help us in this regard, MMU has developed a partnership with Lincoln-Pipestone Rural Water (LPRW) and we have thereby become their water customer. This partnership has provided Marshall with a much needed supplemental water supply which has strengthened our ability to meet the growing water needs of our residents and businesses.

Marshall is among the few growing and thriving communities in southwest Minnesota, and we are a regional employment center. Residential areas are growing and expanding at a good pace. In order to make Marshall a viable place to live and work, we must obtain additional sources of water supply. MMU voices our utmost support for LPRW's work and their continuing efforts to secure water for Marshall and the other communities and farms in southwest Minnesota. Their continued growth and development of water supply is a tremendous enhancement to the quality of life in rural Minnesota.

LPRW has been issued an appropriations permit by the Minnesota Department of Natural Resources to pump at a rate of 750 gallons per minute (gpm) from the Burr Well Field. LPRW has been pumping at that permitted rate for some time with **no adverse effects** to Lake Cochrane or to the calcareous fens, by your own admission. This is also documented by MMU's own hydrological consultant, BA Liesch and Associates. Their investigation shows that not only have there been no adverse effects, but that a greater capacity of water is available from the Burr Well Field.

Marshall Municipal Utilities would like to go on record as strenuously objecting to the conclusion and recommendation in the 2.2.3 Preferred Alternative that LPRW should be limited to 400-525 gpm from the Burr Well Field. There is no scientific evidence to support the fact that such a reduction is necessary. On the contrary, the scientific evidence supports the fact that withdrawal from the Burr Well Field can be sustained at 750 gpm with no adverse effects. Marshall Municipal Utilities recommends that, at a minimum, LPRW be allowed to continue to appropriate water at the 750 gpm rate and if such pumping continues with no adverse effects, that the appropriation limits be increased.

In 1995, each municipal water supplier in the State of Minnesota was required to submit a Water Emergency and Conservation Plan to the Minnesota Department of Natural Resources. In its list of requirements, the DNR recommended that communities and water providers find ways to partner with each other to share and/or to better utilize resources. This type of partnering is exactly what Marshall and LPRW have done to resolve water shortages and make the best use of available resources. Marshall citizens and businesses also make great efforts to use water wisely and to be very conservative because they are well aware of the lack of abundant supply. The wise utilization of Minnesota's water resources should not be hampered based on "possible" environmental impacts that are not expected and not likely.

Sincerely,

Maurice A. Chaplin, Water Superintendent
Jim Babcock, MMU Commission Chairperson
Gary Becker, MMU Commission Vice Chairperson
John DeCramer, MMU Commissioner
Dan Baun, MMU Commissioner
Dwayne Purrington, MMU Commissioner

cc: Shane Hastings, RUS, Marshall
Jim Maras, RUS, St. Paul

MARSHALL INDUSTRIES FOUNDATION

501 WEST MAIN STREET • MARSHALL, MINNESOTA 56258 • PHONE 532-4484

September 1, 1998

Mr. Mark S. Plank
USDA Rural Utilities Service
Mail Stop 1571
Washington, DC 20250

Dear Mr. Plank:

Like many other communities in southwestern Minnesota, water is in short supply for the businesses in Marshall. The Marshall Industries Foundation has always monitored the work by the City of Marshall and the industries in the Marshall area as they have been working to both find additional water sources and conserve the water we do have. We would like to go on record in appreciation of the water allotment we receive from Lincoln-Pipestone Rural Water and support the present 750 gpm LPRW pumping permit.

The City of Marshall is presently exploring new water supplies in an area exceeding fifteen miles radius from Marshall. One of our larger industries has also dug several wells to relieve the stress on the Marshall well sites. Three of our industries have installed expensive water treatment systems to make the most use of recycled water. However, even the best conservation measures do not create water. Without the LPRW water, the community of Marshall would be adversely affected by the loss.

In addition to our own water needs, LPRW supplies water to many of our area citizens. The quality of the water through LPRW many times exceeds the quality available from the local rural well sites. The Marshall Industries Foundation has no desire to see any damage to the Lake Cochrane environment, and the scientific data you already have supports the statement that LPRW's pumping rates do not affect the area. It is our understanding of the study that the Burr Well Field could actually sustain higher pumping levels. As you do your review of the Environment Impact Statement, it is our position that the permits should, at minimum, remain at 750 gpm.

Thank you for your consideration.

Sincerely,

Paul G. Rehkamp, President
Marshall Industries Foundation

SOUTHWEST REGIONAL DEVELOPMENT COMMISSION Form R-3

PROJECT NUMBER		
#98-40	#98030501-8	Appendix A-23

PROJECT APPLICANT

Lincoln-Pipestone Rural Water

ADDRESS OF APPLICANT

Don Evers, Manager Lincoln-Pipestone Rural Wter, East Highway 14, PO Box 188
Lake Benton MN 56149

PROJECT TITLE	PROJECT COST
Environmental Impact Statement/Burr Well Field SW MN	NA

DATE PROJECT NOTIFICATION RECEIVED BY

March 5, 1998

DATE FINAL REVIEW SENT TO APPLICANT

March 20, 1998

CONSULTATION BETWEEN THE SRDC, APPLICANT, AND AFFECTED GOVERNMENT UNITS AND AGENCIES

WAS, (WAS NOT) (circle one) REQUIRED.

DATE OF CONSULTATION_____ PLACE CONSULTATION HELD_____

COMMENTS:

FINAL REVIEW COMMENTS:

The Board of Directors of the Southwest Regional Development Commission, on March 19 1998, reviewed the Environmental Impact Statement for Lincoln Pipestone Rural Water System / Burr Well Field in SW Minnesota (staff analysis of the project is attached). The SRDC Board found this project consistent with regional goals and policies.

This Form is in compliance with Executive Order 12372

plan\bod\burr

SOUTHWEST REGIONAL DEVELOPMENT COMMISSION
BOARD OF DIRECTORS AGENDA ANALYSIS FORM

AGENDA ITEM: 5 **MEETING DATE:** March 19, 1998

SUBJECT: Environmental Impact Statement for the Lincoln-Pipestone Rural Water system at the Burr Well Field in southwestern Minnesota.

COMMITTEE ACTION ___ STATUS OR SCHEDULED REPORT ___ INFORMATION ___

BACKGROUND/RATIONALE: The purpose of the proposed action and all previous phases to the Lincoln-Pipestone Rural Water (LPRW) system is and has been to provide a good, reliable, and affordable source of potable water to the rural residents, municipalities, and businesses in an area of Minnesota that has had difficulty in securing satisfactory water supplies.

LPRW has applied to the DNR to modify its Water Appropriation Permit from 750 gpm to 1500 gpm, in addition to the submittal of an application for financial assistance to fund the Northeast Phase Expansion proposal. If successful, the project would complete a multi-year / phase system expansion project started in 1991. There have been previous requests to increase the appropriation rates at the Burr Well Field. These have not been acted upon by DNR due to concerns that the groundwater withdrawals may have an adverse impact on surface water resources in the area (patterned calcareous fens and Lake Cochrane). These issues and alternative ways to meet LPRWs needs were evaluated in this EIS.

Rural water systems in southwest Minnesota have grown in response to a general need for an improved water supply. In addition, the annual operation and maintenance costs for individual and small community potable water system is often not competitive with economies of scale offered by a rural water system.

Of primary concern identified in the public scoping process was the potential affect on Lake Cocharan and the calcareous fens in the area surrounding the Burr Well Field. A second issue that arose was that with the increased quality of water, there would be an increase in the number ofd large scale confined animal operations - or expansion of existing operations.

The following identifies the proposed action / alternatives and the Agency conclusions:

Proposed Action. Fund the Northeast expansion and to continue to appropriate groundwater at the Burr Well Field at a higher rate than is now permitted. The Agency conclusion was that the proposed action poses unreasonable environmental risks to surface water resources of the area.

Alternative #1. Fund Northeast Phase Expansion and discontinue use of the Burr Well Field and Water Treatment Plant; use Verdi and Holland Well Fields to make up for the loss of the Burr Well Field to meet the systems needs. From the standpoint of system reliability and safety factors, LPRW would not be able to meet the needs of customers under this alternative and is not a feasible option.

Alternative #2. Fund the Northeast Phase Expansion and discontinue use of the Burr Well Field and Water Treatment Plant; use the Verdi and Holland Well Fields and supplement this supply with water from other sources to meet the systems needs.

(continued)

(EIS continued)

Alternative #2 using Lewis and Clark Project as another supply source. While the entire area, not just LPRW, would likely benefit from the Lewis and Clark plan, the decisions necessary to address all the issues related to the funding and feasibility of the Lewis and Clark system and interbasin transfers of water will likely require many years to resolve, and it is not reasonable for the Agency to postpone resolution of the proposed action.

Alternative #2 using Adjacent Rural Water Systems. The surrounding water systems include Rock County to the south , Red Rock to the east and the Big Sioux and Brooking-Deuel to the west. None of these has excess capacity that could be used by LPRW.

Alternative #2 using the Altamont Aquifer. Recent geophysical and geological investigations indicate that the water bearing formation in this area is greater than that of that of the Burr Well Field, and could serve as a primary source of water to LPRW. The aquifer shows great promise and is considered in the Agencys preferred alternative.

Alternative #2 using the Canby Aquifer. While the Canby aquifer provides water to the City of Canby, the extent and types of yields of the aquifer are unknown.

Alternative #3. Fund the Northeast Phase Expansion and continue to utilize the Burr Well Field and the current permitted appropriations and supplement with other sources. Both the Altamont and Wood Lake Aquifers were discussed.

Alternative #4. Fund the Northeast Phase Expansion, maintain current permit conditions at Burr Well Field and develop a new well field and treatment facility in the Northeast Phase Expansion to supply water to the Northeast Phase Expansion customers. Suitable sources of water would be the Canby Aquifer and Wood Lake. After reviewing these alternatives, it was decided that the project would be either cost prohibitive or would create affordability factors for the customers.

Alternative #5. Financing point of use systems for potential customers in the Northeast Phase Expansion area rather than financing the expansion. This option is not competitive with the economies of scale.

Alternative #6. No action. Not a feasible option. This is a multi-phase project in which engineering decisions regarding the design and operation of the system as a whole have been made earlier.

Agency preferred alternative. In order to minimize or avoid any significant adverse impacts the following mitigation measures were identified in the EIS to be implemented with the funding of the Northeast Phase Expansion:

- Continue to maintain the Burr Well Field as a primary water source, but limit the ground water appropriation.
- Supplement existing wells at the Burr Well Field with a new well field in an area south-southeast of the current Burr Well Field. Water would be transported to the Burr Water Treatment facility.
- Appropriation rates of the supplemental wells be similar to those permitted at the Burr Well Field.
- DNR establish as part of its permitting requirements for LPRW, protocols and standard operating procedures for well field operations that are designed to minimize drawdowns in the surface of the Burr units.
- Formalize a water resource management plan that will continue to use existing monitoring points at fen locations and observation wells in the Burr Unit in Minnesota and south Dakota.

Staff comments: The EIS appeared to address the issues and concerns of the proposed project and identified reasonable a reasonable alternative to prevent adverse impacts to the surface waters connected to the Burr Well Field.

302 W 6th St.
Elkton, SD 57026
4/1/97

Mark S Plank
RUS
Mail Stop 1571
Washington, DC 20250

Dear Mark,

In general I was pleased with the E.I.S. done on LPRWS burr unit well field. Some points I would like to comment about are listed below.

There should be no septic leakage from shoreline residences as we have had a closed sanitary system around Lake Cochrane since 1988.

Water quality has deteriorated in past 5 years since Lake Oliver water has flowed thru Lake Cochrane with noticeable algae, etc. now in our Lake.

Agree that Sen Protection is as important as Protection of Lake Cochrane.

Feel that L.P.R.W.S. should formalize an agreement with SDDENR to establish Procedures and Protocols to evaluate the effects of pumping the Burr unit on surface water Resources in SD.

No consideration was given to the millions of dollars worth of property built around Lake Cochrane, its tax value to state and the

effect the loss of property value would have on the surrounding area.

We are opposed to another well being put into the Burt unit of the Prairie Coteau aquifer and to LPRWS increased Pumping rates for expansion as the Sioux Nation Calcareous Fen became dry during 1500 gpm test. This issue was ignored in order to form a conclusion that there were no effects.

Agree that any statement that impacts will be minimal is <u>premature</u> and should be struck from the document.

I strongly feel that environmental effects will be seen on both the Fens and Lake Cochrane from ground water appropriations at the Burt Well Field + further impacts from the Construction of the North EAST Phase Expansion Proposal. Also no consideration was made to the effects increased pumping by LPRWS would have on the aquifer reserve when a drought cycle occurs.

Sincerely,

Charlotte Bann

sent 3/17/98

Dear People

We support the EIS.
But we Must have Minnesota
alternate choice. 2nd.
We want the well put in
by Woodlake, and we do
not want a well in or
near Burn gualfer.

Thank you
Jim & Sheryl Dunn
Irvine

recd at 11/7/97 meeting

Appendix A-27

November 6, 1997

These are the comments of the South Dakota Department of Environment and Natural Resources (DENR) regarding the preliminary draft copy of the October 1997 report prepared by the United States Department of Agriculture, Rural Utilities Service (RUS), titled:

ENVIRONMENTAL IMPACT
STATEMENT
LINCOLN-PIPESTONE
RURAL WATER
Northeast Phase Expansion
Existing System North/Lyon County Phase

The following comments are in reference to statements and conclusions in this report which deals with the hydrogeology of Lake Cochrane and the potential impact on the lake level as a result of pumping water by the Lincoln-Pipestone Rural Water System from a buried aquifer near the lake. To simplify the readability of this letter, the direct quotations from the report will be in italic type followed by comments.

page 88, first full paragraph

It is stated that "*Water levels recorded in 1937 following the "dust bowl" drought of the mid 1930's, indicated that Lake Cochrane's water levels had declined by approximately 10 feet (Hatch, 1996). In comparing this water level reading to pond design criteria developed by the USDA, Soil Conservation Service (SCS, 1988), the SCS (predecessor to the Natural Resource Conservation Service) estimates that, in this part of South Dakota, impoundments fed by surface water should be designed 8 to 10 ft deep to hold sufficient water to offset evaporation losses and seepage. Because of the position of Lake Cochrane in its watershed; the fact that it is underlain by a thick, very slowly permeable till; and the fact that the potentiometric surface of the Prairie Coteau aquifer is above the free water surface of the lake, it is very unlikely that Lake Cochrane loses significant amounts of water through seepage. Consequently, the decline in Lake Cochrane during the mid-1930's was consistent with that predicted by the SCS and is a strong indication that the lake is not receiving significant amounts of groundwater from the Burr Unit aquifer.*"

A review of the reference (SCS, 1988) in the above-mentioned quotation and a review of a copy of a September 1997 report by the Natural Resources Conservation Service (report title: Ponds—Planning, Design, Construction) appear to indicate that, in this area, if the surface runoff is the main source of water, the required contributing drainage area should be approximately 16 acres for each acre-foot of lake storage. The storage of Lake Cochrane, when it is full, is approximately 4,028 acre-feet. Even assuming the lake is only 1 foot deep, with a surface area of approximately 366 acres, it will have a storage of 366 acre-feet. In this example, the lake will need a drainage area of at least 5,856 acres (366 x 16). The actual drainage area of the lake is approximately 876 acres which appears too small to sustain a lake of this size in this location. A minimum drainage-area to lake-area ratio of 16 appears to be necessary; Lake Cochrane has a drainage-area to lake-area ratio of 2.4. Therefore, please quantify (in acre feet) the calculated amount of annual ground water contribution to Lake Cochrane.

On page 87, referring to the presence of certain ostracod fauna in Lake Cochrane, it is stated that, "*These organisms can be very sensitive environmental indicators and respond to natural changes in water quality. According to Dr. Smith, some of the Lake Cochrane ostracods are a variety that is known to thrive in the hard water discharge in seeps along the shoreline of lakes. This combination of*

shallow water habitat in hard water suggests that these seeps are fed by the shallow groundwater aquifer system." Contrary to the implication in the last sentence of the above quotation, Dr. Allison Smith does not say that the source of ground water to the lake is necessarily from a shallow aquifer. In fact, in a letter dated December 18, 1993, she states that *". . . if there are no other shallow unconfined aquifers in the area, it is likely that there are fractures through which the water in the artesian aquifer reaches the lake."* Does your data indicate whether shallow, unconfined aquifers are present and contributing adequate flows to Lake Cochrane?

page 86, first paragraph

This paragraph discusses the decrease of ground water flow to the lake during the 7-day aquifer test. It is stated that the potentiometric surface of the aquifer was 10 to 12 feet above the lake level prior to the pumping. During the pumping, the drawdown was about 1 foot in the western margin of the lake and was over 3 feet in the eastern margin of the lake. It is also stated that *"If it is assumed that the Burr Unit is discharging to Lake Cochrane, then these reductions in head would have resulted in a change of less than 3% in the discharge at the west end of the lake and a reduction of less than 5% at the east end."* If the potentiometric surface was 10 feet above the lake in the western margin prior to the test and the potentiometric surface dropped 1 foot by the end of the test, this is a 10% reduction which corresponds to a 10% reduction in ground water flow from the aquifer to the lake. Likewise, if the potentiometric surface which was 12 feet above the eastern margin of the lake dropped 3 feet at the end of the test, this reduction is 25% which results in a 25% reduction in ground water flow. The point here is that the most fundamental principle of hydrogeology, which is Darcy's law, appears to have been misused in the EIS to arrive at the above-mentioned values for ground water flow reduction to the lake. Please recheck your calculations and the methodology used to arrive at your conclusion.

page 86, second paragraph

The Lake Cochrane water budget calculations by DENR are discussed and it is stated that *"For example, the difference in the average annual precipitation (22 inches) used by SDDENR to calculate the water budget for Lake Cochrane and the annual precipitation (24.79 in/yr) determined for Lake Cochrane by averaging the precipitation for Clear Lake, SD (24.33 in/yr), and Canby, MN (25.25 in/yr), is 12.7%."* This implies that DENR used only 22 inches for the average annual precipitation in their calculations. However, an additional calculation was also made. The average annual precipitation of 22 inches used in the first mentioned water budget calculation was taken from a publication titled *Climate of South Dakota* (Agricultural Experiment Station, South Dakota State University, Brookings, Bulletin 582, November 1971). The lake budget was recalculated by DENR by using an annual average value of 24 in/yr. The lake water budget still did not balance without ground water contribution. The results of these calculations were presented to RUS on December 20, 1995, and they were also sent to the RUS consultant on May 30, 1997. Please correct the document to acknowledge the actual DENR calculation.

used 24

It is also stated that *"Moreover, uncertainties attend* (sic) *determining a value to use for "runoff" in the water budget equation SDDENR calculated two water budgets, one using 0.8 in/yr and a second using 1.5 in/yr. The latter value is more than 93% greater than the former. From these data, it can be seen that the change that could be induced by pumping would be small in comparison to the lack of precision in the data used to calculate the water budget."* The two water budgets mentioned in the above quote were calculated early in the evaluation process to see how much, if any, ground water might be required to balance the water budget for Lake Cochrane. Subsequent to these two calculations, site specific data for the average annual runoff for the Lake Cochrane drainage were

obtained from the Natural Resources Conservation Services (NRCS) in Brookings, South Dakota. The value for average annual runoff provided by NRCS was 0.55 acre-inch/acre (0.55 in/yr). The early calculations by DENR used values of 0.8 and 1.5 in/yr for the average annual runoff. The value of 0.8 in/yr is higher than the value provided by NRCS and still the lake water budget did not balance without a ground water contribution. The value of 1.5 in/yr, which is approximately three times greater than the value provided by NRCS, may demonstrate that the lake water budget cannot be balanced with any reasonable value for surface runoff. The conclusion in the last sentence of the above-mentioned quote appears unfounded and requires clarification.

page 87, first full paragraph

It is stated that *"In the SDDENR water budget analysis, two sources of runoff were not included or considered in the calculation--sizable areas of wetland that are hydraulically connected to Lake Cochrane and four tributary systems that flow into the lake. The wetland areas can act and function as free water surfaces and direct virtually all of the precipitation that falls on them directly to Lake Cochrane. With regard to the tributary systems, some portions of these systems must act as variable source areas with most of the water falling on them running off into the lake."* First, it is not clear which wetlands and four tributary systems the EIS refers to as not being included in the drainage area used for calculation of runoff by NRCS and DENR. Secondly, if the reference is to the Lake Oliver drainage area which has been draining to Lake Cochrane during the last few years, because of the extraordinary amounts of precipitation in the area, it should be realized that generally the water level in Lake Oliver is lower than Lake Cochrane under normal precipitation conditions. Also, as stated on page 84 of the EIS *"During the period from the early 1950's until 1993, Lake Oliver did not overflow into Lake Cochrane."* The data show that Lake Cochrane receives water from the Lake Oliver drainage only during very rare and extremely high precipitation. Nevertheless, DENR calculated the water budget for the combined drainages of Lake Cochrane and Lake Oliver and for the combined drainages of Lake Cochrane, Lake Oliver, and South Slough. Considering these three surface bodies of water together in a water budget calculation increases the surface water area for evaporation and makes it even more unlikely that the water budget could be balanced without ground water contribution. It should be also noted that the results of the above-mentioned calculations were provided to RUS and the consultants and are included as part of an October 5, 1994, document titled "An Amendment to the Environmental Assessment."

pages 81 and 82, under the topic of Environmental Consequences, discussion of the lowering of the potentiometric surface due to pumping

It is stated that *"Production pumping toward the end of a protracted drought could be expected to cause the most extreme lowering of this surface. Because no data are available for either recharge of the aquifer or aquifer performance during protracted droughts, it is not possible to predict with certainty how the aquifer will respond to long-term production pumping combined with drought conditions. The size of the hydraulically connected portions of the aquifer and its response to extended pump tests indicate, however, that withdrawal rates similar to production pumping the Burr Well Field at 750 gal/min should not cause it to be excessively dewatered. In addition, the thickness and areal extent of the aquifer suggest that sufficient water is present within it to sustain pumping for the duration of such a drought."* The first part of this quoted paragraph states that the impact of production pumping during a protracted drought could be extreme and therefore it is not possible to predict with certainty what the impact of the pumping combined with the drought will be on the potentiometric surface. The subject matter is changed in the middle of the paragraph to the availability of water for pumping during a drought. The environmental consequences of impacting the potentiometric surface by production pumping must be clearly and adequately presented.

The following points summarize some major concerns regarding the EIS.

- The EIS indicates that Lake Cochrane does not receive a significant amount of ground water. However, no calculations or documentation are presented to show how Lake Cochrane could exist in this location with a drainage area to lake area ratio of 2.4. A reference is provided in the EIS which indicates that the minimum drainage area to lake area ratio should be 16 for any lake or pond without ground water contribution in this area. This discrepancy needs to be addressed, and in quantifiable terms so that the public can understand the relative importance of each source of inflow to Lake Cochrane.

- The EIS states that pumping toward the end of protracted drought could be expected to cause the most extreme lowering of the potentiometric surface. However, the statement was also made that there are no data to predict with certainty how the aquifer will respond to long-term pumping combined with drought conditions. Not quantifying the aquifer response during this time period and simply passing over this issue is unacceptable. During these periods the greatest potential exists for adverse impacts to water resources in South Dakota.

- The results of calculations in the EIS that show the decrease in ground water discharge to the lake due to pumping and lowering of the potentiometric surface appear to be in error and the method of calculation violates the most fundamental principle of hydrogeology.

Please address our comments and make any needed changes to your preliminary document prior to publishing the draft EIS. We look forward to reviewing the next draft of the EIS.

Gary, S.D
March 10, 1998

Mark Plank
Washington, DC

Dear Mr Plank,

We are in support of the E.I.S. We don't want the alternative of the new well in the same acquifer. Lake Oliver coming in now has ruined our lake. We have now an algae contaminated lake where it had been one of the cleanest in S.D. We hope the pumping of Sioux Rapistone can be controlled.

