

# RED LAKE WATERSHED DISTRICT

March 15, 2019

Agenda

9:00 a.m.

|           |   |              |
|-----------|---|--------------|
| 9:00 a.m. | Call to Order   | Action       |
|           | Review and approve agenda                                     | Action       |
|           | Requests to appear  | Information  |
|           | February 28, 2019 Minutes                                     | Action       |
|           | Financial Report dated March 13, 2019                         | Action       |
|           | Thief River Falls West Side FDR Project, RLWD Project No. 178 | Information  |
|           | Ditch 16, RLWD Project No. 177-Update                         | Information  |
|           | Ditch 17, RLWD Project No. 179-Update                         | Information  |
|           | Water Management District LGU Resolutions                     | Information  |
| 9:30 a.m. | 2018 Audit Report-Brady Martz, Brian Opsahl                   | Info./Action |
|           | Flood Damage Reduction Bonding Bill                           | Information  |
|           | Well Interference Investigation, DNR-Red Lake County          | Information  |
|           | Lidar Delineation Tool-International Water Institute          | Info./Action |
|           | Bartlett Lake-Update  | Information  |
|           | Water Quality-Repair of Sondes                                | Info./Action |
|           | West Polk SWCD – Area 1 Envirothon                            | Info./Action |
|           | Board Room Technology   | Information  |
|           | Staff Vacancies   | Information  |
|           | Administrators Update   | Information  |
|           | Legal Counsel Update  | Information  |
|           | Managers’ updates   | Information  |
|           | Adjourn   | Action       |

## UPCOMING MEETINGS

|                   |   |
|-------------------|---|
| March 18, 2019    | RLWD Advisory Committee Meeting, 9:30 a.m.      |
| March 19, 2019    | Red River Basin Drainage Conference, Moorhead   |
| March 20-21, 2019 | Joint Annual RRWMB & FDRWG Conference, Moorhead |
| March 28, 2019    | RLWD Board Meeting, 9:00 a.m.                   |

# DRAFT

RED LAKE WATERSHED DISTRICT  
Board of Manager's Minutes  
February 28, 2019

President Dale M. Nelson called the meeting to order at 9:00 a.m. at the Red Lake Watershed District Office, Thief River Falls, MN.

Present were: Managers Terry Sorenson, Gene Tiedemann, Brian Dwight, Dale M. Nelson, Allan Page, and LeRoy Ose. Absent: Les Torgerson. Staff Present: Myron Jesme and Tammy Audette and Legal Counsel, Delray Sparby.

The Board reviewed the agenda. A motion was made by Dwight, seconded by Ose, and passed by unanimous vote that the Board approve the agenda. Motion carried.

The Board reviewed the January 24, 2019 minutes. Motion by Sorenson, seconded by Tiedemann, to approve the January 24, 2019 Board meeting minutes as presented. Motion carried.

The Board reviewed the Financial Report and Investment Summary dated February 27, 2019. It was the consensus of the Board, that the Certificate of Deposit set to expire on February 28, 2019, will be deposited into the District's checking account. Motion by Ose, seconded by Page, to approve the Financial Report and Investment Summary dated February 27, 2019 as presented. Motion carried.

Dillon Nelson, EIT, HDR Engineering, Inc. stated that the next Thief River Falls Westside Flood Damage Reduction, RLWD Project No. 179, coordination meeting will take place on March 4, 2019 at 1:30 p.m. at the HDR Engineering, Inc. office. Nelson stated that the replacement of the box culvert through Highway 32, near the outlet of the project will take place July 2019, with Highway 32 being detoured for approximately 1-2 weeks. Discussion was held on the detour route to be used during construction. Construction from County Road 62 and south to the outlet will take place in 2019, with the remainder of the project north of County Road 62 completed in 2020. Construction of the City of Thief River Falls storm sewer project that runs south of Digi Key, along County Road 62, through the railroad crossing and Highway 32 directly south of Pioneer Village, outletting into the river will take place in 2019. Nelson discussed the installation of a relief valve to the city owned lagoons.

Administrator Jesme stated that since the MnDNR Commissioner's Report and the Viewers' Report, have been filed with the District for RLWD Ditch 16, Project No. 177, the Board can set a date for the Final Hearing. Motion by Ose, seconded by Sorenson, to set the date for the Final Hearing for the RLWD Ditch 16, RLWD Project No. 177, for April 4, 2019 at 10:00 a.m. at the District office. Motion carried.

The Board reviewed the Advisory Report from MnDNR and BWSR for the Improvement to Polk County Ditch No. 39, RLWD Project No. 179. Motion by Dwight, seconded by Ose, to set the

Preliminary Hearing for the Improvement to Polk County Ditch 39, RLWD Project No. 179 for March 28, 2019 at 10:00 a.m. at the District office. Motion carried.

The Board reviewed correspondence from the RRWMB regarding cost-share payments due for USGS Stream Gages, in the amount of \$11,352.50 for Fiscal year 2019. Motion by Page, seconded by Sorenson, to approve the cost-share payment in the amount of \$11,352.50 for the District's portion of cost-share for USGS Stream Gages. Motion carried.

Administrator Jesme stated that the \$50,000 Conservation Partnership Grant the District applied for in partnership with Agassiz National Wildlife Refuge for the removal of sediment in Judicial Ditch 11 Main, RLWD Project No. 180B was awarded. Jesme noted that there are some special provisions in the grant that Agassiz National Wildlife Refuge must follow which include a requirement to close the gate at the outlet of JD 11, downstream of the construction site, which will allow for sediment to settle, prior to the release of any water.

The Board reviewed a Resolution to Adopt and Implement the Amended Red Lake River Comprehensive Watershed Management Plan, RLWD Project No. 149A. Motion by Tiedemann, seconded by Dwight, to authorize President Nelson to sign the Resolution to Adopt and Implement the Amended Red Lake River Comprehensive Watershed Management Plan, RLWD Project No. 149A. Motion carried.

Administrator Jesme requested the attendance of Legal Counsel Sparby to attend the March 13, 2019 Thief River 1W1P meeting to explain the Memorandum of Agreement to the Policy Committee. It was the consensus of the Board that Legal Counsel Sparby attend the Thief River 1W1P meeting as requested.

Engineer Tony Nordby, Houston Engineering presented an update on the Black River Impoundment Project, RLWD Project No. 176. Administrator Jesme stated that at this point, it does not appear that Flood Damage Reduction funding will be available for this proposed project unless the Governor has a change of heart.

At 10:00 a.m., President Dale M. Nelson reconvened the general meeting and called the Hearing to order for the Challenger Ditch Re-Alignment and Modification of a Portion of the Existing Drainageway and Outlet of RLWD Project No. 122A. President Nelson stated the hearing had been properly noticed and explained the hearing process. The hearing was videotaped and will be available for viewing at the RLWD office. It was noted that the appropriate notices as required by statute had been given. Engineer Tony Nordby, Houston Engineering, Inc., presented information regarding the petition from Pennington County for the Re-Alignment and Modifications to the Challenger Ditch System as part of a transportation project which also includes the construction of a roadway and bridge which will connect Trunk Highway 32 and Pennington Avenue and entertained questions from the Board and the audience. After all in attendance were given a chance to ask questions and/or make comments, the hearing was closed for public comment. Nelson then opened the hearing up for Board discussion. After discussion by the Board, a motion was made by Tiedemann, seconded by Ose, to approve the Petition from

Pennington County and adopt the Re-Alignment and Modification of a Portion of the Existing Drainageway and Outlet of the Challenger Ditch, RLWD Project No. 122A. Motion carried.

The Board reviewed the permits for approval. Motion by Sorenson, seconded by Ose, to approve the following permit with conditions stated on the permit: No. 19005, Polk County Highway Department, Brandsvold Township, Polk County. Motion carried.

Pennington SWCD submitted a request for a financial donation for the Area I Envirothon. The Area I Envirothon will be held on April 24, 2019, at Lake Bronson State Park. Motion by Dwight, seconded by Tiedemann, to donate \$300 to the Area I Envirothon to promote education and awareness of water quality issues. Motion carried

Staff member Tammy Audette stated that a survey was submitted to the District's Advisory Committee members requesting comments and input on information that is presented by Staff members at the Advisory Committee meeting. The Board reviewed the two surveys received. Invitations were also were sent to the SWCD offices within the District, requesting participation on the Advisory Committee. It was the consensus of the Board to have Audette contact several sportsman clubs to seek participation also.

The Board reviewed two quotes to repair the District's 2015 Ford F150. Motion by Ose, seconded by Page, to accept the low quote from The Shop in the amount of \$2,394.02, less the \$250.00 deductible. Motion carried.

Staff member Ashley Hitt stated that she attended the 24<sup>th</sup> Anniversary of River Watch at the River Watch Forum in Grand Forks, where approximately 250 students and teachers participated. Two schools that Hitt works with participated in the forum assignment, "Data Driven Watershed Problem Solving" where the students identify a problem within the watershed. Hitt announced that the Red Lake County River Watch Students won 1<sup>st</sup> Place. Their project focused on discharge entering the Hill River in Brooks. Red Lake Falls students presented a project on the Buffer Law. Manager Ose stated that students from Marshall County Central testified at the State Capitol, for increased funding for the River Watch program and a push to get the program state wide. Manager Page suggested providing River Watch student's with matching pullover's or shirts. Hitt will bring back recommendations to the Board. Manager Dwight requested that Hitt visit with the Blackduck, Kelliher and Northome School District's regarding River Watch.

#### Administrators Update:

- Jesme and Manager Ose attended the RRWMB meeting held at the District office on February 19, 2019.
- Jesme attended the for the MAWD Legislative Breakfast and Reception February 20<sup>th</sup>.
- Jesme participated in the Red River Valley Region 1 Administrators meeting at the District office on February 26<sup>th</sup>. The meeting was intended to compile ideas to inform legislators for future funding projects and watershed objectives.
- The Thief River 1W1P Advisory and Policy Committee meeting will be held at 9:00 a.m. on March 13, 2019 at the District Office. The Planning Committee held a telephone

conference on February 15<sup>th</sup> and 27<sup>th</sup> to review Section 4, and incorporate comments received from the Advisory and Policy Committee members.

- Included in the packet was a letter from Lauri Fairchild, USFWS, stating that she will be retiring.
- Jesme, Manager Page and Staff Members Sanderson and Hitt, attended the Parnell Advisory meeting held at the District office.
- Jesme attended the MPCA Waters and Watershed meeting held on February 6, 2019 in Brainerd. LGU's gathered in a roundtable group to discuss partnerships, while developing and constructing projects. Jesme presented information on the Grand Marais Outlet Restoration and Cut Channel project.
- Included in the packet was the October 2018 Water Quality Report.

Manager Tiedemann discussed the Agriculture Water Forum meeting he attended at UMC. Tiedemann stated that one of the presenters stated that the Parnell Impoundment was filling up with sediment. Tiedemann addressed the issue with the presenter and the theory, stating that there is no evidence that the impoundment is filling up with sediment.

Legal Counsel Sparby stated that he drafted a response for review by Administrator Jesme, to the Clearwater County Environmental Services, regarding jurisdiction in the lowering of the culvert at the outlet Judicial Ditch No.5, RLWD Project No. 102. Sparby also indicated that he will participate in the March 6, 2019 court hearing via telephone regarding the dismissal motion of the appeal of the Board's decision to not abandon Judicial Ditch #5.

Manager Sorenson asked the status of the redetermination of benefits for Judicial Ditch 72. Jesme indicated he had spoken recently with the Viewers as they had a few additional questions.

Manager Dwight discussed a conversation he had with Koochiching County Commissioner Wayne Skoe regarding Bartlett Lake.

Manager Dwight discussed the need to complete the review of the Gallagher (Fox Lawson) Study.

Staff member Loren Sanderson and Manager Nelson discussed Permit No. 14078, Arden Lundeen, Equality Township, Red Lake County. It was the consensus of the Board, to have Legal Counsel Sparby and District staff review the permit and report back to the Board.

Staff member Loren Sanderson stated that the Inter-Agency meeting with staff from Agassiz National Wildlife Refuge and MnDNR will be held on March 6, 2019 at Agassiz National Wildlife Refuge office.

Motion by Dwight, seconded by Ose, to adjourn the meeting. Motion carried.

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Terry Sorenson, Secretary

**RED LAKE WATERSHED DISTRICT**  
**Financial Report for March 13, 2019**

| <b>Ck#</b> | <b>Check Issued to:</b>           | <b>Description</b>                                      | <b>Amount</b>       |
|------------|-----------------------------------|---|---------------------|
| online     | EFTPS                             | Withholding for FICA, Medicare, and Federal taxes       | \$ 3,551.81         |
| online     | MN Department of Revenue          | Withholding taxes                                       | 654.61              |
| online     | Public Employees Retirement Assn. | PERA contributions                                      | 2,371.87            |
| 37336      | City of Thief River Falls         | Electricity, water, sewer, storm water, etc.            | 1,071.94            |
| 37337      | Sjoberg's Cable TV                | Internet expense  | 106.95              |
| 37338      | Ameripride Services Inc.          | Office rug rental                                       | 35.43               |
| 37339      | Tammy Audette                     | Clean offices in January and February                   | 680.00              |
| 37340      | Centurylink                       | Telephone expense                                       | 275.84              |
| 37341      | Farmers Union Oil Company         | Gas for Traverse  | 42.63               |
| 37342      | Garden Valley Technologies        | Monthly phone maintenance                               | 125.25              |
| 37343      | Houston Engineering, Inc.         | Engineering fees for Black River Impoundment            | 4,291.75            |
| 37344      | Hugo's #7                         | Meeting and building maintenance supplies               | 196.86              |
| 37345      | Les's Sanitation, Inc.            | Garbage pickup  | 34.70               |
| 37346      | Red River Watershed Mgmt. Board   | 2019 USGS gages-per Board approval 2-28-19              | 11,352.50           |
| 37347      | Marco                             | *See below for explanation                              | 3,147.18            |
| 37348      | MCI                               | Long distance telephone expense                         | 70.01               |
| 37349      | MN Energy Resources Corp.         | Heating expense   | 120.99              |
| 37350      | NCPERS                            | Life insurance premium                                  | 112.00              |
| 37351      | Dale M. Nelson                    | Mileage   | 22.04               |
| 37352      | Northwest Beverage, Inc.          | H2O for office  | 45.50               |
| 37353      | Northwestern Mutual Financial     | Deferred Compensation                                   | 484.84              |
| 37354      | Olson Construction                | Snowplow parking lot in February                        | 540.00              |
| 37355      | LeRoy Ose                         | Mileage   | 145.58              |
| 37356      | Pennington SWCD                   | 2019 Envirothon Contribution per Board approval 2-28-29 | 300.00              |
| 37357      | Polk County Taxpayer Service      | Cost share of JD 72                                     | 3,439.33            |
| 37358      | Polk County Township Association  | Annual meeting meal                                     | 16.00               |
| 37359      | Rinke Noonan                      | Legal fees for Thief River Westside FDR                 | 238.00              |
| 37360      | The Shop                          | Repairs to 2015 Ford pickup                             | 2,439.58            |
| 37361      | Thief River Falls Times           | Hearing ad for Challenger Ditch realignment             | 119.98              |
| direct     | Aflac                             | Staff paid insurances                                   | 613.46              |
| direct     | Al Page                           | Mileage   | 176.32              |
| online     | Blue Cross Blue Shield            | Health insurance premium                                | 4,076.00            |
| online     | Further                           | Health Spending Account                                 | 105.00              |
| online     | Further                           | Health Spending Account                                 | 90.00               |
|            | <b>Payroll</b>                    |   |                     |
|            | Check #11612-11620 & 7445         |   | 12,412.54           |
|            | <b>Total Checks</b>               |   | <u>\$ 53,506.49</u> |

**\*Marco**

|                             |               |
|-----------------------------|---------------|
| Monthly managed IT services | 1,347.13      |
| Monthly managed IT services | 1,347.13      |
| Monthly copier expense      | <u>452.92</u> |
|                             | 3,147.18      |

**Banking**

**Northern State Bank**

|   |                     |
|---|---------------------|
| Balance as of February 27, 2019   | \$ 93,832.21        |
| Total Checks Written  | (53,506.49)         |
| Receipt #414511 Northern State Bank-Monthly interest                        | 75.43               |
| Receipt #414514 State of Minnesota-Remaining 10% of Drainage Database grant | 3,870.00            |
| Receipt 414516 Transfer from American Federal Bank                          | <u>50,000.00</u>    |
| Balance as of March 13, 2019  | <u>\$ 94,271.15</u> |

