



PUBLIC UTILITIES COMMISSION AGENDA

City of Brainerd, Minnesota
BPU Service Center, 8027 Highland Scenic Rd, Commission Room
Tuesday, June 25, 2024 @ 9:00 AM

The public is invited to attend these meetings in person

1. **Call To Order**

2. **Roll Call**

___ M. Angland ___ T. Erickson ___ T. Johnson ___ M. O'Day ___ D. Matten

3. **Pledge of Allegiance**

4. **Approval Of Agenda - Voice Vote**

5. **Consent Calendar**

NOTICE TO PUBLIC - all matters listed are considered routine by the Commission and will all be enacted by one (1) motion. There will be no separate discussion of these items unless good cause is shown prior to the time the Commission votes on the motion to be ADOPTED BY ROLL CALL

A. **Approval of Minutes**

B. **Approval of Bills**

6. **Wellhead Protection Plan Presentation - Bolton & Menk**

A. **Wellhead Protection Plan Presentation**

7. **ClimaVision Presentation**

A. **ClimaVision Presentation**

8. **Public Forum**

Time allocated for citizens to bring matters not on the agenda to the attention of the Commission -
Time limits may be imposed

9. **Commission Committee Reports**

A. **Personnel Committee**

B. **Finance Committee**

C. **Operations Policy Committee**

10. **Unfinished Business**
(See attached separate memo regarding updates on unfinished business)
 - A. **Memo 6.25.24**
11. **New Business**
 - A. **Fee Schedule**
 - B. **Artificial Intelligence Use Discussion**
 - C. **Consider Resolution Approving Central Business District Incentive Policy**
12. **Staff Reports**
(Verbal: Any Updates since Packet)
 - A. **City Administrator Report**
 - B. **Council Liaison Report**
 - C. **Public Utilities Director Report**
 - D. **HR Director Report**
 - E. **Finance Manager Report**
 - F. **Operations Manager Report**
 - G. **Water/Wastewater Manager Report**
13. **Commission Member Reports**
14. **Closed Session**
Move to closed session pursuant to Minn. State Statutes 13D.05 subd. 3 section d.
15. **Adjourn**

Visit Brainerd Public Utilities website at www.bpu.org

MISSION

"The mission of Brainerd Public Utilities is to provide safe, reliable, environmentally friendly electric, water and sewer services to our customers at the lowest reasonable cost."



BRAINERD PUBLIC UTILITIES

8027 Highland Scenic Rd • P.O. Box 373 • Brainerd, Minnesota 56401

Business Office: 218.829.8726 ■ **Repair Service:** 218.829.2193

www.bpu.org

The regular meeting of the Brainerd Public Utilities Commission was held at 9:00 AM on May 28, 2024.

Commission President Matten called the meeting to order at 9:00 AM.

Commission Roll Call

Mike Angland – Present

Tad Johnson – Present

Dolly Matten – Present

Mark O'Day – Present

Tad Erickson - Present

Utility Staff Present

Interim Public Utilities Director

Finance Manager

Operations Manager

Water/Wastewater Manager

Electric Distribution Supervisor

Business Office Supervisor

Recording Secretary

Patrick Wussow

Danny Loch

Trent Hawkinson

Charlie Gammon

Mitch Lachelt

Jana Pernula

Mandy Selisker

Others in Attendance

City Administrator

HR Director

Community Development Director

City Liaison

Bolton & Menk

Widseth

CliftonLarsonAllen

CliftonLarsonAllen

Nick Broyles

Kris Schubert

James Kramvik

Jeff Czczok

Morgan Salo, PE

Bill Westerberg, PE

Mary Reedy

Eric Smedsrud

Commissioner Matten opened the meeting with the Pledge of Allegiance.

Approval of Agenda Items

Commissioner Matten requested to add a joint meeting request with the Parks Committee regarding a potential solar project at Rotary Park as Item H under New Business. Motion by Commissioner O'Day and seconded by Commissioner Johnson to approve the amended agenda. There was a unanimous vote in favor of the motion. Motion carried.

Approval of Consent Items

Motion by Commissioner Johnson and seconded by Commissioner Angland to approve the minutes from the April 30th, 2024, regular monthly meeting, the current month's bills, Pay Request No. 5 received from

BRAINERD PUBLIC UTILITIES COMMISSION MEETING

May 28, 2024

Minger Construction for \$47,216.52 for the Directional Drilling Forcemain River Crossing Project, and authorization to obtain bids for two hydro generators. There was a unanimous roll call vote in favor of the motion. Motion carried.

2023 Audit Presentation – see board packet for presentation

Mary Reedy and Eric Smedsrud presented results from the 2023 Audit.

Motion by Commissioner O'Day and seconded by Commissioner Erickson to accept the 2023 audit subject to a final review by the finance committee. There was a unanimous vote in favor of the motion. Motion carried.

Public Forum

Sarah Thiesse, 11687 Oakridge Road, Brainerd presented concerns regarding VCV Digital's crypto mining facility. Discussion included:

- Noise impact from the facility for the neighboring properties
 - The City of Glencoe has been in mediation for two years between residents and a current crypto mining company.
 - Sarah will share the findings of the noise studies which run between \$8,000 - \$10,000 per study. The noise study was done with an operation containing nine containers versus the proposed 26 containers by VCV Digital.
- Asking for consideration of benefits for the City of Brainerd
 - Local jobs are not always brought to existing residents.
 - Local contractors are not always used as there is no contractual obligation.
- Impacts of the operations aren't widely known.

Gary Thiesse, 12437 Oakridge Road, presented concerns with lawn maintenance at the new water tower site.

- Gary is the caretaker for the Lexington property with the new water tower site. There are some nuisance weeds and a mound of dirt on the east side and his request was for the utility to try to control and mow this area.

Public Forum was closed at 9:23 AM

Commission Committee Reports

Personnel

The Commission was provided with notice of a new union forming with the Public Utilities Supervisors and Managers.

Finance

None

Operations Policy Committee

None

Unfinished Business - See board packet for staff memo.

City Liason Czezok requested that the acronyms be defined in the memos going forward.

BRAINERD PUBLIC UTILITIES COMMISSION MEETING

May 28, 2024

Interim Public Utilities Director Wussow discussed the current crypto mining activity. Discussion included:

- Other potential contracts are approaching BPU and direction from the commission is requested on how many to work with.
- Loss of possible revenue due to prolonged negotiations with VCV Digital.
- With the newly revised VCV Digital contract, the 15MW requirement to be operational by December 31, 2024, is in place and action is requested from the commission on action to take if this is not achieved.
 - BPU has been earmarking this capacity for VCV Digital.
 - Commissioner Johnson proposed once opportunity cost is calculated and if 15MW capacity is not met by December 31st, to get a contract extension, the cost would be billed to and paid by VCV Digital starting in January.
- Letter received from BSKK giving notice of ownership change. BPU is required to sign off.

Motion by Commissioner Johnson and seconded by Commissioner O'Day to acknowledge and sign the letter received from BSKK regarding the ownership change of VCV Digital. There was a unanimous vote in favor of the motion. Motion carried.