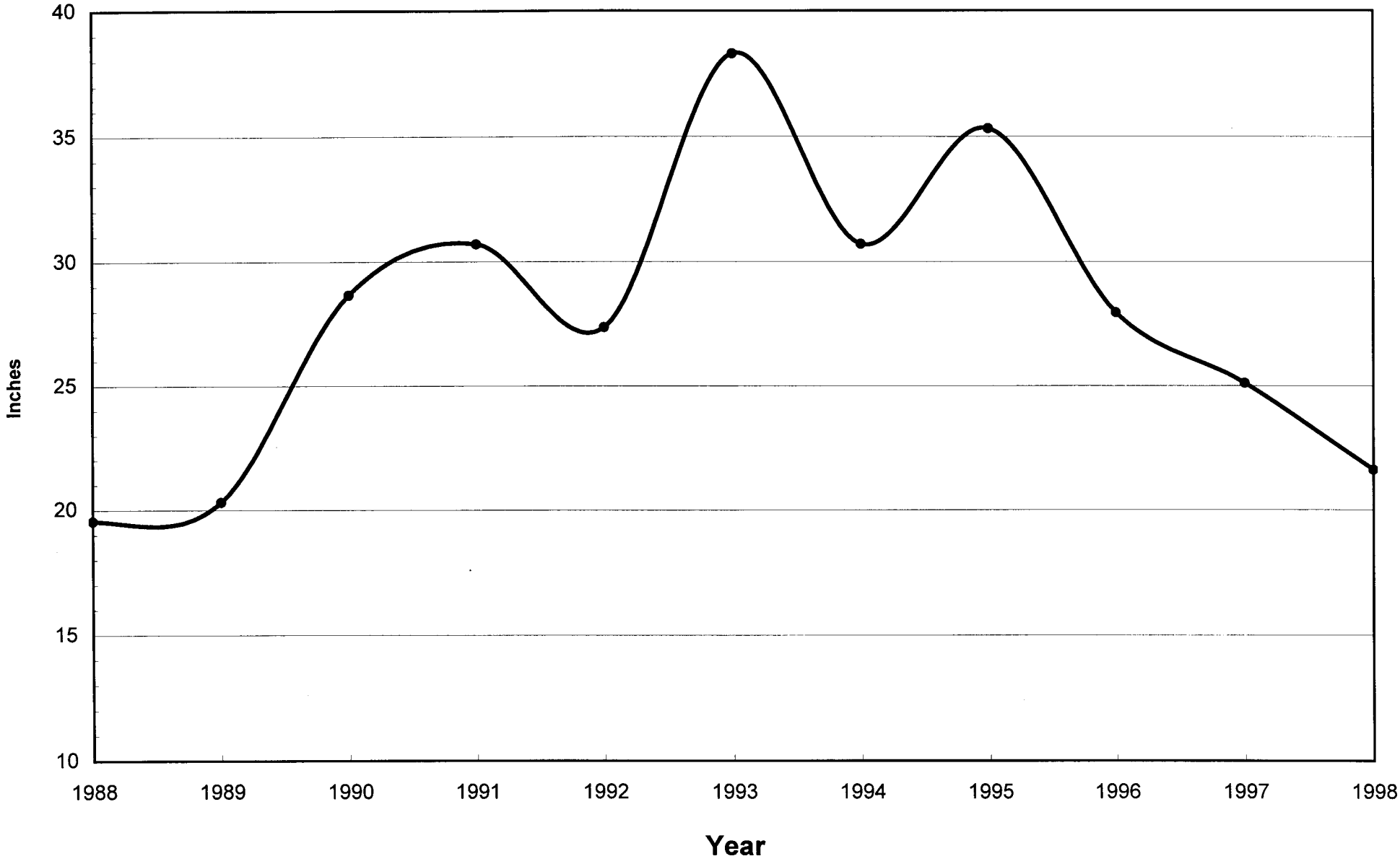
Sincerely,

Bob + Joyce Otkin
RR 1 Box 248
Gary, S.D 57237

Appendix B

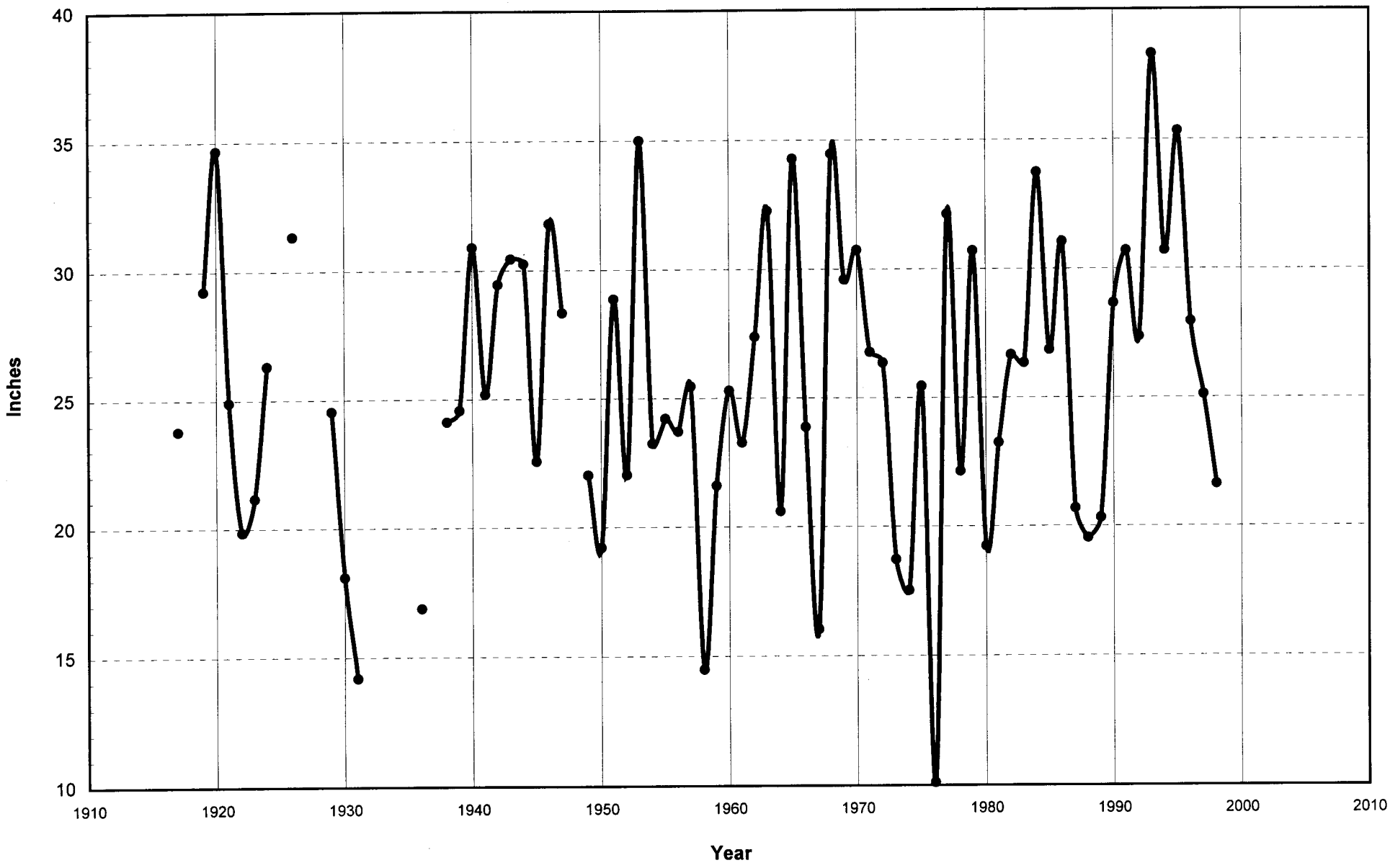
Appendix B-1

ANNUAL PRECIPITATION 1988-1998
CANBY, MINNESOTA
Source: B. A. Lesich



Long-Term Precipation Records (1917-1998)
Canby, Minnesota

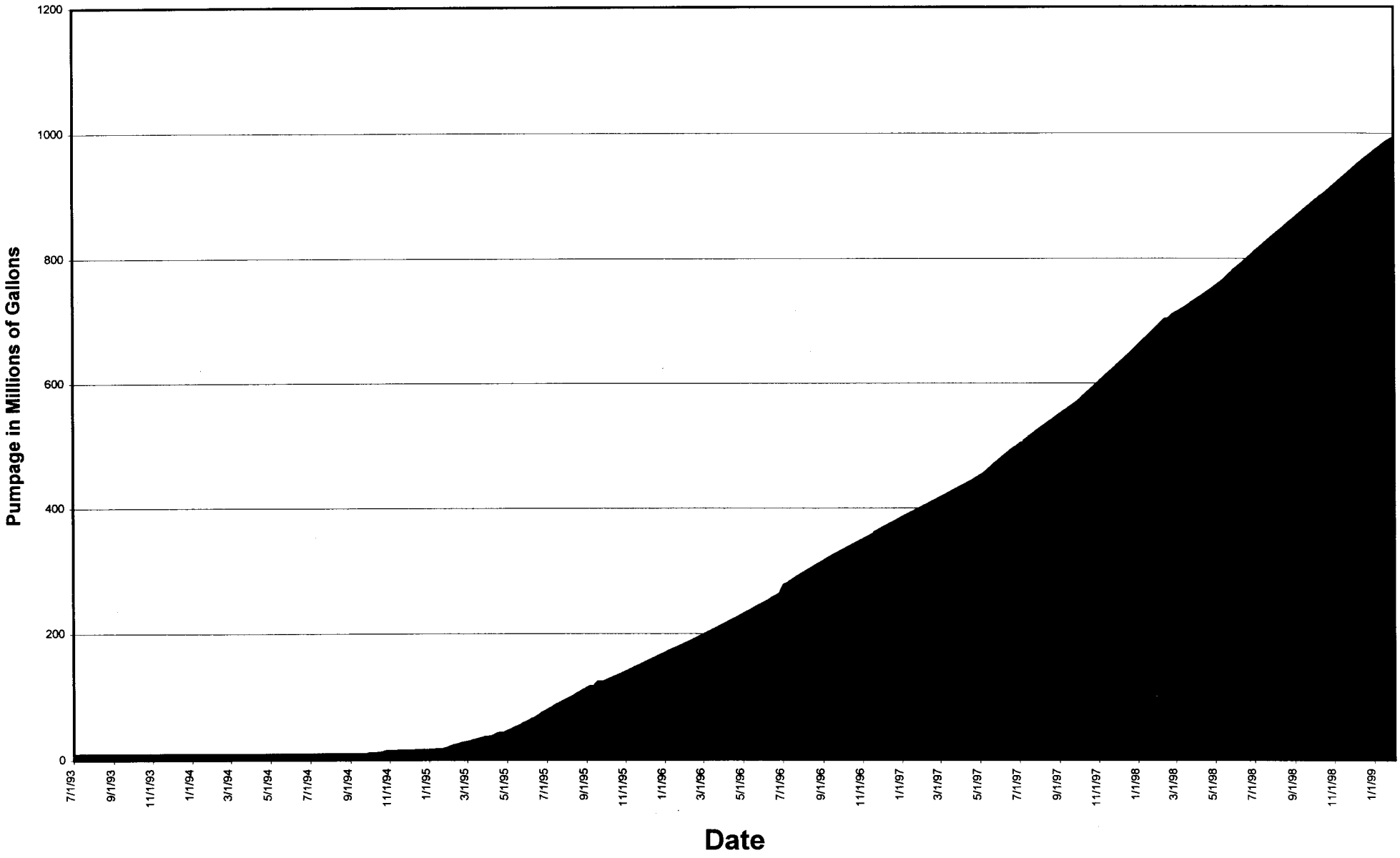
Source: B. A. Leisch



Appendix B-3

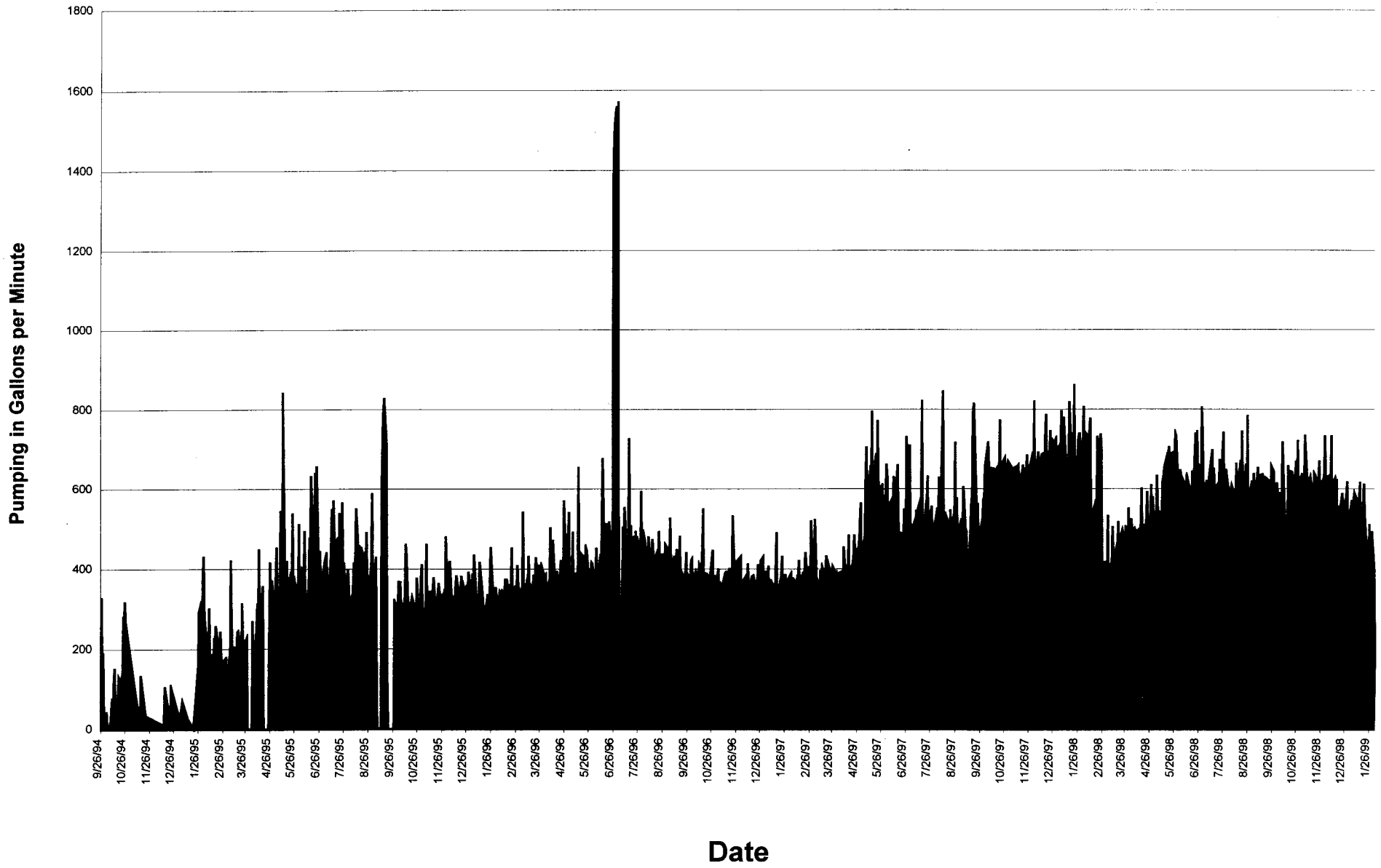
Cumulative Burr Aquifer Pumpgage

Source: MDNR 2/9/99



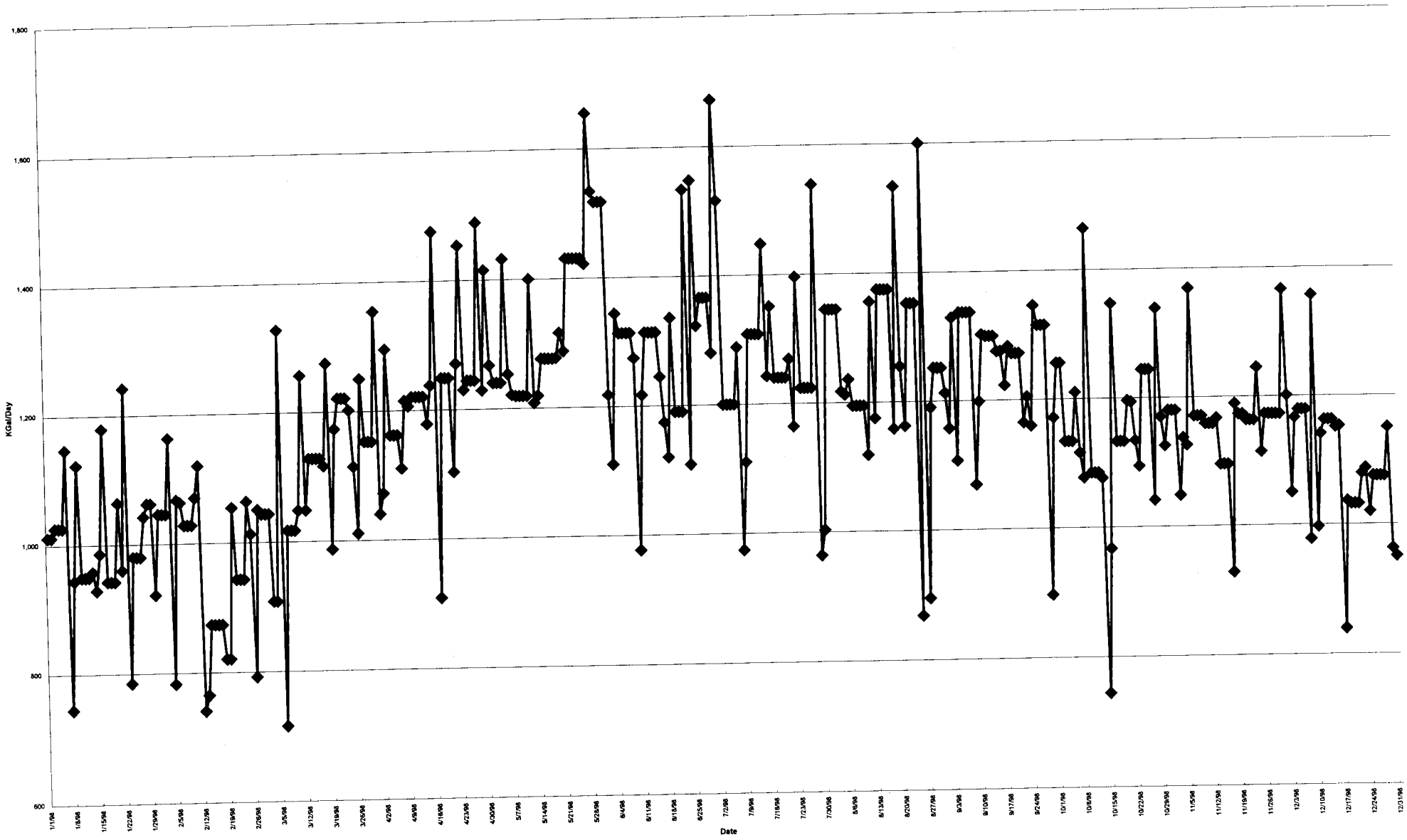
Average Daily Burr Aquifer Pumpage

Source: MDNR 2/9/99



1998 LPRW Use at Burr WTP
Total Water Supplied From All Wells

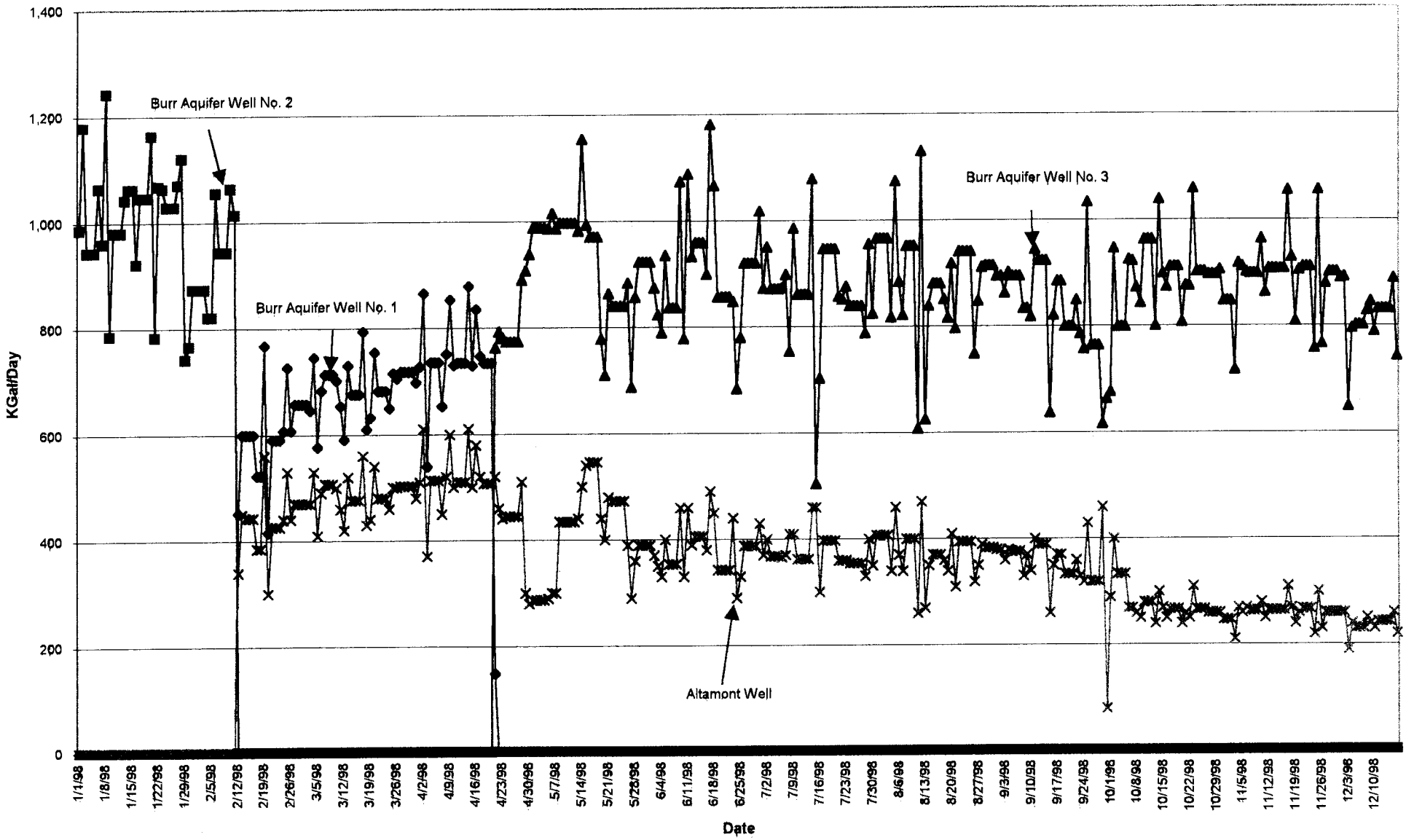
Source: Dewild, Grant, and Reckert



1998 LPRW Use at Burr WTP

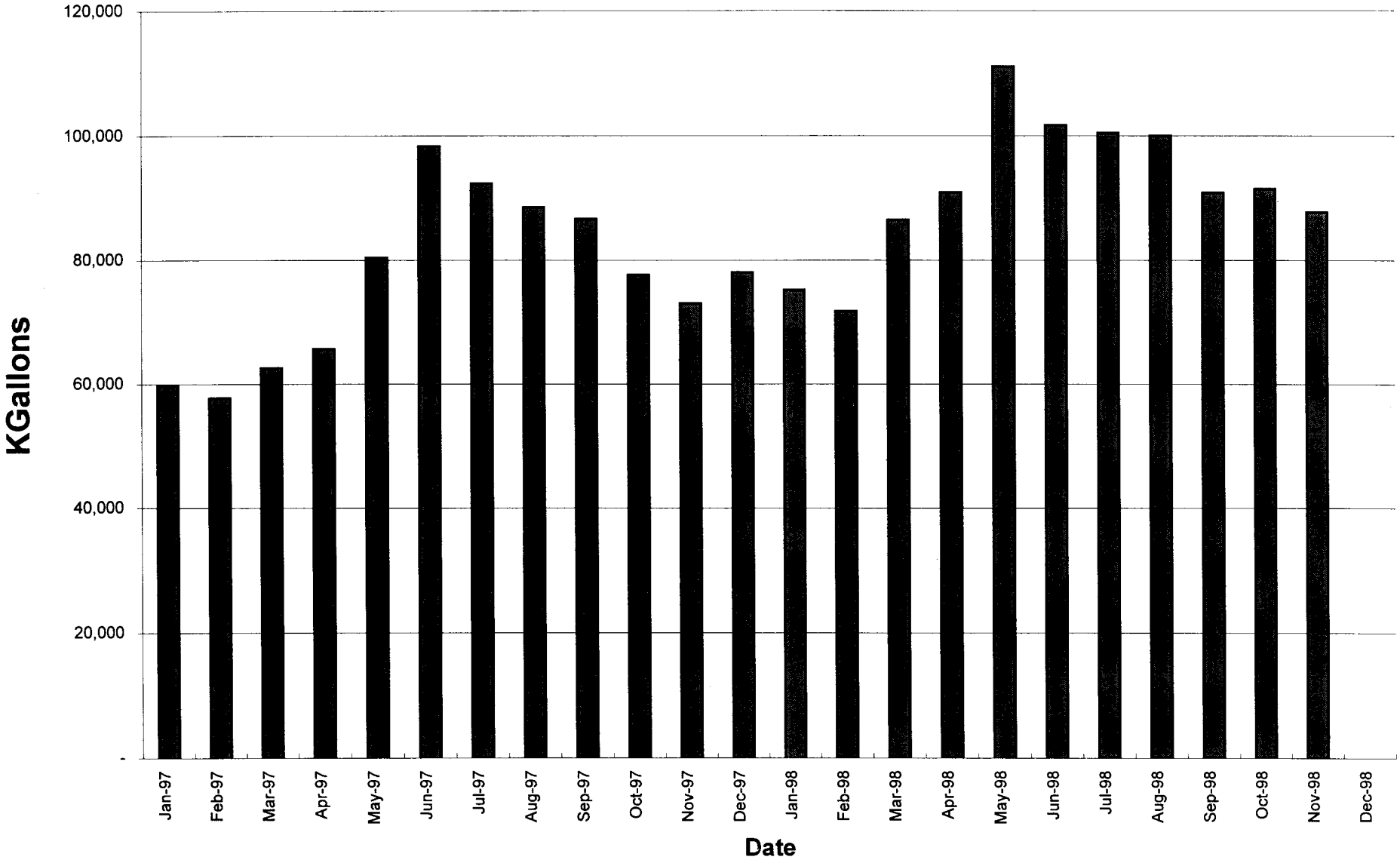
Individual Well Production

Source: Dewild, Grant and Reckert

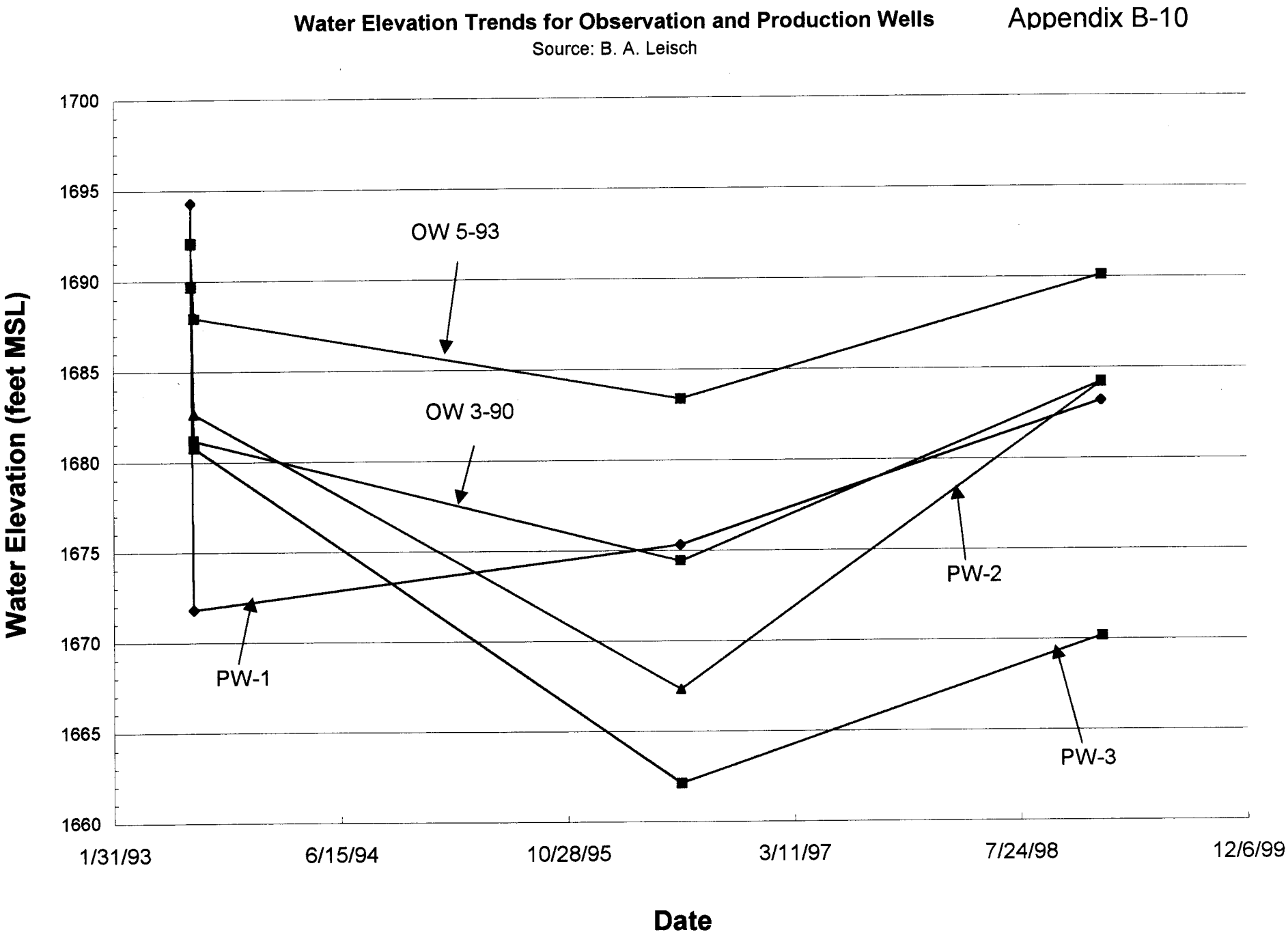


LPRW Total System Use Per Month

Source: Dewild, Grant, and Reckert, 1999

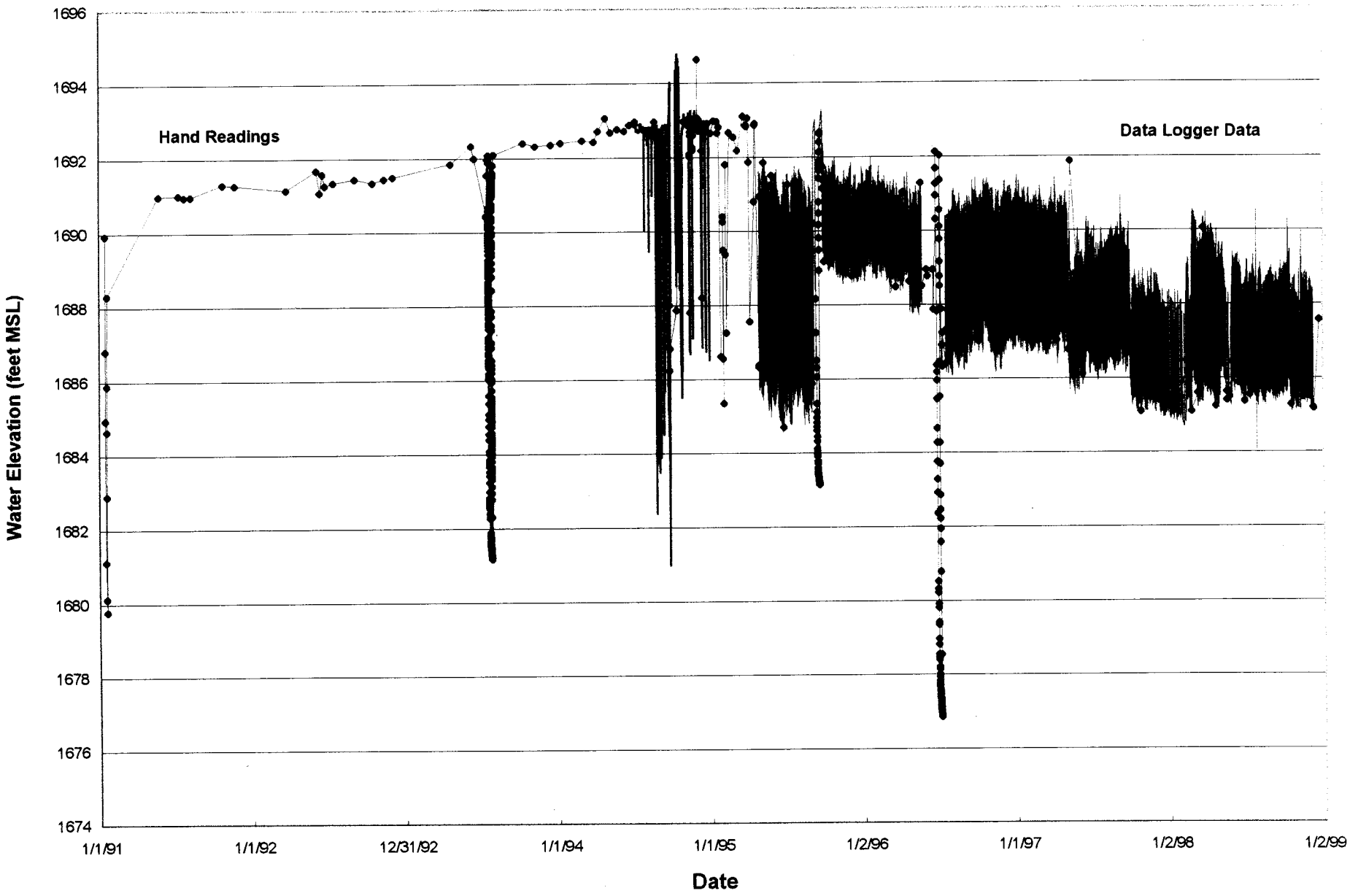


Appendix B-10