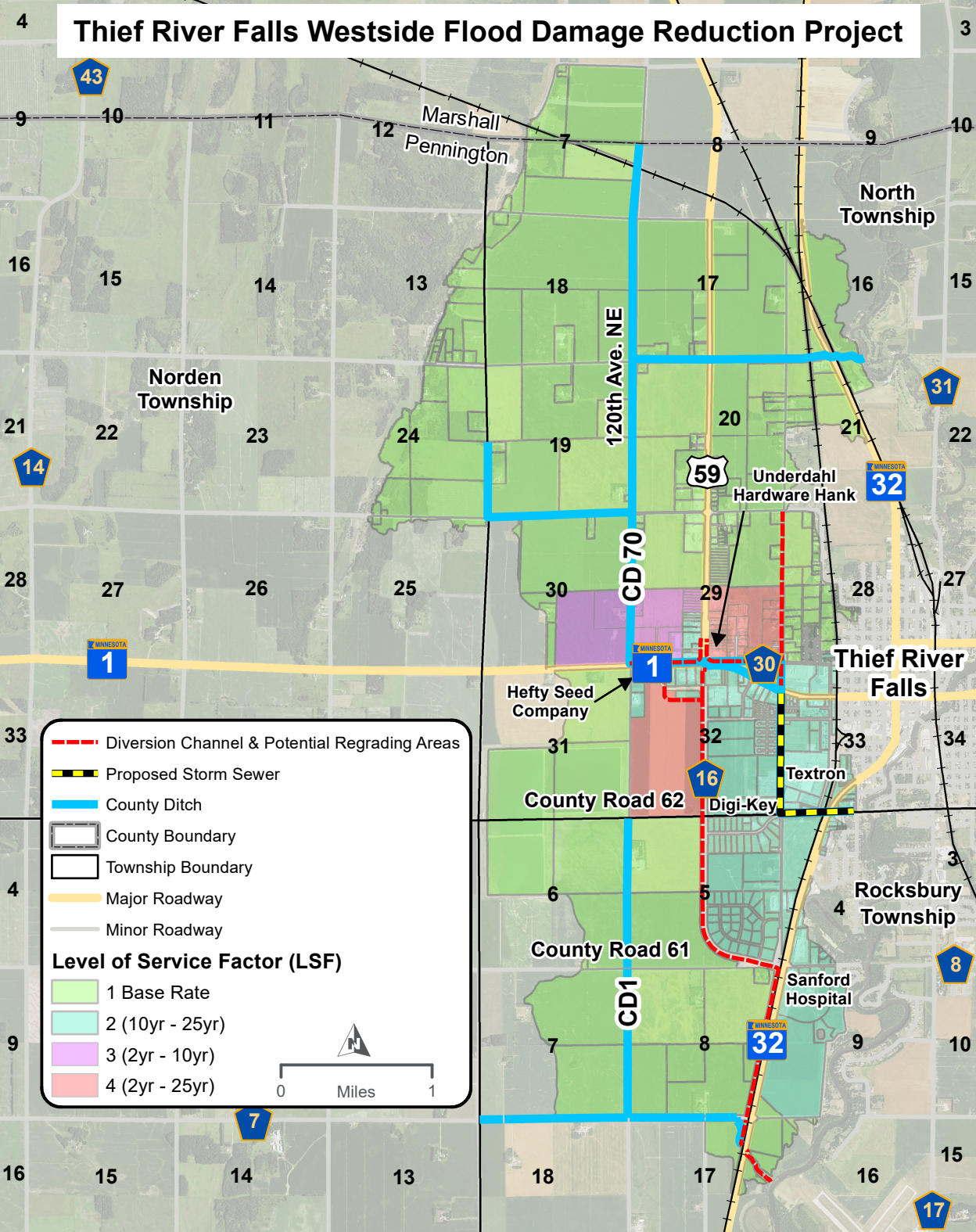
**Border State Bank**

|  |                     |
|--|---------------------|
| Balance as of January 31, 2019                     | \$ 18,209.17        |
| Receipt #414513 Border State Bank-Monthly interest | <u>6.97</u>         |
| Balance as of February 28, 2019                    | <u>\$ 18,216.14</u> |

**American Federal Bank-Fosston**

|   |                        |
|---|------------------------|
| Balance as of February 27, 2019   | \$ 2,060,680.00        |
| Receipt #414512 American Federal Bank-Monthly interest                      | 2,572.83               |
| Receipt #414515 Unity Bank-Matured CD with interest and interest from CDARS | 201,658.33             |
| Receipt 414516 Transfer to Northern State Bank                              | <u>(50,000.00)</u>     |
| Balance as of March 13, 2019  | <u>\$ 2,214,911.16</u> |

# Thief River Falls Westside Flood Damage Reduction Project





\*All numbers are subject to change

### Project Funding Breakdown

| Funding Source                   | Project Funding Participation |
|----------------------------------|-------------------------------|
| RLWD, City, County, MnDOT        | \$3.0 Million (50%)           |
| State of MN – FDR Program        | \$1.5 Million (25%)           |
| Red River Water Management Board | \$1.0 Million (16.7%)         |
| Water Management District (WMD)  | \$0.5 Million (8.3%)          |

### Method for Determining Charges

The method used to determine the amount of charges each parcel will be assessed by the WMD is based on the Pre-Project and Post-Project drainage benefit (level of service) for each parcel. The level of service is defined as the ability for a parcel to drain 12 hours after the storm event has ended. Each parcel within the drainage area of the Project was analyzed for a 2-year (2.49 inches), 10-year (3.77 inches), and 25-year (4.69 inches) 24 hour duration summer storm event. Based on the pre- and post-project level of service, a level of service factor (LSF) was assigned to reflect a relative flood damage reduction benefit.

### \*Level of Service Improvement Categories

| Level of Service Improvement (LSI) | Level of Service Factor (LSF)        | Levy Rate per Acre |
|------------------------------------|--------------------------------------|--------------------|
| 2 Year – 2 Year                    | Outlet Improvement (Base Rate = 1.0) | \$81.65            |
| 10 Year – 10 Year                  | Outlet Improvement (Base Rate = 1.0) | \$81.65            |
| 25 Year – 25 Year                  | Outlet Improvement (Base Rate = 1.0) | \$81.65            |
| 10 Year – 25 Year                  | 2.0                                  | \$163.29           |
| 2 Year – 10 Year                   | 3.0                                  | \$244.94           |
| 2 Year – 25 Year                   | 4.0                                  | \$326.58           |

The formula used for determining the total charge is as follows:

*Water Management District Charge = (LSF) x Base Rate x Size of Parcel in Water Management District (Acres)*

*\*Parcels outside of the City of Thief River Falls are capped at a maximum assessment of 20 acres per parcel.*

*\*The minimum LSF within City limits is 2.0 due to urban impervious surface and associated drainage benefits provided by the Project.*

#### Example 1

| Water Management District Charge |         |
|----------------------------------|---------|
| Level of Service Factor (LSF)    | 1       |
| Base Rate                        | \$81.65 |
| Parcel Acres                     | 1       |
| Total Charge                     | \$81.65 |

#### Example 1 Bond

| Bond                  |         |
|-----------------------|---------|
| Original Principal    | \$81.65 |
| Bond Term (Years)     | 20      |
| Annual Interest Rate  | 5.00%   |
| Payment per Acre/Year | \$6.55  |

#### Example 2

| Water Management District Charge |            |
|----------------------------------|------------|
| Level of Service Factor (LSF)    | 4          |
| Base Rate                        | \$81.65    |
| Parcel Acres                     | 5          |
| Total Charge                     | \$1,633.00 |

#### Example 2 Bond

| Bond                  |            |
|-----------------------|------------|
| Original Principal    | \$1,633.00 |
| Bond Term (Years)     | 20         |
| Annual Interest Rate  | 5.00%      |
| Payment per Acre/Year | \$26.21    |

#### Example 3

| Water Management District Charge           |         |
|--|---------|
| Level of Service Factor (LSF)              | 3       |
| Base Rate                                  | \$81.65 |
| Parcel Acres                               | 160     |
| Parcel Acres at LSF 3 - Capped at 20 Acres | 20      |

#### Example 3 Bond

| Bond                              |            |
|-----------------------------------|------------|
| Original Principal                | \$4,899.00 |
| Bond Term (Years)                 | 20         |
| Annual Interest Rate              | 5.00%      |
| Payment per Acre/Year (160 Acres) | \$2.46     |

This Document can be made available in alternative formats upon request

State of Minnesota HOUSE OF REPRESENTATIVES

NINETY-FIRST SESSION

H. F. No. 2431

03/13/2019 Authored by Lien, Fabian, Poppe, Kiel and Marquart The bill was read for the first time and referred to the Committee on Ways and Means

1.1 A bill for an act
1.2 relating to capital investment; appropriating money for flood hazard mitigation
1.3 grants; authorizing the sale and issuance of state bonds.
1.4 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:
1.5 Section 1. FLOOD HAZARD MITIGATION GRANTS; APPROPRIATION.
1.6 Subdivision 1. Appropriation. (a) \$75,000,000 is appropriated from the bond proceeds
1.7 fund to the commissioner of natural resources for the state share of flood hazard mitigation
1.8 grants for publicly owned capital improvements to prevent or alleviate flood damages under
1.9 Minnesota Statutes, section 103F.161. To the extent practical, community levee projects
1.10 shall meet the state standard of three feet above the 100-year flood elevation. Of this
1.11 appropriation, up to three percent may be used to implement the program.
1.12 (b) Project priorities shall be determined by the commissioner as appropriate, based on
1.13 need and consideration of available leveraging of federal, state, and local funds.
1.14 (c) This appropriation includes money for the following county and municipal projects:
1.15 Afton, Austin, Bloomington, Browns Valley, Delano, Golden Valley, Halstad, Hawley,
1.16 Hendrum, Inver Grove Heights, Montevideo, Newfolden, Nielsville, Owatonna, Moorhead,
1.17 Perley, Rushford, and St. Vincent.
1.18 (d) This appropriation includes money for the following watershed: Bois de Sioux
1.19 Watershed District, Cedar River Watershed District, Lower Minnesota River Watershed
1.20 District, Middle Snake Tamarac Rivers Watershed District, Prior Lake-Spring Lake
1.21 Watershed District, Red Lake Watershed District, Roseau River Watershed District, Sandhill

2.1 River Watershed District, Shell Rock River Watershed District, Two Rivers Watershed  
2.2 District, Upper Minnesota River Watershed District, and Wild Rice River Watershed District.

2.3 (e) For any project listed in this subdivision that the commissioner determines is not  
2.4 ready to proceed, does not have the nonstate match reserved, or does not expend all the  
2.5 money granted to it, the commissioner may allocate that project's unexpended money to a  
2.6 priority project on the commissioner's list.

2.7 (f) To the extent that the cost of a municipal project exceeds two percent of the median  
2.8 household income in the municipality multiplied by the number of households in the  
2.9 municipality, this appropriation is also for the local share of the project.

2.10 (g) Local project match may include all costs associated with project planning,  
2.11 engineering, acquisition, and construction. The project grants are based on a reimbursable  
2.12 payment process and final reconciliation of the project's shared costs are determined by the  
2.13 commissioner of natural resources upon project completion certification.

2.14 (h) In unique instances where the local project sponsor has expended project money for  
2.15 engineering, acquisition, or construction prior to finalization of a grant agreement under  
2.16 this section, those local expenditures are reimbursable consistent with the match requirements  
2.17 of this section.


2.18 Subd. 2. **Bond sale.** To provide the money appropriated in this section from the bond  
2.19 proceeds fund, the commissioner of management and budget shall sell and issue bonds of  
2.20 the state in an amount up to \$75,000,000 in the manner, upon the terms, and with the effect  
2.21 prescribed by Minnesota Statutes, sections 16A.631 to 16A.675, and by the Minnesota  
2.22 Constitution, article XI, sections 4 to 7.

## Groundwater Technical Review

Date: 02/19/2019  
To: Carmelita Nelson, Well Interference Coordinator  
From: Jennifer L. Rose, PG, Groundwater Specialist  
Subject: Lessard Well Interference Investigation, Red Lake County  
Reviewed by: Michele Walker, LPG#30096, Groundwater Specialist  
John Seaberg, PG, Acting Hydrologist Supervisor  
Jay Frischman, PG, Groundwater and Hydrogeology Unit Supervisor

### **PROFESSIONAL GEOLOGIST**

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Geologist under the Laws of the State of Minnesota.

Signature: 

Printed Name: Jennifer L. Rose

Date: 2/19/2019

License Number: 56562

## Executive Summary

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The Jim Lessard well interference complaint is valid. Cumulative high capacity well pumping reduced water levels in the Lessard well beyond the reach of the pump intake. Based on the available information, pumping from two authorized irrigation wells and one unpermitted irrigation well within approximately 2.5 miles of the Lessard well likely contributed to this well interference:

- 1) 2015-0699 Bachand
- 2) 2016-0375 Bachand
- 3) Unpermitted Hess (unique number 829001)

Increasing the depth of the jet pump intake in the Lessard well on August 15, 2018 resolved the water supply issue at this time. If appropriation continues to increase in this area and if water levels drop below approximately 25 feet, then a submersible pump would need to be installed in the Lessard well to provide adequate water supply.

# Groundwater Technical Review

## Lessard Well Interference

### Introduction

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The Minnesota Department of Natural Resources (DNR) received notice that the Jim Lessard residence was out of water on August 13, 2018. Water Well Information and Complaint Questionnaire forms were submitted to DNR on August 20, 2018 (Appendix A). The complainant is located in Lambert Township (Section 22) of Red Lake County. The residence is approximately 2.7 miles southwest of Oklee (Figure 1). DNR sent letters to groundwater appropriation permit holders within five miles of the Lessard residence on August 24, 2018 notifying them of the well interference in the area and requesting monthly water use be submitted for 2018.

This report summarizes the well interference complaint and investigates the connection between nearby high capacity pumping wells and the domestic well.

### Site Investigation

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DNR staff visited the Lessard residence on August 15, 2018. The well driller, Leslie Berg of Berg Well Drilling and Repair, was also on-site to inspect the well. A summary of well information is shown in Table 1. The well is located inside a well house (Figure 2). According to Mr. Lessard, the well once flowed (water level was over the top of the casing) but overflow was reduced in the last two years. Overflow was directed to a cistern (Figure 2) which flowed into a nearby drainage ditch (Figure 3). The well was not flowing during the field visit.

Water is pumped into the house and for garden and lawn watering purposes by a jet pump that sits at the surface (Figure 4). According to Mr. Lessard, the pump was only able to provide water for a short time then would suck air. The well driller removed the top of the well casing using a welding torch. DNR measured the water level in the well to be 6.07 feet from the top of the casing. The pump's suction line was removed by the well driller and was measured to be about 8 feet long however, it appeared that only 6.5 to 7 feet of the pipe was actually down the well. The well driller added suction line to a depth of 60 feet although this shallow jet pump can only lift from a depth of about 25 to 30 feet. According to the driller, extra line was used in case a submersible pump would need to be added in the future. Lengthening the suction line in the well resolved the out of water problem for the Lessard residence on August 15, 2018.

### Setting

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The Lessard residence is located in the Clearwater River watershed and is approximately 0.6 miles north of the Hill River (Figure 1). The topography is level terrain in this area as a result of former Glacial Lake Agassiz.

### Geology and Hydrogeology

The surficial geology consists of Quaternary aged Glacial Lake Agassiz near shore sediments and wave eroded till (Harris 2007). Beneath the lake sediments and till are unconsolidated deposits of glacially eroded glacial sediments (Harris, 2007). The northwest portion of a regional geologic cross section by Harris (2007) located near the Lessard domestic well (Appendix B, Figure B-1) illustrates that wells in this area source water from either unconsolidated river sediment or alluvium deposits (water table aquifers) or unconsolidated buried collapsed channel deposits (confined aquifers; Figure B-2 and B-3). A sequence of confined aquifers in this area have been classified into four categories by Lindgren (1996) based on depth to the top of the aquifer. These aquifers include Shallow, Intermediate, Deep, and Basal Confined with depths to the top of the aquifer ranging from 0-100 feet, 100-199 feet, 200-299 feet, and 300 feet or more, respectively.

Local hydrogeological cross sections constructed as part of this investigation including the Lessard domestic well and nearby high capacity wells (Figure B-1) indicate that the water table, Shallow, Intermediate, and Deep Confined aquifers are present in this area (Figures B-4 to B-7). In some locations, these aquifers appear to be interconnected as the thickness of the sand and till deposits varies. There are no deeper wells to confirm the presence or absence of the Basal confined aquifer.

No well log is available for the Lessard domestic well and limited well logs are located nearby. Based on the measured well depth and cross sections, it appears the Lessard domestic well is likely completed in the Shallow Confined aquifer or Intermediate Confined aquifer or both (Shallow/Intermediate Confined). Lindgren (1996) mapped the uppermost confining unit in the location of the Lessard domestic well to range in thickness from 0 to 49 feet and is thicker (100 to 149 feet) to the northwest (Appendix B, Figure B-8). This may indicate that the Shallow/Intermediate Confined aquifer is bounded or thins to the northwest which is consistent with a hydrogeological cross-section drawn in this orientation (Figure B-4).

In glacial deposits, aquifer characteristics (how much water can be stored and how readily water can move through the material) can vary given the highly variable nature of the deposits. To better understand the local aquifer characteristics and connectivity both horizontally and vertically, nearby test information was gathered. DNR has record of aquifer tests (pump one well and observe water level changes in other wells) and specific capacity tests (observations in the pumped well only) that have been conducted in the area (Appendix C, Figure C-1 and Table C-1). The closest aquifer test was conducted in the Shallow/ Intermediate Confined aquifer and is associated with the irrigation well for permit 2015-0699 located 2.2 miles to the southeast (Figure 1). The aquifer test results indicate the aquifer is a channelized aquifer system that is bounded or varies significantly in thickness and hydraulic conductivity. Leakage through the overlying confining unit was evident at the end of the pumping period. However, no drawdown was measured in the water table aquifer. The effective aquifer parameters ( $T= 12,400 \text{ ft}^2/\text{day}$ ;  $S= 0.00072$ ;  $K= 170 \text{ ft/day}$ ) were consistent with a leaky confined aquifer composed of unconsolidated coarse sand to fine gravel.