Electric Vehicle (EV) Charging Sites – see board packet for memo and site maps

Commissioner Johnson inquired on the potential sites, noting that several years ago the Parking Commission had identified three potential sites, and if proposed sites these had been coordinated with those recommendations. Operations Manager Hawkinson noted that these sites presented by BPU were looked at from an interconnection perspective. Interim Public Utilities Director Wussow inquired on the Commissions goals of the sites with Commissioner Johnson noting the intention is to draw business to downtown Brainerd while charging stations are being utilized.

New Business

Contracted Energy Discussion

Finance Manager Loch presented the following:

- Current capacity agreements with AEP are through 2030. Currently AEP will bring opportunities for potential amendments as they arise. Discussion from the Commission included:
 - Future amendments and opportunities should continue to be pursued by staff and the goal is to have rates contracted out ten years. Amendments to be presented using a blended cost of MWh.
 - Potential amendments can be reviewed and recommended by the Finance Committee, but final approval of the entire commission is requested.

Property Coding Correction – Outside of City Limits

Finance Manager Loch reviewed the findings of an internal review of all Riverside Drive properties outside of city limits. There was one property on Riverside Drive identified that was not being charged the correct rate. Recommendation from staff is to notify the property owner in June and start billing the correct rate in July with no retro charges.

BRAINERD PUBLIC UTILITIES COMMISSION MEETING

May 28, 2024

Policy 2005-10 Update for Disconnected Services – see board packet for policies

Finance Manager Loch presented the redline version of policy 2005-10 and reviewed the reason for abolishing policy 2003-3 was due to redundancy. Discussion around the reconnection fees occurred and was requested to be reviewed by staff.

Motion by Commissioner Johnson and seconded by Commissioner Erickson to approve the updated policy 2005-10 with recommended changes and abolish policy 2003-3. There was a unanimous vote in favor of the motion. Motion carried.

Fee Schedule

Finance Manager Loch presented the 2024 schedule of fees with updated meter costs.

Motion by Commissioner Johnson and seconded by Commissioner Angland to approve the 2024 Schedule of Fees.

Commissioner Johnson amended his motion to remove the reconnect fee if the account has been shut off for non-payment. Motion seconded by Commissioner Angland. There was a vote with all members voting nay. Motion failed.

Discussion by Commission occurred related to charging of reconnect fees and their concerns, tabled to next meeting.

Motion by Commissioner Johnson to withdraw his original motion approving the fee schedule, seconded by Angland, motion withdrawn, no action taken commission asked for item to be brought to next meeting.

Service Territory Discussion

Interim Public Utilities Director Wussow presented maps and discussed BPU service territory.

Main Lift Pumping Building Study

Finance Manager Loch and Water/Wastewater Manager Gammon discussed the following:

- The failing asset of the Main Lift Station included the river crossing. While working on the permitting of the river crossing, the Main Lift was left alone. With the river crossing project now getting finished up, staff is requesting to look at the Main Lift to replace or rebuild.
- The previous budget (pre-covid) was \$20,000 and the current proposal is around \$92,000.
- There are two existing pumps that staff can no longer get parts for.

Commissioner Johnson inquired on the last time the Main Lift was evaluated, which Gammon noted was around 1978. The expected life of the structure is around the 50-year mark with the pumps and mechanisms around the 10-30 year mark, depending. There are two existing pumps that no longer can get parts for.

BRAINERD PUBLIC UTILITIES COMMISSION MEETING

May 28, 2024

Motion by Commissioner O'Day and seconded by Commissioner Erickson to approve moving forward with the quote from Widseth for the Main Lift Station Design. There was a unanimous vote in favor of the motion, with Commissioner Angland abstaining. Motion carried.

MESERB Invite

An invitation was extended to the Commission and City Liaison to the 2024 MESERB Summer Conference at Arrowwood Lodge in Baxter, June 13th-14th, 2024.

Parks Committee/BPU – Joint Meeting Request

Interim Public Utilities Director Wussow reviewed that Mr. Winkleman, on behalf of the Rotary Club, has a presentation he would like to give to the Parks Committee and BPU via a joint meeting on June 4th at 4:30 to be held at City Hall. This is in relation to the proposed Solar Project at Rotary Park.

Staff Reports

City Administrator Report

City Administrator Broyles reported on the following:

- Strike Contingency Work Group
 - Provided an update noting:
 - Meeting twice weekly since April 30th
 - Members include members of the City Council along with Commissioners Angland and Erickson.
 - Presentations have been provided by BPU Finance, IT, Hydro, Electric, Water, and Wastewater, HR, and Emergency Services. These presentations included options and recommendations for continuity of operations.
 - Finalizing report and final document will be ready by 2nd week of June.

City Liaison Report

Czeczok reported on the following:

- A meeting was held to discuss the Riverside Drive properties and connections with Public Utilities staff and City Staff.
- Adjourning a meeting to another meeting does not forego public notice if there is time to do so.

HR Director's Report – see board packet for report.

Public Utilities Director's Report – see board packet for report.

Wussow also reported:

- At the June 25th Commission meeting there will be a presentation regarding a potential weather radar being located on the water tower that is presented to a public safety group. No commitments have been made other than listening to the presentation.
- Roberts Property
 - Commissioner Johnson inquired if eminent domain was still moving forward.
 - Commissioner Matten noted recommended reaching out again with a final date and prepared easement language from a title company.

BRAINERD PUBLIC UTILITIES COMMISSION MEETING

May 28, 2024

Managers Reports

Finance Manager's Report – see board packet for report.

Operations Manager Report – see board packet for report.

Discussion occurred around the 2040 Renewable Energy/Carbon Free requirement.

Requests from the Commission:

- Add back in outage report
- Continue to report Hydro energy production

Water/Wastewater Report – see board packet for report.

Gammon reported the transition to all day shifts at the Water Plant will occur on June 19th, 2024. Additional security went in to aid in this transition. This transition will also aid in staffing for operations.

Commissioner Angland inquired on the 20-year feasibility study. Gammon confirmed that this is being worked on.

Commission Members – Reports

Commissioner Erickson commended BPU staff on the facilities tour.

Commissioner Johnson reported on the following:

- Expressed gratitude to the public for communicating concern for the noise complaint related to Crypto mining and working through the proper channels. Johnson also noted that the Commission is in the business of selling power.
- Extended a thank you to the Strike Work Force Committee and the work put into this.

Next Board meeting is scheduled for June 25, 2024.

Adjournment

Motion by Commissioner Erickson and seconded by Commissioner Johnson to adjourn to the joint Parks Commission/BPU meeting on June 4th at 4:30 PM at City Hall and to the 2024 MSERB Summer Conference June 13-14, 2024 at Arrowwood Lodge. There was a unanimous vote in favor of the motion. Motion carried.

Motion by Commissioner O'Day and seconded by Commissioner Johnson to adjourn the meeting. Motion carried at 10:51 AM.