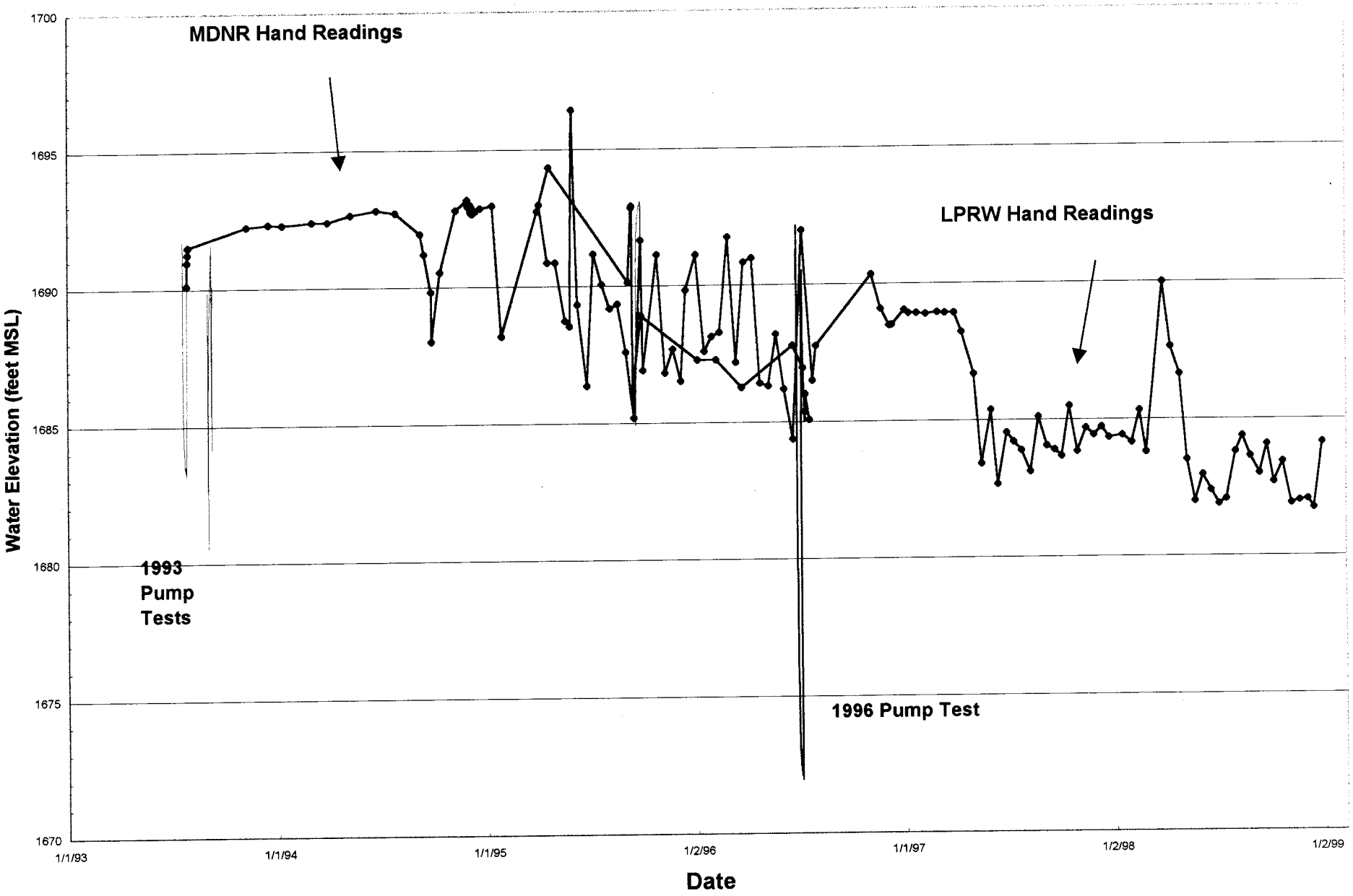
OW 3-90 Water Elevations

Source: MDNR



OW 1-93 Water Elevations

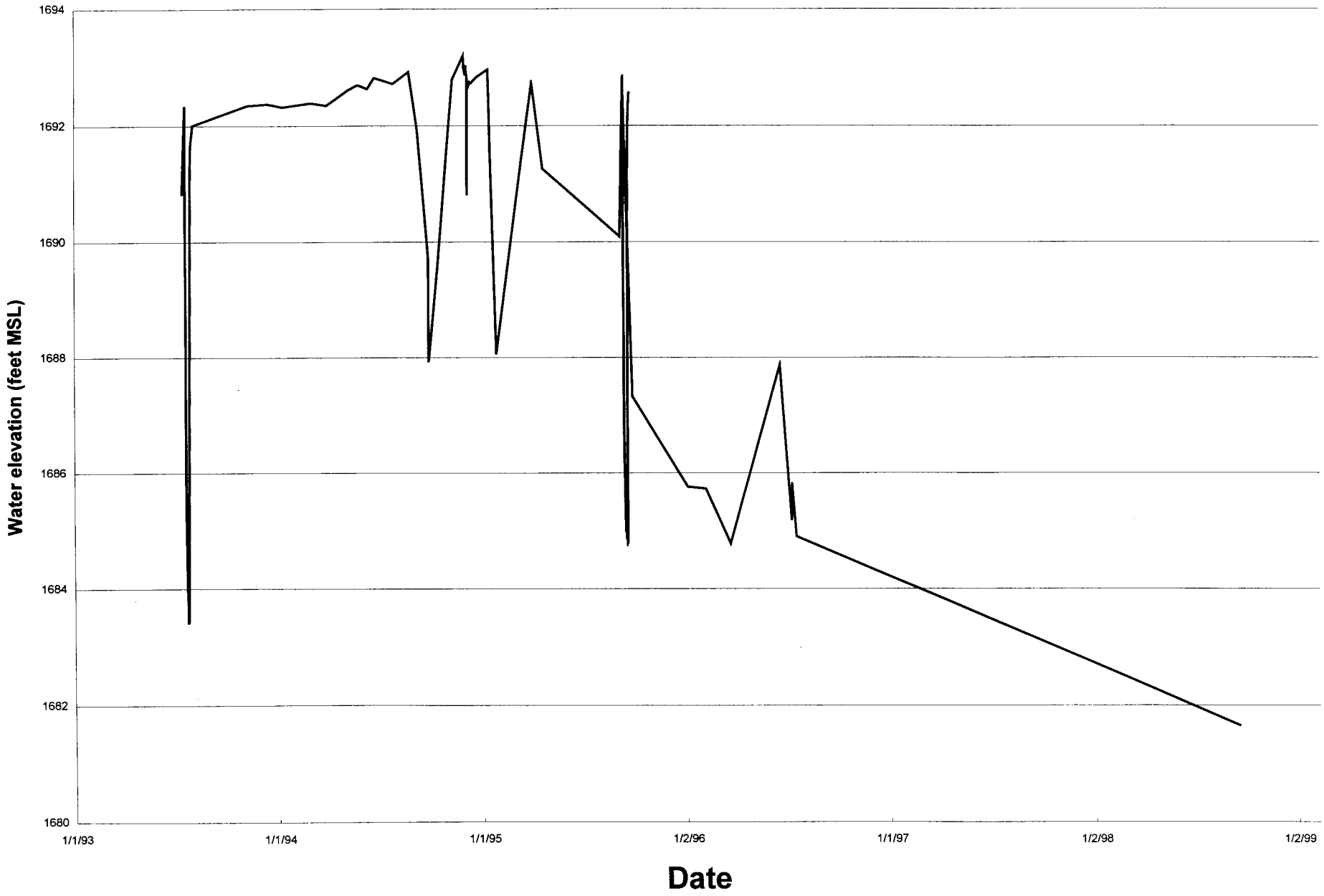
Source: MDNR



Appendex B-13

OW 2-93 Water Elevations

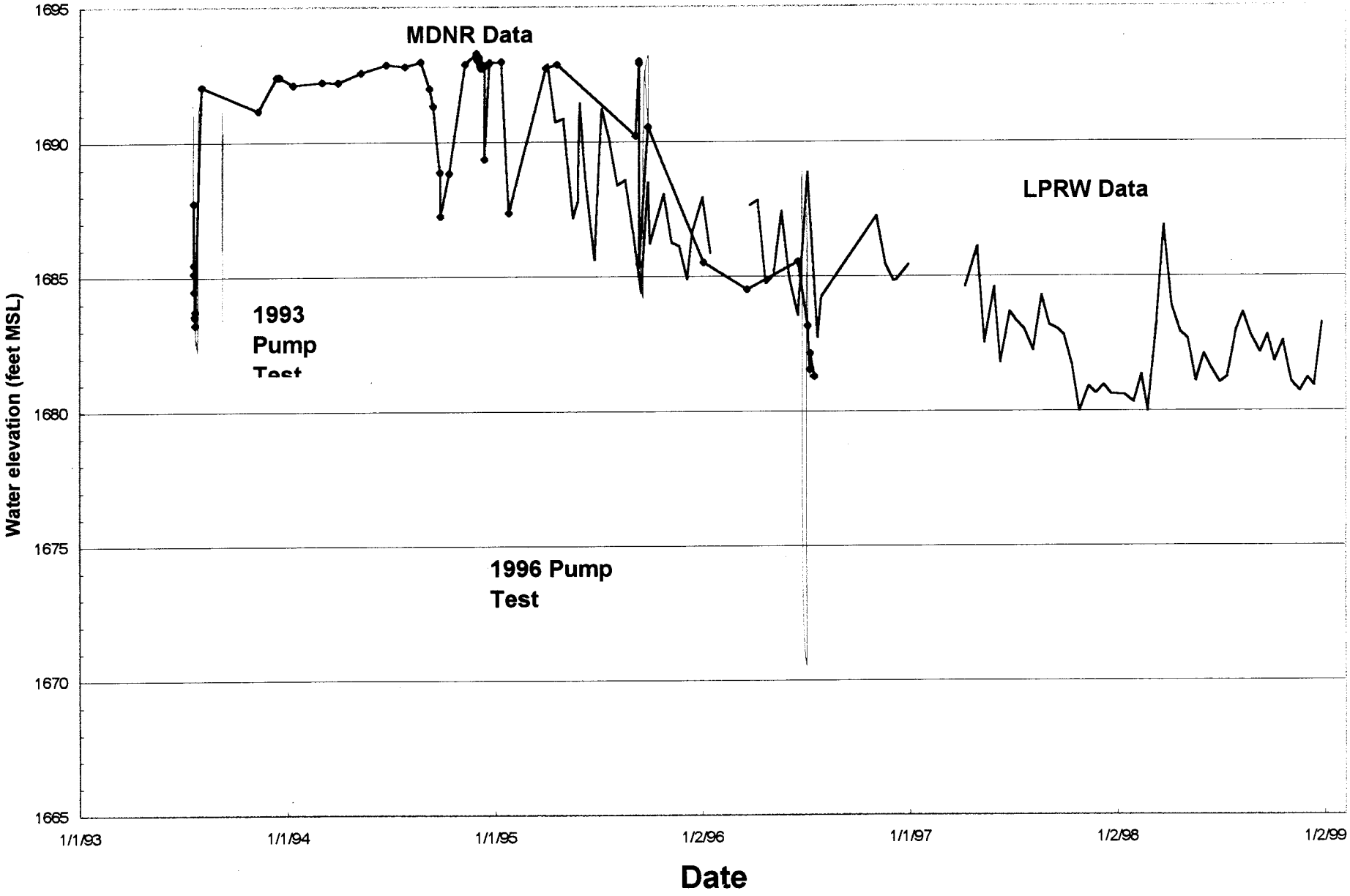
Source: MDNR



Appendix B-14

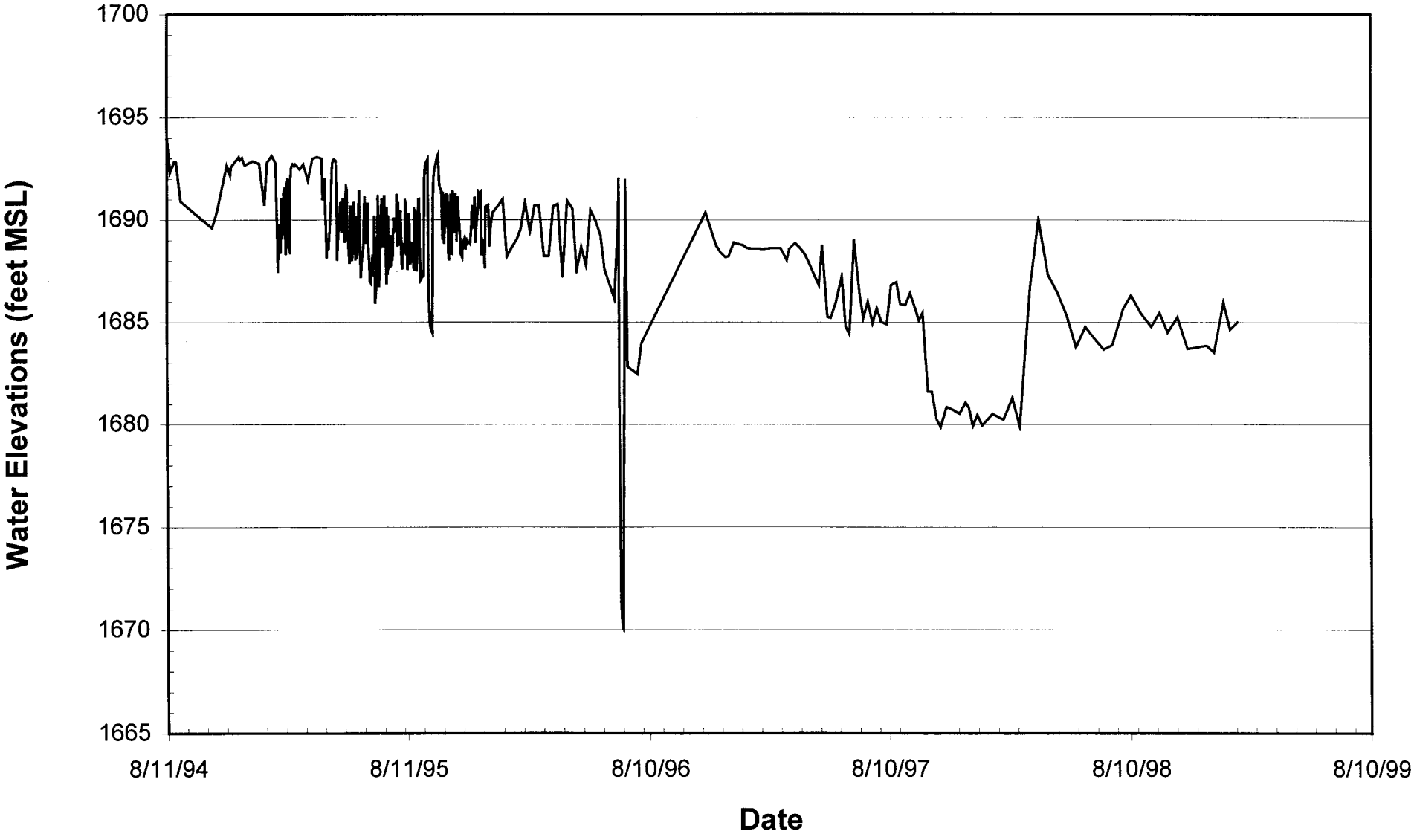
OW 3-93 Water Elevations

Source: MDNR



OW 4-93 Water Elevations

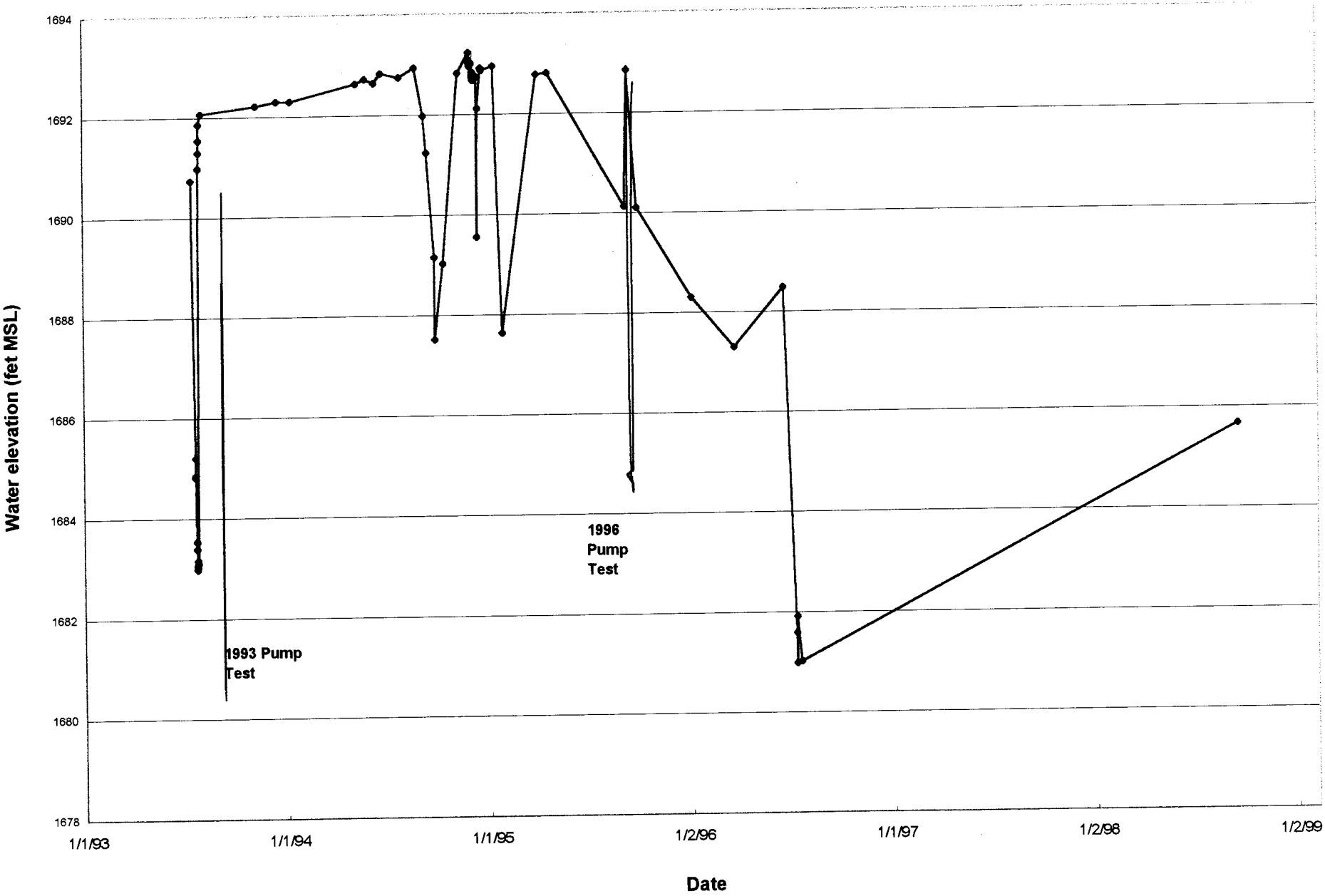
Source: B. A. Leisch



Appendix B-16

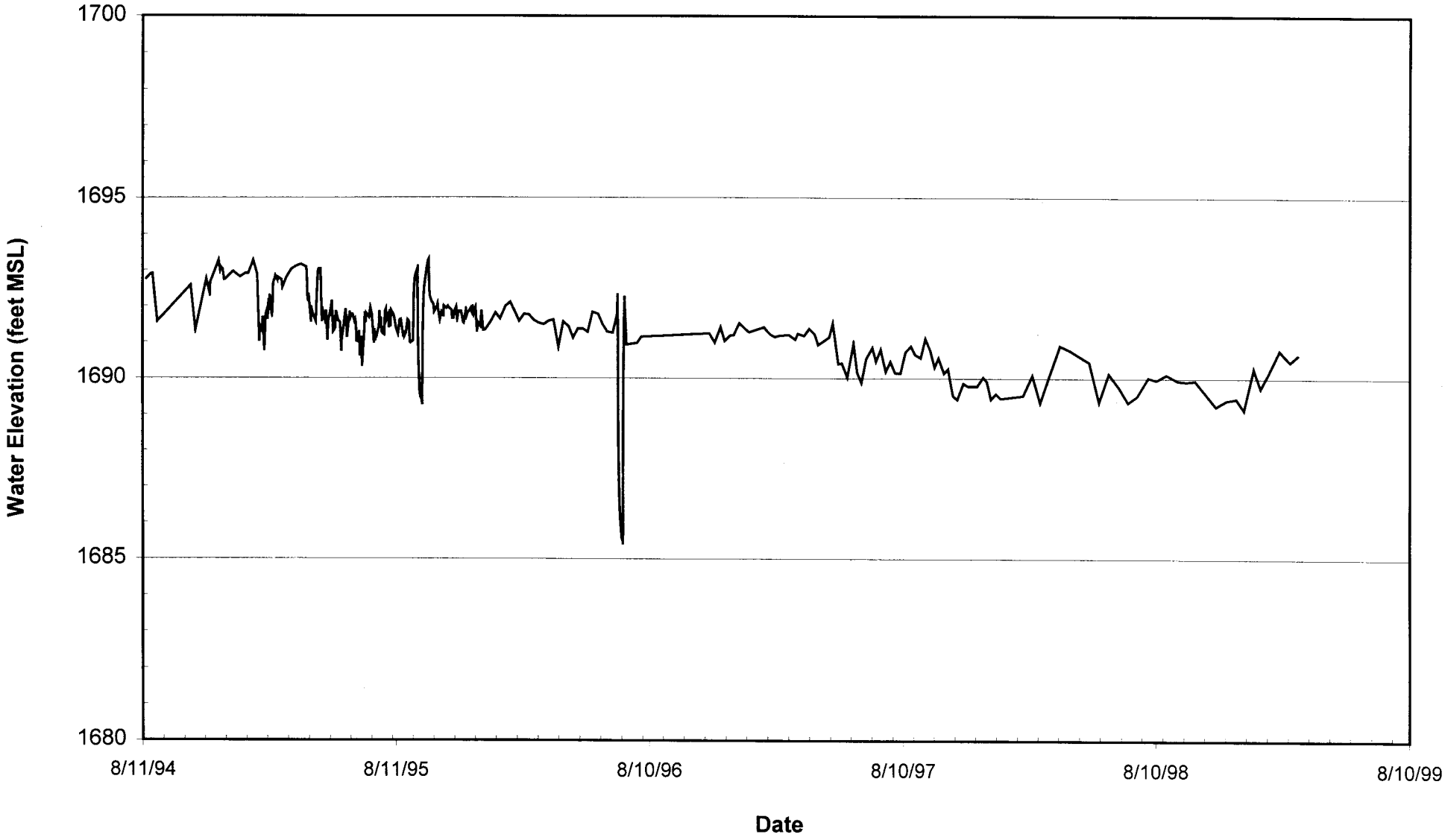
OW 4-93 Water Elevations

Source: MDNR



OW 5-93 Water Elevations

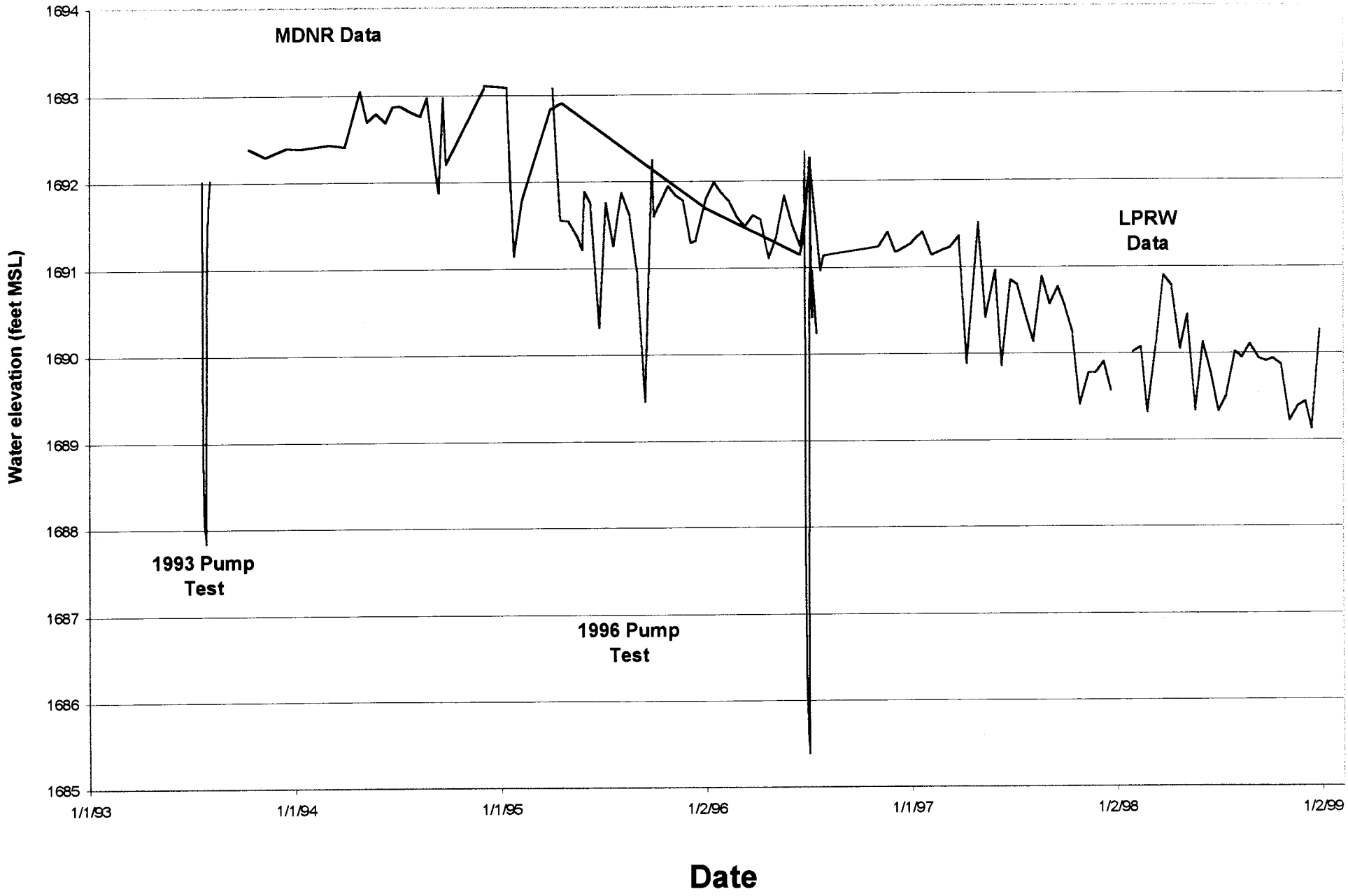
Source: B. A. Leisch



Appendix B-18

OW 5-93 Water Elevations

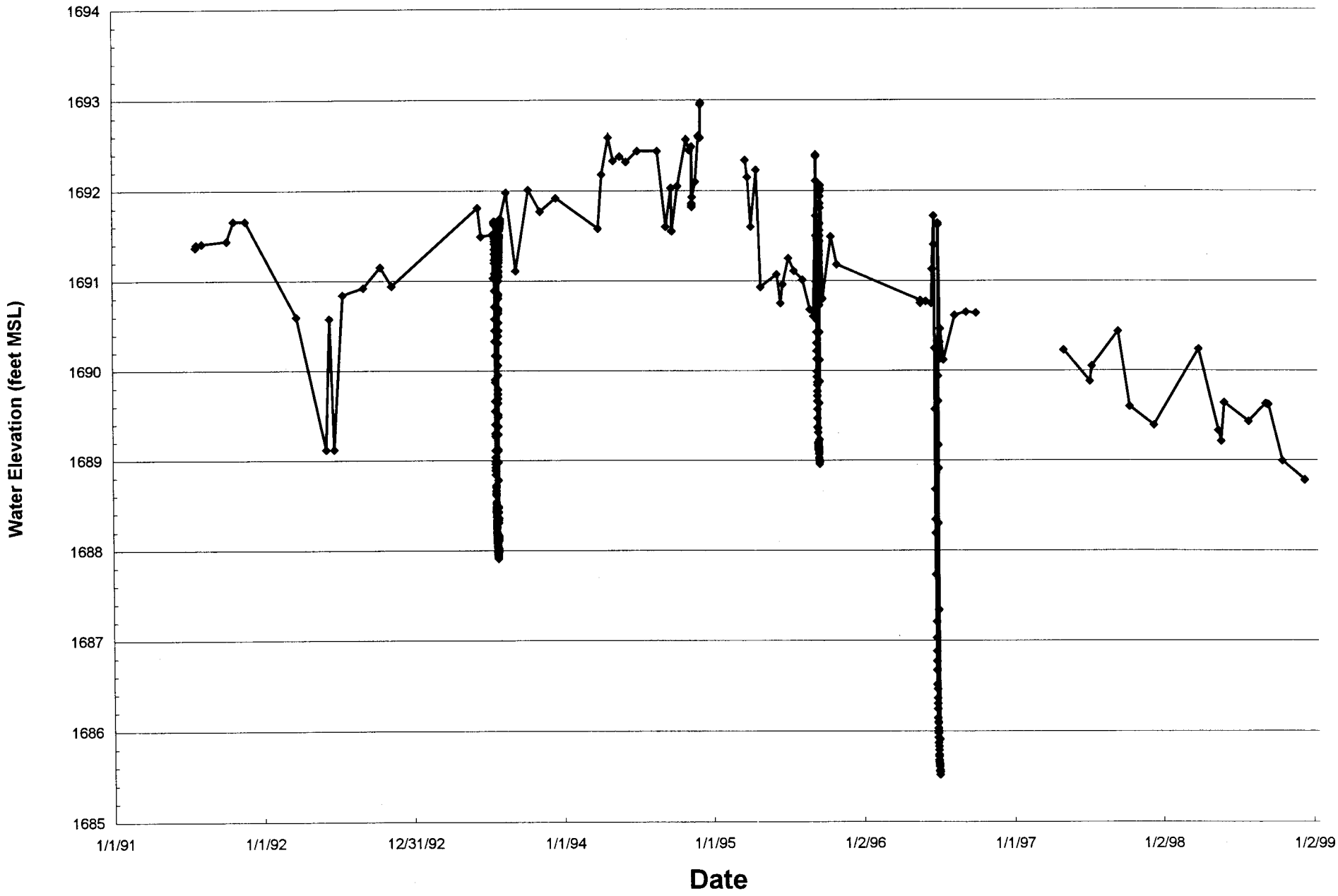
Source: MNDNR



Sioux Nation - Deep Steel OW Water Elevation

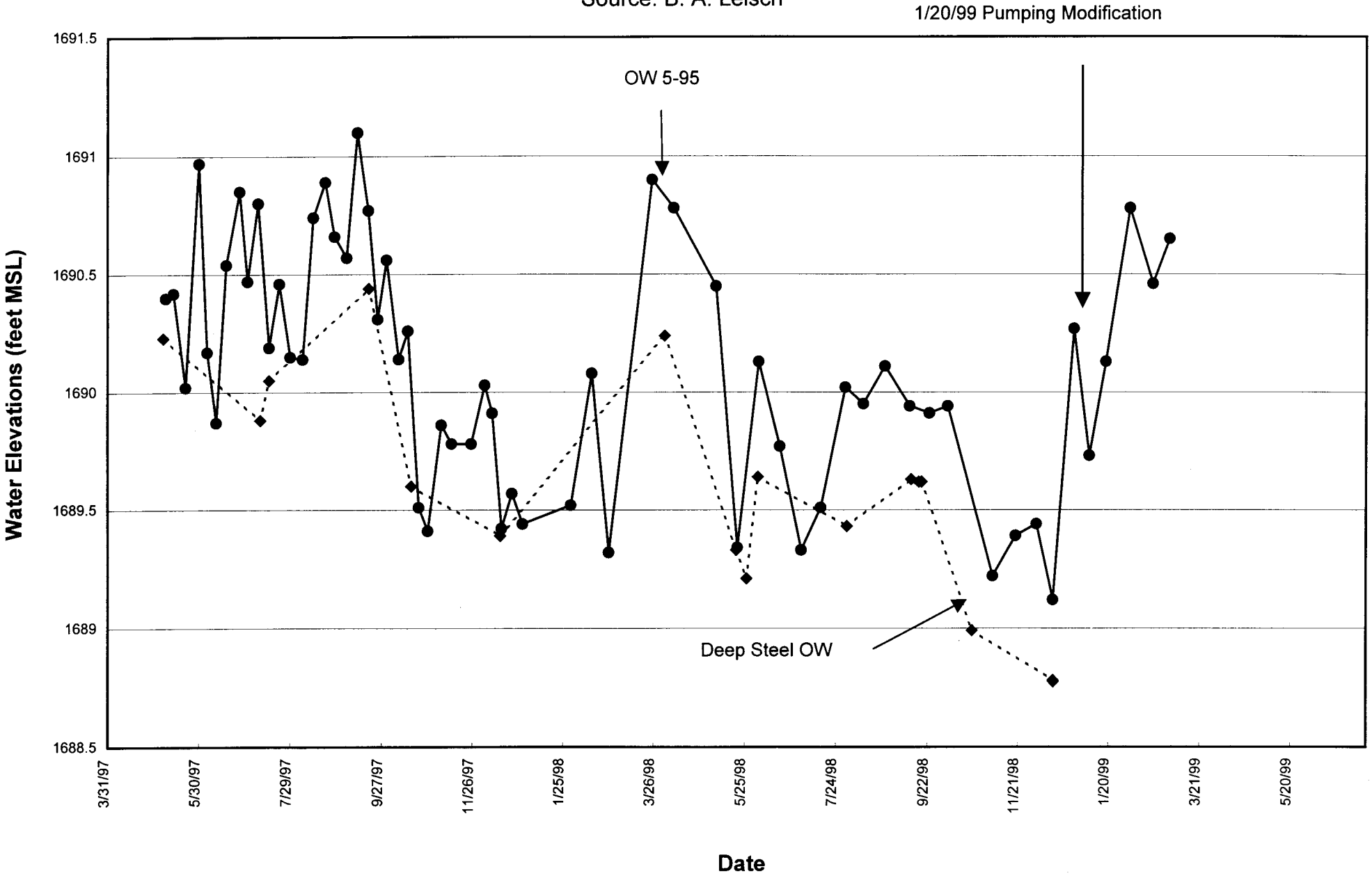
Hand Readings

Source: MDNR

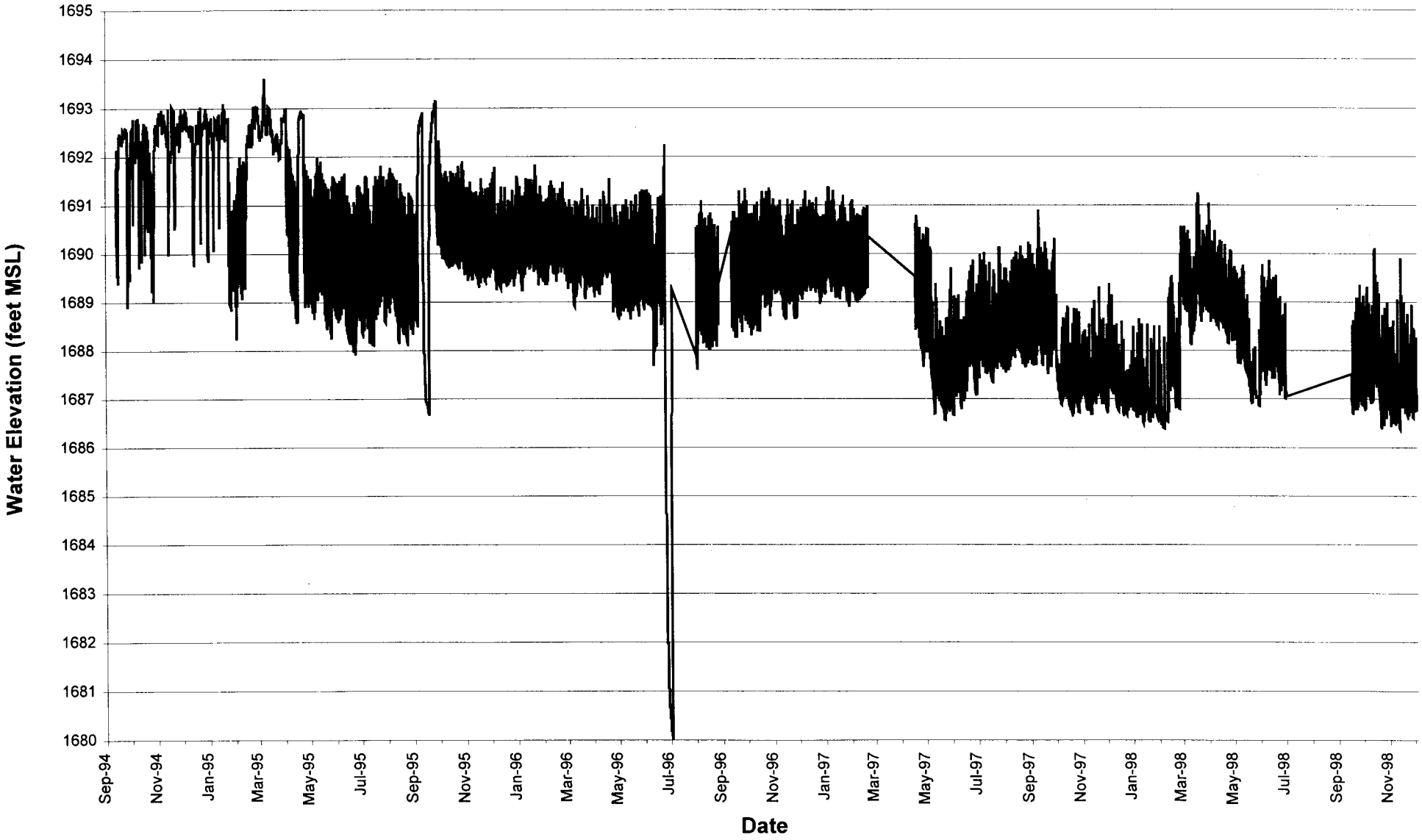


Comparison of Sioux Nation Deep Steel OW and OW 5-93

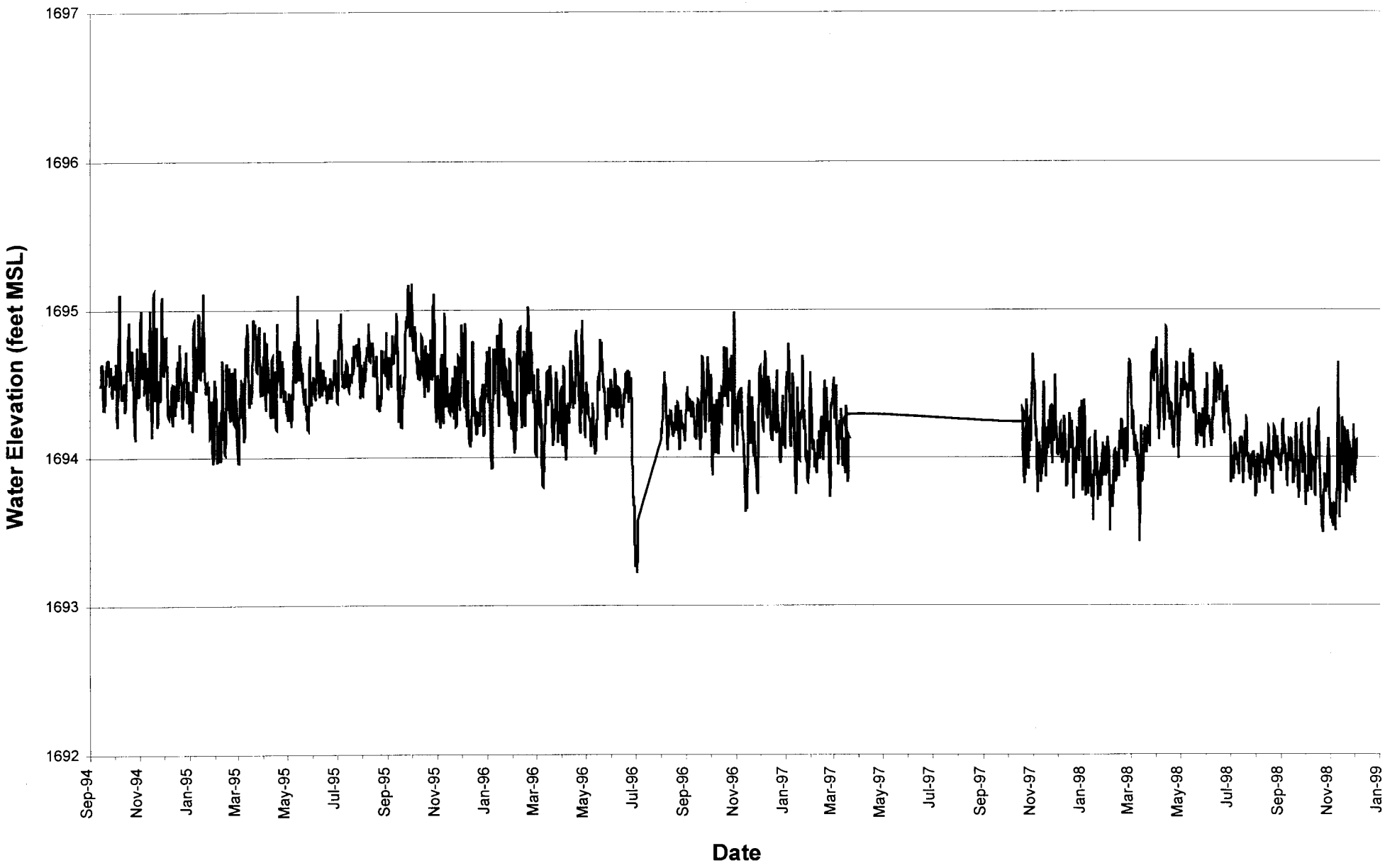
Source: B. A. Leisch



OW R2 93-10 Water Elevations