Based on the available information, the conceptual model for the Shallow/Intermediate Confined aquifer that the Lessard domestic well is likely screened within is a leaky confined channel aquifer composed of buried unconsolidated sediment (likely sand and possibly some gravel).

## Groundwater Users

Within five miles of the Lessard domestic well there are twelve high capacity permits that source water from both groundwater and surface water sources (Figure 1 and Table 2). During this investigation DNR found an unpermitted irrigation well (829001) owned by William Hess (Figure 1 and Table 2). On August 24, 2018, DNR requested water use records for 2018 from nearby permit holders that source water from groundwater wells and dug pits. Water appropriation records were not requested for permit 2016-0361 Swenson due to the lack of connectivity between the Hill River and the buried confined aquifer. Also, permit 2018-3378 Bachand was issued after the well interference occurred and therefore was excluded from this investigation.

Table 3 contains the water use records as submitted by the permit holders, either in in the MNDNR Permitting and Reporting System (MPARS) or by email. The submitted records were in some cases different than what was reported on MPARS. DNR attempted to clarify the information with the permit holders as best as possible. If the information could not be clarified with the permit holder, the data reported in MPARS was used.

Monthly reported water use from 2008 to 2018 for agricultural irrigation groundwater wells, municipal supply groundwater wells, and dug pits within five miles of the Lessard domestic well is presented in Figure 5. Note that groundwater appropriation for agricultural irrigation began in 2012 and has increased over the last six years (40.8 million gallons in 2012 to 254.75 million gallons in 2018). The majority of the water appropriated for agricultural irrigation comes from Quaternary buried artesian aquifer wells which the Lessard well is likely screened within.

## Groundwater Level Monitoring

Groundwater levels are monitored by permit holders and DNR in dedicated observation wells and private wells in this area (Figure 6). The closest observation well, Bachand 2015-0699 Observation Well, is screened from 140 to 150 feet below land surface within the Shallow/ Intermediate confined aquifer and is located approximately 2 miles to the south of the Lessard domestic well. This observation well (unique well number 811826) is likely within the same aquifer as the Lessard domestic well (Appendix B, Figure B-4). Groundwater level data from other monitoring wells shown in Figure 6 were not presented in this report as the wells were not screened within the same aquifer, too far away from the Lessard well, or had limited or no data available during 2018.

Groundwater levels in the Bachand 2015-0699 Observation Well have been monitored by the permit holder since 2015 following the aquifer test as previously discussed. These groundwater levels were plotted to further examine the Shallow/ Intermediate confined aquifer's response to high capacity well pumping in this area (Figure 7). Pumping signatures are seen in the hydrograph during the irrigation season months (April to October) due to the close proximity of the 2015-0699 irrigation well (0.25 miles south). Groundwater levels during the 2016, 2017, and 2018 irrigation seasons in this observation well dropped lower each season (Figure 5). Groundwater levels declined by approximately 11 feet from May to August 2018 in the Bachand 2015-0699 observation well. The lowest level was recorded on August 13, 2018 which coincides with the timing of the Lessard water supply issues.

## Analysis of Pumping Impacts

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Based on the submitted pumping records, the following high capacity wells and dug pit were appropriating water in August 2018 (Table 3) when the Lessard domestic well experienced water supply issues (ordered in proximity to Lessard):

- 2016-0350 Swenson- Dug Pit (Installation Pump 2- North Pit)
- 2016-0375 Bachand- Deep Confined aquifer
- 2015-0699 Bachand- Shallow/ Intermediate Confined aquifer
- Unpermitted Hess- Shallow/ Intermediate Confined aquifer
- 1984-1111 City of Oklee- Deep Confined aquifer
- 2014-0733 Bachand- Water Table aquifer
- 2015-2249 Strand- Intermediate Confined aquifer
- 2012-1282 Yaggie- Intermediate Confined aquifer
- 2014-0727 Voxland- Deep Confined aquifer

To determine if pumping from each of the appropriators listed above could have reduced water levels at the Lessard domestic well, an analysis of pumping impacts was undertaken using available information described in the Setting section of this report. Drawdown predictions were made using analysis software AQTESOLV (Duffield, 2007), available aquifer parameters, and pumping records through August 2018. The analysis is described by interpreted aquifer.

### Dug Pits and Water Table Aquifer Pumping

Based on available information, the appropriation from the dug pit (2016-0350 Swenson- Installation Pump 2- North Pit) and the water table aquifer well (2014-0733 Bachand) did not cause the Lessard water supply issues. Note that no water was appropriated from the 2016-0350 Swenson Installation Pump 1- South Pit in 2018 and therefore is not discussed further in this report. The Swenson 2016-0350 North Pit is likely connected to a water table aquifer using the available depth of the north pit (approximately 14 feet deep) and hydrogeologic cross-sections (Appendix B, Figure B-4 and B-5). Aquifer test results from permit 2015-0699 indicated the water table aquifer and Shallow/Intermediate confined aquifer

are not directly connected. Therefore, based on available information, the Lessard well, the 2016-0350 Swenson North Pit, and the 2014-0733 Bachand water table well are not directly connected.

Even if they were connected, pumping the Bachand 2014-0733 water table well would not induce drawdown approximately three miles away and pumping the Swenson 2016-0350 North Pit would have minimal impacts (<0.2 feet) on a water table well 0.7 miles away from the surface pump intake. Pumping drawdown predictions were made using the Theis (1935) unconfined aquifer analytical solution, a range of available water table aquifer characteristics, and reported monthly pumping volumes. A range of aquifer parameters were used as no aquifer test data are associated with these permits. These included the Bachand 2014-0733 specific capacity test data, literature values (Freeze and Cherry, 1979), and aquifer test results ( $T= 33,000$  to  $39,000$  ft<sup>2</sup>/day,  $S=0.12$  to  $0.22$ ) from a water table irrigation well (permit 2013-0440) located 5 to 7 miles east of these permits.

Permit holder 2016-0350 informed DNR that the water level in the North Pit reduced 30 inches (2.5 feet) from July 1 to August 27, 2018 (Keith Swenson, written commun., August 27, 2018). This reduction in the pit level is not enough to cause the Lessard well water levels to drop below the pump intake in the Lessard well and is likely due to a combination of evaporation, water table fluctuations, and pumping.

### **Shallow/ Intermediate Confined Aquifer Pumping**

There are four high capacity irrigation wells screened within the Shallow Confined aquifer, Intermediate Confined aquifer, or both (Shallow/Intermediate Confined) in this area. Two irrigation wells, 2015-0699 Bachand well and the unpermitted Hess well, are at a similar distance away from the Lessard well (2.2 and 2.4 miles, respectively) and appear to be screened within the same aquifer (Appendix B, Figure B-4 and B-7). Analysis results using the Theis (1935) confined aquifer analytical solution method and information described below indicate:

- Pumping the 2015-0699 Bachand well likely caused measurable drawdown in the Lessard well, approximately 1.5 feet, based on aquifer test results (Table C-1 and as described in the Setting) and monthly pumping volumes (Table 3) broken into pumping cycles evenly distributed between May to August 2018.
- Pumping the unpermitted Hess well may have contributed approximately 1 foot of drawdown at the Lessard well based on the 2015-0699 Bachand aquifer test results and the Hess pumping times and rates provided (see MPARS 2014-1853). Further aquifer testing from the Hess well would improve the understanding of this aquifer system (see discussion above on aquifer variability in glacial systems) as no aquifer test or specific capacity test results are available.

Irrigation wells associated with 2015-2249 Strand and 2012-1282 Yaggie are approximately 4.2 and 4.4 miles southwest, respectively, from the Lessard well and are screened at a similar elevation (Appendix B, Figure B-6). Due to the large separation distance, the aquifer(s) in which the irrigation wells are screened are not likely directly connected to the Lessard well given the nature of glacial deposits (see discussion above on aquifer variability in glacial systems). The pumping radius of influence is unknown as there is no aquifer test information available for either of these irrigation wells and the geologic information in this area is limited. However, based on the limited geological information and the distance between these wells and the Lessard well, pumping 2015-2249 Strand and 2012-1282 Yaggie did not likely directly contribute to the Lessard water supply issues. Further aquifer testing from one of these irrigations wells would help determine the connectivity of this aquifer system.

Based on the available information, cumulative appropriation from two irrigation wells, 2016-1609 Bachand and unpermitted Hess, screened within the Shallow/Intermediate confined aquifer(s) contributed to water level reductions in the Lessard domestic well (same aquifer it is screened within). However, no one well alone reduced water levels beyond the reach of the pumping equipment in the Lessard well.



## Deep Confined Aquifer Pumping

There are three appropriation permits associated with wells screened within the Deep Confined aquifer in this area that were pumping in August 2018 (as listed above). Analysis results using the data and methods described below indicate:

- The 2016-0375 Bachand irrigation well is the closest high capacity well, located 1.4 miles northwest of the Lessard domestic well (Figure 1). It is unknown if the Shallow/Intermediate Confined aquifer and Deep Confined aquifers are connected in this location as there are limited well logs and aquifer test information between these wells. However, the aquifers appear to be interconnected to the northwest (Appendix B, Figure B-4). Anecdotal evidence (Anthony Bachand, verbal commun., August 2018) indicated that when the deeper Bachand wells (2016-0375 and 2015-2563) are pumped, the shallower domestic wells reported water supply problems (Lessard and Johnson Domestic Wells; Figure B-4). Assuming the aquifers are directly connected, approximately 1 to 1.5 feet of drawdown is conservatively estimated at the Lessard well from pumping this well. Drawdown predictions were made using the Theis (1935) confined aquifer analysis solution method, the monthly reported pumping volumes (Table 3) broken into pumping cycles through August 2018, and a range of available aquifer parameters (2016-0375 specific capacity test and 2015-0699 aquifer test results shown in Table C-1). Further aquifer testing would help determine the vertical connectivity of these aquifer systems.
- Aquifer test results for the 1984-1111 City of Oklee wells indicated the aquifer is confined and bounding aquitards do not appear leaky. Even if the City of Oklee wells and Lessard wells were connected, pumping from these wells would not likely cause measurable drawdown in the Lessard well based on the Theis (1935) confined aquifer method and submitted pumping records (see MPARS 1984-1111 and Table 3).
- Aquifer test results for 2014-0727 Voxland irrigation well indicated the aquifer is leaky confined and drawdown was observed in overlying aquifers. Appropriation from the 2014-0727 Voxland did not result in pumping impacts at the Lessard well using the leaky aquifer model parameters (Table C-1), analytical solution method applied for the aquifer test analysis (Hantush, 1960), and submitted pumping cycle records (see MPARS 2014-0727).

Pumping from one of three Deep Confined aquifer appropriation permits in this area, 2016-0375 Bachand, likely contributed to the water supply issues at the Lessard well. However, it's pumping alone did not cause the Lessard water supply issues.

## Conclusions and Technical Recommendations

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The James Lessard well interference complaint has been determined to be valid. The following conclusions are drawn from this investigation:

- The Lessard domestic well is likely screened within the Shallow/Intermediate confined aquifer based on the well depth. Groundwater levels in a nearby observation well within the Shallow/Intermediate confined aquifer were the lowest on August 13, 2018 which coincides with the timing of the Lessard water supply issues. Based on the available groundwater level data, the Lessard domestic well complaint is valid as water levels in this aquifer in this area reduced beyond the reach of his jet pump suction line (6.5 to 7 feet deep in the well).
- Groundwater appropriation for agricultural irrigation has been increasing in this area over the last six years (40.8 million gallons in 2012 to 254.75 million gallons in 2018).
- Cumulative high capacity well pumping caused the water level in the Lessard well to reduce beyond the reach of the pumping equipment. Based on the available information, pumping from two permitted irrigation wells and one unpermitted irrigation well likely contributed to the Lessard well interference:
  - 1) 2015-0699 Bachand
  - 2) 2016-0375 Bachand
  - 3) Unpermitted Hess (unique number 829001)
- Pumping 2015-2249 Strand and 2012-1282 Yaggie did not likely directly contribute to the Lessard water supply issues based on the available information. Further aquifer testing would improve the understanding of this aquifer system.
- Increasing the depth of the jet pump intake in the Lessard well on August 15, 2018 resolved the water supply issue at this time.
- If appropriation continues to increase in this area and if water levels drop below approximately 25 feet, then a submersible pump would need to be installed in the Lessard well to provide adequate water supply.

## References

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- Duffield, G. M., 2007, AQTESOLV for Windows Version 4.5 User's Guide: Reston, VA, HydroSOLVE, Inc.
- Freeze, R.A. and Cherry, J.A., 1979, Groundwater: Prentice Hall, Inc.
- Hantush, M.S., 1960, Modification of the theory of leaky aquifer: Journal of Geophys. Res., vol. 65, no. 11, pp. 3713-3725.
- Harris, K.L., 2007, M-177 Quaternary geology of the Fosston 30' x 60' quadrangle, northwest Minnesota: Minnesota Geological Survey, retrieved from the University of Minnesota Digital Conservancy at: [M-177 Miscellaneous Map Series](#).
- Lahti, L., 2014, Technical review of application for groundwater appropriation permit 2014-0733, Anthony Bachand, 2014 irrigation season, Red Lake Co.: Minnesota Department of Natural Resources Ecological and Water Resources, [MPARS](#).
- Lahti, L., 2017a, 2016-0375, Anthony Bachand, Red Lake County: Minnesota Department of Natural Resources Ecological and Water Resources, [MPARS](#).
- Lahti, L., 2017b, 2015-2563, Anthony Bachand, Red Lake County: Minnesota Department of Natural Resources Ecological and Water Resources, [MPARS](#).
- Lindgren, R.J., 1996, Availability and quality of water from drift aquifers in Marshall, Pennington, Polk and Red Lake Counties, northwestern Minnesota: U.S. Geological Survey Water Resources Investigations Report 95-4201.
- Rose, J.L., 2015a, PA 2015-0699 Bachand, aquifer test analysis and evaluation of resource impacts: Minnesota Department of Natural Resources Ecological and Water Resources, [MPARS](#).
- Rose, J.L., 2015b, Permit application 2014-1853, Hess, Red Lake County: Minnesota Department of Natural Resources Ecological and Water Resources, [MPARS](#).
- Rose, J.L., 2015c, Permit 2014-0727 amendment application, Voxland, aquifer test analysis and evaluation of resource impacts: Minnesota Department of Natural Resources Ecological and Water Resources, [MPARS](#).
- Theis, C.V., 1935, The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwater storage: Am. Geophys. Union Trans., vol. 16, pp. 519-524.
- U.S. Geological Survey Geologic Names Committee, 2010, Divisions of geologic time- major chronostratigraphic and geochronologic units: U.S. Geological Survey Fact Sheet 2010-3059, 2p.
- Walker, M., 2016, Technical review of groundwater appropriation permit amendment 2015-2249: Minnesota Department of Natural Resources Ecological and Water Resources, [MPARS](#).

# Tables

**Table 1. Lessard well information**

|   |   |
|---|---|
| <b>Well Name</b>  | Lessard domestic well   |
| <b>Unique Well No.</b>                                      | Unknown   |
| <b>Date Drilled</b>   | Unknown; > 40 years old   |
| <b>UTM Location* Easting, Northing</b>                      | X: 283443 m, Y: 5298573 m   |
| <b>Ground Elevation (ft)- estimated from LiDar by DNR</b>   | 1158 feet MSL   |
| <b>Top of Casing Stickup (above land surface)</b>           | 1 foot- measured by driller   |
| <b>Depth (ft BGS**)</b>                                     | 132 (+/-2 feet)- measured by driller  |
| <b>Screened Interval (ft BGS)</b>                           | Unknown   |
| <b>Initial Static Water Level (ft BGS) from Well Log</b>    | No well log available   |
| <b>Static Water Level (ft BGS) taken on August 15, 2018</b> | 6.5 feet BGS- measured by driller at ~13:20<br>6.07 feet BGS- measured by DNR at 13:47  |
| <b>Diameter</b>   | 4 inches- measured by DNR and driller   |
| <b>Pump Depth (ft BGS)</b>                                  | Jet pump – suction line depth pre- August 15, 2018= 8 feet below top of casing; post August 15, 2018= 60 feet below top of casing |
| <b>Penetrated Aquifer</b>                                   | QBAA*** Shallow or Intermediate confined (Lindgren, 1996)   |

\*Location coordinates surveyed by DNR with a hand held GPS unit.

\*\*BGS stands for below ground surface.

\*\*\*QBAA stands for Quaternary buried artesian aquifer. The Quaternary period on the geologic time scale is the current and most recent period that began 2.588 million years ago (U.S. Geological Survey, 2010).