Dolly Matten, Commission President

Danny Loch, Finance Manager/Secretary



Brainerd Public Utilities, MN

Check Report

By Check Number

Date Range: 05/24/2024 - 06/21/2024

Vendor Number	Vendor Name	Payment Date	Payment Type	Discount Amount	Payment Amount	Number
Payable #	Payable Type	Post Date	Payable Description	Discount Amount	Payable Amount	
Bank Code: AP2-BREMER BANK						
00152	Truist Governmental Finance	05/29/2024	EFT	0.00	31,725.00	192
992300009400001	Invoice	05/28/2024	BOND 2017A / 992300009400001 - June p...	0.00	31,725.00	
09535	U.S. BANK ST PAUL	05/29/2024	EFT	0.00	46,447.50	193
2557916	Invoice	05/28/2024	SERIES 2014A / Account #0018106NS	0.00	46,447.50	
00140	AEP ENERGY PARTNERS, INC.	06/18/2024	EFT	0.00	1,413,671.18	195
175-21498388	Invoice	06/17/2024	Invoice Period: 05/01/24-05/31/24	0.00	1,413,671.18	
02210	CLIFTONLARSONALLEN, LLP	05/30/2024	Regular	0.00	11,546.85	82118
1241330499	Invoice	05/23/2024	2023 Audit: Addtl documentation/review...	0.00	1,641.15	
1241331950	Invoice	05/23/2024	2023 Audit: 3rd Installment	0.00	9,905.70	
09192	Dycom Industries, Inc.	05/30/2024	Regular	0.00	9,532.00	82119
278594	Invoice	05/30/2024	Boring: 514 Quince Street	0.00	2,030.00	
278595	Invoice	05/30/2024	Boring: 721 4th St SW	0.00	1,540.00	
278596	Invoice	05/30/2024	Boring: Grove St & N 7th	0.00	5,962.00	
07928	MILLS AFTERMARKET ACCESSORIES, INC.	05/30/2024	Regular	0.00	467.90	82122
BRD-56015-01	Invoice	05/30/2024	Mount Kit / Grip Steps	0.00	467.90	
06085	Minger Construction Companies, Inc	05/30/2024	Regular	0.00	47,216.52	82123
05/21/24 - PYMT...	Invoice	05/30/2024	Forcemain River Crossing: Payment App #5	0.00	47,216.52	
06201	MPCA	05/30/2024	Regular	0.00	15.00	82125
05/21/24-J.Gage	Invoice	05/30/2024	Jason Gage: Certification Fee for Type 4O-...	0.00	15.00	
07143	NORTHLAND FIRE PROTECTION	05/30/2024	Regular	0.00	1,929.00	82126
58276	Invoice	05/30/2024	Fire Alarm Inspection - Service Center	0.00	890.00	
58277	Invoice	05/30/2024	FIRE ALARM INSPECTION - WWTP/Chemica..	0.00	325.00	
58278	Invoice	05/30/2024	FIRE ALARM INSPECTION - WWTP-SBR	0.00	714.00	
10254	REX BLOCK	05/30/2024	Regular	0.00	94.98	82127
05/22/24-SAFETY...	Invoice	05/30/2024	Reimburse Safety Boots @ 50%	0.00	94.98	
06268	Ryan Churchill	05/30/2024	Regular	0.00	1,280.00	82128
5523110	Invoice	05/30/2024	WEBSITE SUPPORT / TRAINING: April 2024	0.00	640.00	
5523112	Invoice	05/30/2024	WEBSITE SUPPORT / TRAINING: May 2024	0.00	640.00	
03495	FLAHERTY & HOOD, P.A.	05/31/2024	Regular	0.00	1,136.25	82129
21135	Invoice	05/31/2024	NPDES Permit Issues	0.00	1,136.25	
06141	MINNESOTA DEPT OF HEALTH	06/07/2024	Regular	0.00	11,960.00	82141
1180002- Q2 2024	Invoice	06/07/2024	System:118002 - Wtr Supply Connection F...	0.00	11,960.00	
06556	MPOWER TECHNOLOGIES, INC.	06/07/2024	Regular	0.00	7,837.50	82142
5746	Invoice	06/07/2024	MPOWER SUPPORT SERVICES/ FIELD MAPS..	0.00	7,837.50	
07335	OFFICE SHOP	06/07/2024	Regular	0.00	2,481.50	82143
1141400-0	Invoice	06/07/2024	OFFICE SUPPLIES	0.00	186.03	
1141400-1	Invoice	06/07/2024	OFFICE SUPPLIES	0.00	35.93	
1141400-2	Invoice	06/07/2024	OFFICE SUPPLIES: Toner	0.00	300.26	
1141401-0	Invoice	06/07/2024	OFFICE SUPPLIES	0.00	5.95	
1141401-1	Invoice	06/07/2024	OFFICE SUPPLIES	0.00	6.28	
1141739-0	Invoice	06/07/2024	OFFICE SUPPLIES: Office Chair	0.00	538.30	
1141739-1	Invoice	06/07/2024	OFFICE SUPPLIES: Toner	0.00	902.08	
1142068-0	Invoice	06/07/2024	OFFICE SUPPLIES	0.00	12.88	