SD/MN State Line Observation Well
Source: SDDENR



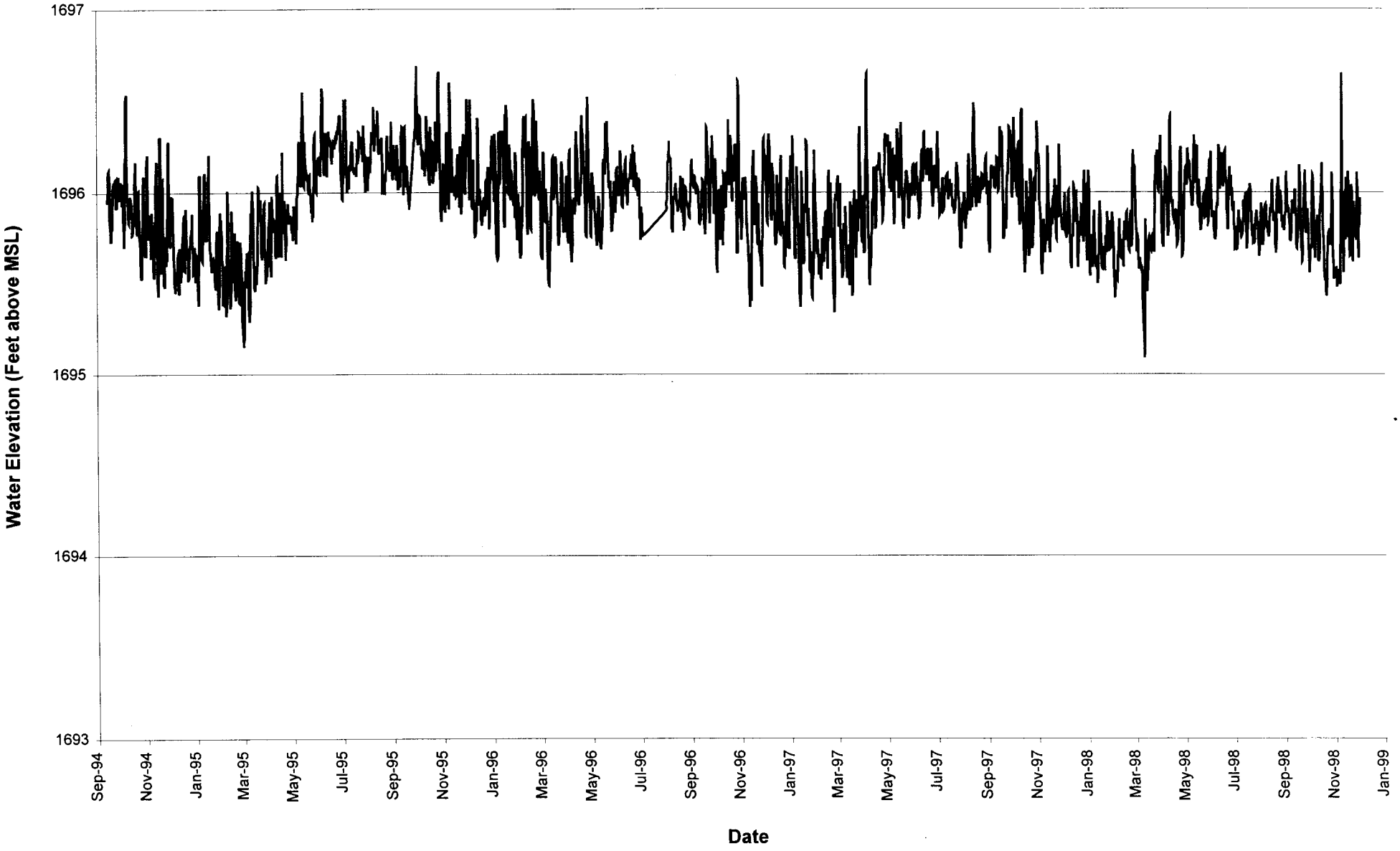
OW R2 94-26 Water Elevations
West End of Lake Cochrane
Source: SDDENR



OW R2 94-33 Water Elevations

2.25 miles west of Lake Cochrane

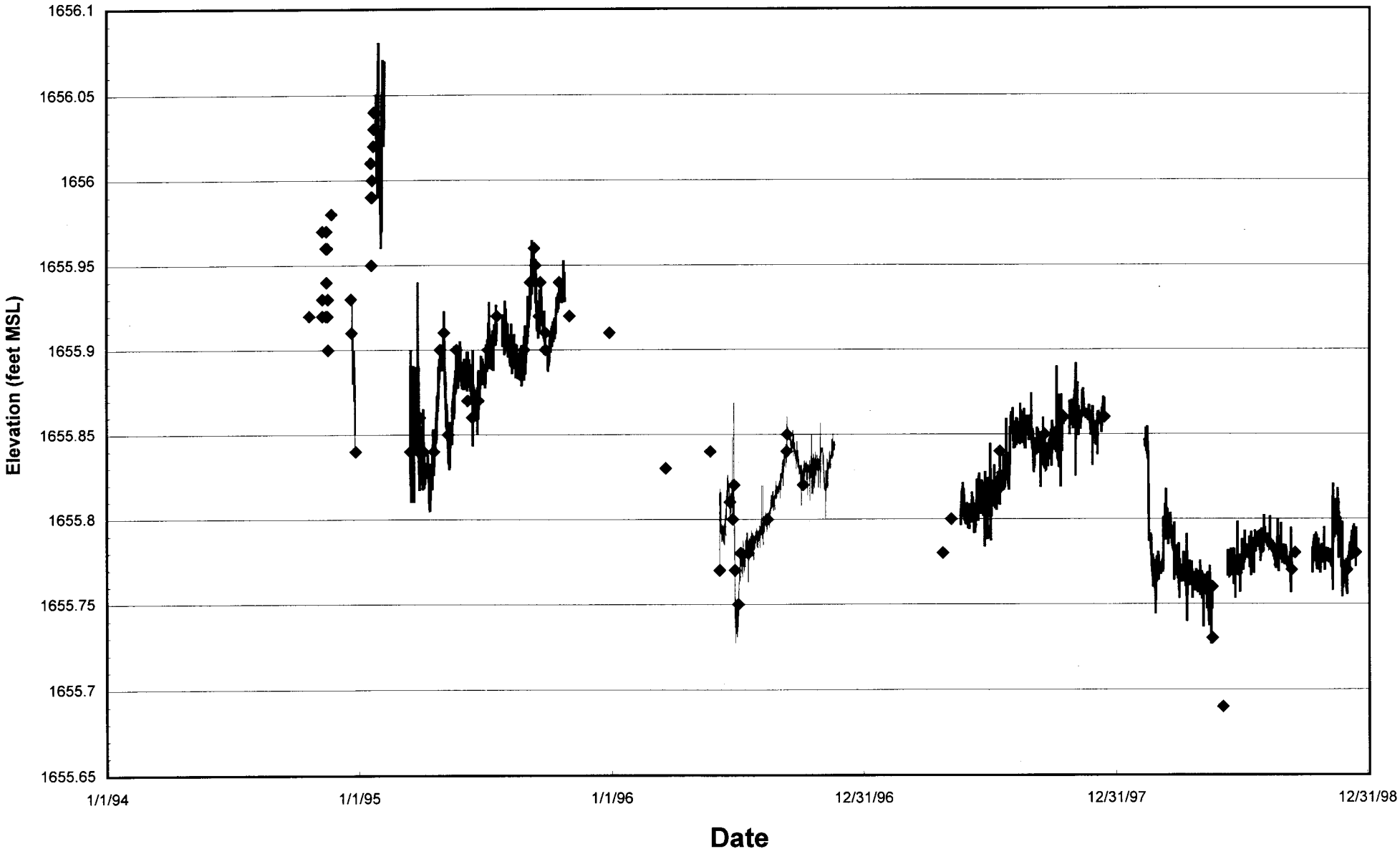
Source: SDDENR



Fairchild Fen Water Table Well

Hand Readings

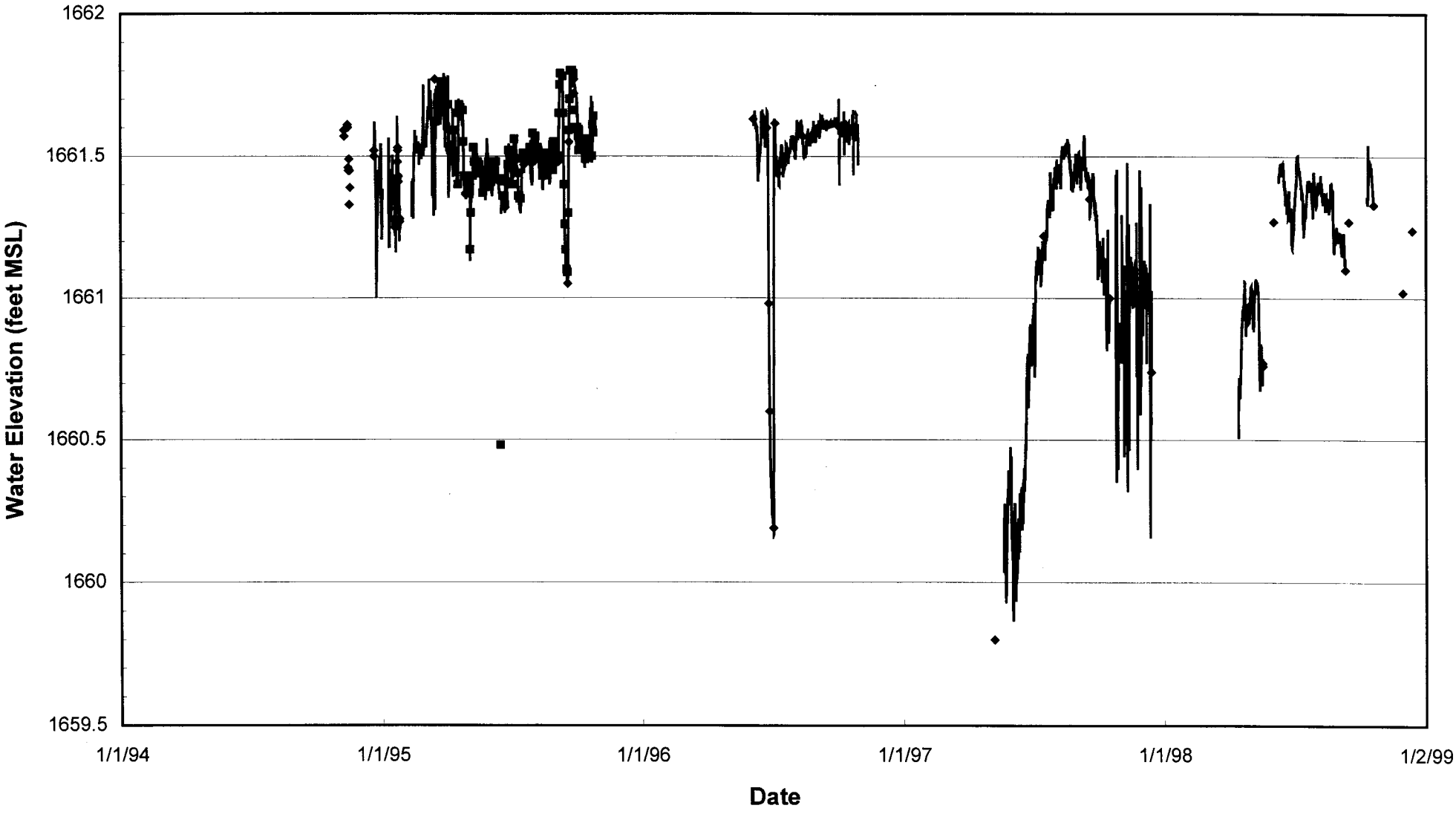
Source: MDNR



Fairchild Fen Deep Well

Hand Readings

Source: MDNR



Appendix C

BURR AREA SEISMIC REFLECTION SURVEYS
YELLOW MEDICINE AND LINCOLN COUNTIES, MINNESOTA
DEUEL COUNTY, SOUTH DAKOTA

By Todd Petersen and Jim Berg

Minnesota DNR Waters

March, 1999

BURR AREA SEISMIC REFLECTION SURVEYS

By Todd Petersen and Jim Berg

March, 1999

SUMMARY AND CONCLUSIONS

Most of the seismic lines in the Burr Area have series of high reflectivity zones separated by quieter zones. These high reflectivity series correlate with interbedded sands and/or sand/clay interfaces. This correlation can be used to create a seismic stratigraphy to look for potential aquifer materials.