**Table 2. Nearby appropriation permits**

| <b>Appropriations Permit No. and Land owner</b>       | <b>Water Source (Aquifer name interpreted from Lindgren, 1996)</b> | <b>Distance to Lessard domestic well</b> | <b>Unique well number and depth</b>  | <b>Use</b>                         | <b>Appropriation Annual Volume</b> | <b>Appropriation rate</b>                  | <b>Month and Year Permit Issued</b> |
|---|--|--|--------------------------------------|------------------------------------|------------------------------------|--|-------------------------------------|
| 2016-0350<br>Keith Swenson                            | Dug pits (two locations)   | 0.7 and 1.15 miles                       | None                                 | Agricultural Irrigation-260 acres  | 70.6 MGY                           | 2000 gpm (1000 gpm from each pit)          | May 2017                            |
| 2016-0375<br>Jeffrey Bachand                          | Groundwater; Deep confined   | 1.4 miles                                | 818220; 265 feet                     | Agricultural Irrigation-112 acres  | 37 MGY                             | 800 gpm                                    | May 2017                            |
| 2015-0699<br>David Bachand and Mary Lynn Bachand Inc. | Groundwater; Shallow/ Intermediate confined                        | 2.2 miles                                | 805423; 161 feet                     | Agricultural Irrigation-405 acres  | 90 MGY                             | 1500 gpm                                   | July 2015                           |
| <i>Unpermitted</i><br>Willam Hess                     | Groundwater; Shallow/ Intermediate confined                        | 2.4 miles                                | 829001; 236 feet                     | Agricultural Irrigation-300+ acres | Not Available                      | ~600 to 800 gpm                            | Not issued                          |
| 2014-1853<br>William Hess                             | Groundwater; Shallow/ Intermediate confined                        | 2.5 miles                                | 803608; 148 feet                     | Agricultural Irrigation-150 acres  | 20 MGY                             | 350 gpm                                    | March 2016                          |
| 1984-1111<br>City of Oklee                            | Groundwater; Deep confined   | 2.6 and 3 miles                          | 608421; 300 feet<br>221011; 268 feet | Municipal/ Public Water Supply     | 18 MGY                             | 450 gpm (221011= 200 gpm; 608421= 250 gpm) | June 1984                           |
| 2016-0351 Ray Swenson                                 | Surface water; Hill River  | 2.7 miles                                | Not applicable                       | Agricultural Irrigation-539 acres  | 80.6 MGY                           | 700 gpm                                    | February 2017                       |
| 2015-2563<br>Charles and Carol Bachand Inc.           | Groundwater; Deep confined   | 3 miles                                  | 818219; 255 feet                     | Agricultural Irrigation-230 acres  | 75 MGY                             | 700 gpm                                    | June 2017                           |
| 2014-0733<br>Charles and Carol Bachand Inc.           | Groundwater; Water table   | 3 miles                                  | 801438; 52 feet                      | Agricultural Irrigation-140 acres  | 45.6 MGY                           | 800 gpm                                    | April 2014                          |
| 2018-3378<br>Carol Bachand                            | Surface water; Ditch   | 3.2 miles                                | Not applicable                       | Agricultural Irrigation-240 acres  | 45.6 MGY                           | 1300 gpm                                   | October 2018                        |
| 2015-2249<br>Brent Strand                             | Groundwater; Intermediate confined                                 | 4.2 miles                                | 817065; 226 feet                     | Agricultural Irrigation-420 acres  | 76 MGY                             | 1600 gpm                                   | June 2016                           |
| 2012-1282<br>Michael Yaggie                           | Groundwater; Intermediate confined                                 | 4.4 miles                                | 788660; 148 feet                     | Agricultural Irrigation-135 acres  | 51.5 MGY                           | 800 gpm                                    | July 2012                           |
| 2014-0727<br>Jerome and Michael Voxland               | Groundwater; Deep confined   | 4.8 miles                                | 801951; 296 feet                     | Agricultural Irrigation-128 acres  | 42 MGY                             | 800 gpm                                    | May 2014                            |

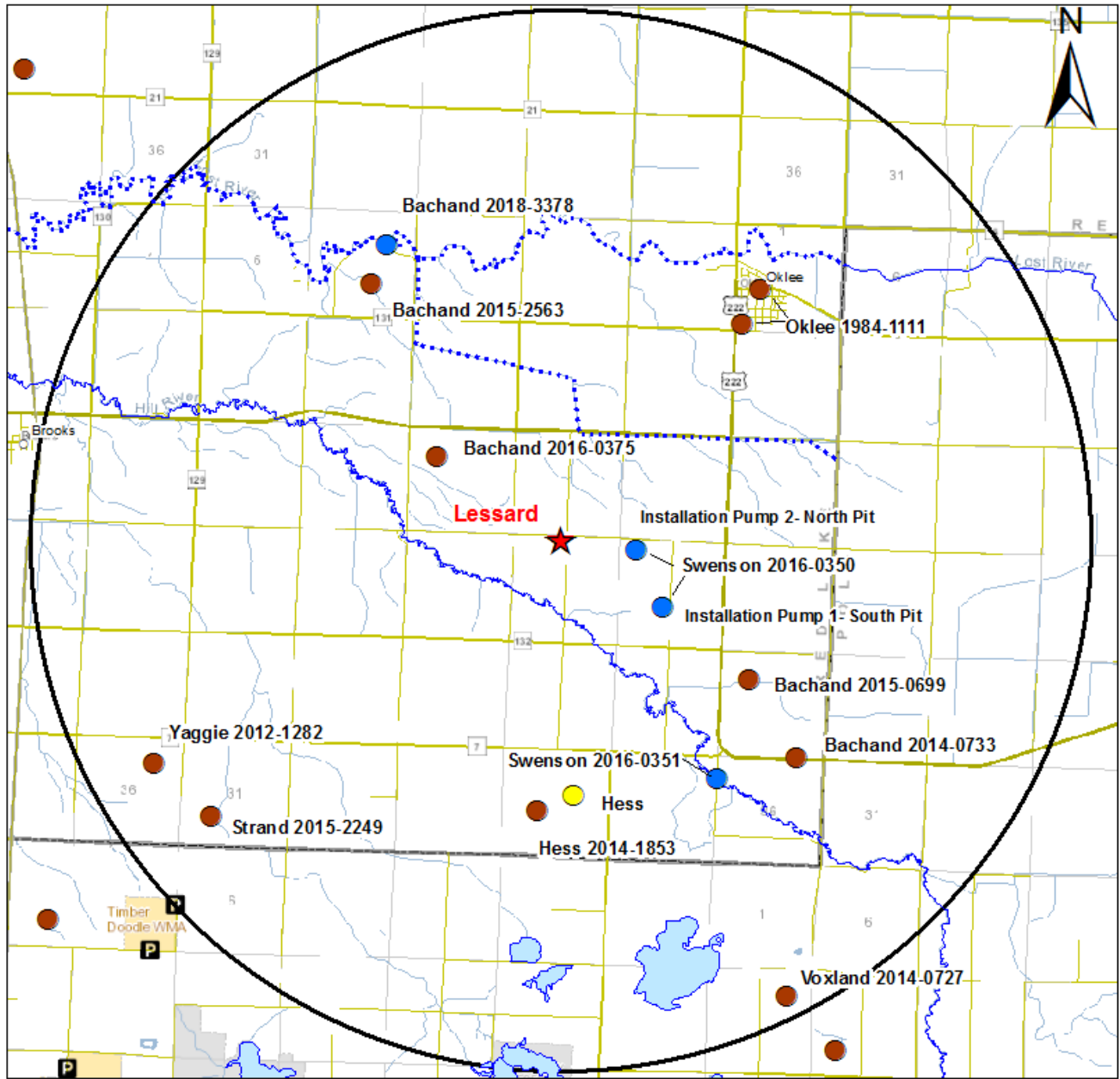
**Table 3: Monthly reported water use (million gallons) for wells and dug pits in 2018.**

| Appropriation Permit and Land owner                | Water Source (Aquifer name interpreted from Lindgren, 1996) | January 2018 | February 2018 | March 2018 | April 2018 | May 2018 | June 2018 | July 2018 | August 2018 | September 2018 | October 2018 | November 2018 | December 2018 |
|--|---|--------------|---------------|------------|------------|----------|-----------|-----------|-------------|----------------|--------------|---------------|---------------|
| 2016-0350 Keith Swenson                            | Dug pit (Pump 2-North Pit only)                             | 0            | 0             | 0          | 0          | 0        | 1.160833  | 12.49315  | 15.5416     | 0              | 0            | 0             | 0             |
| 2016-0375 Jeffrey Bachand                          | Groundwater Deep confined                                   | 0            | 0             | 0          | 0          | 0        | 1.9214    | 7.2452    | 9.9667      | 2.5524         | 0            | 0             | 0             |
| 2015-0699 David Bachand and Mary Lynn Bachand Inc. | Groundwater Shallow/ Intermediate confined                  | 0            | 0             | 0          | 0          | 1.8835   | 6.9064    | 15.0182   | 22.5284     | 0              | 0            | 0             | 0             |
| <i>Unpermitted</i> William Hess*                   | Groundwater Shallow/ Intermediate confined                  | 0            | 0             | 0          | 0          | 0        | 0         | 5.184     | 17.28       | 5.184          | 0            | 0             | 0             |
| 2014-1853 William Hess*                            | Groundwater Shallow/ Intermediate confined                  | 0            | 0             | 0          | 0          | 0        | 0         | 0         | 0           | 0              | 0            | 0             | 0             |
| 1984-1111 City of Oklee                            | Groundwater Deep confined                                   | 0.9617       | 0.75          | 0.8289     | 0.83710    | 1.1957   | 1.7891    | 1.237     | 1.3451      | 1.1841         | 0.9663       | 0.9165        | 0.8836        |
| 2015-2563 Charles and Carol Bachand Inc.           | Groundwater Deep confined                                   | 0            | 0             | 0          | 0          | 0        | 0         | 0         | 0           | 0              | 0            | 0             | 0             |
| 2014-0733 Charles and Carol Bachand Inc.           | Groundwater Water table                                     | 0            | 0             | 0          | 2.0248     | 3.8644   | 5.4322    | 8.3102    | 12.7213     | 0              | 0            | 0             | 0             |
| 2015-2249 Brent Strand                             | Groundwater Intermediate confined                           | 0            | 0             | 0          | 0          | 0        | 4.41936   | 22.3344   | 17.29728    | 4.79952        | 0            | 0             | 0             |
| 2012-1282 Michael Yaggie                           | Groundwater Intermediate confined                           | 0            | 0             | 0          | 0          | 0        | 2.5       | 8.7       | 7.5         | 0              | 0            | 0             | 0             |
| 2014-0727 Jerome and Michael Voxland               | Groundwater Deep confined                                   | 0            | 0             | 0          | 0          | 0        | 5.7471    | 12.8822   | 11.3522     | 0              | 0            | 0             | 0             |

\*Monthly volume for *Unpermitted William Hess* was reported in MPARS under permit number 2014-1853. However, the permitted well under permit 2014-1853 did not appropriate water in 2018.

# Figures

Figure 1. Location map of the Lessard domestic well and appropriators within 5 miles.



## Legend

★ Lessard Domestic Well

— Public Water Watercourse

### Water Appropriation Permits

● Groundwater

⋯ Public Ditch/Altered Natural Watercourse

● Surface Water

■ Public Waters Basins

● Unpermitted Irrigation Well (829001)

□ 5 mile radius



Figure 2. Photograph of the Lessard domestic well.



Figure 3. Photograph of the Lessard overflow drainage ditch.

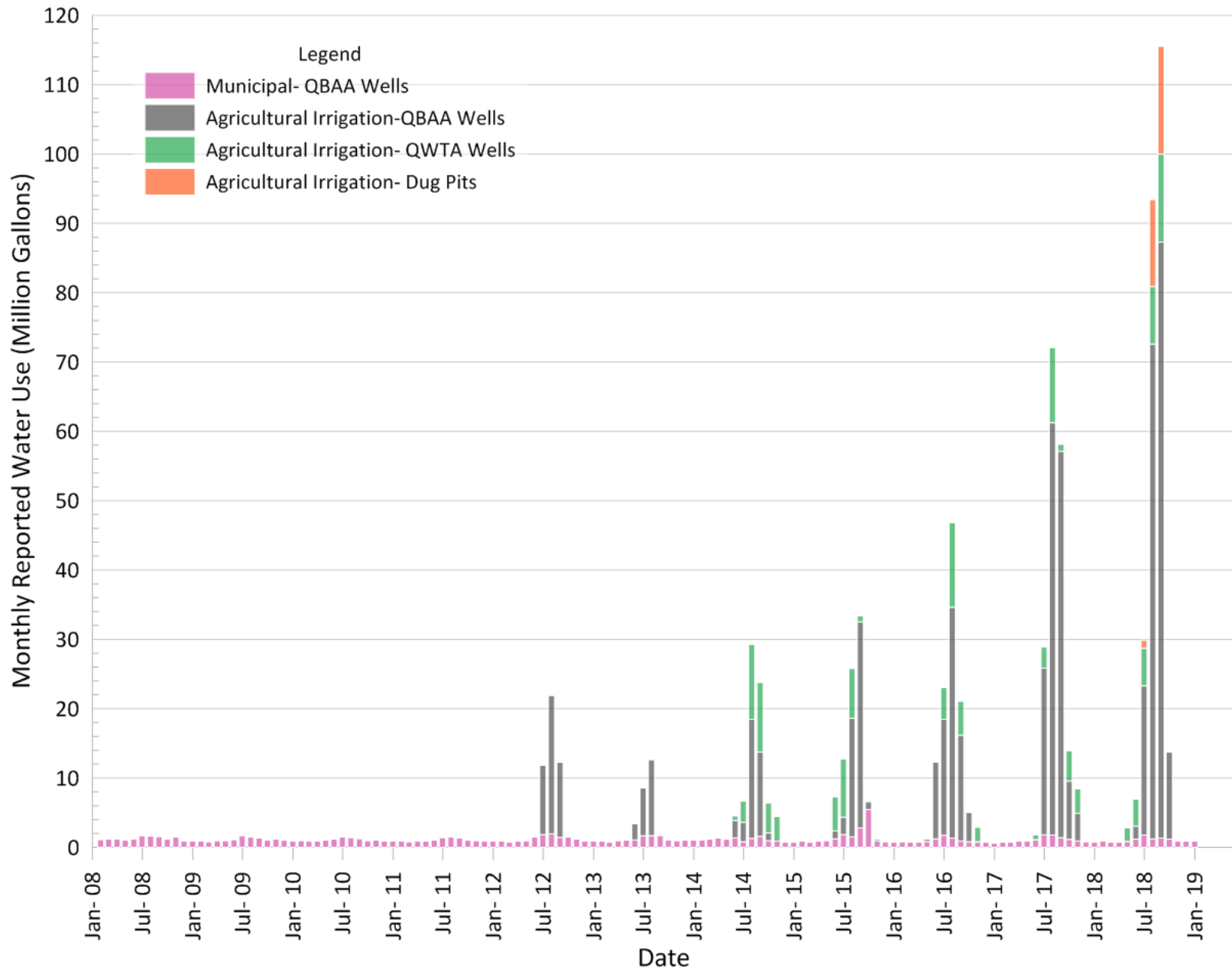




Figure 4. Photograph of the Lessard cistern and jet pump.

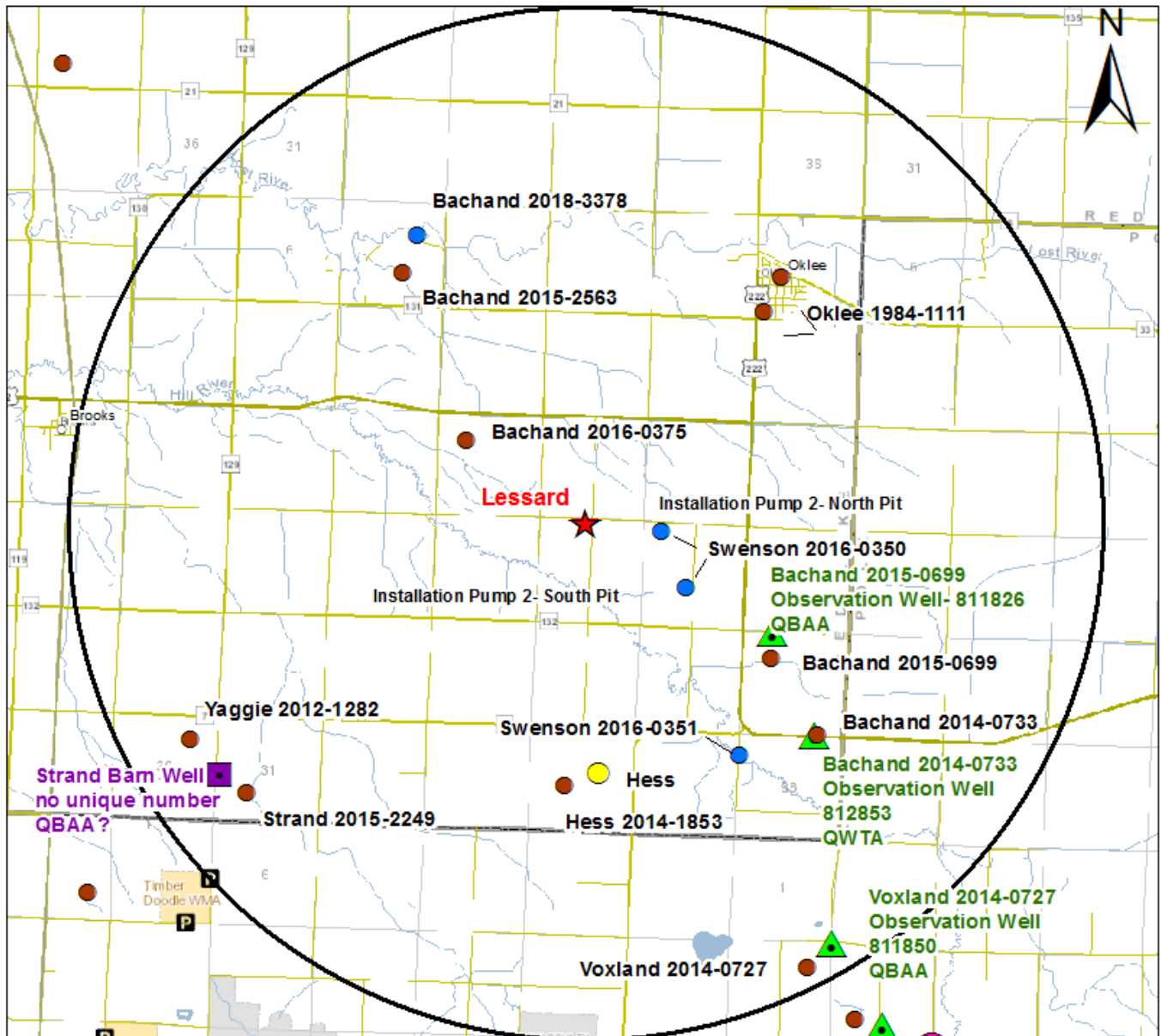


Figure 5: Monthly reported groundwater well and dug pit use from 2008 to 2018.