Check Report

Date Range: 05/24/2024 - 06/21/2024

Vendor Number	Vendor Name	Payment Date	Payment Type	Discount Amount	Payment Amount	Number
Payable #	Payable Type	Post Date	Payable Description	Discount Amount	Payable Amount	
1142068-1	Invoice	06/07/2024	OFFICE SUPPLIES	0.00	26.31	
1142071-0	Invoice	06/07/2024	OFFICE SUPPLIES: Toner	0.00	204.26	
1142105-0	Invoice	06/07/2024	OFFICE SUPPLIES	0.00	31.95	
1142105-1	Invoice	06/07/2024	OFFICE SUPPLIES: Sheet Protectors	0.00	133.98	
1142365-0	Invoice	06/07/2024	OFFICE SUPPLIES: Inkjet Cartridge	0.00	74.43	
1142419-0	Invoice	06/07/2024	OFFICE SUPPLIES	0.00	22.86	
08410	SCR-NORTHERN	06/07/2024	Regular	0.00	305.00	82146
W49533	Invoice	06/07/2024	Digester: Boiler Maintenance	0.00	305.00	
02002	CITY OF BAXTER	06/17/2024	Regular	0.00	15,227.03	82148
02/2024-8038CP...	Invoice	06/17/2024	PFA LOAN INTEREST REBATE	0.00	15,227.03	
00075	A W RESEARCH	06/21/2024	Regular	0.00	3,372.72	82172
63050	Invoice	06/21/2024	WWT TESTING	0.00	3,372.72	
00105	ACE HARDWARE-BRAINERD	06/21/2024	Regular	0.00	189.37	82173
324231	Invoice	06/21/2024	Trolleys	0.00	34.60	
324330	Invoice	06/21/2024	Paint/Hardware	0.00	62.47	
324350	Invoice	06/21/2024	Spray Paint	0.00	62.52	
324758	Invoice	06/21/2024	Cleaning Supplies	0.00	29.78	
10188	ALPENGLOW TECHNOLOGIES, LLC	06/21/2024	Regular	0.00	400.00	82174
10597	Invoice	06/21/2024	Monthly IT Billing: 06/2024	0.00	400.00	
00250	AMARIL UNIFORM COMPANY	06/21/2024	Regular	0.00	7,455.58	82175
IV261761	Invoice	06/21/2024	Hi Vis Gear	0.00	7,455.58	
00315	AMERICAN STEEL INC	06/21/2024	Regular	0.00	568.00	82176
120917	Invoice	06/21/2024	Metal - Well Houses	0.00	568.00	
00337	AMERICAN WELDING & GAS INC	06/21/2024	Regular	0.00	84.85	82177
0010155528	Invoice	06/21/2024	CYLINDER RENTAL INVOICE	0.00	84.85	
00670	BARR ENGINEERING CO	06/21/2024	Regular	0.00	49,487.50	82178
23181016.06-27	Invoice	06/21/2024	Work Order #6 - Support for Hydro Project:	0.00	6,394.00	
23181016.07-6	Invoice	06/21/2024	Hydro Proj Phase II - Unit 6 Generation St...	0.00	14,878.50	
23181016.08-1	Invoice	06/21/2024	Detailed Design-Powerhouse Units 4 & 6 ...	0.00	28,215.00	
00692	BATTERIES PLUS # 035	06/21/2024	Regular	0.00	2,310.15	82179
P72412699	Invoice	06/21/2024	12V / 3V Batteries	0.00	28.98	
P72624629	Invoice	06/21/2024	PUR WW SLA 12V 9A BATTERIES	0.00	1,679.52	
P72908480	Invoice	06/21/2024	12V Batteries	0.00	16.99	
P73231151	Invoice	06/21/2024	Procell Intense / 3.7V / 3V Batteries	0.00	394.06	
P73267584	Invoice	06/21/2024	12V Batteries	0.00	190.60	
00735	BEST OIL COMPANY	06/21/2024	Regular	0.00	6,019.45	82180
6734	Invoice	06/21/2024	GAS	0.00	1,182.15	
6735	Invoice	06/21/2024	DIESEL	0.00	800.40	
6802	Invoice	06/21/2024	GAS	0.00	599.40	
6803	Invoice	06/21/2024	DIESEL	0.00	348.00	
6893	Invoice	06/21/2024	GAS	0.00	1,050.60	
6894	Invoice	06/21/2024	DIESEL	0.00	507.20	
6975	Invoice	06/21/2024	GAS	0.00	834.30	
6976	Invoice	06/21/2024	DIESEL	0.00	697.40	
00778	BLA Clean, LLC.	06/21/2024	Regular	0.00	2,476.00	82181
345	Invoice	06/21/2024	Cleaning Services: 05/2024	0.00	2,476.00	
00820	BOLTON & MENK, INC.	06/21/2024	Regular	0.00	19,641.50	82182
0337231	Invoice	06/21/2024	Biosolids Dewatering Project: 04/13/24-05...	0.00	1,035.00	
0337232	Invoice	06/21/2024	WHPP Part 2: 04/13/24-05/10/24	0.00	2,644.00	
0337237	Invoice	06/21/2024	WTP Filter Backwash Reclaim	0.00	15,962.50	

Check Report

Date Range: 05/24/2024 - 06/21/2024

Vendor Number	Vendor Name	Payment Date	Payment Type	Discount Amount	Payment Amount	Number
Payable #	Payable Type	Post Date	Payable Description	Discount Amount	Payable Amount	
00825	BORDER STATES ELECTRIC	06/21/2024	Regular	0.00	75,759.08	82183
928415966	Invoice	06/21/2024	INV MISC UG ELEC	0.00	104.40	
928415978	Invoice	06/21/2024	INV EO4110 HOR SWITCH	0.00	14,352.76	
928448425	Invoice	06/21/2024	INV 35KV 350 AND 500 KITS	0.00	5,969.46	
928465539	Invoice	06/21/2024	INV ELEC TOP TIES AND 35KV ELBOWS	0.00	17,089.80	
928465543	Invoice	06/21/2024	INV COOPER UNDERGROUND PARTS	0.00	9,871.50	
928473643	Invoice	06/21/2024	INV BLK COMMERCIAL LIGHTS	0.00	1,564.50	
928498688	Invoice	06/21/2024	INV BLK COMMERCIAL LIGHTS	0.00	20,837.20	
928547085	Invoice	06/21/2024	INV 4/0 T-BOLT KIT	0.00	5,969.46	
00982	BRAINERD HYDRAULIC AIR & INDUSTRIAL SUPPLY	06/21/2024	Regular	0.00	339.34	82184
31895	Invoice	06/21/2024	Pipe Threads / Clamp Welds / Hose	0.00	291.87	
31911	Invoice	06/21/2024	3000 PSI Rear Mount	0.00	47.47	
01805	CENTERPOINT ENERGY	06/21/2024	Regular	0.00	678.34	82185
8000014432-1-05...	Invoice	06/21/2024	MONTHLY GAS BILL - WTR PROD/WTR DIS...	0.00	678.34	
01837	CENTURYLINK	06/21/2024	Regular	0.00	479.75	82186
218201-0080497...	Invoice	06/21/2024	MONTHLY PHONE BILL: 06/2024	0.00	479.75	
01890	CHARTER COMMUNICATIONS	06/21/2024	Regular	0.00	1,249.00	82187
237487601060124	Invoice	06/21/2024	Fiber Internet 500Mbps: 06/2024	0.00	1,249.00	
02556	CORE & MAIN LP	06/21/2024	Regular	0.00	1,749.08	82188
V064360	Invoice	06/21/2024	PUR 12" OVERSIZE SLEEVES	0.00	1,749.08	
02785	DACOTAH PAPER CO	06/21/2024	Regular	0.00	437.06	82189
25533	Invoice	06/21/2024	Cleaning/Paper Supplies	0.00	437.06	
02790	DAKOTA SUPPLY GROUP	06/21/2024	Regular	0.00	402.18	82190
S103716875.001	Invoice	06/21/2024	PUR 12" DUCTILE IRON MJ SLEEVE	0.00	402.18	
02860	Dixon Mechanical Electric, LLC	06/21/2024	Regular	0.00	978.05	82191
8478	Invoice	06/21/2024	A/C Delco Battery Assy	0.00	978.05	
02955	DONDELINGER INCORPORATED	06/21/2024	Regular	0.00	203.79	82192
44390	Invoice	06/21/2024	Belt Kit - FA # 2011	0.00	203.79	
09192	Dycom Industries, Inc.	06/21/2024	Regular	0.00	5,586.00	82193
280740	Invoice	06/21/2024	757 Brian Lane _ Boring	0.00	5,586.00	
03115	ESCH CONSTRUCTION SUPPLY, INC.	06/21/2024	Regular	0.00	709.18	82194
INV65792	Invoice	06/21/2024	Diamond Blades	0.00	709.18	
03118	ESSENTIA HEALTH	06/21/2024	Regular	0.00	158.00	82195
890000327-06/0...	Invoice	06/21/2024	DOT Physical	0.00	158.00	
03275	FASTENAL COMPANY	06/21/2024	Regular	0.00	112.85	82196
MNBAX267979	Invoice	06/21/2024	Beam Clamp	0.00	112.85	
07691	FERGUSON ENTERPRISES INC #3326	06/21/2024	Regular	0.00	1,025.92	82197
R262988	Invoice	06/21/2024	PUR HYDRANT PRO DIFFUSER	0.00	1,025.92	
03321	FIRST IMPRESSION PRINTING	06/21/2024	Regular	0.00	322.50	82198
91123	Invoice	06/21/2024	PRINTING/PUBLISHING FORMS: SDS Sheets	0.00	322.50	
03542	Forum Communications	06/21/2024	Regular	0.00	175.00	82199
MP3168200524	Invoice	06/21/2024	Graduation Ad	0.00	175.00	
03557	FRONTIER ENERGY, INC.	06/21/2024	Regular	0.00	8,794.58	82200
194751	Invoice	06/21/2024	CIP SERVICES - 05/2024	0.00	8,794.58	
03695	GOPHER STATE ONE-CALL	06/21/2024	Regular	0.00	299.70	82201
4050110	Invoice	06/21/2024	GSOC TICKETS: 05/2024	0.00	299.70	
03699	GRAINGER	06/21/2024	Regular	0.00	24.41	82202