The Prairie Coteau aquifer can be traced on many, but not all of the seismic lines. The Prairie Coteau aquifer is found on lines DEUB, YELF, YELH, YELJ, YELK, and YELL (Figure 1). Lines YELA, YELD, and YELE have strong guided waves that obscure any potential Prairie Coteau reflections. Line LINA does not have any Prairie Coteau reflections. Lines DEUC, DEUD, and LINB have very poor data quality overall. The other three lines YELC, YELG, and YELI show poor shallow data quality.

Middle and deeper Quaternary reflections, which may be separated from the Prairie Coteau aquifer are seen on some lines. Seismic lines YELA, YELD, and YELE have strong reflection events from the lower Quaternary (Figure 2). The reflections on YELA and YELE probably correlate with Berg's (1997) units 4B, 5, and BQ. The reflections on YELD probably correlate with units 5 and BQ. Based on their seismic signatures, lines YELA and YELE may be the most promising areas for test drilling for lower Quaternary sands.

Other lines also show significant reflectivity in the Quaternary section. YELH has a strong reflection from approximately 1400 feet NGVD (National Geodetic Vertical Datum). YELK has two series of reflections: one might be associated with unit 4 (1350 – 1450') and a second may be associated with the BQ (Altamont) (1200 – 1300'). The adjacent test hole (87-7) contained approximately 20 feet of sand at the upper boundary of units 4a and 4b and about 40 feet of sand in the upper BQ. The strong reflectivity sequence associated with unit 4 might imply more sand than is actually present.

Line YELL has a reflection pattern very similar to YELK, implying that we might expect a similar stratigraphic sequence in the lower Quaternary.

Line YELC has a good reflector at about 1265 feet, which may be from a sand unit in the BQ section. It also has other reflections from the Quaternary, but they are more widely separated than those found on other seismic lines. The general absence of sand in test hole 87-8 may explain this different pattern.

INTRODUCTION

Seventeen seismic lines were made in Yellow Medicine and Lincoln Counties, Minnesota and Deuel County, South Dakota near the Burr Well Field during the 1998 field season. The objective of the surveys was to better define the Quaternary stratigraphy and to explore for a sand aquifer that is deeper than and not connected to the Prairie Coteau aquifer.

One of the first lines collected was a downhole hydrophone survey, which was used to determine time-depth relationships for this area. The deepest well in the area (approximately 440 feet) was surveyed. This survey provides direct velocity and time-depth information for all of the other seismic lines, which were gathered entirely on the surface.

Nine of the remaining sixteen lines were collected as walkaway surveys. The remaining seven lines were collected as CDP reflection lines.

A walkaway survey is the first step in collecting seismic reflection data in a new area. A string of geophones is laid out on the ground at a close spacing. (For the depths of interest in this area the geophones were placed between two feet and one meter apart.) The seismic source, usually a

sledgehammer or accelerated wave drop (AWD), a two hundred pound hydraulically driven hammer, is placed one geophone distance off of the end of the geophone spread. The first shot is collected at that point. Next the source is walked away from the geophone spread at intervals equal to the length of the geophone spread. For example, if 48 geophones are placed 1 meter apart, the source is walked away in 48-meter increments. All of the data from the various source positions can be plotted together as a group of traces with increasing shot-geophone distance.

The walkaway survey allows for geometrical separation of the data into various wave types. With the walkaway survey, it is possible to discriminate reflections from refractions, surface waves, and the air wave. One can also make an estimate of the depth to a reflector and the average velocity from the surface to that reflector. But, these estimates are much less accurate than downhole surveys.

The walkaway survey also is used to determine the near and far offset distances and geophone spacings for subsequent CDP surveys in the same area.

The seven CDP reflection lines were made with specifications determined by the walkaway surveys. The near and far shot to geophone offset distances were 160 and 390 feet, with a geophone spacing of 10 feet. This focussed the data collection on the depths of interest, between 200 and 1000 feet. A series of shot gathers were collected along the line. These seismic traces are then regathered into common depth or mid point (CDP) gathers. A CDP gather includes all of the shot receiver pairs that have a common depth or mid point. Because all of the traces in a CDP gather represent different versions of the same depth point, they can be stacked (summed together) to improve the signal to noise ratio.

Fourteen of the seismic lines produced good results; three had a very poor signal to noise ratio (S/N) and were very hard to interpret. The main problem with these three lines was poor near surface conditions and extreme wind noise.

RESULTS

Figure 3 is a location map of all of the seismic data collected for this survey. It also contains relevant well locations. Four lines were collected in Deuel County, South Dakota and thirteen lines were collected in Minnesota: eleven in Yellow Medicine County and two in Lincoln County. Table 1 lists the line locations and type of survey: downhole, walkaway, or reflection. Figures 4 through 7 contain portions of the Canby 7.5 minute quad with line locations marked on them.

TABLE 1: SEISMIC LINE LOCATIONS AND SURVEY TYPE

SEISMIC LINE	TOWNSHIP	RANGE	SECTION	QUARTER	TYPE	COMMENTS
DEUA	114N	47W	3	C	DOWNHOLE	Hammer
DEUB	114N	47W	3	C	WALKAWAY	Hammer
DEUC	114N	47W	32	AA	WALKAWAY	Hammer Not interpreted due to poor quality
DEUD	114N	47W	32	AA	WALKAWAY	AWD Not interpreted due to poor quality
LINA	113N	46W	6	BB	WALKAWAY	Hammer & Kinepak
LINB	113N	46W	3	A	REFLECTION	Hammer and Kinepak Not interpreted due to poor quality
YELA	114N	46W	6		WALKAWAY	Hammer &Kinepak
YELC	114N	46W	34	A	WALKAWAY	Hammer & Kinepak
YELD	114N	46W	6	D	REFLECTION	Hammer
YELE	114N	46W	6	A	REFLECTION	Hammer & Kinepak
YELF	114N	46W	17	B	REFLECTION	Hammer

YELG	114N	46W	20	B	REFLECTION	Hammer & Kinepak
YELH	114N	46W	28	AAA	REFLECTION	Hammer & Kinepak
YELI	114N	46W	28	DAA	REFLECTION	Hammer & Kinepak
YELJ	114N	46W	28	C	WALKAWAY	Hammer
YELK	114N	46W	28	C	WALKAWAY	AWD
YELL	114N	46W	35	C	WALKAWAY	AWD

DEUA

Seismic line DEUA is a downhole hydrophone survey down well R2-96-02. A hammer and plate provided the seismic source. The first arrivals were picked for the hydrophones downhole. This provided a function showing depth vs. one-way time. In order to best use this data for comparison with seismic reflection data, the function was converted to elevation versus two-way time. With a reference (or datum) elevation of 1670 feet NGVD. This datum was chosen because all of the seismic reflection lines were corrected to that elevation.

This corrected time function for well R2-96-02 is shown in figure 8. This function is the best reference we have for time to elevation correlation in the Burr area, and is used to estimate depth for all of the seismic lines we collected there.

The velocity function is not 100 % accurate for all of the seismic lines, because sand and clay velocities are different, and the thickness of sand units varies from place to place. But, it provides a very good estimate of the elevation of a given reflector.

DEUB

Figure 9 contains the CDP stack from line DEUB (a walkaway survey). They have been corrected for normal moveout (NMO). The Prairie Coteau aquifer is seen as the series of reflections between 50 and 80 ms. (between 1450 and 1550 ft elevation). There are also strong reflections just below the Prairie Coteau aquifer (between 80 and 100 ms). These reflections are near the unit 4/ unit 5 boundary of Berg (1997). The reflection at 160 ms. is probably from about 1200 feet elevation. It may be the top of Cretaceous. The reflection from 195 ms is probably from the top of Precambrian. Because the top of Cretaceous and the Cretaceous material velocity are both poorly known, the depth to the Precambrian is not known.

Figure 10 is a CDP stack from line DEUB, produced with a fictitious geometry. Here it is assumed that 144 geophones were laid out every 1 meter in a row and the sledgehammer source was offset one meter from the nearest geophone. This is very similar to Figure 3, but the geometric relationships between shallow and deep reflections are easier to see. The same reflections can be seen in both displays, but the lateral continuity and the deepest reflection (> 250 ms.) are much easier to see in figure 4 than in figure 3.

YELA

Figure 11 shows walkaway survey YELA. The 80 to 100 ms window where the Prairie Coteau aquifer might be present is obscured by guided waves. But, there is a good set of reflections between 130 and 170 ms. (t0 = 100 to 140 ms.). These reflections come from between 1265 and 1400 feet elevation. They are probably associated with lower Quaternary sands, perhaps the units 5and BQ in Berg (1997). There is a strong reflector at 240 ms, which is probably from the top of Precambrian. If the Cretaceous velocity is approximately 8000 ft/sec, then the top of Precambrian is probably at about 960 feet elevation.

Figure 12 is an NMO corrected version of line YELA, where the data has been corrected to zero offset times.

YELC

Figure 13 shows walkaway test YELC. Figure 12 is an NMO corrected version of YELC. Seismic line YELC is located next to borehole 87-8. The strong event at 140 ms. is probably from the Quaternary/Cretaceous boundary. There are a few reflectors in the Quaternary section, but they are fairly widely spaced. They may represent till boundaries. There is very little sand in this borehole.

YELD

Figure 15 is a collection of shot gathers from seismic line YELD. Figure 16 is a CDP stack of the same line. In the shot gather display (figure 9) there are strong doublets at 100 and 140 ms. These events are both seen on the stacked section, but the separation of doublet events is less clear on the CDP stack. These two events are probably from about 1390 and 1270 feet elevation, respectively, which makes them from unit 4, 5 or BQ (Berg, 1997). The deepest reflection is at approximately 155 ms. or 1210 feet. This may be the top of Cretaceous.

YELE

Figure 17 and Figure 18 are the shot gathers and stacked section for line YELE. The shallow Prairie Coteau section is obscured by refractions and guided waves. There is a strong band of reflections between 110 and 150 ms. These reflections are associated with lower Quaternary sediments and perhaps, the top of Cretaceous. Corresponding elevations are between 1360 and 1265 feet. A strong top of Precambrian event is seen at 230 ms.

YELF

Figures 19 and 20 contain some shot gathers and the CDP stack for line YELF, respectively. There are strong reflections in the upper Quaternary at approximately 1445 and 1490 feet NGVD. There is also a reflection from about 1280 feet and 1230 feet NGVD. The 1230 foot reflection is probably the top of Cretaceous.

There are also strong reflections at 205, 215, 250 and 295 ms. The 205 and 215 ms. reflections may be from Cretaceous horizons. The deeper reflections are probably from the Precambrian. Their depth is unknown, because the Cretaceous velocities have not been measured.

YELG

Line YELG has generally poorer quality than most of the other seismic lines. There are some reflections from the lower Quaternary section between 1250 and 1330 feet NGVD. This suggests the presence of some sand and gravel in this interval. (See figures 21 and 22.)

YELH

Seismic line YELH has much better quality than line YELG. There are two versions, one that was shot with a sledgehammer and one that was shot with Kinepak. Shot gathers for line YELH are shown in figures 23 and 24. CDP stack sections are shown in figures 25 and 26. Figures 23 and 25 are hammer data, while figures 24 and 26 are Kinepak data.

There are a significant number of reflections in the upper Quaternary between 60 and 90 ms (~1530 to 1430 feet NGVD). These reflections fall in and below the Prairie Coteau aquifer zone.

A strong reflection is present at about 100 ms. (1400 ft. NGVD). This is probably somewhere in unit 4 from Berg (1997). The strong event at 215 ms. is probably the top of Precambrian. I am not sure of its true origin. The deepest reflections, between 240 and 290 ms., are probably from within the Precambrian section.

The Kinepak data have higher frequency and higher amplitudes than the hammer data. Because the Kinepak source was buried five feet below land surface, the reflected energy arrives a little sooner than the hammer data does. For example, the 100 ms. reflection on figure 24 correlates with the reflection at 110 ms. on figure 23.

YELI

Figure 27 contains shot gathers from line YELI. The S/N of reflections in the data is very poor. (There are strong first arrivals, guided waves and surface waves, but poor reflection data.) Shot point 85 has the best data. There are reflections at 120, 150 and 220 ms. The 120 ms reflection is probably from around 1330 feet NGVD. The 150 ms reflection is from approximately 1225 feet NGVD (near the top of Cretaceous). The reflection at 215 ms may be the top of Precambrian.

Shot gather 100 has a nice reflection from about 85 ms, or approximately 1445 feet NGVD. This is in the unit 4 region of Berg (1997).

Figure 28 is a CDP stack of line YELI. It shows the same data as in figure 25.

YELJ

Figure 29 contains a walkaway survey (line YELJ) done over boring 87-7. Figures 30 and 31 show walkaway survey YELK. Surveys YELJ and YELK were made using exactly the same source and geophone locations. The only difference is that the seismic source for YELJ is the sledgehammer and the source for YELK is the AWD. Both lines are very good, but the AWD section (YELK) is slightly cleaner because there is a stronger signal.

Figure 30 is an uncorrected walkaway survey; figure 31 has NMO correction applied and the refractions, air wave and surface waves muted out. The reflection events between 50 and 65 ms are from reflectors between 1510 and 1560 ft NGVD. These are probably related to the Prairie Coteau aquifer. There is a second set of strong reflections between 85 and 120 ms that are probably from reflections between 1350 ad 1460 feet NGVD. These are probably reflections from sand or sand/clay horizons in unit 4 of Berg (1997). The strong reflections between 120 and 160 ms., lie between 1200 and 1300 feet NGVD. They are probably associated with the Altamont aquifer. In borehole 87-7, approximately 40 feet of sub-quaternary sand sits on top of lake clay.

YELL

Walkaway survey YELL is shown in figure 32. The air wave, surface waves, and refraction data have all been muted. There are a number of strong reflection packages on this line. There are two shallow reflections at 60 and 80 ms. (~1530 and 1460 feet NGVD). These are probably associated with the Prairie Coteau aquifer.

A stronger set of reflections exist between 100 and 150 ms. This is about 1400 to 1230 feet NGVD. This is associated with units 4, 5 and BQ. The strong reflection at 150 ms. (1230 feet NGVD) may correspond to the top of Cretaceous. Not having a well at this location, we don't know for sure.

LINA

Walkaway survey LINA is shown in figure 33. It was shot next to borehole 41-1. There are very few reflections in the upper portion of the Quaternary (above 1400 feet). In the lower Quaternary there is a nice package of reflections between 100 and 150 ms. (approximately 1235 to 1400 feet NGVD). The strongest reflections are at 100 and 130 ms. (approximately 1400 and 1300 feet NGVD, respectively). The top reflector in this sequence is in the middle of unit 4B, the bottom reflector is at the unit 5 / BQ boundary.

There is also a strong reflection at approximately 270 ms. This may be from the top of the Precambrian section. There are a number of interbedded sands and clays in the lower Quaternary section in test hole 41-1. These correlate reasonably well with the reflections on line LINA. But the data quality is too poor to see one-to-one correlations of the sand-clay interfaces to the reflections.

Figure 34 shows LINA after mute and NMO correction. The same events are visible both before and after NMO. Figure 35 is also LINA, but with a different seismic source. This data was gathered with Kinepak high explosive. The strong reflection at 100 ms. is probably correlative with the reflector at 105 ms. on the sledgehammer data. This is due to the Kinepak charge being buried five feet below land surface. Because of this the downgoing seismic energy does not have to travel in the extremely slow near-surface material. Thus, it arrives faster than the equivalent hammer data, where the downgoing seismic energy must travel through the slow surface layer.

The Kinepak data is much cleaner. This is due to the large increase in S/N because of the larger shot energy.

REFERENCES

Berg, Jim, 1997, Southwestern Minnesota Ground Water Exploration Project 1996-1997, Progress Report.

LIST OF FIGURES

1. Seismic lines with prominent Prairie Coteau aquifer reflections.
2. Seismic lines with strong events in the lower Quaternary section.
3. Map showing seismic line locations.
4. Burr Well Field Area/Canby NW Quad – Seismic Line Locations.
5. Sioux Nation WMA Area/Canby NW Quad – Seismic Line Locations.
6. Lazarus Creek Area/Canby NW Quad – Seismic Line Locations.
7. Canby Creek Area/Canby NW Quad – Seismic Line Locations.
8. Time-depth function for well R2-96-02. (Downhole seismic line DEUA.)
9. Seismic line DEUB – CDP stack.
10. Seismic line DEUB – CDP stack using fictitious geometry (assuming constant source location with geophones moved away from the source).
11. Seismic line YELA walkaway survey
12. Seismic line YELA corrected for NMO.
13. Seismic line YELC walkaway survey.
14. Seismic line YELC corrected for NMO.
15. Line YELD – shot gathers.
16. Line YELD – CDP stack.

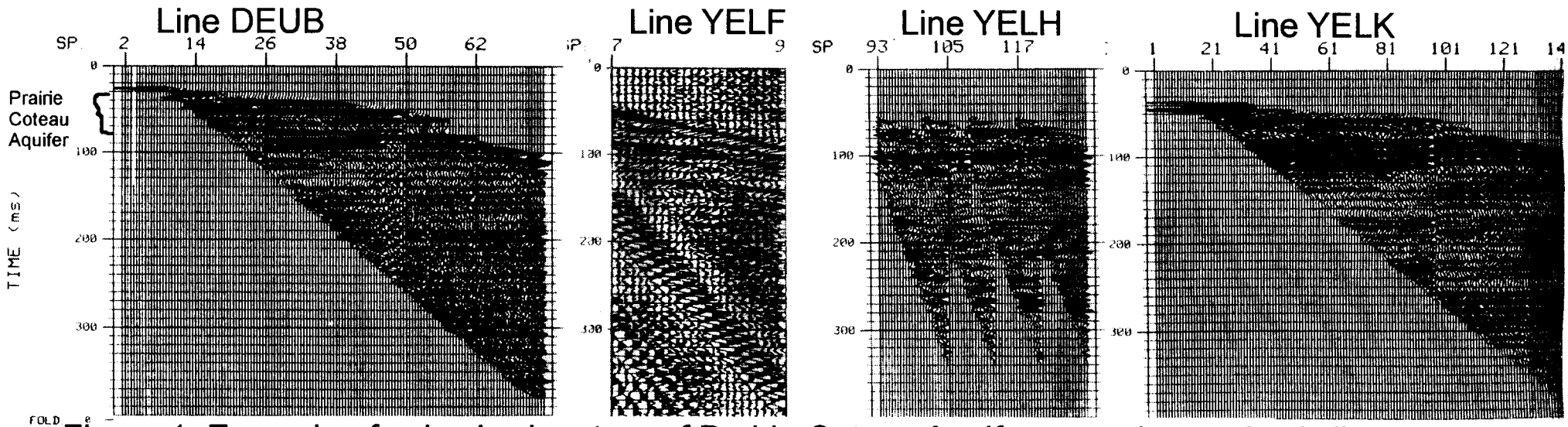


Figure 1: Example of seismic signature of Prairie Coteau Aquifer on various seismic lines.

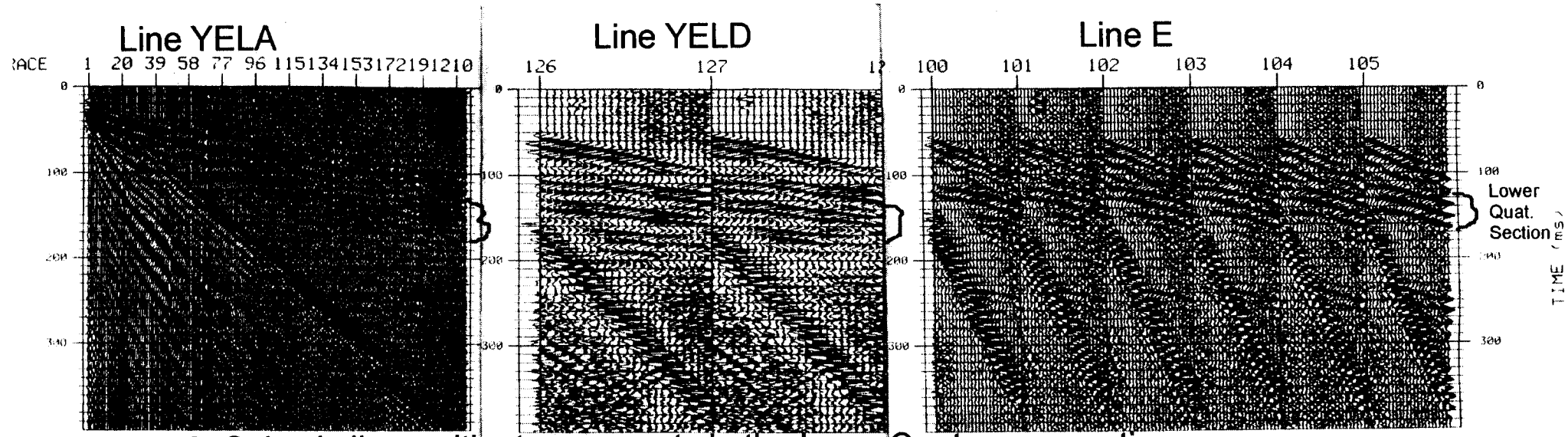
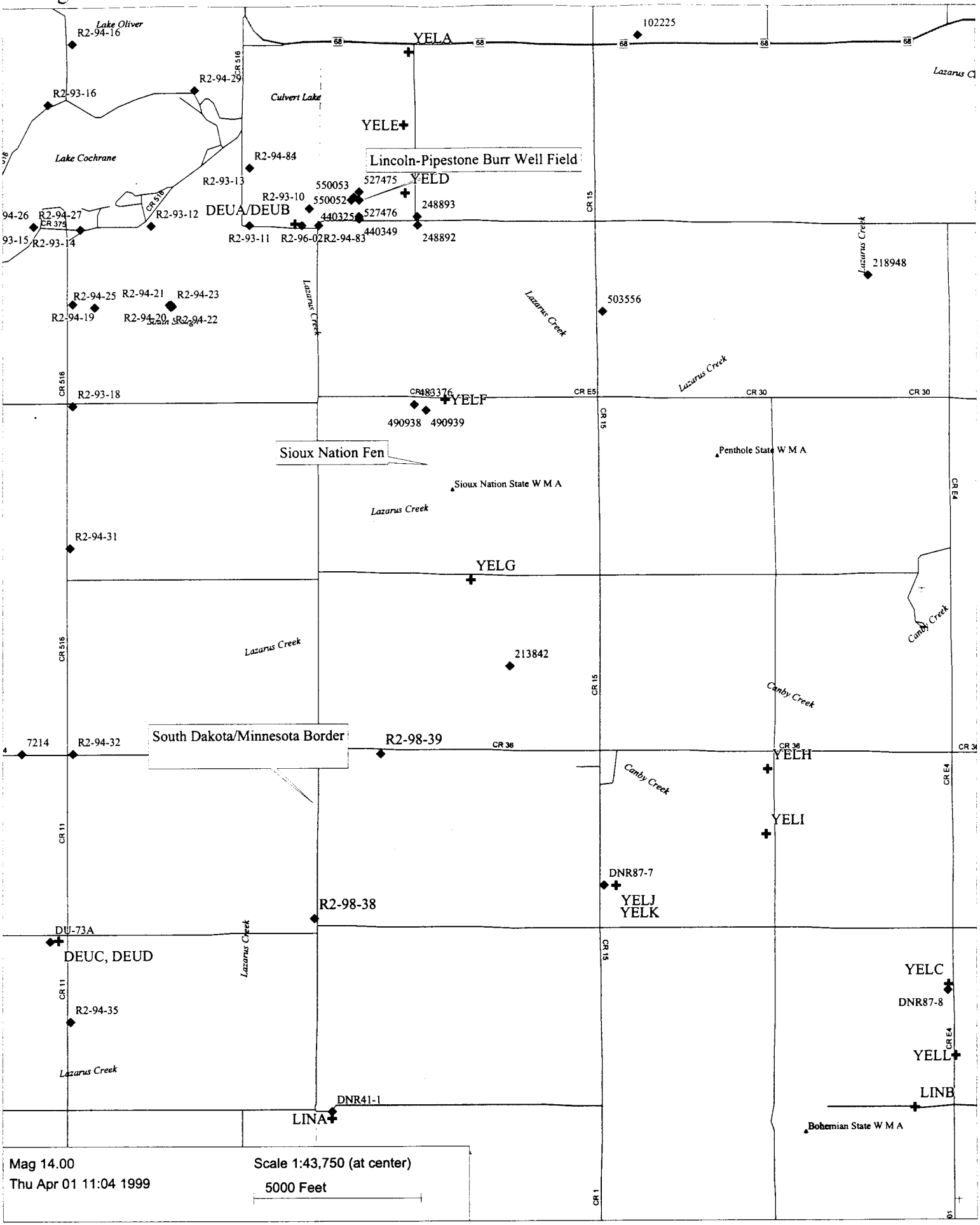


Figure 2: Seismic lines with strong events in the lower Quaternary section

Figure 3 - Burr Well Field/ Lake Cochrane Area Test Hole, Well and Seismic Locations