Note: QBAA stands for Quaternary buried artesian aquifer and QWTA stands for Quaternary water table aquifer.

Figure 6: Groundwater level monitoring location map.



## Legend



Lessard Domestic Well



Permit Holder monitored observation well



5 mile radius



Private wells temporarily monitored by DNR

## Water Appropriation Permits



Groundwater



DNR Monitoring Network observation well



Surface Water

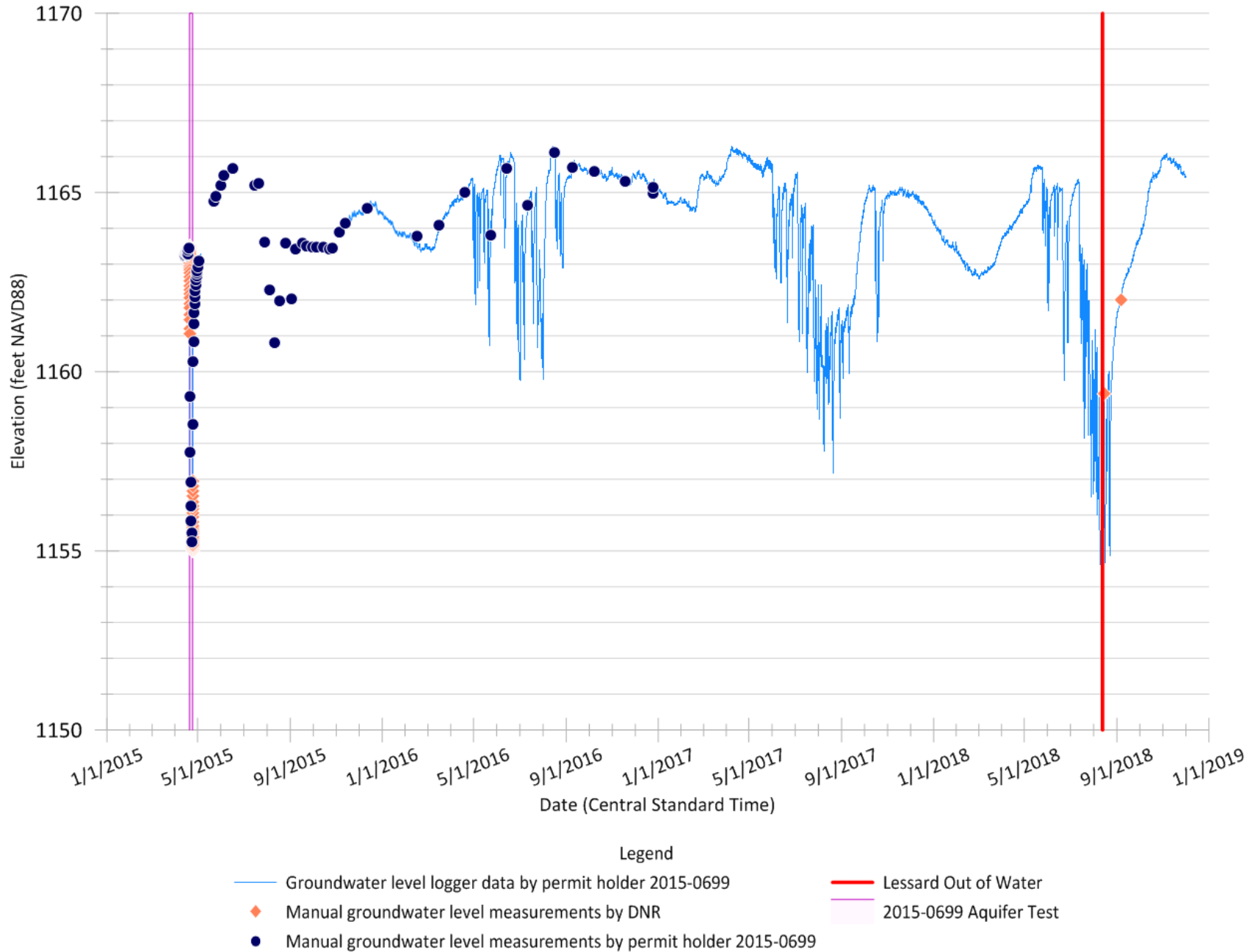


Unpermitted Irrigation Well (829001)



Note: QBAA stands for Quaternary buried artesian aquifer and QWTA stands for Quaternary water table aquifer.

Figure 7. Groundwater levels in Bachand 2015-0699 Observation Well (Shallow/Intermediate Confined aquifer).



# Appendix A- Complaint Information

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DEPARTMENT OF NATURAL RESOURCES  
DNR Eco-Waters  
B. Brumfi

## WATER WELL INFORMATION

| PART A WELL LOCATION GPS Coordinates:            |  |              |  |                     |                |
|--|--|--------------|--|---------------------|----------------|
| <input checked="" type="checkbox"/> Owner's Name | Jim Lessard                            |              | Telephone Number   | Home (218) 796-5377 |                |
| <input type="checkbox"/> Authorized Agent        | 27429 250th St. SE<br>Brooks, MN 56715 |              | Work   | (218) 280-7363      |                |
| Mailing Address                                  | 27429 250th St SE<br>Brooks, MN 56715  |              | Place an "X" on the grid showing the exact location of your well. The grid is one section (640 acres divided into 1/4, 1/4, 1/4 sections). (1980, 40, 10 acres). Attach a map or aerial photograph indicating the location of well(s). |                     |                |
| Email Address                                    | lessjam11@gmail.com                    |              |  |                     |                |
| County   | Township Name                          | Township No. | Range  | Section             | Fraction       |
| Red Lake   | Lambert                                | 150          | 41   | 22                  | NW 1/4 1/4 1/4 |

| PART B Describe existing well   |  | WELL CONSTRUCTION (Submit a copy of original Water Well Record, if available)   |  |
|---|--|---|--|
| Name of Company which drilled well:   |  | Date Completed  | Drilled Depth  |
| unknown   |  |   |  |
| CASING  | MATERIAL:  | Height Above (Below) Land Surface:  | Interval:  |
|   | <input checked="" type="checkbox"/> Steel<br><input type="checkbox"/> Plastic<br><input type="checkbox"/> Concrete<br><input type="checkbox"/> Wood<br><input type="checkbox"/> Other  | 1 ft  | from   |
|   | Diameter: 4 inches<br>Length: 132 feet   | _____ feet to   | _____ feet   |
| SCREEN  | SCREEN:  | Or open hole  | DRILLING METHOD: (if known)  |
|   | Make unknown   | from _____ ft. to _____ ft.   | <input type="checkbox"/> Mud Rotary<br><input type="checkbox"/> Air Rotary<br><input checked="" type="checkbox"/> Cable Tool<br><input type="checkbox"/> Bored/Augered<br><input type="checkbox"/> Driven<br><input type="checkbox"/> Dug<br><input type="checkbox"/> Other  |
|   | Type _____ Dia.: _____<br>Slot/Gauge _____ Length: _____<br>Set between _____ ft. and _____ ft.  | FITTINGS:   | USE: Type & Amount in gallons per day (gpd)<br><input checked="" type="checkbox"/> Domestic _____ gpd<br><input type="checkbox"/> Livestock _____ gpd<br><input type="checkbox"/> Irrigation _____ gpd<br><input type="checkbox"/> Public Supply _____ gpd<br><input type="checkbox"/> Commercial _____ gpd<br><input type="checkbox"/> Industrial _____ gpd<br><input type="checkbox"/> Other _____ gpd |
| PUMP  | TYPE:  | Age:  | Original & Current Non-Pumping Water Level (Above) Land Surface:   |
|   | <input type="checkbox"/> Submersible<br><input checked="" type="checkbox"/> Jet, Shallow<br><input type="checkbox"/> Jet, Deep<br><input type="checkbox"/> Reciprocating<br><input type="checkbox"/> Centrifugal<br><input type="checkbox"/> Other | 40+ years   | Pumping Rate: _____ gpm  |
|   | Pump Setting-submersible (Below Ground Level) _____ ft.<br>Drop Pipe Length-non-submersible (Below Ground Level) _____ ft.   | 1' above ground<br>6.5' below ground  | Original _____ Current _____<br>date measured _____<br>method of measurement (steel tape, etc.) _____  |
| Flowing Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |  | Original & Current Pumping Water Level Below Land Surface:<br>Original _____ Current _____<br>date measured _____<br>method of measurement (steel tape, etc.) _____ |  |

| PART C WELL CONDITION  |  |
|--|--|
| NOTE: Attach additional sheets as needed.  |  |
| CASING:  | Comment (Describe method of inspection): |
| <input type="checkbox"/> Cracked<br><input type="checkbox"/> Holes<br><input type="checkbox"/> Filled with Sediments<br><input type="checkbox"/> Incrusted<br><input type="checkbox"/> Other | installed suction line deeper 60'        |
| SCREEN (if one exists):  | Comment (Describe method of inspection): |
| <input type="checkbox"/> Incrusted<br><input type="checkbox"/> Plugged<br><input type="checkbox"/> Rusted/Corroded<br><input type="checkbox"/> Other   |  |
| PUMP:  | Comment (Describe method of inspection): |
| <input type="checkbox"/> Incrusted<br><input type="checkbox"/> Rusted/Corroded<br><input type="checkbox"/> Electrical<br><input type="checkbox"/> Other                                      |  |
| DROP PIPE:   | Comment (Describe method of inspection): |
| <input type="checkbox"/> Rusted/Corroded<br><input type="checkbox"/> Holes/Cracks<br><input type="checkbox"/> Water Marks<br><input type="checkbox"/> Other                                  |  |
| DISTRIBUTION:  | Comment (Describe method of inspection): |
| <input type="checkbox"/> Plugged Lines<br><input type="checkbox"/> Vacuum in Lines<br><input type="checkbox"/> Other   |  |
| OTHER (Describe method of inspection):   |  |
| Does this well comply with the MN Health Department Water Well Construction Code? <u>YPS</u> If not, why not?  |  |

| PART D SIGNATURES    |         |  |         |
|----------------------|---------|--|---------|
| Well Owner or Agent: | Date:   | Driller:   | Date:   |
| Jim Lessard          | 8-16-18 | Leslie Berg<br>Address: 78029 450th Ave SE<br>Gully MN 56046<br>218-268-4548 | 8/15/18 |

**PART E****COMPLAINT QUESTIONNAIRE**

Please answer the following questions by providing as much information as possible. Attach any documents involved, such as receipts, worklists, bids, water level measurements, observation or related investigative information, etc.

1) Describe the problem:

Well quit pumping - needed to have a longer suction line installed

2) Indicate the number of people, livestock and other type(s) of water use supplied by the well(s):

2 people

3) Suspected cause of the problem:

farmers irrigation systems nearby

4) Have you contacted well owner(s) whose well(s) you suspect might be affecting yours? Explain (provide their name, address and phone number)

yes Tony Bachand 507-951-6466  
24059 275th AVE SE Brooks Mn 56715

5) Past well problems? (when and what was the problem?):

None - in the 40 years I've lived here

6) Describe any maintenance that has been done on this well:

Regular maintenance new motor and pump + pressure tank

7) Have you corrected the problem? Explain:

Yes - well driller fixed - new suction line

8) How do you feel this problem can be fairly resolved? (if possible, attach a list of work, materials, and costs needed to resolve the problem)

not sure - no problems before farmers started to irrigate in area. No bill recieved yet.

9) Have you complained before? When? To whom?

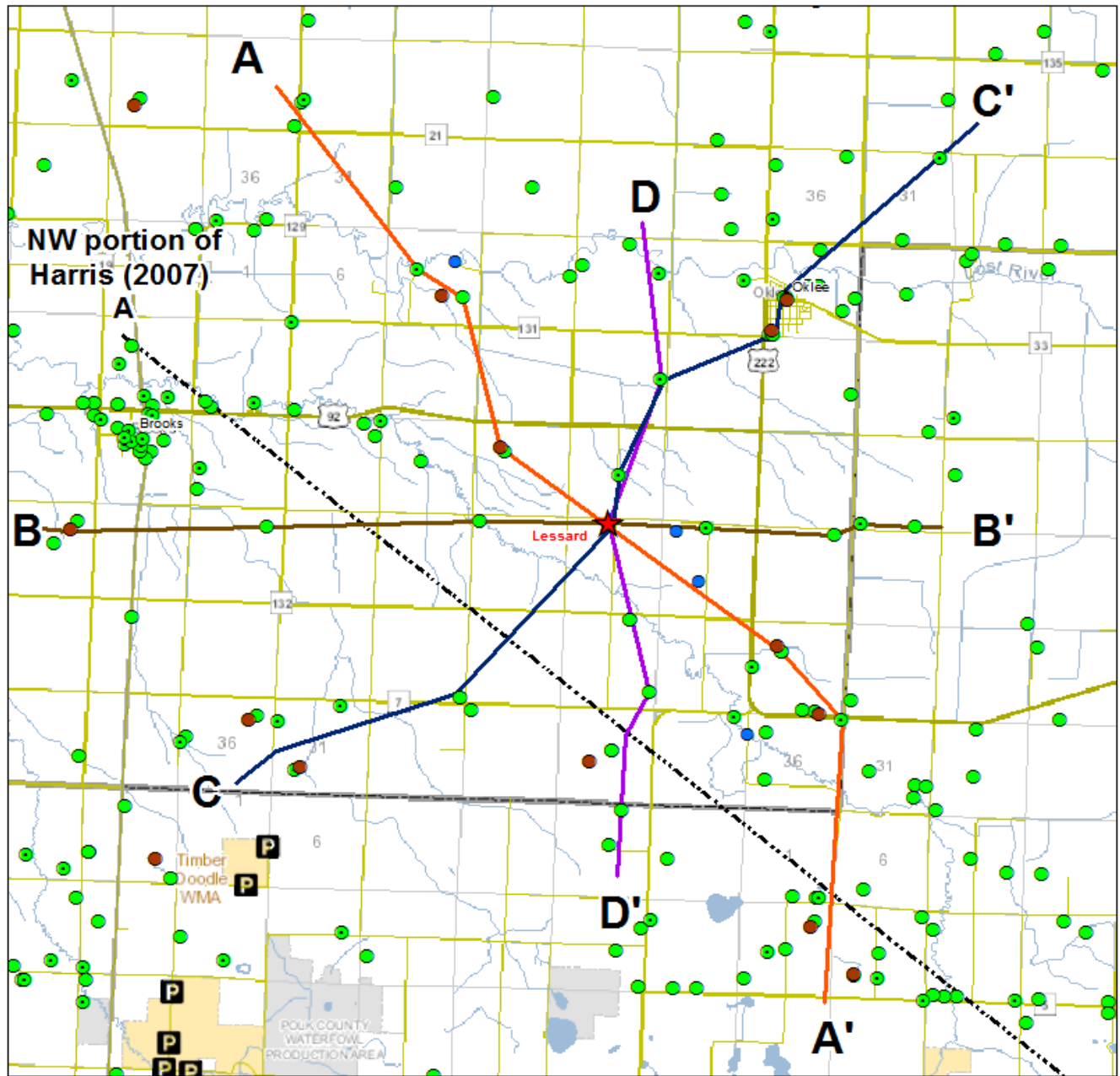
no

10) General Comments:











what's the purpose of tiling there ground and then irrigating on sandy ground that won't grow anything without, the soil is usally blowing in windy conditions

# Appendix B- Hydrogeological Cross Sections

Figure B-1: Location of cross section traces near Lessard.



## Legend

-  Lessard domestic well
-  Cross section A to A' running northwest to southeast
-  Cross section B to B' running west to east
-  Cross section C to C' running southwest to northeast
-  Cross section D to D' running north to south
-  Northwest portion of Harris (2007) Quaternary geology cross section
-  County Well Index - Verified Locations
-  County Well Index - Unverified Locations
-  Groundwater
-  Surface Water

## Water Appropriation Permits

-  Groundwater
  -  Surface Water
-   
**DEPARTMENT OF NATURAL RESOURCES**



Figure B-2: Northwest portion of the Quaternary geology cross section by Harris (2007).