Check Report

Date Range: 05/24/2024 - 06/21/2024

Vendor Number	Vendor Name	Payment Date	Payment Type	Discount Amount	Payment Amount	Number
Payable #	Payable Type	Post Date	Payable Description	Discount Amount	Payable Amount	
9139578877	Invoice	06/21/2024	Band Clamp	0.00	24.41	
03765	GRAYBAR ELECTRIC CO, INC.	06/21/2024	Regular	0.00	1,124.26	82203
9337642528	Invoice	06/21/2024	PUR SEMI-CON STRIPPERS AND BLADES	0.00	1,124.26	
04050	HAWKINS INC.	06/21/2024	Regular	0.00	2,283.80	82204
6766174	Invoice	06/21/2024	CHLORINE CYLINDERS	0.00	2,263.80	
6783530	Invoice	06/21/2024	CHLORINE CYLINDERS	0.00	20.00	
04580	IP NETWORKS, INC.	06/21/2024	Regular	0.00	51,340.00	82205
20248261	Invoice	06/21/2024	Fortinet Maintenance Renewal	0.00	8,600.00	
20248263	Invoice	06/21/2024	Fortinet Cloud / EPP-APT/ Analyzer - Subsc...	0.00	42,740.00	
04613	JACO ANALYTICAL, INC.	06/21/2024	Regular	0.00	276.90	82206
39E90324	Invoice	06/21/2024	Testing	0.00	276.90	
04750	JOHN HENRY FOSTER MINNESOTA, INC.	06/21/2024	Regular	0.00	4,017.63	82207
10705859-00	Invoice	06/21/2024	Filters/Separators/Elements	0.00	3,415.85	
10705859-01	Invoice	06/21/2024	Elements	0.00	300.89	
10705859-02	Invoice	06/21/2024	Micron Elements	0.00	300.89	
04963	KAESER COMPRESSORS, INC.	06/21/2024	Regular	0.00	532.53	82208
916807713	Invoice	06/21/2024	PUR KAESER FILTER AND BELT	0.00	532.53	
05130	KOMLINE-SANDERSON	06/21/2024	Regular	0.00	5,449.18	82209
42060103	Invoice	06/21/2024	PUR GRAVITY LIFT REPLACEMENT PARTS	0.00	3,900.18	
42060133	Invoice	06/21/2024	PUR GRAVITY BELT K-S 4086 87" X 33' 9"	0.00	1,549.00	
05335	LAKES AREA MAT SERVICE II, INC	06/21/2024	Regular	0.00	101.09	82210
20240513	Invoice	06/21/2024	MAT/TOWEL SERVICE	0.00	51.12	
20240527	Invoice	06/21/2024	MAT/TOWEL SERVICE	0.00	49.97	
05530	LEAGUE OF MN CITIES INS. TRUST WC	06/21/2024	Regular	0.00	27,829.50	82211
10002612-W/C-...	Invoice	06/21/2024	ACCT: 10002612-WORK COMP - Q3 2024	0.00	27,829.50	
05625	LOCATORS & SUPPLIES, INC.	06/21/2024	Regular	0.00	288.05	82212
0314518-IN	Invoice	06/21/2024	Red Safety Paint	0.00	288.05	
06125	MINNESOTA DEPT OF COMMERCE	06/21/2024	Regular	0.00	3,496.51	82213
1000051641	Invoice	06/21/2024	INDIRECT ASSESSMENT: #217 - Q1 Fiscal Yr...	0.00	3,496.51	
06266	MINNESOTA VALLEY TESTING LABS	06/21/2024	Regular	0.00	2,099.50	82214
1253664	Invoice	06/21/2024	TESTING	0.00	88.00	
1253885	Invoice	06/21/2024	TESTING	0.00	486.00	
1253886	Invoice	06/21/2024	TESTING	0.00	358.00	
1255023	Invoice	06/21/2024	TESTING	0.00	444.50	
1256016	Invoice	06/21/2024	TESTING	0.00	317.50	
1256564	Invoice	06/21/2024	TESTING	0.00	88.00	
1257273	Invoice	06/21/2024	TESTING	0.00	317.50	
06426	MOBOTREX	06/21/2024	Regular	0.00	605.00	82215
274166	Invoice	06/21/2024	PUR BLUE LEDDOMED RED LIGHT RUNNIN...	0.00	484.00	
274515	Invoice	06/21/2024	PUR BLUE LEDDOMED RED LIGHT RUNNIN...	0.00	121.00	
06790	NAPA AUTO PARTS BAXTER	06/21/2024	Regular	0.00	503.10	82216
707337	Invoice	06/21/2024	Oil Filters / Compressor Oil	0.00	111.94	
707967	Invoice	06/21/2024	Motor Oil / Oil Filters	0.00	150.62	
708065	Invoice	06/21/2024	Brake Cleaner / Oil	0.00	108.14	
710447	Invoice	06/21/2024	Mud Flaps	0.00	18.40	
713359	Invoice	06/21/2024	Oil Filters	0.00	91.36	
713849	Invoice	06/21/2024	Brake away kits / Oil filters	0.00	22.64	
07143	NORTHLAND FIRE PROTECTION	06/21/2024	Regular	0.00	790.00	82217
58555	Invoice	06/21/2024	ANNUAL SPRINKLER INSPECT/BACKFLOW ...	0.00	345.00	