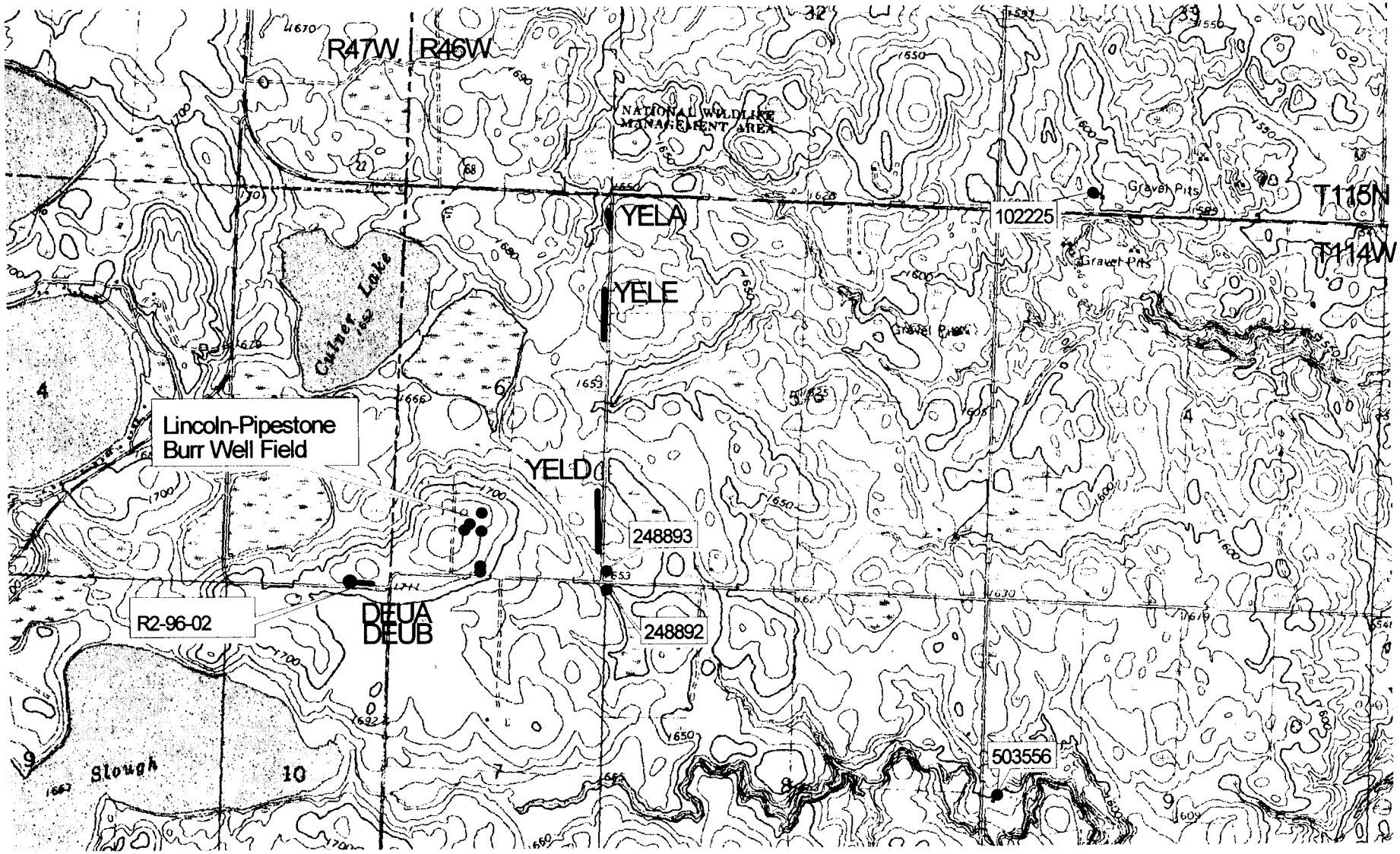


Figure 4
Burr Well Field Area/Canby NW Quad
Seismic Line Locations (1998)

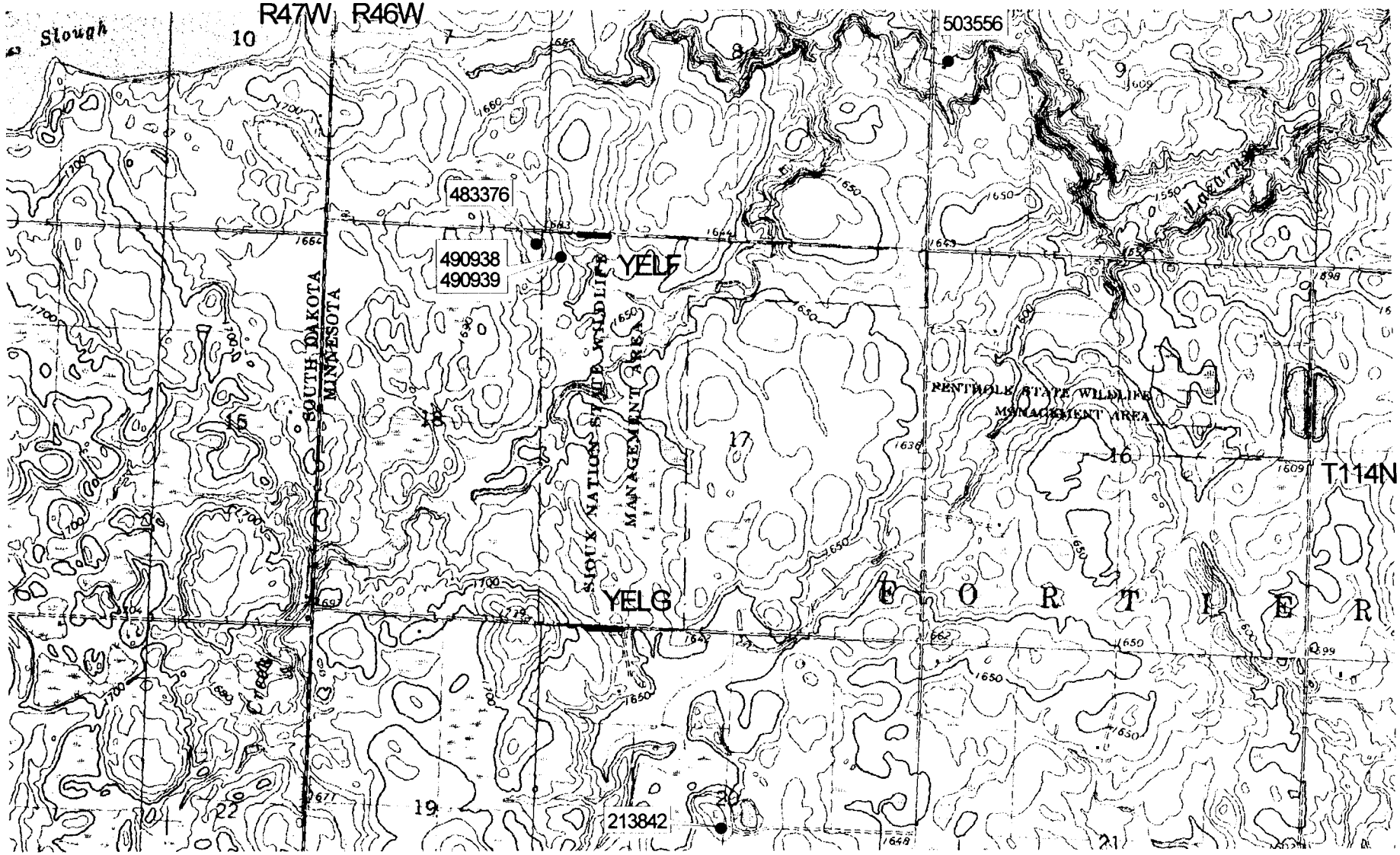


Figure 5
Sioux Nation WMA Area/Canby NW Quad
Seismic Line Locations (1998)

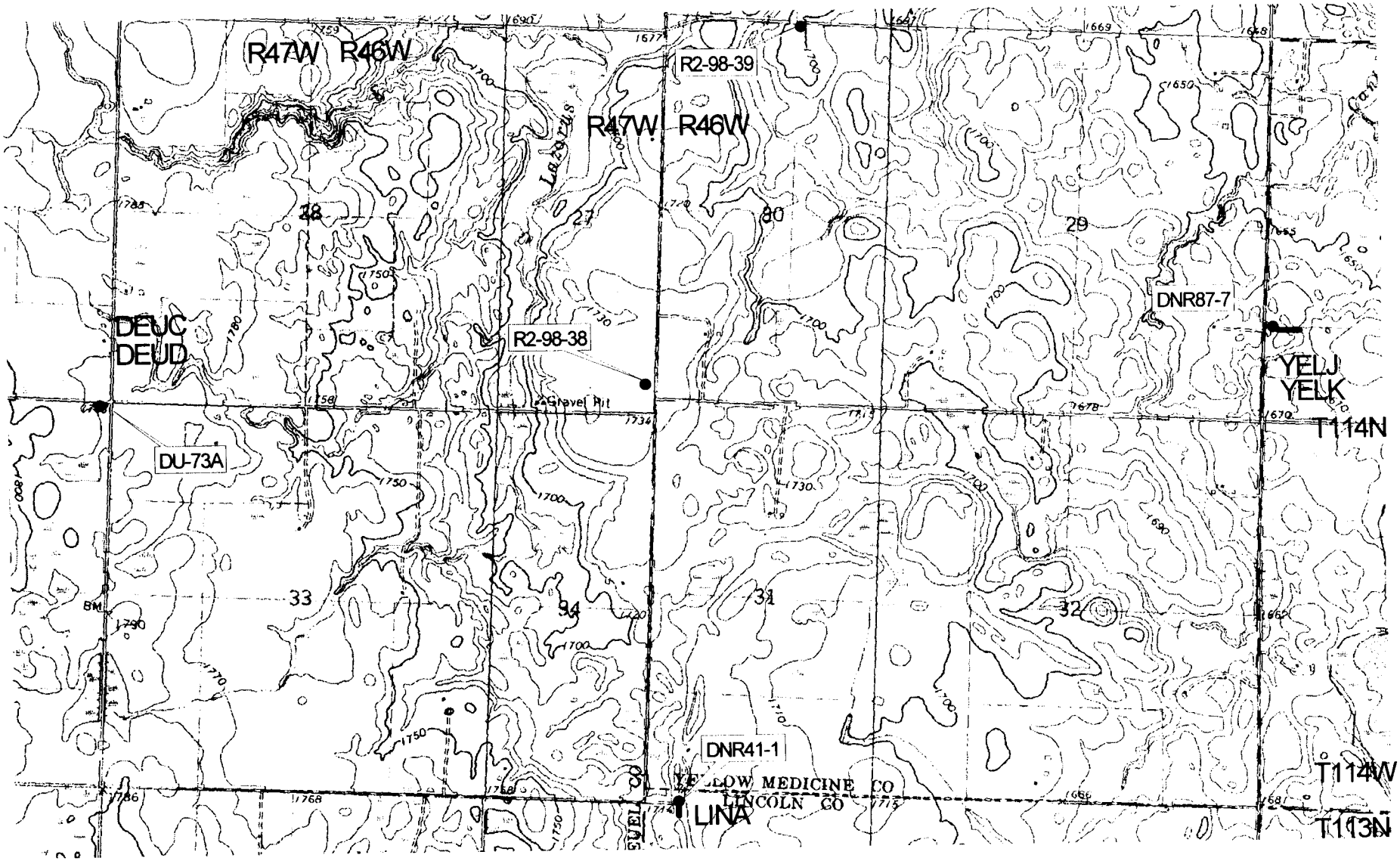


Figure 6
Lazarus Creek Area/Canby NW Quad
Seismic Line Locations (1998)

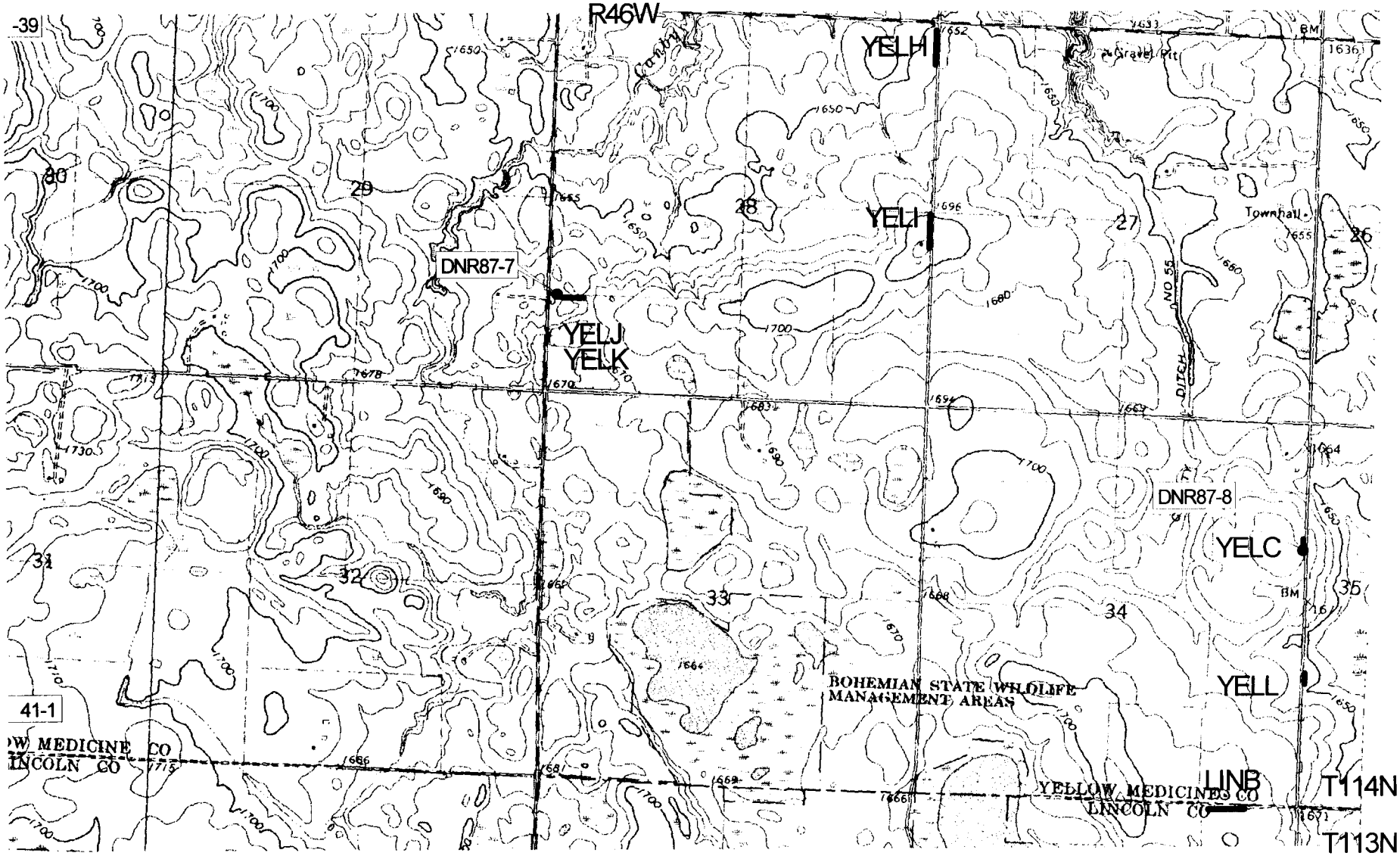


Figure 7
Canby Creek Area/Canby NW Quad
Seismic Line Locations (1998)

Minnesota Department of Natural Resources

500 Lafayette Road
St. Paul, Minnesota 55155-40__

February 26, 1999

Mr. Joe Weber, Chairman
Lincoln Pipestone Rural Water
East Highway 14, Box 188
Lake Benton, MN 56149

Dear Mr. Weber:

REPORT OF BURR WELL FIELD MONITORING THROUGH 1998

We have been working on the compilation of monitoring data for the Burr Well Field over the last few months. Enclosed is a memorandum that includes the results of this effort.

We are concerned that existing calcareous fen protection thresholds may not be adequate and need to be revised. We would like to meet with Lincoln Pipestone to discuss fen impacts and recommendations for monitoring and fen management.

Sincerely.
DNR Waters

John Linc Stine, Administrator
Permits and Land Use Section

enclosure

cc: Mark Plank, Rural Utility Service
Jim Maras, Rural Development
John Madden, DGR
David Watson

Interoffice Memo

February 19, 1999

To: John Stine

From: Dr. Jeanette H. Leete, Jay R. Frischman

Through: Brian Rongitsch

Subject: Report of Burr Well Field Monitoring through 1998

The Technical Analysis workgroup of the Ground Water Unit recently processed and calibrated data collected to monitor impacts of pumping at the Burr Well Field.

Brief Background

There is concern about the impact of the well field pumping on nearby calcareous fens including Cleveland, Fairchild, Fortier and Sioux Nation fens. Calcareous fens are wetlands which accumulate peat (peat is a soil formed from partially decomposed plant remains that are amassed over many hundreds of years) and which are always wet, but never (or extremely rarely) flooded, with persistent upwelling of calcium-bearing, oxygen poor ground water. The presence of a calcareous fen indicates that upwelling conditions are persistent, with ground water discharge always in excess over evapotranspiration and precipitation. Calcareous fens frequently harbor a number of endangered or threatened plant species that thrive in the harsh calcareous fen environment.

If water levels in the aquifer are on the decline, the sustainability of these resources is in doubt. For discharge into the fen to occur at all, heads in the aquifer must remain above the ground surface. Any declines in the head gradient will cause proportionate decreases in discharge into the fen*. Many aspects of calcareous fen hydrology are poorly understood, but what is known for certain is that the system is dependent upon constant upwelling of ground water and that upward gradients sufficient to supply the water needed for evaporation, plant transpiration, and overflow must be maintained. Ground water discharge must be so dominant that the water chemistry of the precipitation does not impact the water chemistry of the fen. If the water balance in a fen were to shift toward significant precipitation inputs, then the nature of the peat

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* Ground water flow (Q) is proportional to Hydraulic Conductivity (K), Head Gradient (I) and Area (A) through which flow occurs. Q=KIA.

would change, leading to less hospitable conditions for the rarer plants of the sedge mat and a more welcoming situation for shrubs, reed, and cattail. Increased numbers of plants of these invading species have been noted in other areas where fens are impacted by land use or hydrology changes.

Monitoring History

Data collection began in 1991. An existing observation well (OW-3-90) completed in the Prairie Coteau aquifer (PC) at the Burr Well Field (Figure 1) was included in the monitoring program along with shallow monitoring wells which were installed by hand in the northern-most dome of the Sioux Nation Fen Wetland Complex (North Dome). The fen monitoring points at the North Dome include water table and subpeat piezometers.

Additional observation wells were drilled into the Prairie Coteau aquifer at the north boundary of the Sioux Nation WMA (Deep Steel) and within the Burr Well Field. Only the data from the well field observation well OW-1-93 (Figure 1) is discussed in this memo, but water level measurements were taken at several more observation wells, one of which is a flowing well (OW-2-90).

Fairchild fen was added to the monitoring program in 1994 (but no aquifer observation well could be added at the Fairchild site because a well at that location would be a flowing well). More details of well and piezometer construction are given in Table 1.

Well Name	*Unique Number*	*Aquifer**	*Substrate*	*Depth (ft)*	*Start of Monitoring*
OW-3-90	440349	PC	peat	170	1990
Dome 1 (WT)	547573	fen	peat	7.5	1991
USGS Dome	549730	subpeat	sand	12.9	1992
Deep Steel	490938	PC	aquifer sands	187	1991
OW-1-93	unknown	PC	aquifer sands	195	1993
Fairchild Deep	547578	subpeat	sand	19.7	1994
Fairchild WT	547577	fen	peat	2.3	1994

* PC= Prairie Coteau aquifer

Surveys to measure the elevations of the measuring points at each well and to measure the ground surface and control points within the study area have been conducted at intervals throughout the study. These surveys included elevations at the Cleveland fen and Fortier fen Wetland Complex, while species lists have been recorded for the Fairchild, Cleveland and

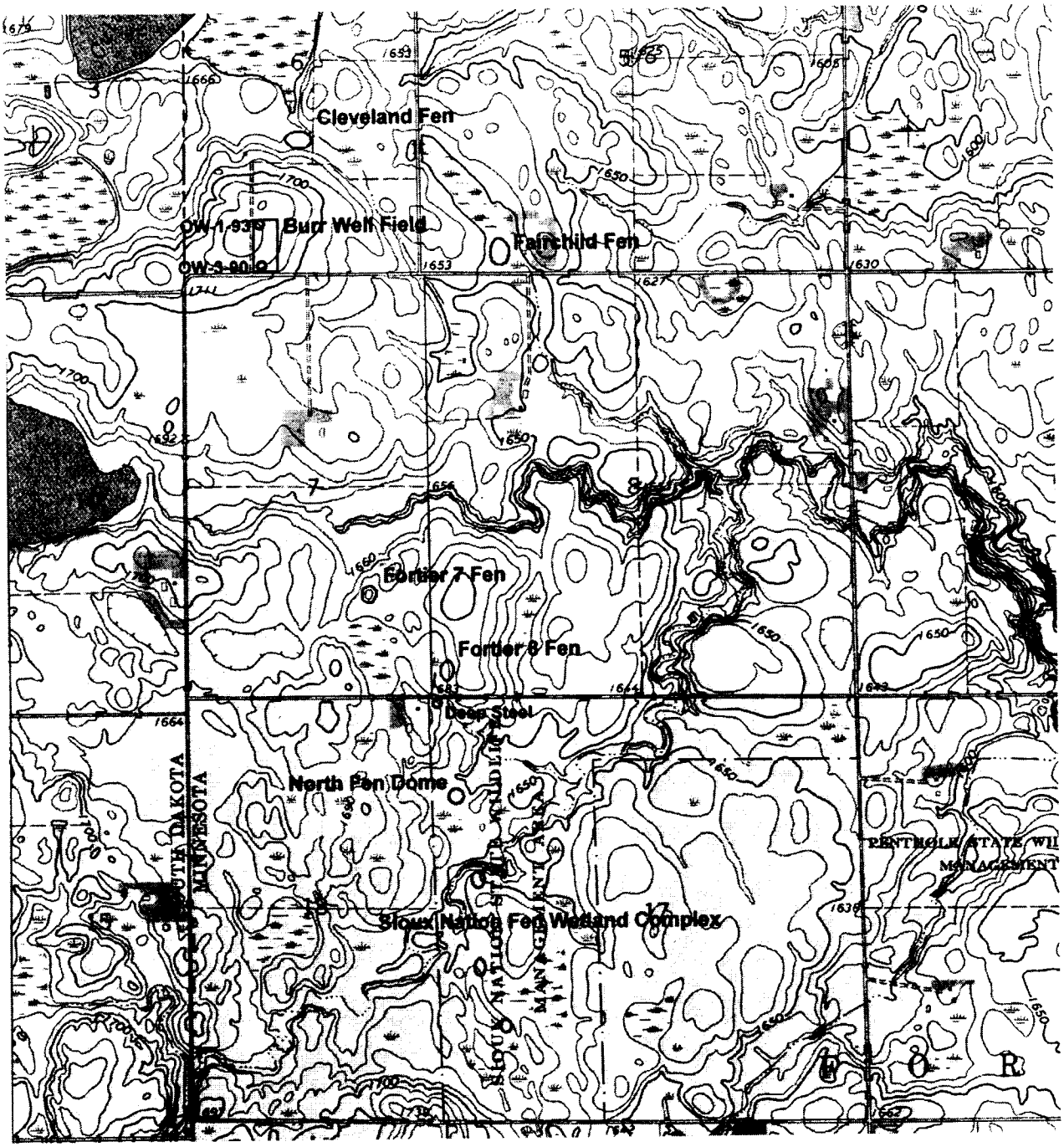


Figure 1: Map of the Study area (Yellow Medicine County T114N R46W and adjoining Deuel County South Dakota. This map does not depict all resources and features. For clarity, only those features and resources referred to in this memo are shown.)

Fortier fens. Field observations of changes in habitat have been recorded. Shrub height and density has increased while phragmites and cattail areas have expanded.

The fen hydrologist position has been unfunded since fall of 1996. These data sets had to be compiled, calibrated and interpreted during time taken from other tasks. Only now can we see the corrected data displayed in concert with recent surveys at the site.

Operation of the Well Field

After periods of trial pumping during 1993 and 1994, the well field began production in early spring 1995. Figure 2 is a record of pumping rates from the Prairie Coteau Aquifer.

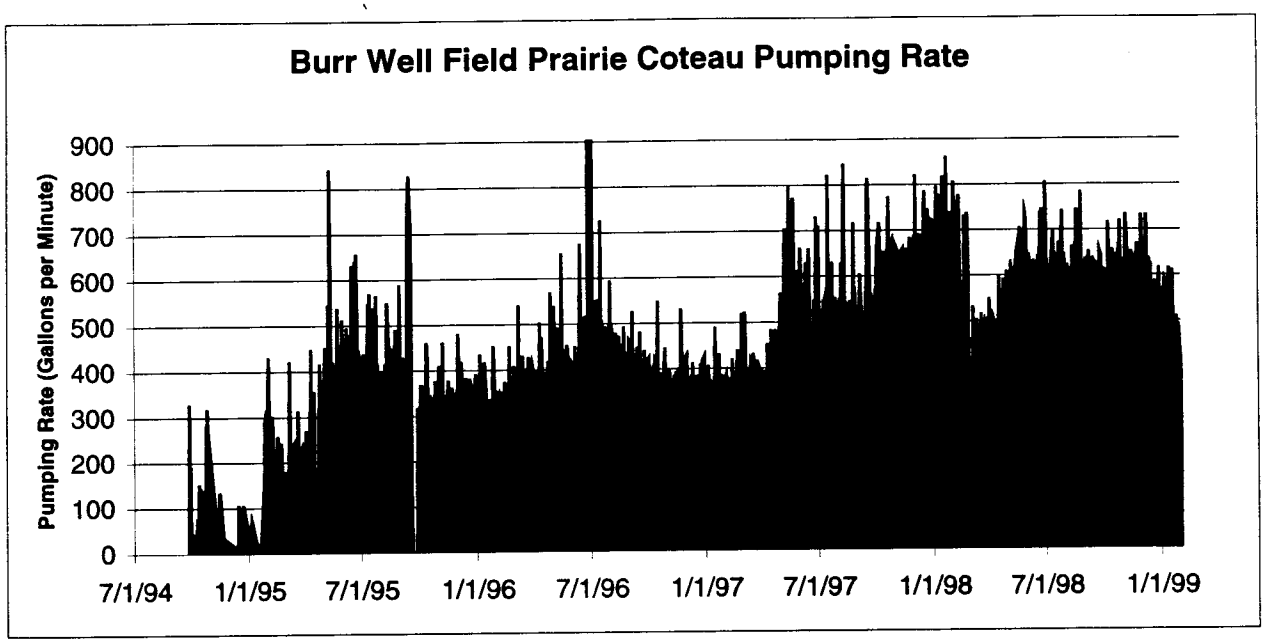


Figure 2: Summation of pumping rates from Prairie Coteau production wells PW-1, PW-2 and PW-3.

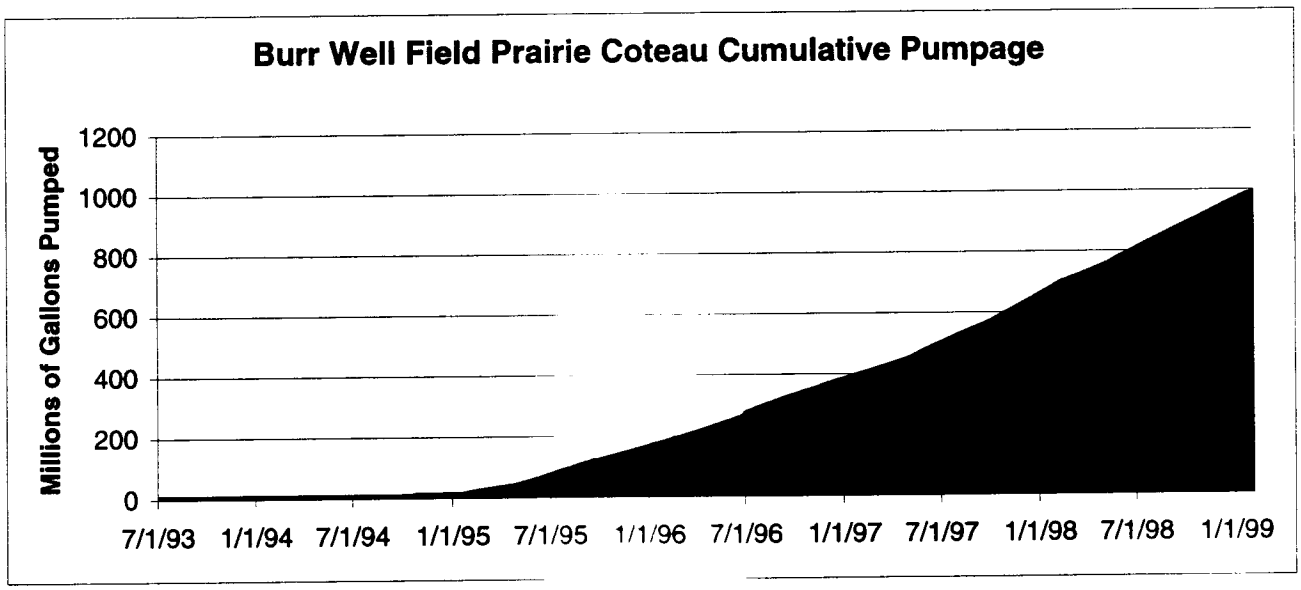


Figure 3: Cumulative volume removed from the Prairie Coteau aquifer.