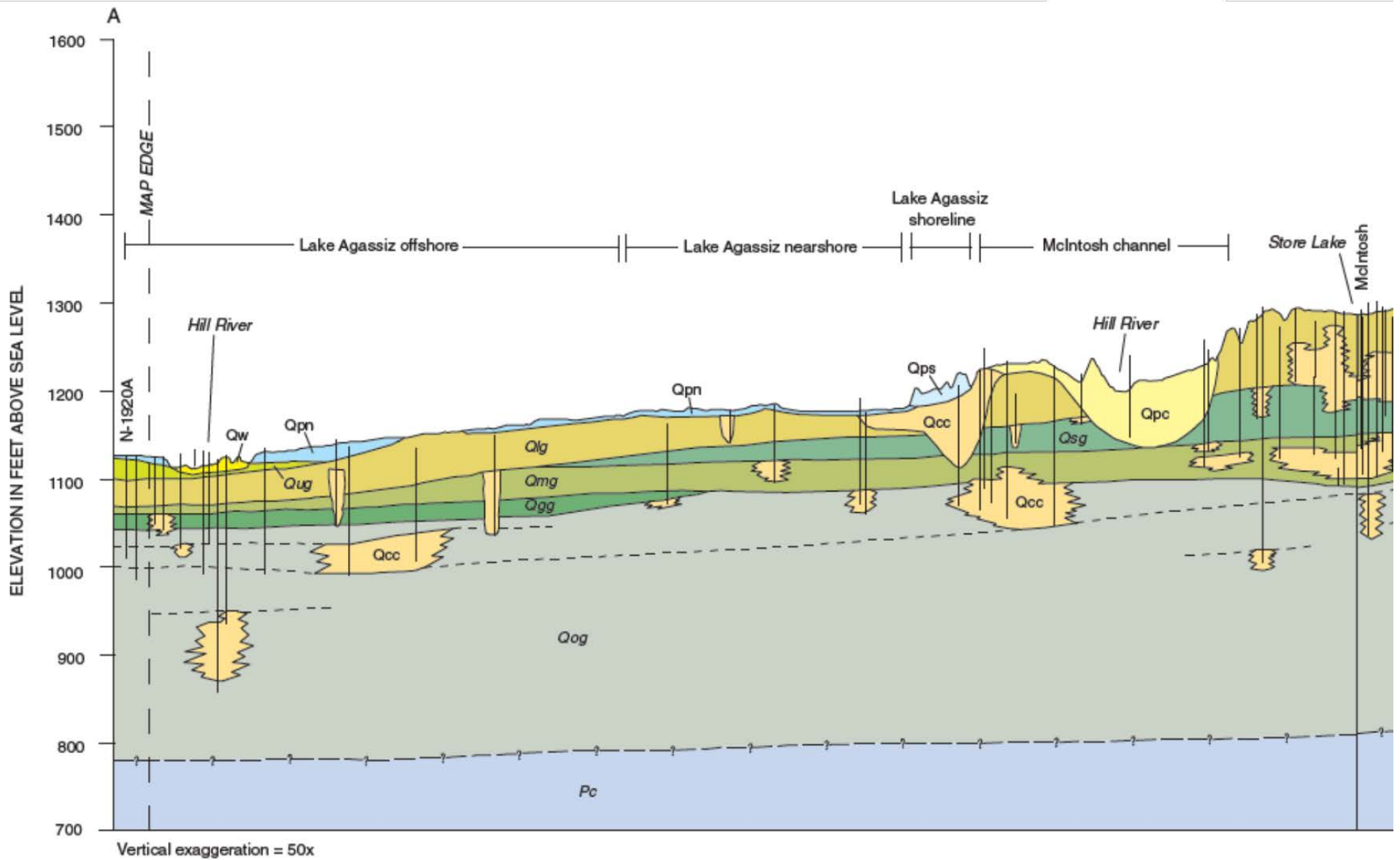




Figure B-3: Map units key for Harris (2007) cross section.

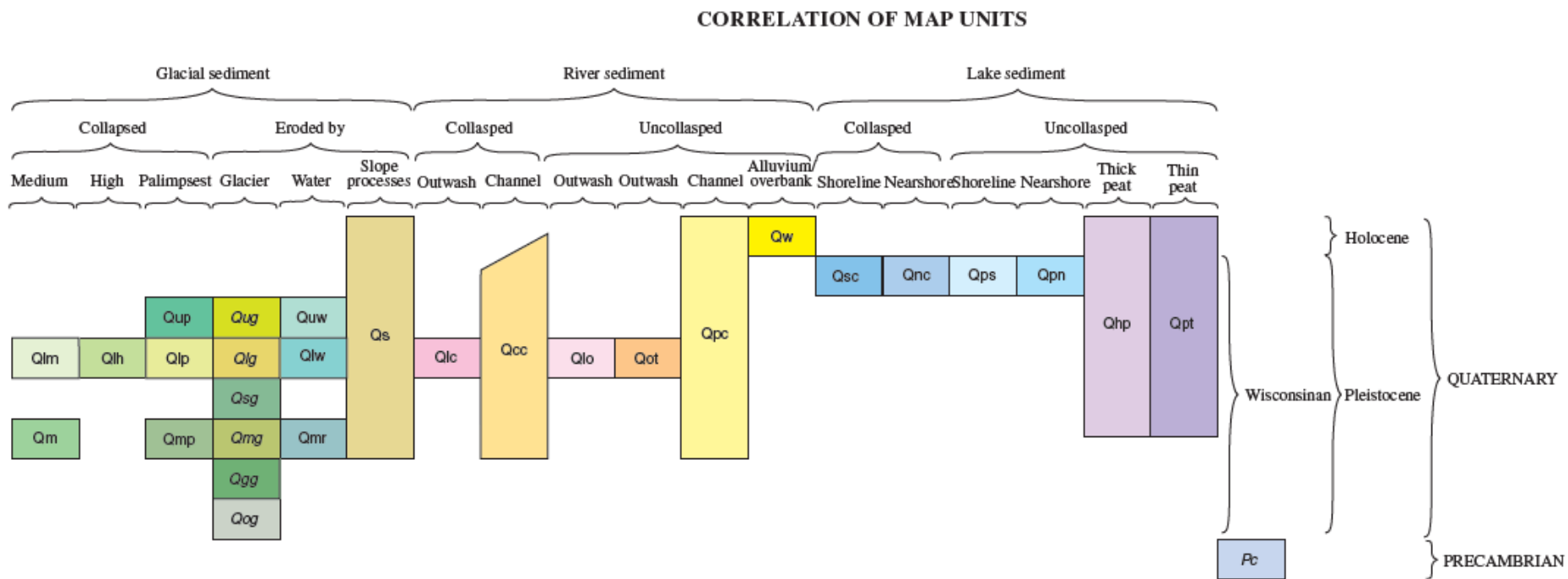


Figure B-4: Hydrogeological cross section A to A' running northwest to southeast.

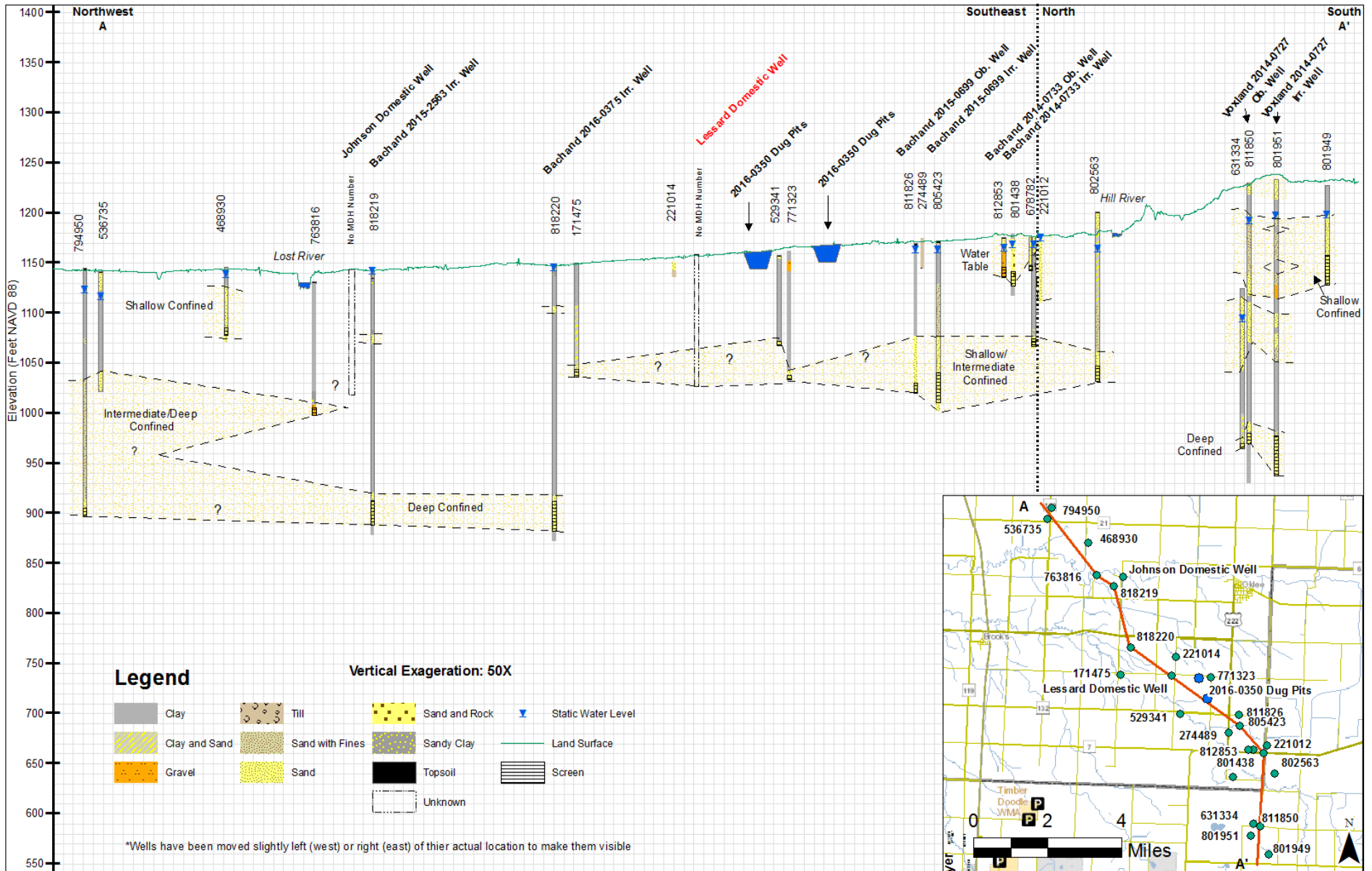


Figure B-5: Hydrogeological cross section B to B' running west to east.

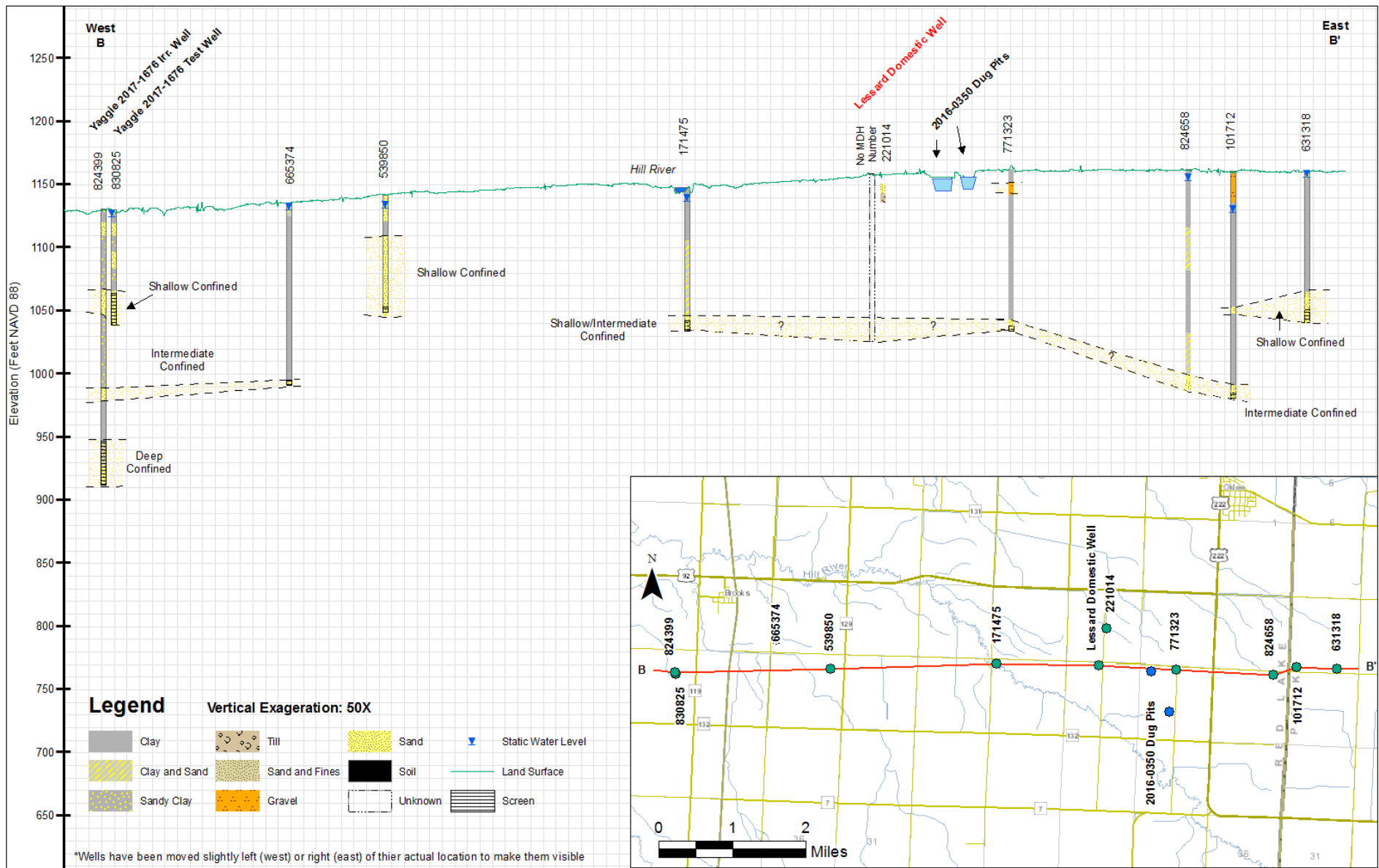


Figure B-6: Hydrogeological cross section C to C' running southwest to northeast.

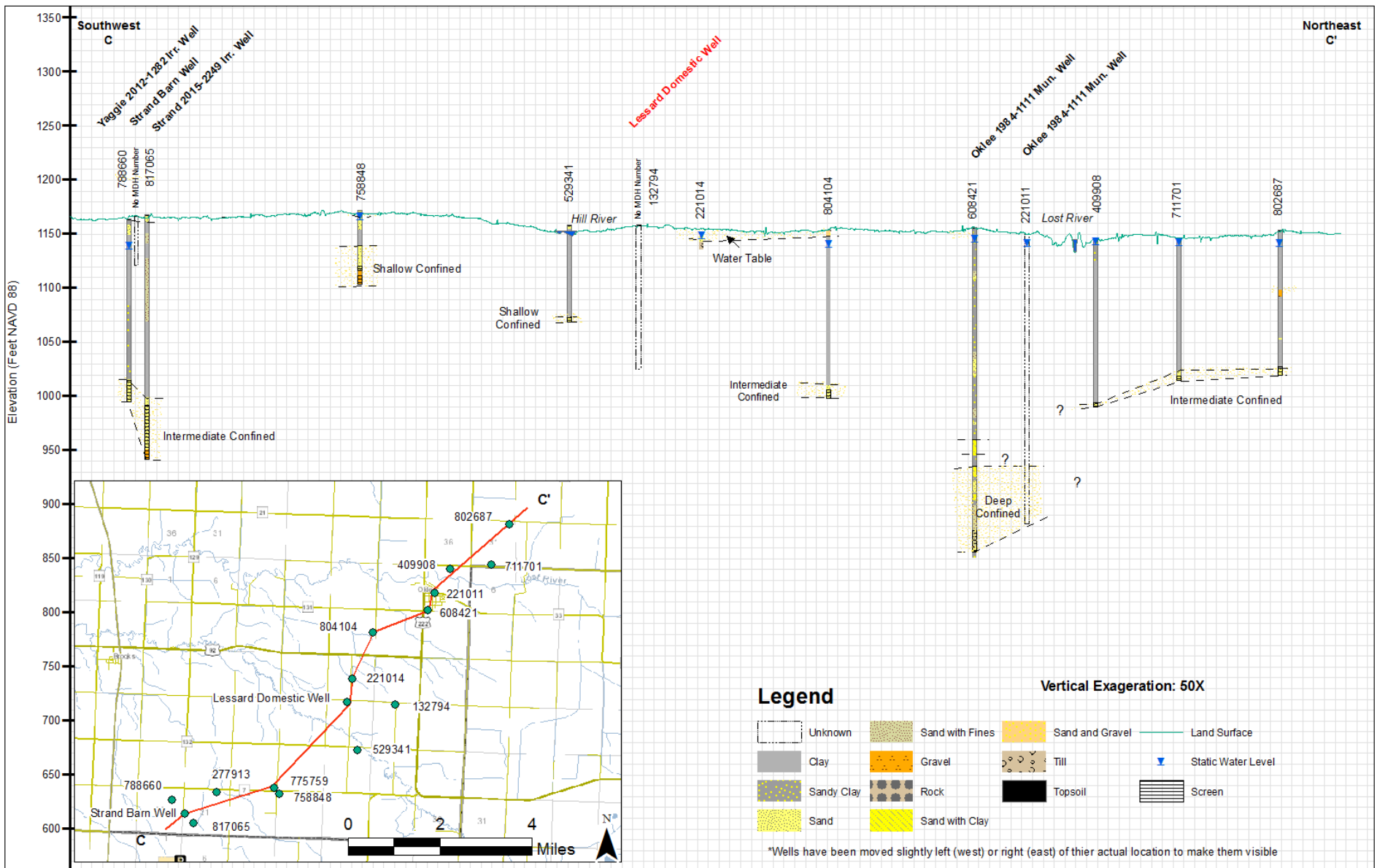


Figure B-7: Hydrogeological cross section D to D' running north to south.