Check Report

Date Range: 05/24/2024 - 06/21/2024

Vendor Number	Vendor Name	Payment Date	Payment Type	Discount Amount	Payment Amount	Number
Payable #	Payable Type	Post Date	Payable Description	Discount Amount	Payable Amount	
58556	Invoice	06/21/2024	ANNUAL SPRINKLER INSPECTION: SERVICE...	0.00	445.00	
07339	ONLINE INFORMATION SERVICES, INC.	06/21/2024	Regular	0.00	230.88	82218
1259215	Invoice	06/21/2024	ONLINE UTILITY EXCHANGE REPORT: 05/2...	0.00	230.88	
07615	PIKE PLUMBING & HEATING OF BRD, INC	06/21/2024	Regular	0.00	2,963.22	82219
87160	Invoice	06/21/2024	Annual Backflow Preventer Testing	0.00	2,963.22	
07920	QUALITY FLOW SYSTEMS, INC.	06/21/2024	Regular	0.00	16,475.00	82220
46839	Invoice	06/21/2024	PUR SENSAPHONE 800 ALARM DIALER	0.00	763.00	
46947	Invoice	06/21/2024	PUR RIVERSIDE BOOSTER VFD	0.00	5,689.00	
47016	Invoice	06/21/2024	QCI Controller / Installation / Labor	0.00	10,023.00	
08002	RDO EQUIPMENT CO.	06/21/2024	Regular	0.00	308.27	82221
P3442103	Invoice	06/21/2024	Swivel / LP Series pop / Gauge	0.00	264.53	
P3514303	Invoice	06/21/2024	LP Series Pop	0.00	43.74	
08058	RESCO	06/21/2024	Regular	0.00	59,217.74	82222
3034891	Invoice	06/21/2024	INV POLE MOUNT XFRMRS	0.00	52,427.29	
3036946	Invoice	06/21/2024	INV METERBASES	0.00	1,024.52	
3037122	Invoice	06/21/2024	INV POLE MOUNT XFRMRS	0.00	5,765.93	
08072	RHI SUPPLY - FARGO	06/21/2024	Regular	0.00	170.44	82223
1363938	Invoice	06/21/2024	Shaft / Bearings	0.00	170.44	
08380	SCHWEITZER ENGINEERING LABORATORIES, INC	06/21/2024	Regular	0.00	20,069.06	82224
INV-000989895	Invoice	06/21/2024	PUR ELEC SEL-487E WITH SECONDARY IN...	0.00	20,069.06	
08410	SCR-NORTHERN	06/21/2024	Regular	0.00	3,915.11	82225
W49900	Invoice	06/21/2024	Condenser maintenance/replacement par...	0.00	2,256.29	
W49905	Invoice	06/21/2024	Boiler Maintenance	0.00	1,518.82	
W49908	Invoice	06/21/2024	Boiler - Air Bleeder / Diagnosis	0.00	140.00	
08789	Spencer Fane LP	06/21/2024	Regular	0.00	1,461.50	82226
1283230	Invoice	06/21/2024	Large Power Agreements	0.00	1,382.50	
1292625	Invoice	06/21/2024	Large Power Agreements	0.00	79.00	
08805	STAR ENERGY SERVICES, LLC	06/21/2024	Regular	0.00	2,000.00	82227
22999	Invoice	06/21/2024	NOVA POWER PORTAL: 07/01/24-06/30/25	0.00	2,000.00	
08895	STUART C. IRBY CO	06/21/2024	Regular	0.00	9,456.25	82228
S013908733.002	Invoice	06/21/2024	INV AMPACT	0.00	303.75	
S013964663.001	Invoice	06/21/2024	PUR 350' 1000MCM COPPER CABLE	0.00	9,152.50	
10040	TEST-RIGHT, LLC	06/21/2024	Regular	0.00	449.68	82229
659	Invoice	06/21/2024	Testing - Gloves	0.00	449.68	
00340	Vestis Group, Inc.	06/21/2024	Regular	0.00	141.71	82230
2530276473	Invoice	06/21/2024	WORK UNIFORMS	0.00	33.81	
2530278997	Invoice	06/21/2024	WORK UNIFORMS	0.00	33.81	
2530281466	Invoice	06/21/2024	WORK UNIFORMS	0.00	40.28	
2530284163	Invoice	06/21/2024	WORK UNIFORMS	0.00	33.81	
09663	VIKING ELECTRIC SUPPLY, INC	06/21/2024	Regular	0.00	314.89	82231
S008111304.001	Invoice	06/21/2024	Test leads / cable ties / Galv tie wire	0.00	192.23	
S008133289.001	Invoice	06/21/2024	PVC Conduit / Bushings / Clamps	0.00	122.66	
09728	WASTE PARTNERS	06/21/2024	Regular	0.00	1,535.19	82232
45X00106	Invoice	06/21/2024	TRASH/RECYCLING SERVICE: ACCT#242053	0.00	1,535.19	
09899	WESCO RECEIVABLES CORP	06/21/2024	Regular	0.00	145,121.00	82233
409746	Invoice	06/21/2024	INV	0.00	145,121.00	
09925	WEX HEALTH, INC	06/21/2024	Regular	0.00	25.50	82234
0001970775-IN	Invoice	06/21/2024	MONTHLY COBRA BILLING: 05/2024	0.00	25.50	

Check Report

Date Range: 05/24/2024 - 06/21/2024

Vendor Number	Vendor Name	Payment Date	Payment Type	Discount Amount	Payment Amount	Number
Payable #	Payable Type	Post Date	Payable Description	Discount Amount	Payable Amount	
01204	WHITE CAP, LP	06/21/2024	Regular	0.00	32.35	82235
50026626702	Invoice	06/21/2024	BAGS	0.00	32.35	
01191	BREMER BANK - CC	06/21/2024	Bank Draft	0.00	3,918.56	DFT0001132
05/24/2024 CC S...	Invoice	06/21/2024	Bremer CC Statement (Elan)t: 05/24/2024	0.00	3,918.56	
00472	AT&T MOBILITY	06/21/2024	Bank Draft	0.00	2,328.02	DFT0001133
287302792515X...	Invoice	06/21/2024	AT & T MONTHLY BILL: 04/26/24-05/25/2...	0.00	2,328.02	
01805	CENTERPOINT ENERGY	06/21/2024	Bank Draft	0.00	18.37	DFT0001134
11582840-2-05/1...	Invoice	06/21/2024	1602 E RIVER RD	0.00	18.37	
01805	CENTERPOINT ENERGY	06/21/2024	Bank Draft	0.00	70.39	DFT0001135
11595232-7-05/1...	Invoice	06/21/2024	50 JENNY STREET	0.00	70.39	
02455	CTC	06/21/2024	Bank Draft	0.00	2,124.40	DFT0001137
21393276	Invoice	06/21/2024	MONTHLY BILL: 06/12 -07/11	0.00	2,124.40	
02717	CULLIGAN	06/21/2024	Bank Draft	0.00	74.00	DFT0001138
150-10024107-7-...	Invoice	06/21/2024	150-10024107-7 Hydro	0.00	74.00	
02717	CULLIGAN	06/21/2024	Bank Draft	0.00	99.72	DFT0001139
150-010595575-2...	Invoice	06/21/2024	150-01059575-2 Service Center	0.00	99.72	
07640	PITNEY BOWES, INC.	06/21/2024	Bank Draft	0.00	3,500.00	DFT0001142
06/03/24-POSTA...	Invoice	06/21/2024	POSTAGE REFILL	0.00	3,500.00	
01655	CANON FINANCIAL SERVICES, INC	06/21/2024	Bank Draft	0.00	598.10	DFT0001153
33179586	Invoice	06/21/2024	Canon Invoice-Contract Charge: 05/20/24...	0.00	598.10	
01191	BREMER BANK - CC	06/21/2024	Bank Draft	0.00	10,056.83	DFT0001154
05/31/24-CC STA...	Invoice	06/21/2024	Bremer CC Statement: 05/31/2024	0.00	10,056.83	