Rates vary in response to both water demand and water treatment plant operations. The cumulative volume of water withdrawn is depicted in Figure 3.

Conditions in the aquifer

The Deep Steel well is currently the best Prairie Coteau aquifer monitoring point in Minnesota although it is within the cone of depression of the well field. Long range plans include the drilling of an aquifer observation well in Minnesota that is not within this cone of depression. The need for such a 'far field' observation well is clear upon inspection of the hydrograph for the Deep Steel well (Figure 4). Prior to the start of production pumping at the Burr Well Field, water levels in this observation well displayed a rising trend of 3 to 4 feet over three years (presumably in

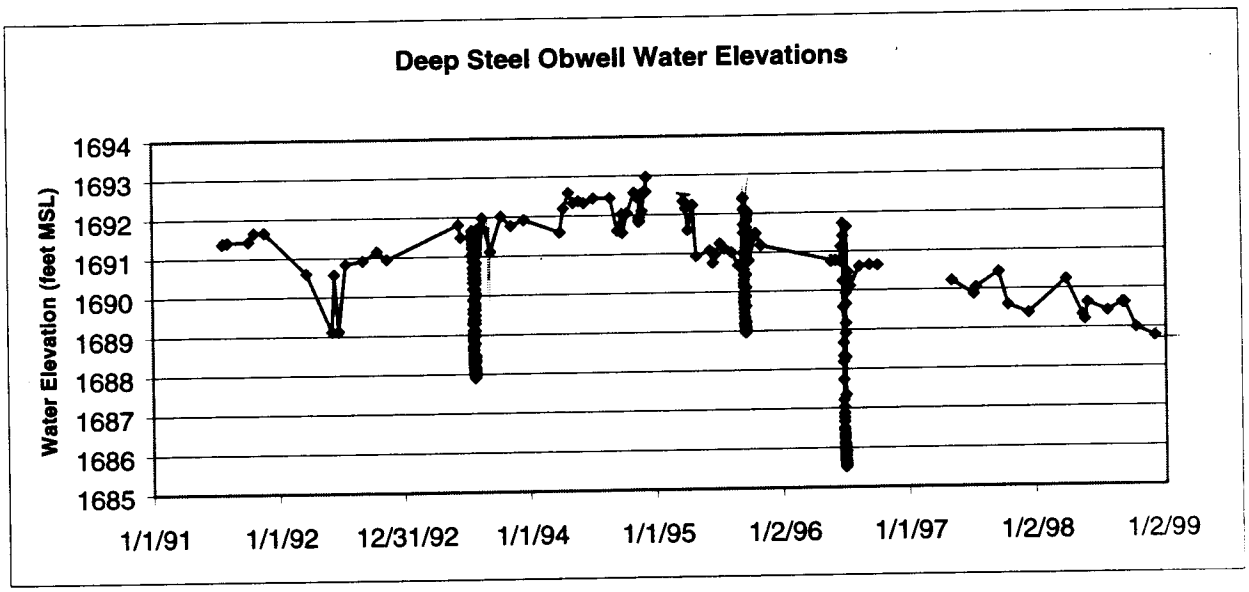


Figure 4: Water levels in the Deep Steel Observation well over the period of record.

response to recovery from drought effects). Aquifer tests explain the downward spikes in the data. Aquifer testing proved that this well is indeed within the cone of depression, and water levels in the well began an overall downward trend of four feet from 1995 to the present. Because we do not have another monitoring point in this aquifer outside of the cone of depression, we do not know if the aquifer continued to rise for a period of time\ If that has been the case, the total impact due to pumping from the Burr Well Field from 1995 through the end of 1998 could be as high as six to eight feet of water level decline.

The rate of decline at the Deep Steel well does not appear to be slowing, a fact that is cause for concern. Steadily declining water levels show that the cone of depression within the aquifer s

still growing. The potential for impact to additional surface resources also grows, as does the threat to sustainability of the use of the aquifer.

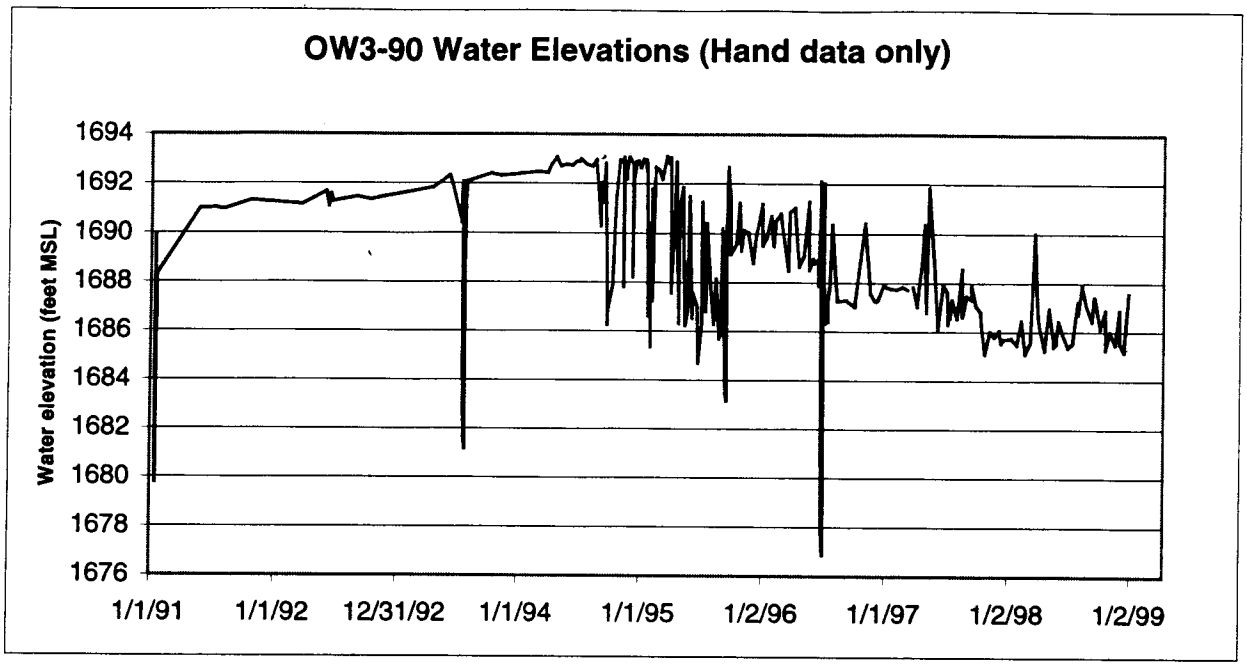


Figure 5: Hydrograph of water elevations in observation well OW3-90, south end of Burr Well field.

An inspection of the record at OW-3-90 (Figure 5) allows the same general conclusions to be drawn: there is a growing cone of depression in the supply aquifer. This well is adjacent to the pumping wells and thus the water level in the well responds quickly to pumping.

Resource Impacts

The Prairie Coteau aquifer has been determined to be the source of the ground water that sustains both ground water inflows to South Dakota's Lake Cochrane and ground water discharge to many of the region's springs, seeps, and calcareous fens.

Fortier Fen

The Deep Steel monitoring point is located just south of the Fortier fen complex. The Fortier 8 fen is a side-slope fen. The peat is mounded with three distinct discharge zones at the apex of the dome. A large population of orchids exists in this fen.

The elevation of one of the discharge zones at Fortier fen has been surveyed at 1685.16 feet above mean sea level (Figure 6). The head difference between the aquifer ground water level and the water level at the fen in late 1994 was approximately 7.8 feet, while it is now only 3.6

feet and dropping. This represents a loss of 54% of the available head and a proportionate decrease in discharge into the peat.

Pumping tests demonstrated that sustained high rate pumping at the Burr Well Field has the potential to draw aquifer levels below the discharge point at Fortier fen and cause potential impacts to the fen.

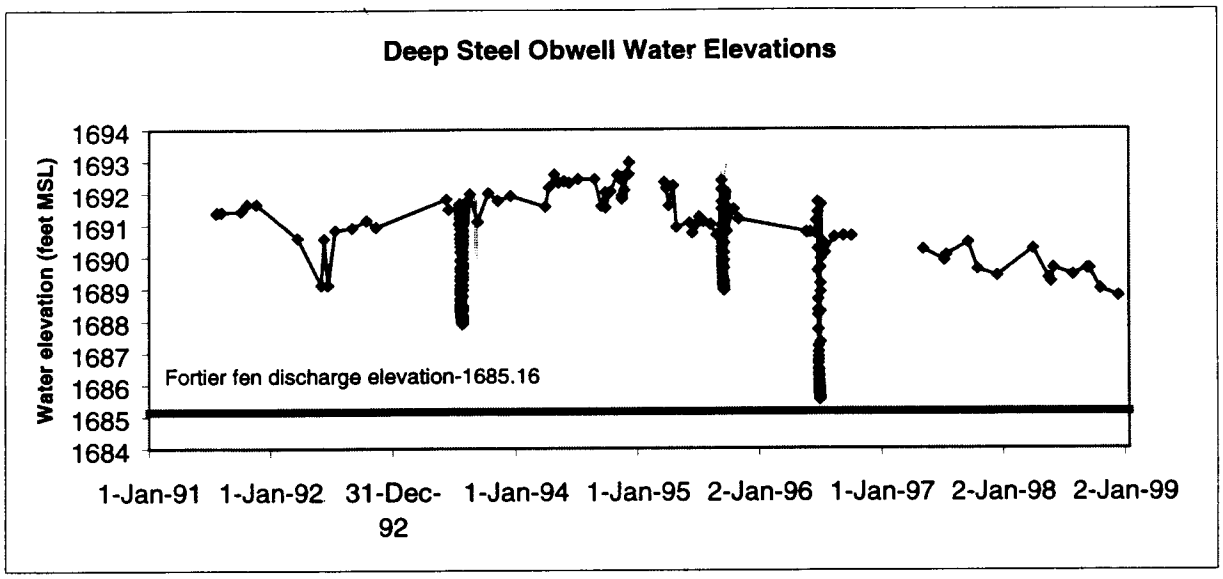


Figure 6: Water level elevation in the Deep Steel observation well relative to the discharge elevation in Fortier 8 fen.

Cleveland Fen

The Cleveland fen is a calcareous fen north of the Burr Well field. In spite of degradation due to past (and present) land use practices, this fen still provides habitat for plants that are specifically adapted to the calcareous fen environment. OW-1-93, the northern-most observation well within the Burr Well Field is between the pumping center and the fen. At the end of 1994 the available aquifer head above the discharge point was 24.9 feet, it is now only 13.8 feet, a loss of approximately 45%, which implies a proportionate decrease in discharge. Here too, it is possible to see (Figure 7) that high rates of pumping, seen here as the short term downward spikes in the hydrograph during the pumping tests, threaten to reduce heads and discharges to only 20% or less of the 1994 values.

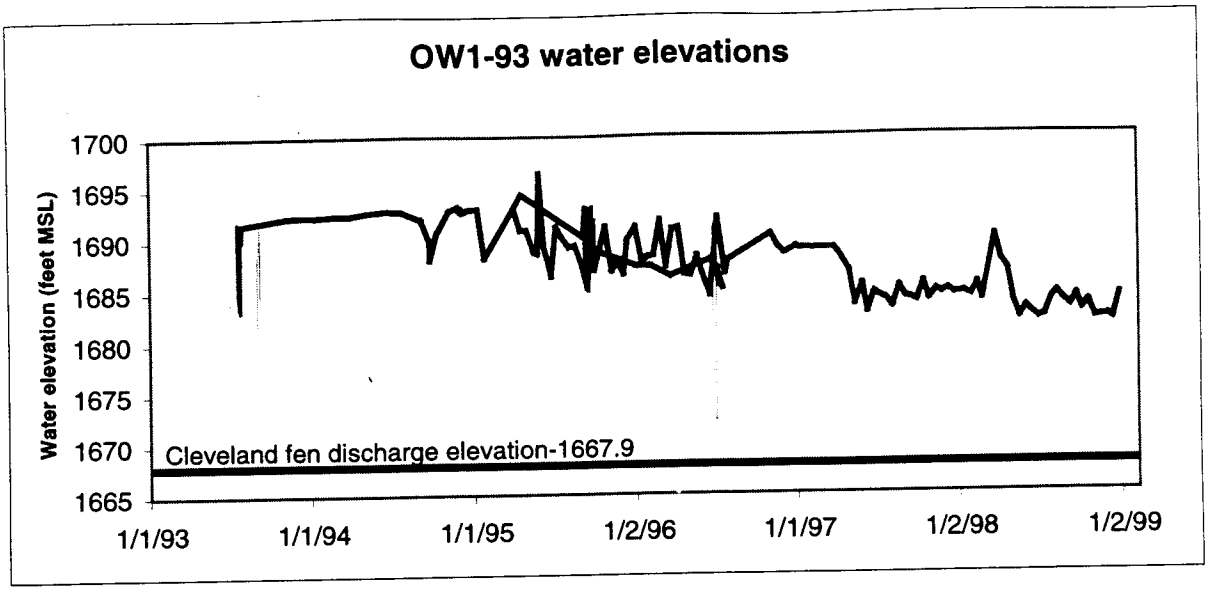


Figure 7: Water level elevations in well OW1-93 relative to the discharge elevation in Cleveland fen.

Sioux Nation Fen

The most-studied and arguably most beautiful of the region's calcareous fens is located 1.5 miles south of the Burr Well Field within the Sioux Nation Wildlife Management Area. The Deep Steel observation well is the closest Prairie Coteau aquifer level monitoring point to this fen at a distance of about 1200 feet. Aquifer tests conducted earlier in this study revealed the potential for ground water withdrawals to affect the region's wetlands and spring-fed systems. Because the potential threat to surface water and wetland resources had been recognized very early on in the planning process, protection levels (thresholds) were set at key locations. These protection levels set limits on how far water levels in the key wells could be allowed to drop without a significant threat to upwelling conditions, discharge volumes, or the degree of saturation in the peat. In addition, the peat domes were surveyed so that limits could be set on the amount of subsidence that could occur at the fen domes without significant threat to the existence of the rare and specialized plants in the fens. The limits were established by reviewing the limited data in hand at that time. To our knowledge this is the first attempt at aquifer management at a calcareous fen complex. It is not known whether the limits will accomplish the goal of preventing impacts to the calcareous fens in the area surrounding the Burr Well Field. Vegetation response to changes may lag the initiation of the change by a number of years and it may be irreversible at that time, thus we must be very conservative in our management approach. The thresholds on the Sioux Nation Fen North Dome (SNF Dome) were set relative to water levels in the USGS Dome well and the Dome 1 (WT) well. .

The hydrographs developed from the data collected at Sioux Nation Fen during pumping tests in 1993 (Figure 8) and 1996 (Figures 9 and 10) are given below.

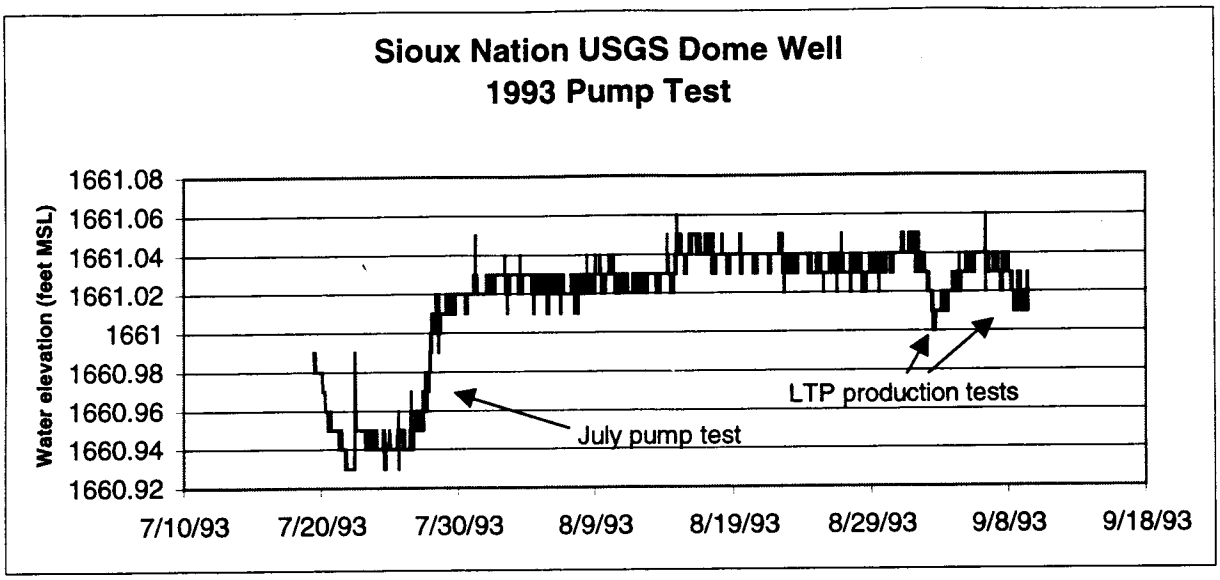


Figure 8: Water elevations recorded by a datalogger (discretization only to 0.01 feet) during pumping tests in 1993.

Water levels did not stabilize during the 1993 aquifer test, indicating that continued pumping could result in increased drawdowns. In 1996 an additional pumping test was conducted to investigate the potential impacts of requested increases in permitted Burr Well Field withdrawals on the wetland resources in the area of influence.

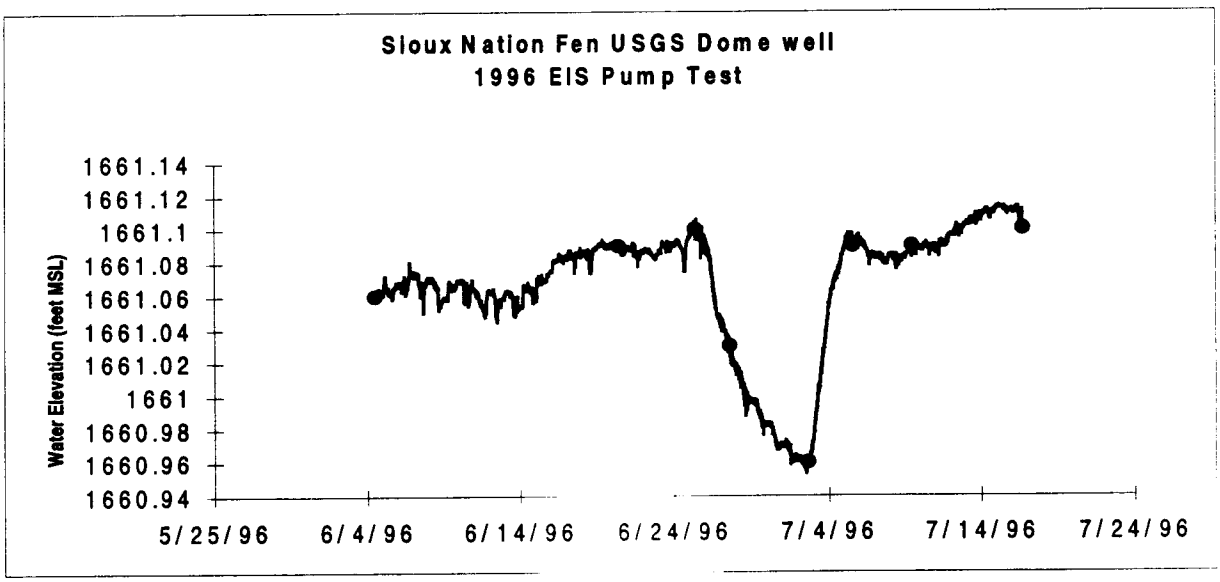


Figure 9: Water Level Elevations in the USGS Dome well during the 1996 Pump Test.

The dome well responds to pumping and recovers most of the drawdown rapidly once the test has ended. The water table well at the same location has a muted response to pumping and a very slow recovery (Figure 10). The fen wells in which these responses to well field withdrawals are evident are not screened in the aquifer which is being pumped (Table 1). The response is transmitted through the overlying materials to the wells in the fen and is considered unequivocal evidence of impact despite the small absolute change displayed.

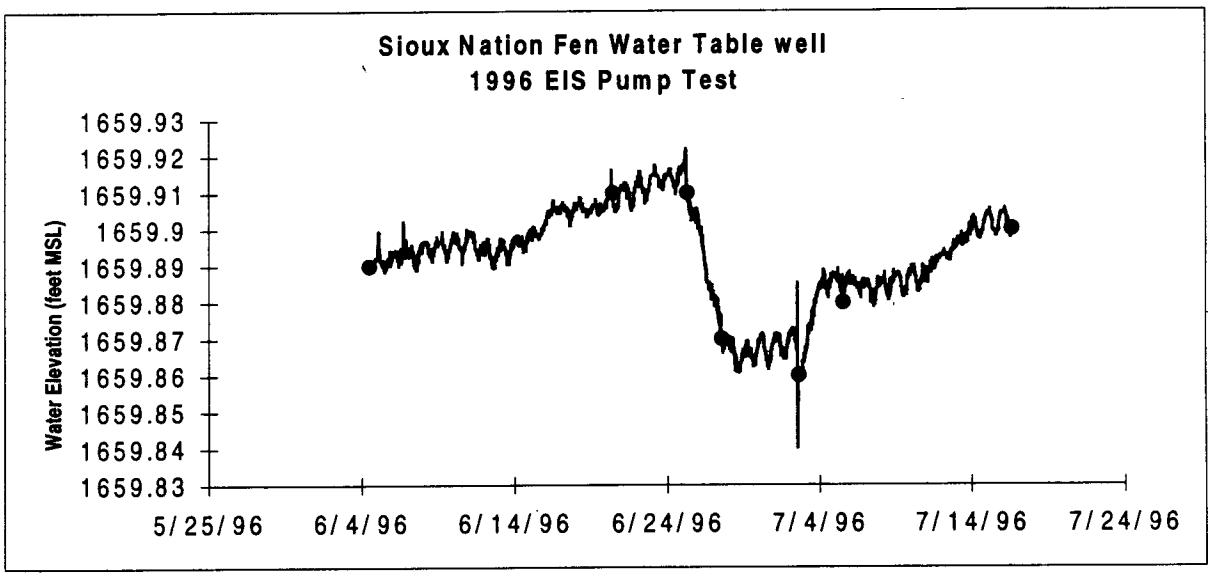


Figure 10: Water Level Elevations in the Sioux Nation Fen water table well during the 1996 pump test.

USGS Dome Well Thresholds and Water Levels

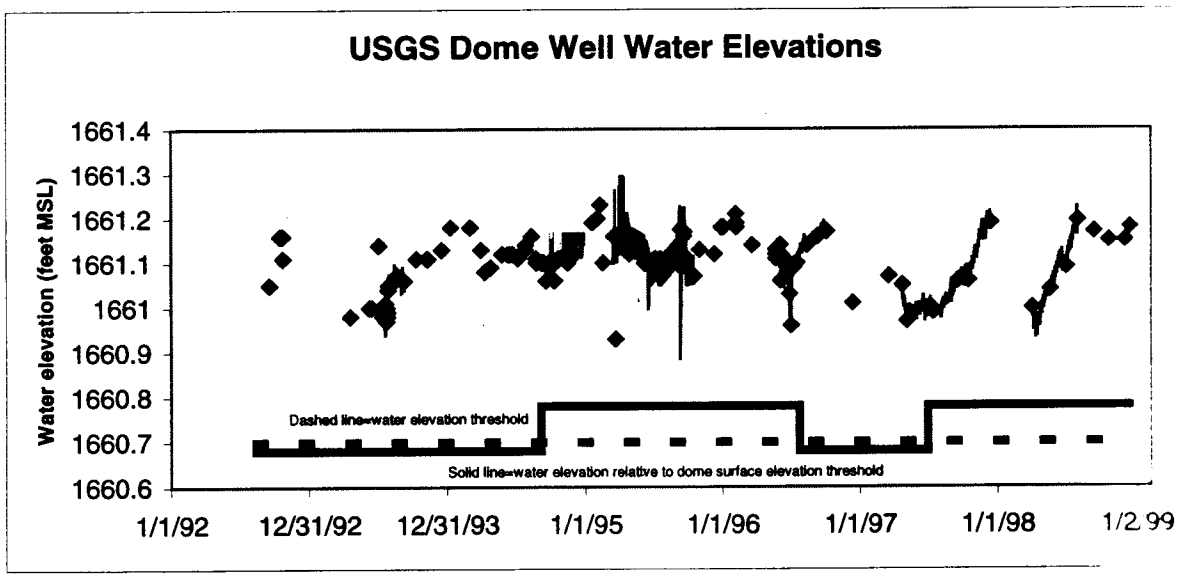


Figure 11: Water Level Elevations in the USGS Dome Well over the period of record.

Figure 11 displays the thresholds relative to ground surface (solid line-repeated surveys cause the threshold relative to dome surface elevation to be replotted) and relative to water level elevation (dashed line) at the USGS Dome well installed at the SNF Dome. Water levels in 1992 were few and under the influence of well development, flushing and sampling work. There was a general upward trend in these water levels from spring 1993 until the end of 1994, after which water levels appear to follow a pattern of early to late spring water level declines followed by summer through fall recovery. These cyclical responses are not thoroughly understood. The timing of the initial downturn in water levels coincides with the start of production pumping at the Burr Well Field, and perhaps with the high demand for water for spraying. The fact that this occurs at the same time that vegetation is greening in spring may be driving the pattern of water levels since the end of 1994. All of these changes are played out over a range of water levels totaling 4 tenths of a foot* only 2 tenths of a foot above the thresholds. Conservative management is indicated.

The head gradient available in December 1998 (31.8 feet) relative to the aquifer, as measured at the Deep Steel observation well, is about 13% less than the available head difference at the end of 1994 (27.6 feet). Peat mounds are vulnerable to decreases in head gradient that might leave the fen peat with dwindling ground water discharge during a period of high evapotranspiration or natural period of low aquifer recharge. Thus artificially induced (through pumping at the well field) decreases in available head have the potential to cause irreversible subsidence, aerobic decay and associated structural changes in the peat, which would in turn impact vegetation. Desirable species may decrease in number, while invading species might increase.

* The difference between the highest measured water level and the lowest measured water level

Water Table Thresholds and Water Levels

The water level record at the top of the Sioux Nation Fen dome is displayed in Figure 12.