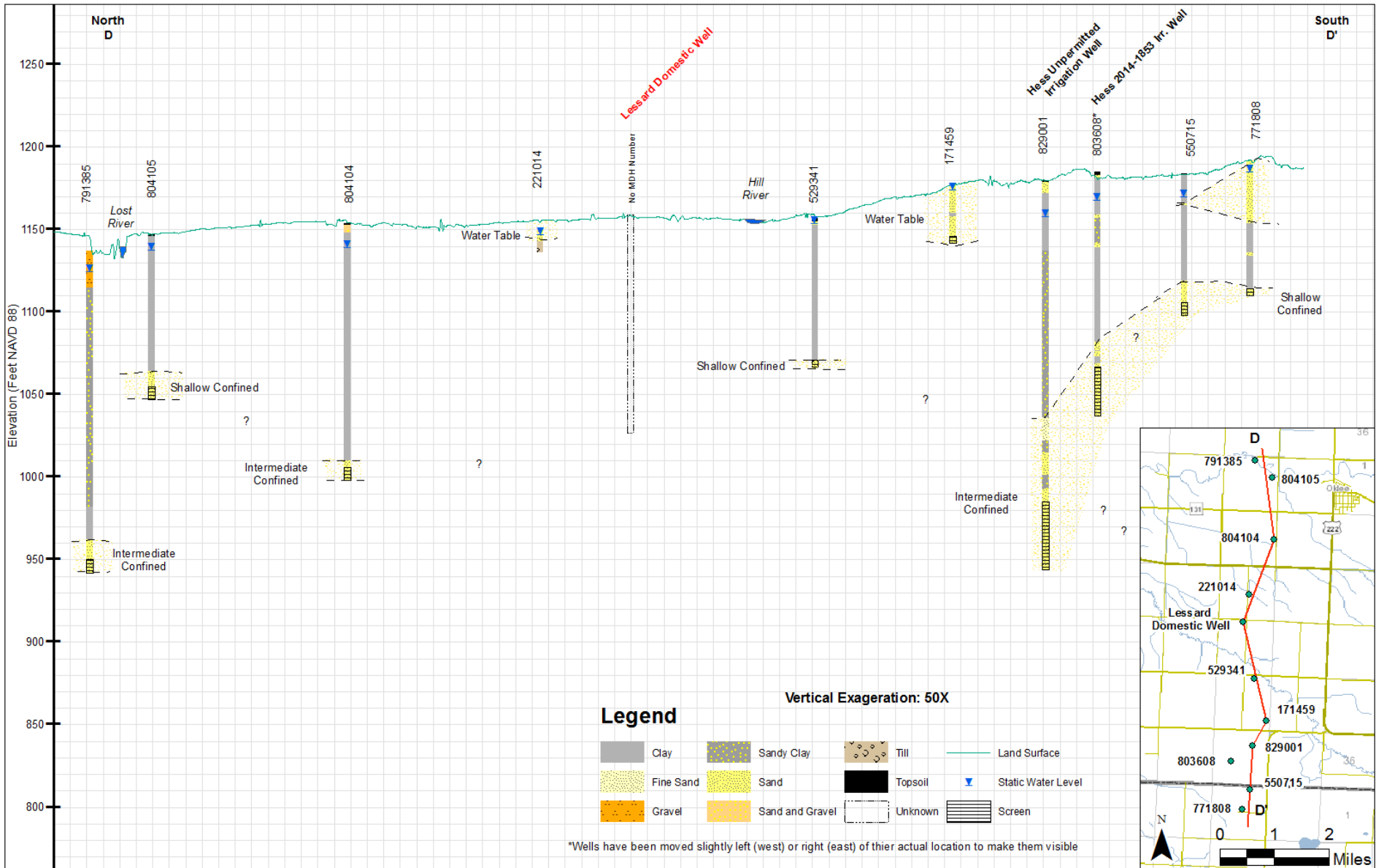
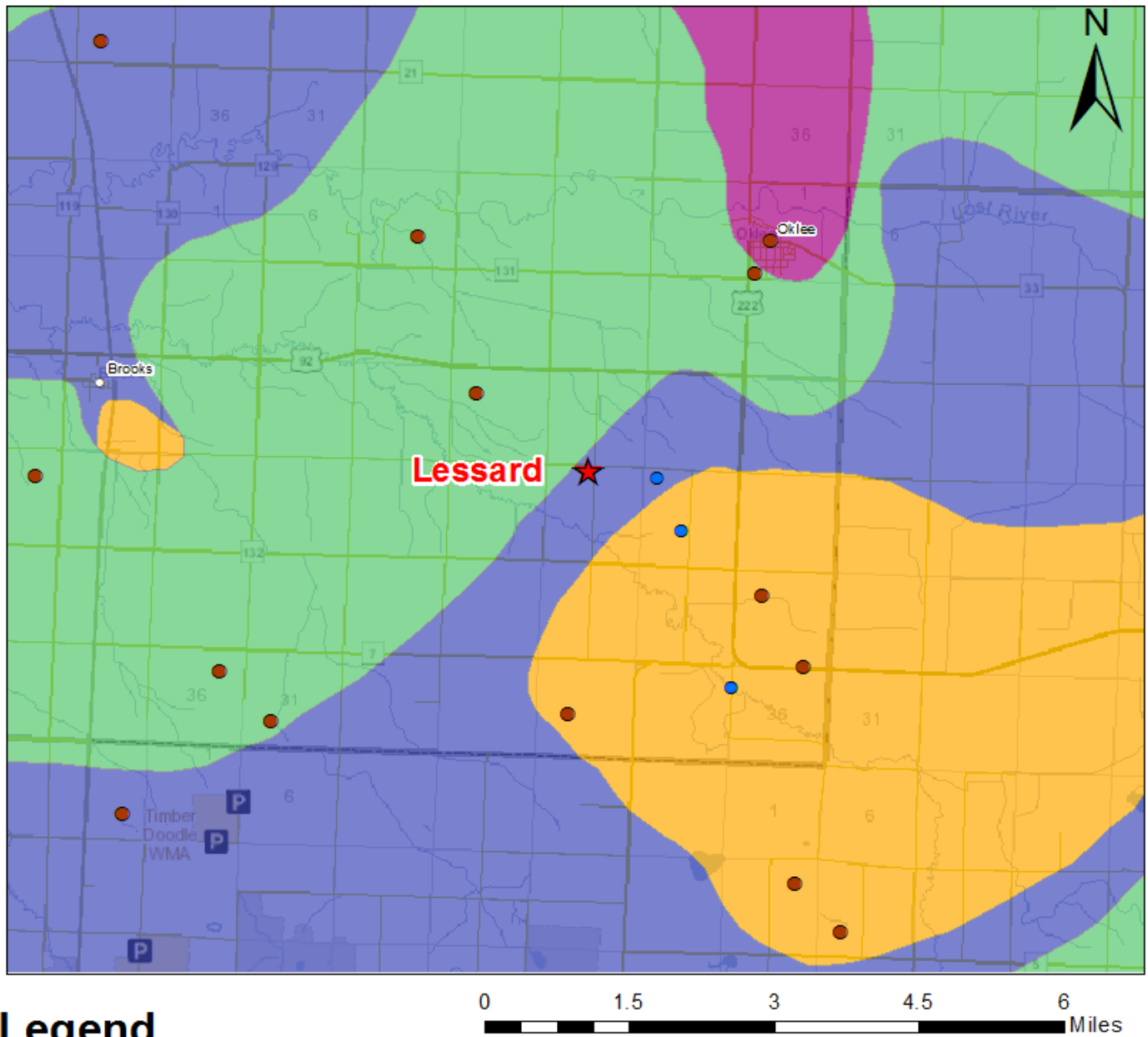


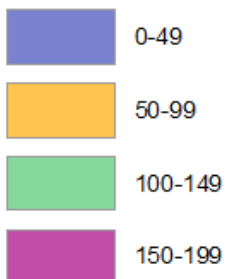
Figure B-8: Thickness of the uppermost confining unit from Lindgren (1996).



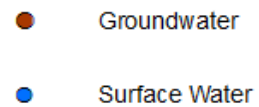
## Legend

★ Lessard domestic well

### Uppermost confining unit thickness in feet (Lindgren, 1996)

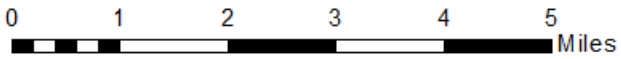
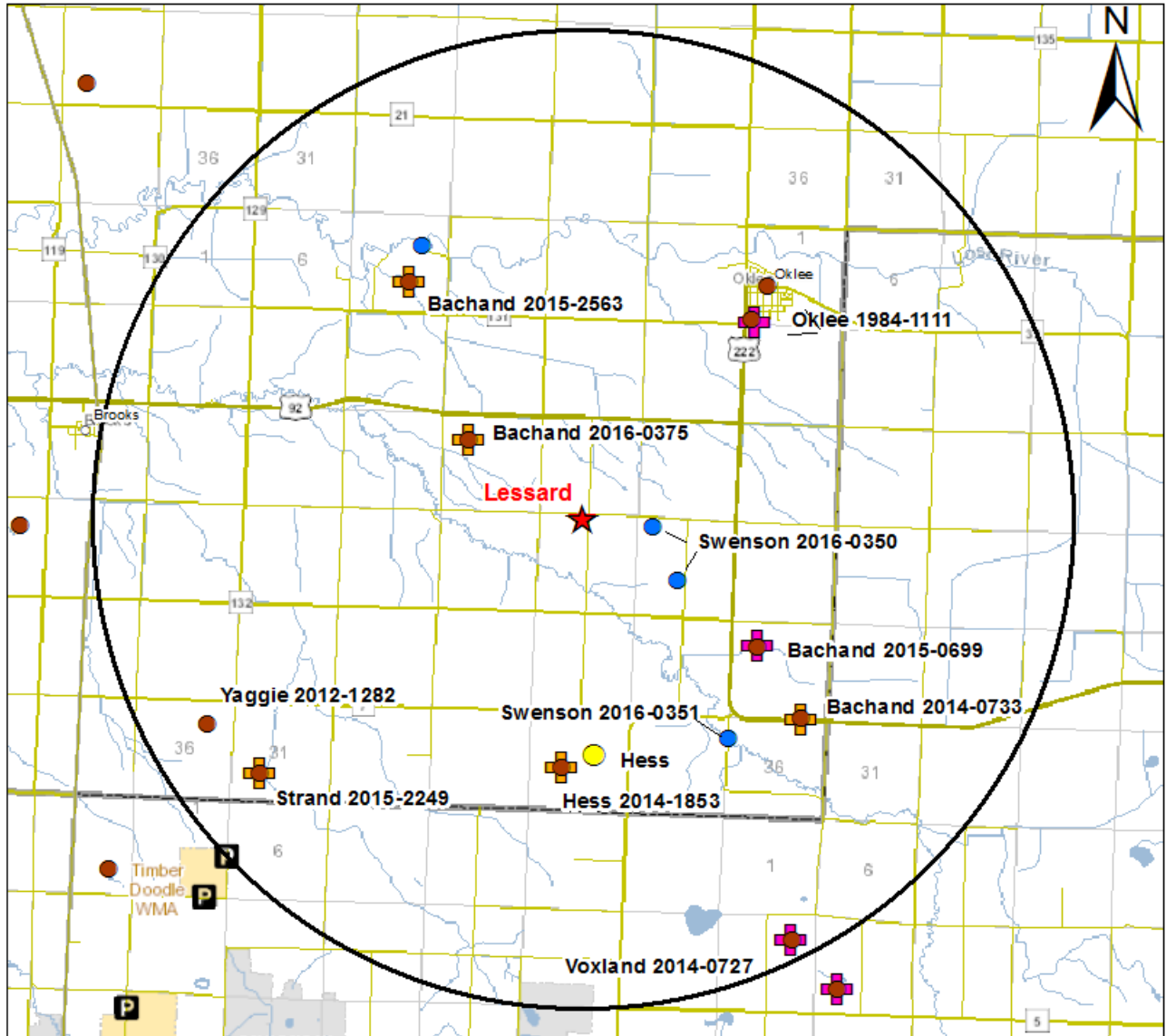


### Water Appropriation Permits



# Appendix C- Aquifer Parameters

Figure C-1. Aquifer information locations.



## Legend

- ★ Lessard Domestic Well
- Water Appropriation Permits**
- Groundwater
- Surface Water
- Unpermitted Irrigation Well (829001)

- Test Locations**
- + Aquifer Test
- + Specific Capacity Test
- 5 mile radius



**Table C-1: Available aquifer parameters for area permits.**

| Appropriations Permit No. and Land owner              | Water Source (Aquifer name interpreted from Lindgren, 1996) | Distance to Lessard domestic well | Unique well number and depth               | Aquifer Thickness (feet) | Aquifer Transmissivity (ft <sup>2</sup> /day) | Aquifer Storativity (unitless) | Hydraulic Conductivity (ft/day) | Source of Information and Date of Test  |
|---|---|-----------------------------------|--|--------------------------|---|--------------------------------|---------------------------------|---|
| 2014-0733<br>Bachand                                  | Groundwater;<br>water table                                 | 3 miles                           | 801438;<br>52 feet                         | 47                       | 10,560  | Not applicable                 | 225                             | Specific capacity test. December 2 to 4, 2013. Pumping rate of 605 and 804 gpm. DNR analyzed (Lahti, 2014).   |
| 2015-0699<br>David Bachand and Mary Lynn Bachand Inc. | Groundwater;<br>Shallow/<br>Intermediate confined           | 2.2 miles                         | 805423;<br>161 feet                        | 75                       | 12,400  | 0.00072                        | 165                             | Aquifer test. April 20 to 24, 2015. Pumping rate of 1553 gpm. DNR analyzed (Rose, 2015a). Leakage at late time. Channel aquifer. No drawdown in water table well. |
| 2014-1853<br>William Hess                             | Groundwater;<br>Shallow/<br>Intermediate confined           | 2.5 miles                         | 803608;<br>148 feet                        | 45                       | 125   | Not applicable                 | 3                               | Specific capacity test. July 28, 2014. Pumping rate of 350 gpm. DNR analyzed (Rose, 2015b)  |
| 2015-2249<br>Brent Strand                             | Groundwater;<br>Intermediate confined                       | 4.2 miles                         | 817065;<br>226 feet                        | 57                       | 20,000  | Not applicable                 | 350                             | Specific capacity test. December 15 to 16, 2015. Pumping rate of 1600 gpm. DNR analyzed (Walker, 2016).   |
| 2016-0375<br>Jeffrey Bachand                          | Groundwater;<br>Deep confined                               | 1.4 miles                         | 818220;<br>265 feet                        | 36                       | 4500  | Not applicable                 | 125                             | Specific capacity test. March 23, 2016. Pumped at 1109 gpm. DNR analyzed (Lahti, 2017a).  |
| 1984-1111<br>City of Oklee                            | Groundwater;<br>Deep confined                               | 2.6 and<br>3 miles                | 608421;<br>300 feet<br>221011;<br>268 feet | 43                       | 4804  | 0.0006                         | 112                             | Aquifer test. July 30 to 31, 1998. MDH analyzed. Well #3 pumped at 210 gpm. Aquifer is confined and bounding aquitards do not appear leaky.                       |
| 2015-2563<br>Charles and Carol Bachand Inc.           | Groundwater;<br>Deep confined                               | 3 miles                           | 818219;<br>255 feet                        | 33                       | 6900  | Not applicable                 | 209                             | Specific capacity test. March 23, 2016. Pumping rate of 690 gpm. DNR analyzed (Lahti, 2017b).   |
| 2014-0727<br>Jerome and Michael Voxland               | Groundwater;<br>Deep confined                               | 4.8 miles                         | 801951;<br>296 feet                        | 44                       | 1200  | 0.00012                        | 27                              | Aquifer test. May 19 to 22, 2015. Pumping rate of 758 gpm. DNR analyzed (Rose, 2015c). Leaky confined aquifer. Drawdown in overlying aquifers.                    |



## Loren Sanderson

---

**From:** Charles Fritz <charles@iwinst.org>  
**Sent:** Thursday, March 07, 2019 9:23 AM  
**To:** Myron Jesme; Loren Sanderson  
**Subject:** Fwd: IWI Funding Request  
**Attachments:** Watershed Delineation and Hydrology Report Tool.docx

Loren (and Myron),

I got your VM. I sent this to Rob yesterday...