Bank Code AP2 Summary

Payment Type	Payable Count	Payment Count	Discount	Payment
Regular Checks	155	78	0.00	667,143.30
Manual Checks	0	0	0.00	0.00
Voided Checks	0	0	0.00	0.00
Bank Drafts	10	10	0.00	22,788.39
EFT's	3	3	0.00	1,491,843.68
	168	91	0.00	2,181,775.37

All Bank Codes Check Summary

Payment Type	Payable Count	Payment Count	Discount	Payment
Regular Checks	155	78	0.00	667,143.30
Manual Checks	0	0	0.00	0.00
Voided Checks	0	0	0.00	0.00
Bank Drafts	10	10	0.00	22,788.39
EFT's	3	3	0.00	1,491,843.68
	168	91	0.00	2,181,775.37

Fund Summary

Fund	Name	Period	Amount
9	POOLED CASH CONTROL	5/2024	151,391.00
9	POOLED CASH CONTROL	6/2024	2,030,384.37
			2,181,775.37



BRAINERD
MINNESOTA
A City for All Seasons

City of Brainerd Wellhead Protection Plan Amendment Part II

Potential Contaminant Source Management Strategy

October 2024 – October 2033



Submitted by:
Bolton & Menk, Inc.
7533 Sunwood Drive, Ste 206
Ramsey, MN 55303
P: 763-433-2851

Table of Contents

Public Water Supply Profile	iv
Documentation List.....	v
Members of the Wellhead Protection Team	vi
Executive Summary.....	1
CHAPTER 1: DATA ELEMENTS / ASSESSMENT.....	7
I. REQUIRED DATA ELEMENTS	7
A. Physical Environment Data Elements	7
B. Land Use Data Elements.....	14
C. Water Quantity Data Elements.....	30
II. ASSESSMENT OF DATA ELEMENTS	31
A. Use of the Wells.....	31
B. Wellhead Protection Area Delineation Criteria	32
C. Quality and Quantity of Water Supplying the Public Water Supply Well	32
D. Land and Groundwater Uses in the DWSMA	33
CHAPTER 2: IMPACT OF CHANGES ON PUBLIC WATER SUPPLY WELL	34
CHAPTER 3: ISSUES, PROBLEMS AND OPPORTUNITIES	36
I. LAND USE ISSUES, PROBLEMS AND OPPORTUNITIES RELATED TO:	36
A. The Aquifer	36
B. Well Water.....	36
C. Drinking Water Supply Management Area.....	36
II. IDENTIFICATION OF:	36
A. Problems and Opportunities	36
B. Comments Received	37
CHAPTER 4: WELLHEAD PROTECTION GOALS.....	41
CHAPTER 5: OBJECTIVES AND PLANS OF ACTION	42
I. OBJECTIVES	42
II. WHP MEASURES AND ACTION PLAN	42
III. ESTABLISHING PRIORITIES	43
CHAPTER 6: EVALUATION PROGRAM	54
CHAPTER 7: ALTERNATIVE WATER SUPPLY; CONTINGENCY STRATEGY	55

Figures

Figure 1A: Drinking Water Supply Management Area (DWSMA)	3
Figure 1B: Groundwater Contribution Area (GWCA) and Vulnerability	4
Figure 1C: Surface Water Contribution Area (SWCA) and Vulnerability.....	5
Figure 2: Section-Township-Range (Basemap)	6
Figure 3: Soil Infiltration.....	10
Figure 4: Soil Erodibility	11
Figure 5: Water Resources	13
Figure 6: Land Cover within the DWSMA.....	16
Figure 7: Zoning within the DWSMA.....	17
Figure 8A: Potential Contaminant Sources within the DWSMA	21
Figure 8B: Potential Contaminant Sources - Wells	22
Figure 8C: Potential Contaminant Sources – Tanks	23
Figure 8D: Potential Contaminant Sources – Other.....	24
Figure 9: Storm Sewer System	27
Figure 10: Water Distribution System.....	28
Figure 11: Sanitary Sewer System.....	29

Tables

Table 1: Precipitation Data for Brainerd (inches)	7
Table 2: Hydric Soils in the DWSMA	9
Table 3: Erodible Soils within the DWSMA	9
Table 4: Land Use within the DWSMA	14
Table 5: Zoning within the DWSMA	14
Table 6: Potential Contaminant Sources and Assigned Risk.....	20
Table 7: Potential Contamination Sources and Assigned Risk for the IWMZ	25
Table 8: List of Wells	30
Table 9: Annual Well Pumping Amounts (million gallons per year)	31
Table 10: Expected Changes and Impacts within the DWSMA.....	34
Table 11: Issues, Problems, and Opportunities	37
Table 12: WHP Action Plan	44
Table 13: Cooperating Agencies List	53

Appendix

Appendix A: 2022 Part 1 Wellhead Protection Plan (WHPP) and 2011 Part 2 WHPP

Appendix B: 2022 Part 2 Scoping Decision Notice

Appendix C: Potential Contaminant Source Inventory (PCSI) and DWSMA Parcel List

Appendix D: Inner Well Management Zone (IWMZ) Inventory

Appendix E: Old Municipal Well Inventory

Appendix F: Brainerd Public Water Supply Plan, Emergency Response and Contingency Plan, and DNR Approval Letter

Appendix G: Controls/Programs and Glossary of Terms

Appendix H: Implementation Schedule

Appendix I: LGU Review and Public Hearing

Public Water Supply Profile

PUBLIC WATER SUPPLY

NAME	City of Brainerd (PWSID 1180002)
ADDRESS	Charlie Gammon, Water/Wastewater Manager 8027 Highland Scenic Road, PO Box 373 Brainerd, MN 56401-0373
TELEPHONE NUMBER	(218) 330-8485
E-MAIL	cgammon@bpu.org

WELLHEAD PROTECTION MANAGER

NAME	Charlie Gammon Brainerd Public Utilities Water/Wastewater Manager
ADDRESS	8027 Highland Scenic Road, PO Box 373 Brainerd, MN 56401-0373
TELEPHONE NUMBER	218-330-8485
E-MAIL	cgammon@bpu.org

CONSULTANT

NAME	Bolton & Menk, Inc.
ADDRESS	7656 Design Road, Suite 200 Baxter, MN 56425-8676
TELEPHONE NUMBER	218-839-2303
E-MAIL	morgan.salo@bolton-menk.com

GENERAL INFORMATION

UNIQUE WELL NUMBERS:	Primary - Well #3 (Unique Number: 232347) Primary - Well #4 (Unique Number: 232348) Primary - Well #5 (Unique Number: 232349) Primary - Well #6 (Unique Number: 232350) Primary - Well #7 (Unique Number: 232352) Primary - Well #8 (Unique Number: 403973)
COUNTY:	Crow Wing
POPULATION SERVED:	14,395
SERVICE CONNECTIONS:	4,943