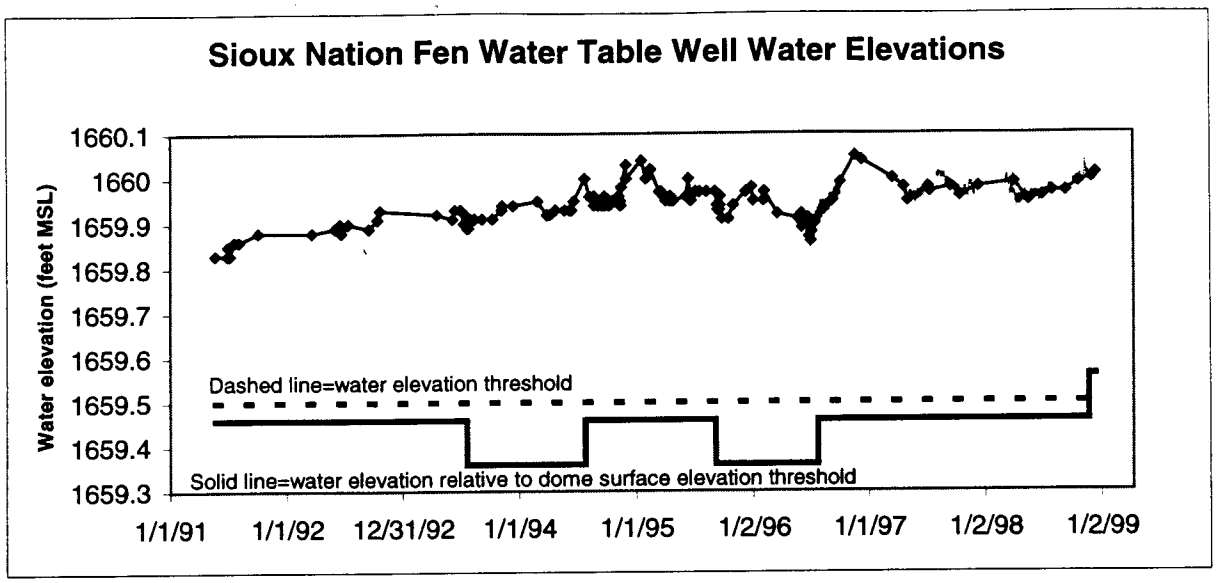


Figure 12: Water Level Elevations in the Sioux Nation Fen water table well over the period of record.

The discharge zone at the apex of this fen is surrounded by an approximately circular hardened marl rim. Discharging water flows through the peat sides of the mound and up and over the rim that acts as a dam. If ground water discharge is adequate, flow over the rim should be relatively constant and water levels should be stable or rising as the rim accumulates more calcium carbonate cemented plant remains. Flow over the rim keeps water available in excess over evapotranspiration in the sedge mat and pools can form and be maintained on the peat surface along the side slopes of the dome. Many of the rarer plants are found in these pool zones of the sedge mat.

The thresholds relative to both water level elevation (straight dashed line) and ground surface (solid line - changed as needed to reflect survey information) are shown (Figure 12). While the threshold for the deeper (subpeat) well is set with the intention of maintaining gradient and flow through the peat, the water table threshold is set to be certain that the surface of the discharge zone is always saturated.

A water table well only approximates the water table. It represents the summation of potentials over the length of the well screen. A perfect water table well would have a very tiny well screen right at the water table. In the real world, a well screen must have some length, or changes in water levels could not be measured. In soft peat soil, the well must also have enough length in the ground to be able to stand up straight and not be blown over in the next storm. Water table

wells must be replaced when screens clog or when peat accumulation in the well cannot be removed. To deal with this dilemma, the water elevation threshold must be set somewhat above the ground surface. Recent topographic survey data reveal that the threshold determination at this site should be revisited.

Water levels in the water table well rose from installation until the end of 1994, along the same general trend as the aquifer response in this area. Then, over the next two years, water levels declined, coincident with the start of production pumping from the Burr Well Field. From late summer 1996 to the end of the year, the water elevation in the water table well recovered all of the head that had been lost the previous two years, corresponding to one of the cycles displayed in the subpeat well. The water table well does not continue to track well with the subpeat well for reasons we cannot currently explain with certainty. The well is scheduled to be replaced in Spring 1999.

Note that the hydrographs in Figures 11 and 12 show that the water levels have never dropped below the thresholds at Sioux Nation fen. Near the end of the pumping phase of the 1996 aquifer test, it was observed that the pools along the west side of the fen were empty. As the aquifer recovered from the pumping phase of the test, so did the pools at the fen dome. Withdrawals from the aquifer had apparently reduced the volume of upwelling ground water until it was no longer in excess of plant requirements.

Several confounding factors exist:

1) As the roots of vegetation recover around the installation site of the water table well, screen openings may become partially obstructed. If screen openings nearest the ground surface are clogged, then the well would tend to represent the head deeper below ground surface and water levels in the well will rise slightly – thus the record may show a combination of response to aquifer conditions and to well-specific changes.

2) The rim around the discharge zone has been breached on occasion by foot traffic. For a period of time during the vegetation survey, flow over the rim was concentrated on the weather station side of the dome (this may coincide with the decline in levels over 1995 and 1996 and the near entombment of the weather station in ice one winter). Barriers to flow were installed and flow appeared to equalize around the rim (this may coincide with improving conditions on the west side of the dome as water flow through the peat was augmented once again by flow over the rim).

3) Because the rim functions as a dam, but the dam itself can change, the interpretation of the relationship between water levels at the fen and pumping at the well field is not straightforward and all information must be taken into account.

Our conclusion is that the threshold set at this well is not adequately protective of the fen. Negative impacts have been observed and recorded in field notes (lack of flow to the sedge mat pools; increased dominance of dogwood shrubs, reeds and cattails in spite of a burn) during a period of time when the threshold was not exceeded. The confounding factors, which interfere with straightforward analysis of water levels in the fen also, interfere with aquifer management using the existing thresholds. We suggest referencing new thresholds to water levels in the Deep Steel Observation well.

Fairchild Fen

Fairchild fen is the monitored fen that is closest to the Burr Well Field. No aquifer monitoring point can exist adjacent to this fen without being a flowing well, with all of the maintenance problems that would entail. Indeed, the drilled well between the Fairchild fen and the well field is a flowing well and few recorded pressure readings exist. To calculate an approximate change in head difference relative to the aquifer at the Fairchild fen, a distance/drawdown relationship can be established from known distance/drawdown relationships. The resulting estimate of drawdown in the Prairie Coteau aquifer beneath Fairchild fen is 6.9 feet, and the estimated initial head is 1692.5 MSL. Relative to the aquifer beneath the fen and using the water table elevation at the fen as the reference (Figure 13), Fairchild fen has 18% less head available to push water up to the fen. Relative to the levels measured in the subpeat well (Fairchild deep),

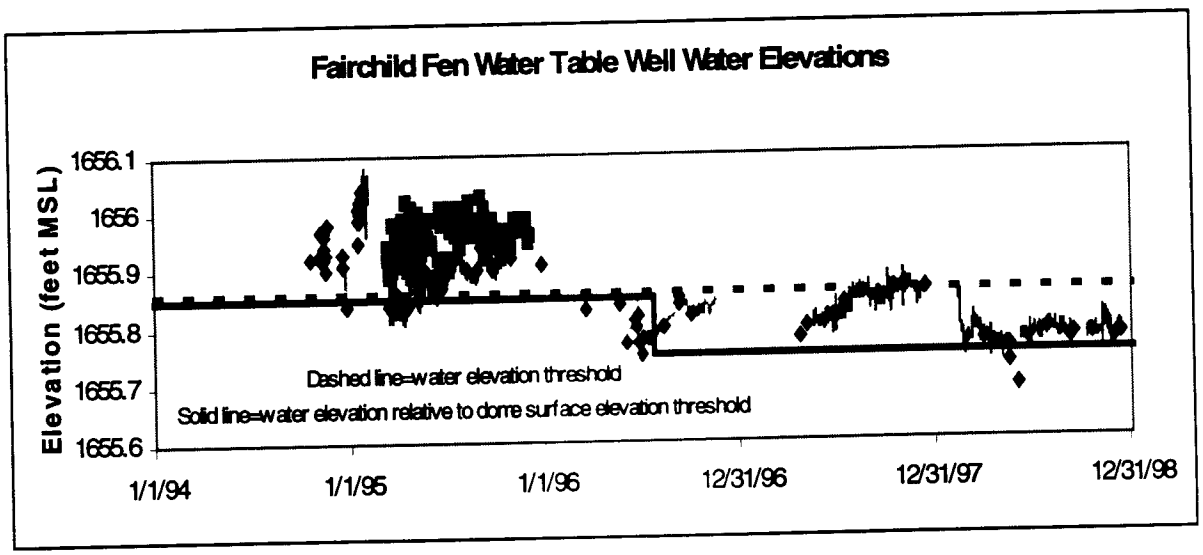


Figure 13: Water table elevation in Fairchild fen, thresholds indicated. The threshold relative to the dome surface has changed due to subsidence recorded by topographic survey.

Fairchild fen has lost 21% of the available head.

Subsidence at this fen has been documented from survey data. Survey data has indicated the fen surface elevation has declined 0.2 feet.

Given the inadvertent damage cause by foot traffic at the Sioux Nation fen, a board pathway to the dome wells at the Fairchild fen has been laid and foot traffic by DNR staff across the sedge mat to the discharge zone is purposely limited. This approach has been deemed successful: to date no channel has formed along the board pathway and the board pathway is substantially narrower than other pathways. The owners of the fen have used the discharge from the fen for the purpose of stock watering for thirty years or more. More than twenty years ago the stock were fenced out of the fen and a gravity fed discharge pipe (somewhat smaller than a garden hose) was installed from the dome to a watering tank in the cattle yard. Discharge from this pipe has continued since that time.

The pattern of water level elevations in the water table well at Fairchild fen is cause for concern (Figure 13). The threshold set to preserve upwelling conditions has been exceeded. Water levels have declined to below ground surface on occasion; the ground surface itself has subsided and not rebounded to date; and pumping cycles appear to express themselves directly on the water levels in the water table well. The wells were installed at a time when the other monitoring points began to show water level declines due to the start of production pumping at the Burr well field. The extent of the water table decline is approximately .25 feet, which corresponds with the magnitude of subsidence measured at this fen.

As discussed above, a water table monitoring well should display a level above ground surface to ensure that water levels do actually stay at or above the surface. In addition, water table wells at calcareous fens are conceptually more similar to staff gauges in reservoirs than to typical water table wells. Changes in conditions within the system are expressed in changes in discharge from the dome as well as in water level changes in the well. The water level changes in response to pumping should be subdued. Observable impacts at the Fairchild fen include increases in cattail stands and decreases in the area of typical sedge mat vegetation. Because no vegetation monitoring beyond species lists has been conducted at Fairchild fen, these changes cannot be quantified. Permanent vegetative monitoring plots should be established on Fairchild fen to more accurately document any future vegetative changes.

With regard to the exceedance of the threshold set at the water table well, it appears that ground water withdrawals during high demand periods are causing cyclical water level declines which are also very evident in the record at the Fairchild Fen Deep Well (Figure 14). These n

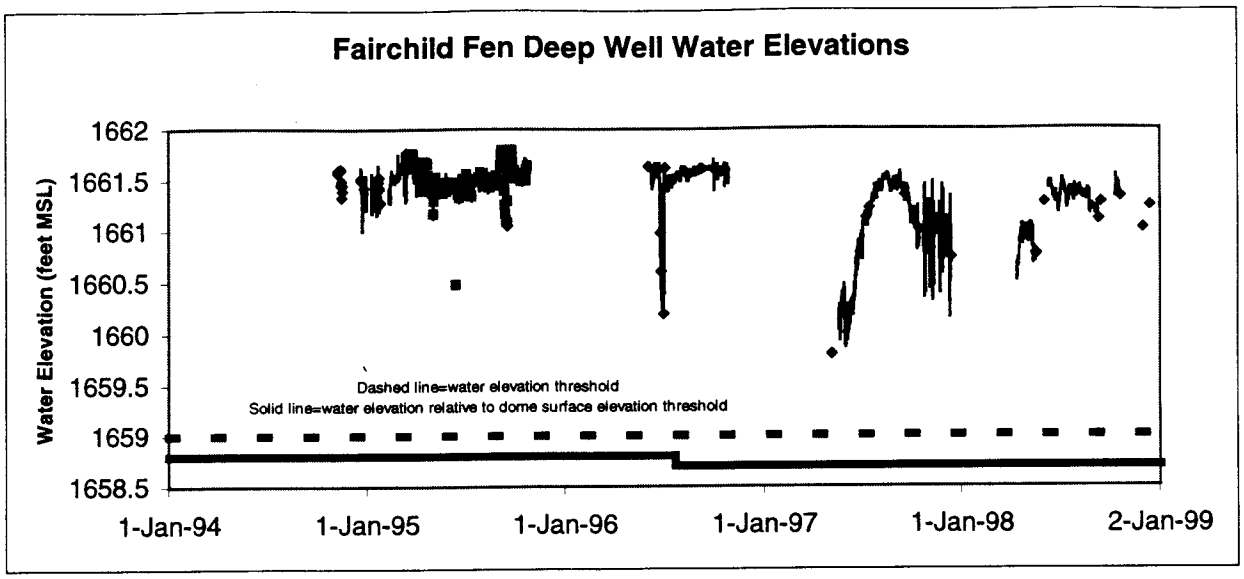


Figure 14: Water level elevations in Fairchild fen subpeat well 'Fairchild Fen Deep' Thresholds indicated.

water level declines appear to dewater the peat dome by a small amount, only part of which rebounds during recovery. After many of these cycles, cumulative subsidence is evident. Careful consideration of possible actions is needed. Two changes to water level management need to be made. They are: 1) Manage the high demand cycles in some other way – with the goal of avoiding dewatering during high evapotranspiration periods, and 2) arrange for a buyout or an alternative water supply for domestic stock watering at Fairchild's. That water, as small a volume as it may be, would then be available to flow through the peat and buffer the dewatering effects.

The hydrograph of the water levels in the subpeat well at the Fairchild fen (Figure 14) reveals an approximate loss of 0.7 foot of head overall, with alarming periodic responses to pumping events. Peak pumping periods result in maximum drawdown elevations that are trending lower as time passes, while recovery is less and less complete.

Conclusions

Impacts due to ground water withdrawals at the Burr Well Field are observable. The impacts on both the aquifer and the surface resources lead to concern that the current production of water from the Prairie Coteau aquifer is not sustainable. Modification to pumping volumes and schedules is necessary to maintain the water supply to the ground water dependent natural resources. The thresholds set at Fairchild fen and at Sioux Nation Fen may not be adequate to protect the calcareous fen resource.

Recommendations

1. Reevaluate the thresholds. Consider the transfer of the water level elevation thresholds at Sioux Nation Fen to the Deep Steel well for the non-freezing part of the year. Consider the transfer of the water elevation thresholds at Fairchild fen to a nearby aquifer monitoring point. There is a possible candidate well in existence between the well field and the Fairchild fen: OW-2-90.

2. Install an observation well in the Prairie Coteau Aquifer outside of the cone of depression from the Burr Well Field.

3. Establish permanent vegetation monitoring plots at Fairchild fen. This will allow assessment of change.

4. Work with landowners and neighbors of fens (e.g. LPRWD) to begin management of Cleveland fen and Fairchild fen.

Possible management actions:

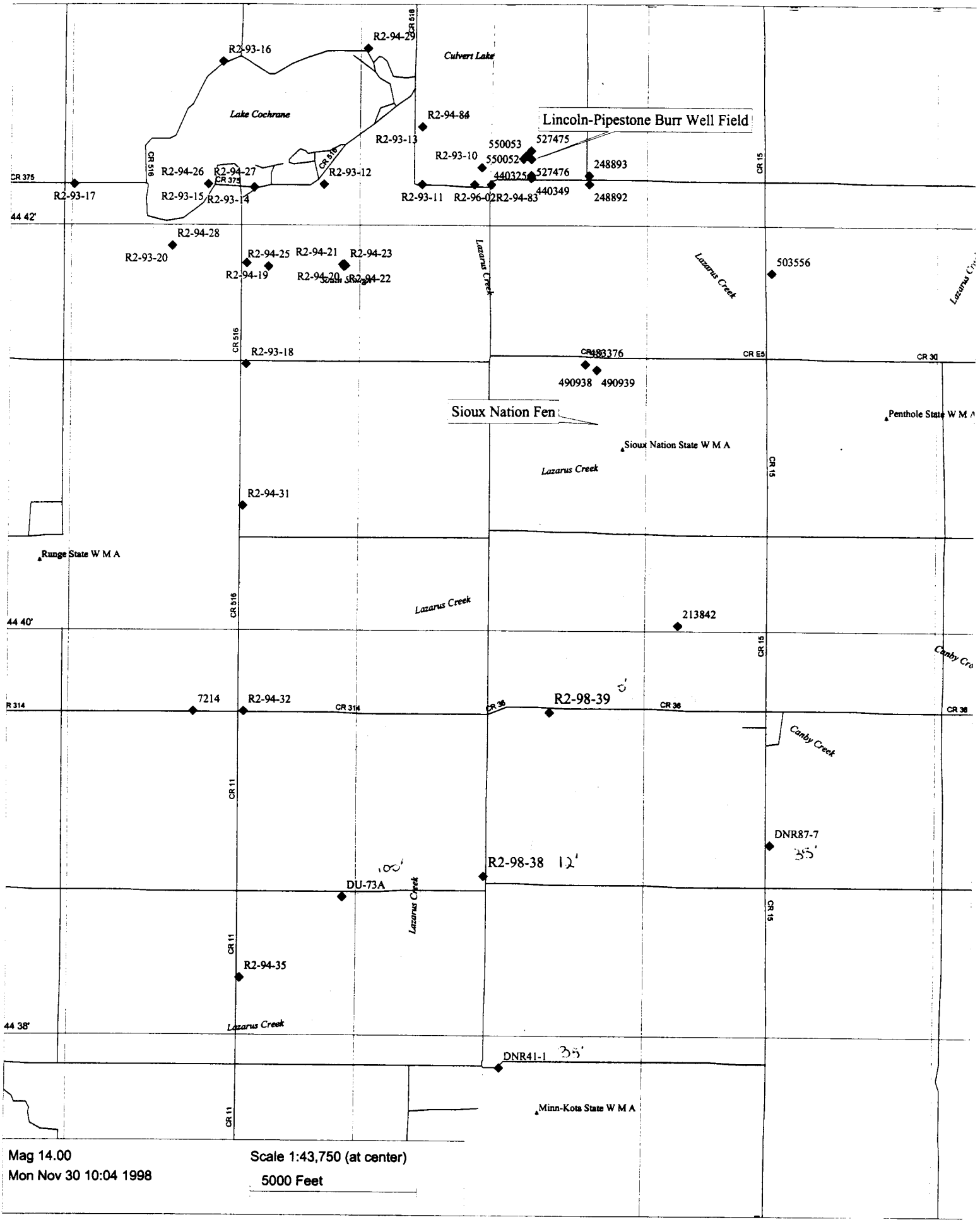
- Fencing may improve the vegetation at Cleveland fen through prevention of cattle grazing and
- Replacement of the water supply for domestic stock watering at Fairchild fen may increase the volume of water available to the fen.
- A controlled management burn in spring at either fen when the surrounding land is plowed would be a possibility.

Test Hole Results (September 1998)

During September 1998, two deep test holes were drilled in an area located approximately 3 to 4 miles south of the Lincoln-Pipestone Burr Well Field by the South Dakota Geological Survey (SDGS) and the Minnesota Department of Natural Resources (DNR). Test holes R2-98-38 and R2-98-39 (Figure 1) were drilled into the top the Cretaceous Shale to depths of 549 feet and 541 feet respectively. The purpose of these test holes was to define the northwestern extent of the Altamont aquifer equivalent sand layers that were discovered in test holes DNR 41-1 and DNR 87-7 in 1996.

Both of the 1998 test holes were gamma logged by the SDGS. The logs of these test holes are shown on cross section E-E'. The location of this cross section is shown on Figure 2. Approximately 12 feet of the Altamont sand was found in test hole R2-98-38. No Altamont sand was found in test hole R2-98-39. The previously drilled test holes nearest R2-98-38 and R2-98-39 encountered Altamont sand layers with a thickness range of 35 feet (DNR 41-1 and DNR 87-7) to 100 feet (DU-73A). These wide variations of sand thickness within a relatively small area suggest depositional and stratigraphic complexities that require additional test drilling to define.

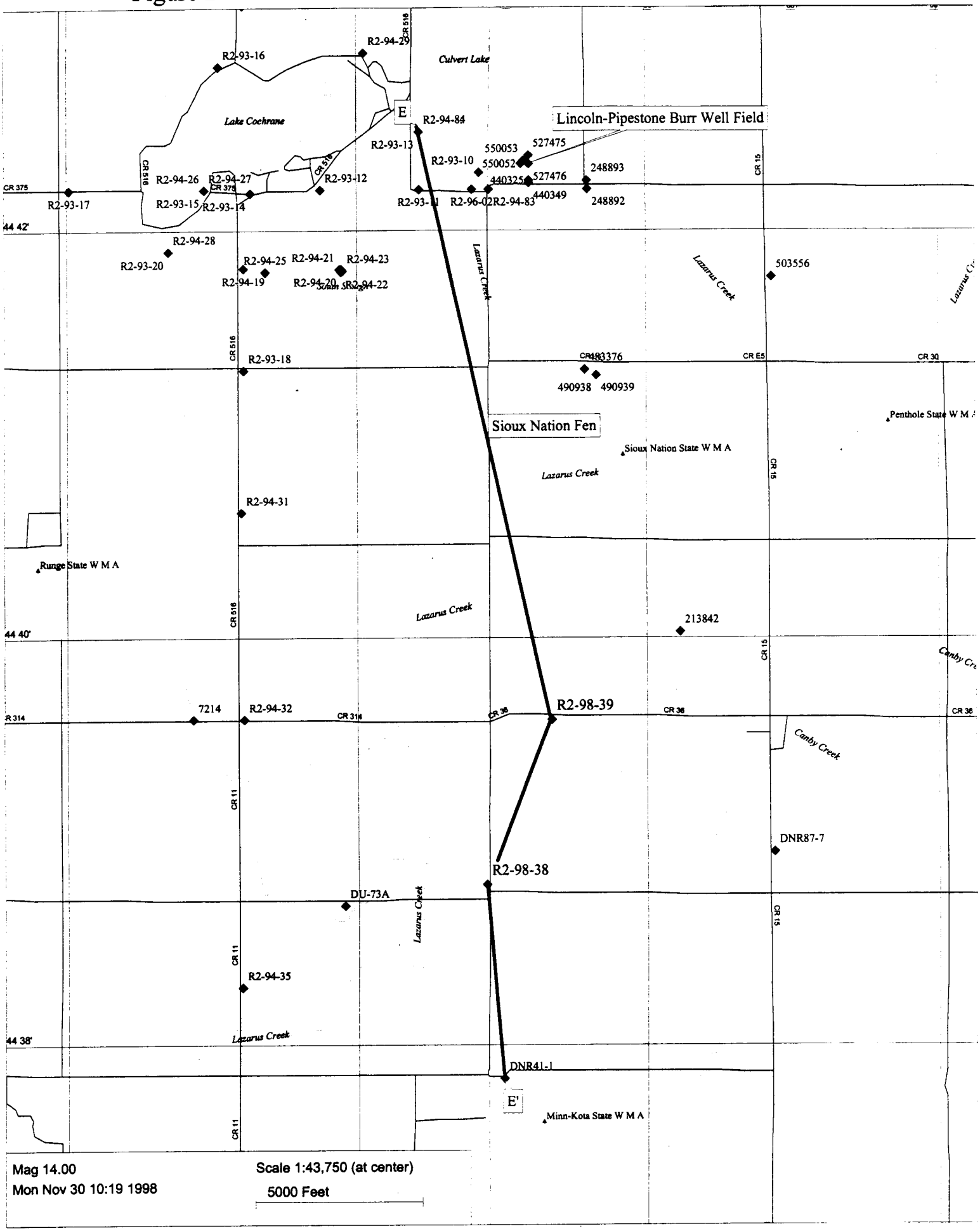
Figure 1 - Burr Well Field/ Lake Cochrane Area Test Hole and Well Locations



Mag 14.00
Mon Nov 30 10:04 1998

Scale 1:43,750 (at center)
5000 Feet

Figure 2 - Burr Well Field/ Lake Cochrane Area, Cross Section E-E'



E

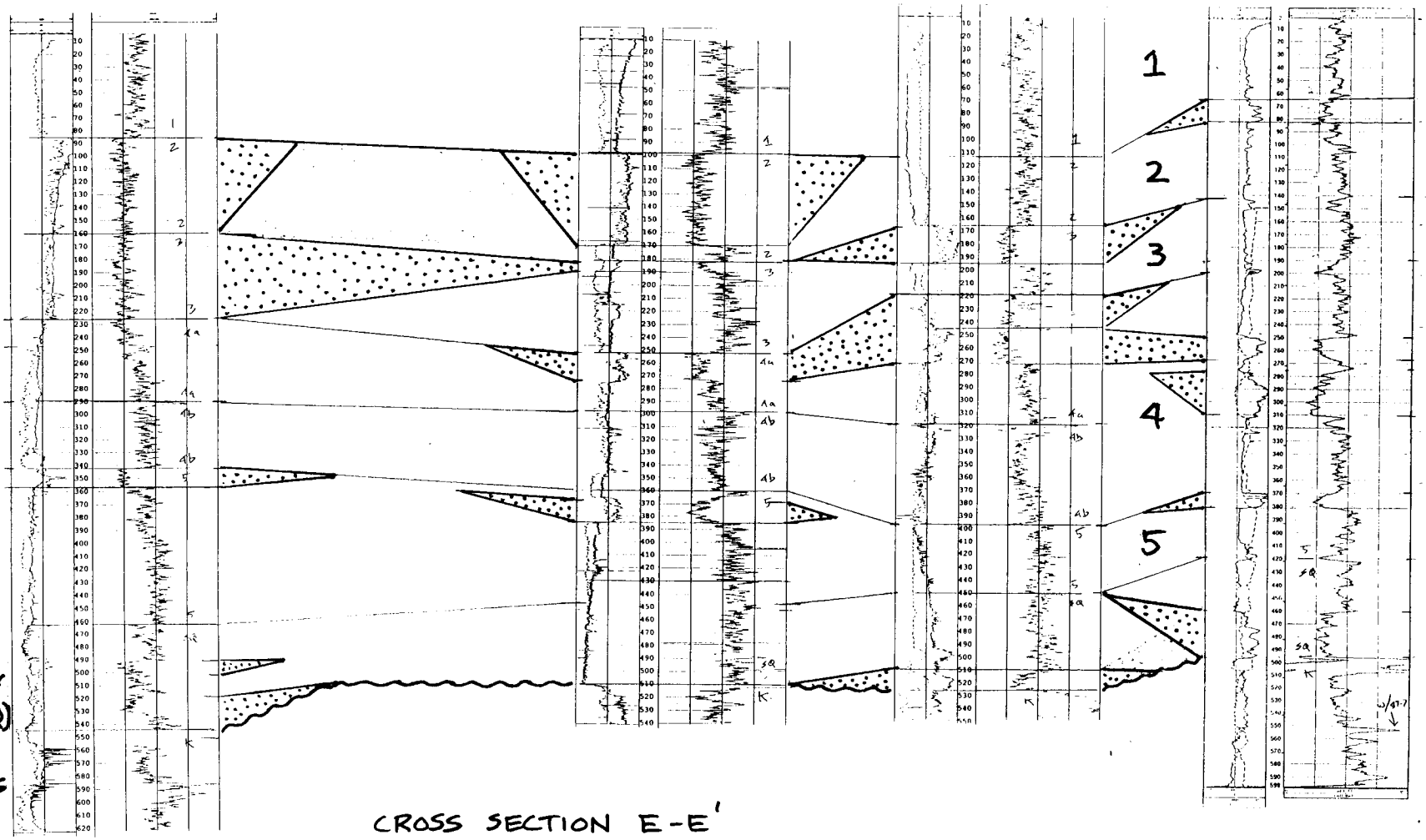
R2-94-84
NORTH

R2-98-39

R2-98-38

DNR 41-1
SOUTH

E'



CROSS SECTION E-E'
BURR WELL FIELD/ LAKE COCHRANE AREA