Note there are areas in your district that do not have h3DEMs. There is a rigorous QA process we apply before a DEM gets a h3DEM or h3DEM+ seal. That being said, if Ashley has updated DEMs, we could incorporate I suppose.

cf

----- Forwarded message -----

**From:** Charles Fritz <charles@iwinst.org>  
**Date:** Wed, Mar 6, 2019 at 3:06 PM  
**Subject:** Re: IWI Funding Request  
**To:** Rob Sip <rob.sip@rrwmb.org>

Rob -

I took a stab at a short descriptor for the watershed delineation and hydrology report tool. I placed a \$40K number on this. The estimate I have figured (talking with Brian Fischer and Grit today) is ~ \$30K. BUT, it seem like there are always issues that arise, so I (arbitrarily) said it was a "not to exceed" \$40K effort. If no troubles/issues, the billable hours should fall into that \$30K range, if trouble/issues arise, it would be closer to \$40K methinks. Make sense?

Note there are watersheds that do NOT have h3DEMs. These would be a "hole" in this application until such time as they are available.. I understand BWSR submitted a proposal to NRCS to get these remaining RRB watersheds done. When they are, it is a relatively simple matter to get them uploaded/included in this application.

The item that may get questioned is the hydrology/discharge calculations. Engineers groused about this last time.... I have been assured by Mark and Brian, that the math / input data used is as good as it gets...same method engineers use when they figure this stuff.

The other issue is outreach and training - there is no dollars or scope for anyone to run around informing/training folks....probably should be, but it's always an afterthought.

Let me know if this works.  
Chuck

On Wed, Mar 6, 2019 at 7:36 AM Rob Sip <rob.sip@rrwmb.org> wrote:

Chuck,

The online Watershed Delineation and Hydrology Report Tool (WDHRT) was developed in 2013 (Red River Basin Decision Information Network Project Planning Tool). The WDHRT will allow users to delineate watershed basin (up to 8 digit HUCs) and small catchments and generate a hydrology report (example attached).

The International Water Institute will (IWI) will update and host the WDHRT as part of the current IWI Map Portal

(<https://gisapps.iwinst.org/map-portal/>). Estimated (not to exceed) cost to update the application to include MN RRB watershed with H3DEMs is \$40,000.

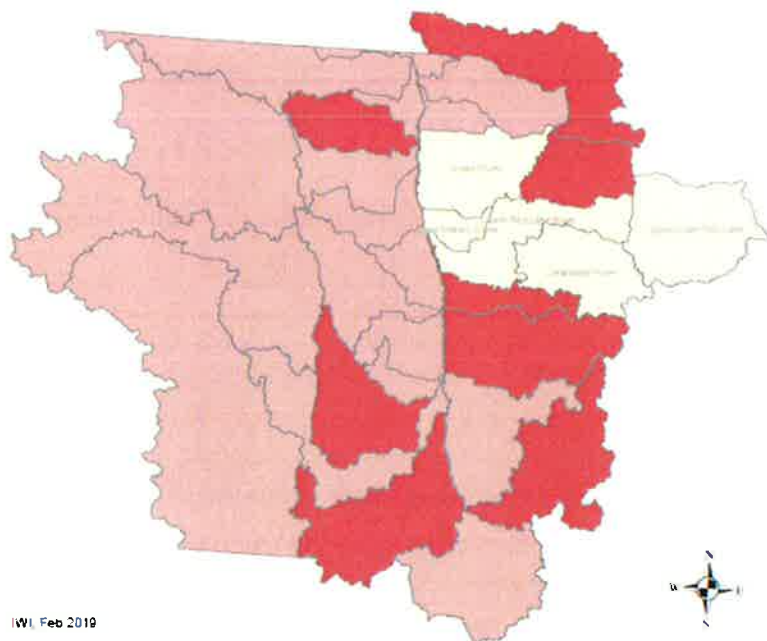
**Tasks:**

- 1) Compile required datasets
- 2) Write batch processing script
- 3) Adjoined catchment processing
- 4) Assemble watershed data packages
- 5) Modify James River Hydrology Report Script (MN regressions, etc.)
- 6) Upload to IWI GIS server

The tool will be available where H3DEMs currently exist. The remaining watershed will be added as h3DEMs are completed and become available.

**Conditioning Status in RRB and James River WS**

| Legend  |                    | Watersheds without PTMApp Area (SquareMiles) |                |
|---|--------------------|--|----------------|
| <span style="display: inline-block; width: 15px; height: 10px; background-color: red; border: 1px solid black;"></span>     | PTMApp             | Snake River                                  | 1,463.2        |
| <span style="display: inline-block; width: 15px; height: 10px; background-color: #f08080; border: 1px solid black;"></span> | PTMApp in Progress | Grand Marais Creek                           | 320.9          |
| <span style="display: inline-block; width: 15px; height: 10px; background-color: #ffff00; border: 1px solid black;"></span> | None               | Lower Red Lake River                         | 1,339.8        |
|   |                    | Clearwater River                             | 1,358.5        |
|   |                    | Upper/Lower Red Lake                         | 1,940.1        |
|   |                    | <b>TOTAL</b>                                 | <b>6,422.6</b> |



IWI Feb 2019

# James River Basin

## Decision Support Tool

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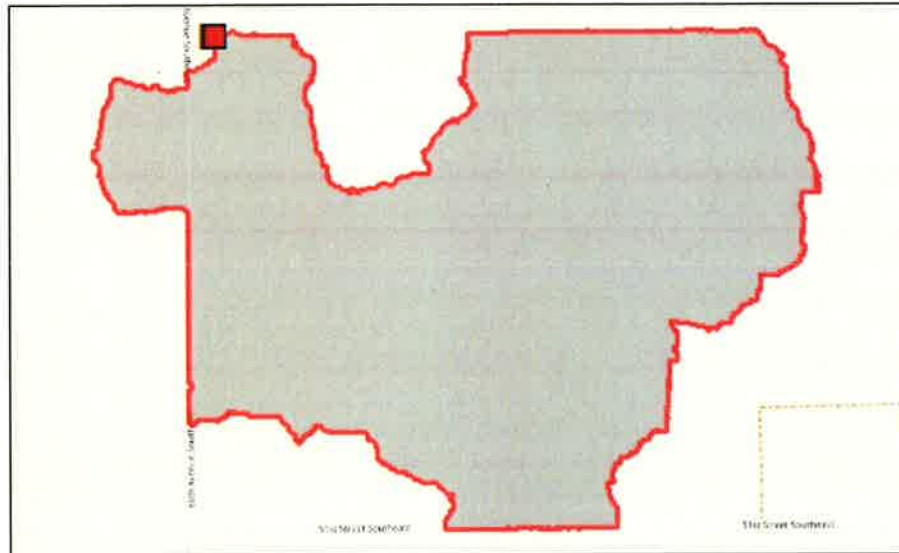
### Watershed Delineation and Hydrology Report

---

#### Report Statistics:

Run Date: 03/06/2019

Run Time: 02:32:35  
PM



#### Location Summary:

■ Watershed Outlet

**BACKGROUND:** This demonstration project is sponsored by the North Dakota Department of Health with the express purpose of applying and evaluating possible new technologies for planning flood damage reduction, natural resource enhancement and water quality improvement projects. This project demonstrates the use of geospatial data, high resolution topographic information derived from Light Detection and Ranging (LIDAR) data, advanced LIDAR derived hydrologic products, and emerging computer and internet technologies, to assist the general public, planners and public decision makers.

**LIMITATION OF LIABILITY:** With respect to the data presented by or available through this application, neither the North Dakota Department of Health nor any of its employees, the International Water Institute nor any of its employees, or any Cooperators, Consultants or Subcontractors, makes any warranty, express or implied, including the warranties of merchantability and fitness for a particular purpose, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, product, or process disclosed, or represents that its use would not infringe privately owned rights. The user of this system assumes all responsibility and risk for the use of the information and any decision made as a result of this information, available from this server and the Internet generally. The user alone is responsible for the application and interpretation of this information and is responsible for use consistent with an appropriate level of caution. You should see the advice of a Professional Engineer or other suitable technical specialist to further evaluate and provide additional detail about the preliminary information contained within this report.

**REPORT PURPOSE:** The purpose of this report is to deliver basic hydrology information about the watershed being delineated. The information provided is preliminary information suitable for PLANNING PURPOSES ONLY. In no way should the information be construed as to be of sufficient detail and accuracy for any other purpose than planning.

#### SUBWATERSHED PHYSICAL CHARACTERISTICS

##### Slope Characteristics

| Characteristic                    | Value                    | Units     | Data Source              |
|-----------------------------------|--------------------------|-----------|--------------------------|
| Total Drainage Area               | 0.24                     | Sq. Miles | LIDAR Derived Slope Grid |
| Proportion of Area < 3%           | 76.7%                    | Percent   | LIDAR Derived Slope Grid |
| Proportion of Area > 3% and <= 6% | 20.7%                    | Percent   | LIDAR Derived Slope Grid |
| Proportion of Area > 6%           | 2.5%                     | Percent   | LIDAR Derived Slope Grid |
| Maximum elevation                 | 1,506.5 Feet (1988 NAVD) |           | James River LIDAR Data   |
| Minimum Elevation                 | 1,478.4 Feet (1988 NAVD) |           | James River LIDAR Data   |
| Elevation at Outlet               | 1,479.8 Feet (1988 NAVD) |           | James River LIDAR Data   |
| Maximum Elevation Change          | 28.1                     | Feet      | James River LIDAR Data   |

#### HYDROLOGY AND WATER QUALITY

This portion of the report provides information about HYDROLOGY based on the Subwatershed.

Hydrology Summary - The top five curve number soils and land use combinations for the subwatershed are:

| CN Value | Acres |
|----------|-------|
| 74       | 80.3  |
| 81       | 43.3  |
| 69       | 20.6  |
| 65       | 3.0   |
| 84       | 2.5   |

The dominant hydrologic soils group for this subwatershed is: B.

| Soil Group | Area (Acres) |
|------------|--------------|
| A          | 0.0          |
| B          | 102.9        |

|         |      |
|---------|------|
| C       | 45.8 |
| D       | 0.0  |
| A/D     | 0.0  |
| B/D     | 3.5  |
| C/D     | 0.0  |
| No Data | 0.0  |

#### Estimated Discharges Using U.S. Geological Survey Regression Equations

Peak discharges are computed using the <https://pubs.er.usgs.gov/publication/sir20155096> report. The report should be reviewed to ensure the reasonableness of input parameters used to develop peak flow rates.

Drainage Area = 0.2 Sq. Miles

Ruggedness Number = 143.0 Feet per mile

2 Year = 8.7 Cubic Feet per Second

5 Year = 21.8 Cubic Feet per Second

10 Year = 33.4 Cubic Feet per Second

25 Year = 50.4 Cubic Feet per Second

50 Year = 64.3 Cubic Feet per Second

100 Year = 79.4 Cubic Feet per Second

500 Year = 115.7 Cubic Feet per Second

YSI 600 QS sonde repair

RLWD owns 3 YSI 600 QS sondes that need pH probes replaced. YSI has discontinued the 600 QS sonde but will be servicing them till 2020.

| Sonde Name                       | Price for repair |
|----------------------------------|------------------|
| River Watch Sonde 1              | \$550            |
| River Watch Sonde 2              | \$550            |
| East Polk Water Quality Sampling | \$550            |
| <b>Total</b>                     | <b>\$1,650</b>   |

600 QS sonde that was purchased in 2007 cost approximately \$3,900

The latest sonde RLWD purchased (2015) for District water quality sampling was \$6,800 (Manta brand)



## West Polk Soil & Water Conservation District

528 Strander Avenue  
Crookston, Minnesota 56716-2912  
Telephone: (218) 281-6070 ext 4  
FAX: (218) 281-6071  
www.westpolkswcd.com

AN EQUAL OPPORTUNITY EMPLOYER

March 12, 2019

Dear Envirothon Sponsor:

The West Polk SWCD is requesting financial support for the Area I Envirothon. It will take place on Wednesday, May 1st, 2019, at the Rydell Refuge, Erskine MN. The Envirothon is a problem-solving, natural resources competition in which teams, usually comprised of five students, are tested on their knowledge of natural resources management and issues.

This is an outdoor environmental learning event/competition for Minnesota high school students. Schools from Northwestern Minnesota are invited to participate in our Area I event.

**We are asking for donations of \$25 - \$300.** This money will help finance trophies, prizes, noon lunch for the students and advancement to the state competition.

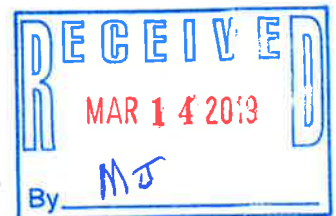
**If you wish to donate, please make the check payable to Area I Envirothon, and send it to our office by Friday, April 15<sup>th</sup>, 2019.**

Your support is appreciated greatly!

If you have any questions, please call 218-281-6070.

Sincerely,

Nicole Bernd  
District Manager



(Pictures Courtesy of West Polk SWCD)



(Area Envirothon)

(State Envirothon)

THANKS AGAIN FOR YOUR SUPPORT!!

## **Red Lake Watershed District - Administrators Report**

**March 15, 2019**

**Red River Watershed Management Board** – LeRoy and I will be attending the RRWMB meeting held 9:30 am on March 20, 2019 at the Courtyardby Marriott in Moorhead, MN.

**RRWMB Drainage Conference** - The RRWMB will be holding their 1<sup>st</sup> Annual Drainage Conference held at 8:45 am on March 19, 2019 at the Courtyard by Marriott in Moorhead, MN. The goal of this conference is to draw more folks from the Red River Valley that have not in the past, attended the Drainage Conference sponsored by Rinke Noonan which has been held in St. Cloud.

**RRWMB March Conference** – I will be attending on a small portion of the March Conference this year due to my vacation plans.

**Thief River 1W1P** – Advisory Committee met at 9:30 am, Wednesday March 13, 2019 at the Red Lake Watershed District Board Room. After completion of the meeting, the Policy Committee met to discuss the Memorandum of Agreement as well as discussion of timeline for completion of the draft plan which will be hopefully put out for public comments sometime in the early summer of 2019.

**Advisory Committee** – The Advisory Committee will be holding its annual meeting at 9:00 am March 18, 2019 at the Red Lake Watershed District Board Room.

**River Watch** – Ashley has included in your packet, a picture and article from the Leader Record which features and recognizes RLCC River Watch students on their first-place finish at the River Watch Forum.

**Mexico Vacation** – I will be leaving for Mexico sometime next Thursday and will be returning April 1<sup>st</sup>.



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Tamara Edevold spoke at the Clearbrook-Leonard Senior Citizens Center on Clearwater County Historical sites on Tuesday, February 19.

dress, **DOES NOT** change your paper address. If you do not let us know we have to pay 59 cents for each one that is returned. Thank You.



Red Lake County Central River Watch Team accepts their First Place Gold Award: Pictured from left to right are, RLCC River Watch Advisor Kathryn Tran, Tanisha Srnsky, Sidney Olson, Kaitlyn Morris and Red Lake Watershed District Staff Ashley Hitt.

# River Watch students solving Watershed problems

Grand Forks, ND — On February 27, students in the Red River Basin descended upon the Alerus Center to celebrate the 24th Anniversary of River Watch with the Annual River Watch Forum. River Watch is a watershed education program created for junior high and high school students. Students collect water quality samples from local rivers and streams, learn about their local watersheds and participate in a watershed-based project over the winter months. This year's Forum highlights included guest speaker Natalie Warren, who is one of the first two women to paddle from Minneapolis to Hudson Bay; River Watch Jeopardy; college and career fair; and Forum project winners. This year's project was "Data Driven Watershed Problem Solving". River Watch teams were asked to examine their watersheds, find an issue or problem, and propose a solution using an ArcGIS Online tool called Story

Maps to present their project. Red Lake Watershed District staff work closely with local schools who participate in the River Watch program, of those schools Red Lake Falls and Red Lake County Central completed the project for this year's forum. Red Lake Falls River Watch team found, after talking with local land owners and community members, that many people weren't aware of where to find buffer law information, regulations, or who to contact with questions about the buffer law. The team put together an ArcGIS Story Map to share with land owners. The story map answers common buffer law questions, with links to informational pages, maps, and contact information. Red Lake County Central found a source of pollution while invertebrate sampling in October 2018, students contacted local agencies looking for more information about the pollution

source and if this was a known problem. After learning the pollution was coming from an old tile line draining into the river and comparing water quality data taken from the pollution source vs. data collected upstream of the source, they knew something must be done to stop the tile line from draining into the river. The team came up with two different solutions and budgets for fixing the problem. They presented the problem and solutions to the Red Lake Watershed District and the Red Lake County Environmental Officer. An ArcGIS Story Map was created to describe the problem, research conducted, and solution proposals. Red Lake County Central won first place for their project at this year's River Watch Forum, beating out 16 other teams. Schools from Minnesota and North Dakota participate in River Watch activities throughout the year.