Documentation List

STEP	DATE PERFORMED
Scoping Meeting 2 Held (4720.5340, subp. 1)	January 21, 2022
Scoping 2 Letter Received (4720.5340, subp. 2)	February 14, 2022
Remaining Portion of Plan Submitted to Local Units of Government (LGUs) (4720.5350)	May 3, 2024
Review Received From Local Units of Government (4720.5350, subp. 2)	July 3, 2024
Review Comments Considered (4720.5350, subp. 3)	July 3-12, 2024
Public Hearing Conducted (4720.5350, subp.4)	July 15, 2024
Remaining Portion WHP Plan Submitted (4720.5360, subp. 1)	July 19, 2024
Final WHP Plan Review/Approval Received (4720.5360, subp. 4)	October 19, 2024

Members of the Wellhead Protection Team

NAME	REPRESENTING
Todd Wicklund	Brainerd Public Utilities – Director
Charlie Gammon	Brainerd Public Utilities – Water/Wastewater Manager
Trent Hawkinson	Brainerd Public Utilities – Operations Manager
Danny Loch	Brainerd Public Utilities – Finance Manager
Aaron Meyer	Minnesota Rural Water Association
Chris Parthun	Minnesota Department of Health - Planning
Morgan Salo	Bolton and Menk, Inc.
Angie Smith	Bolton and Menk, Inc.
James Kramvik	City of Brainerd – Community Development Director
Jessie Dehn	City of Brainerd – City Engineer, Public Works Director
TBD	City of Brainerd – Environmental Resources Technician
Chris Pence	Crow Wing County – Environmental Services Manager

Abbreviations

BMP	Best Management Practices	NRCS	Natural Resources Conservation Services
BWSR	Board of Water and Soil Resources	NWI	National Wetlands Inventory
CRP	Conservation Reserve Program	OBWEL	Observation Well
DNR	MN Department of Natural Resources	OHW	Ordinary High Water Level
DWSMA	Drinking Water Supply Management Area	PCSI	Potential Contaminant Source Inventory
EPA	Environmental Protection Agency	PWS	Public Water Supply
GIS	Geographic Information Systems	RST	Registered Storage Tank
HWGP	Hazardous Waste Generator Permit	SSTS	Sub-surface Sewage Treatment Systems
IWMZ	Inner Wellhead Management Zone	SWCD	Soil & Water Conservation District
LGU	Local Government Unit	ST	Storage Tank
LUST	Leaking Underground Storage Tanks	STOR	Ag Chemical Storage Permit
LWMP	Local Water Management Plan	SWUDS	State Water Use Permit
MDA	MN Department of Agriculture	TMDL	Total Maximum Daily Load
MDH	MN Department of Health	TOT	Time-of-travel
MGY	Million Gallons per year	UST	Underground Storage Tank
MN	Minnesota	WHP	Wellhead Protection
MNDOT	MN Department of Transportation	WHPA	Wellhead Protection Area
MPCA	MN Pollution Control Agency	WHPP	Wellhead Protection Plan
MRWA	MN Rural Water Association		

Executive Summary

The City of Brainerd Wellhead Protection Plan (WHPP) addresses the six municipal water supply wells' vulnerability and strategies to mitigate potential contaminants that could impact the public water supply. The City's previous WHPP was approved by the Minnesota Department of Health (MDH) in 2011. This WHPP amendment was prepared in accordance with the applicable portions of the State of Minnesota Wellhead Protection Rules: Minnesota Rules 4720. The overall goal of the City of Brainerd's Wellhead Protection Plan is to promote public health, economic development and community infrastructure by maintaining a potable drinking water supply for all residents of the community, both now and into the future.

In the Part 1 WHPP, the confirmation of the Wellhead Protection Area (WHPA), the Drinking Water Supply Management Area (DWSMA), vulnerability of the wells, and vulnerability status of the aquifer in which the city's wells are located was completed and approved by the MDH.

The City of Brainerd's groundwater supply is obtained from six primary wells screened in a sand and gravel aquifer, known generically as a Quaternary Water Table Aquifer (QWTA). At the location of the public water supply (PWS) wells, aquifer thickness ranges between approximately 105 to 140 feet, and the majority of the city's primary wells have a depth-to-water generally less than 20 feet. Well #8 is the outlier in this regard, with a well depth-to-water at about 75 feet. All wells are located more than 50 feet from designated the Mississippi River and Little Buffalo Creek 100-year floodplains. The underlying aquifers' vulnerability was assessed based on geologic logs from wells in the area, soils maps, and chemical and isotope data. **Figures 1A through 1C** map the vulnerability areas – Moderate and High – as well as both the Groundwater Contribution Area (GWCA) and the Surface Water Contribution Area (SWCA) within the DWSMA. **Figure 2** identifies the Section-Township-Range, roadways and, and property parcels as they relate to the DWSMA vulnerability.

The total DWSMA area is 1,617.9 acres, most of which falls within the city of Brainerd, in Crow Wing County, although there is a small area along the western portion of the DWSMA that falls within Oak Lawn Township. The GWCA has approximately 978 acres in moderate vulnerability and 306 acres in high vulnerability, while the SWCA has about 559 acres in high vulnerability. The discrepancy between these acreages and the total DWSMA acreage is due to approximately 162.56 acres overlapping between the GWCA and SWCA near the city's wells. The GWCA and SWCA have slightly different potential contaminant source requirements, and these are outlined in the Potential Contaminant Source Inventory (PCSI) in **Figures 8A through 8D** and **Appendix C**. Where these areas overlap, the GWCA PCSI standards were used as the primary source.

The DWSMA was originally delineated in 2011 and updated in 2021. The new DWSMA is about 30 percent smaller than the previous delineation, primarily due to changes in the 10-year capture zone boundaries and the elimination of the SWCA for Little Buffalo Creek. The vulnerability of the city's DWSMA is based on geologic sensitivity ratings, surficial geologic maps, and water chemistry data from

the city's wells. MDH has assigned a mixed vulnerability of high in the western part of the DWSMA and moderate in the eastern part. As a result of the mixed vulnerability status, the city's DWSMA is considered prone to a variety of contaminant threats that will be addressed in this Part 2 WHPP.

Management strategies focus on actions the city, along with the wellhead team, can facilitate during the next 10 years. These strategies incorporate the following areas of concern: Inner Wellhead Management Zone; Transportation Corridors; Surface Water Discharges; and MPCA-regulated activities, and Wells.

This Part 2 WHPP speaks to MN Rules sections 4720.5220 through 4720.5290 and addresses:

- Data elements and their assessments;
- Impacts of changes on the public water supply well;
- Issues, problems and opportunities, including potential contaminant sources;
- Wellhead protection goals, objectives and action plans;
- Program evaluation; and
- Alternative water supply/contingency strategy.

The Wellhead Protection Team intends to coordinate with Crow Wing County and other local and state agencies to facilitate land use planning within the DWSMA in the high and moderate vulnerability areas to the extent practicable. Through increased public awareness, the City of Brainerd can establish habits to decrease the potential for future water issues and the community can continue to enjoy the current quality of water it has come to expect.

Crow Wing County
Minnesota



Figure 1B
Groundwater Protection Areas and Vulnerabilities
Brainerd Public Utilities



Figure 1C: Surface Water Contribution Area (SWCA) and Vulnerability

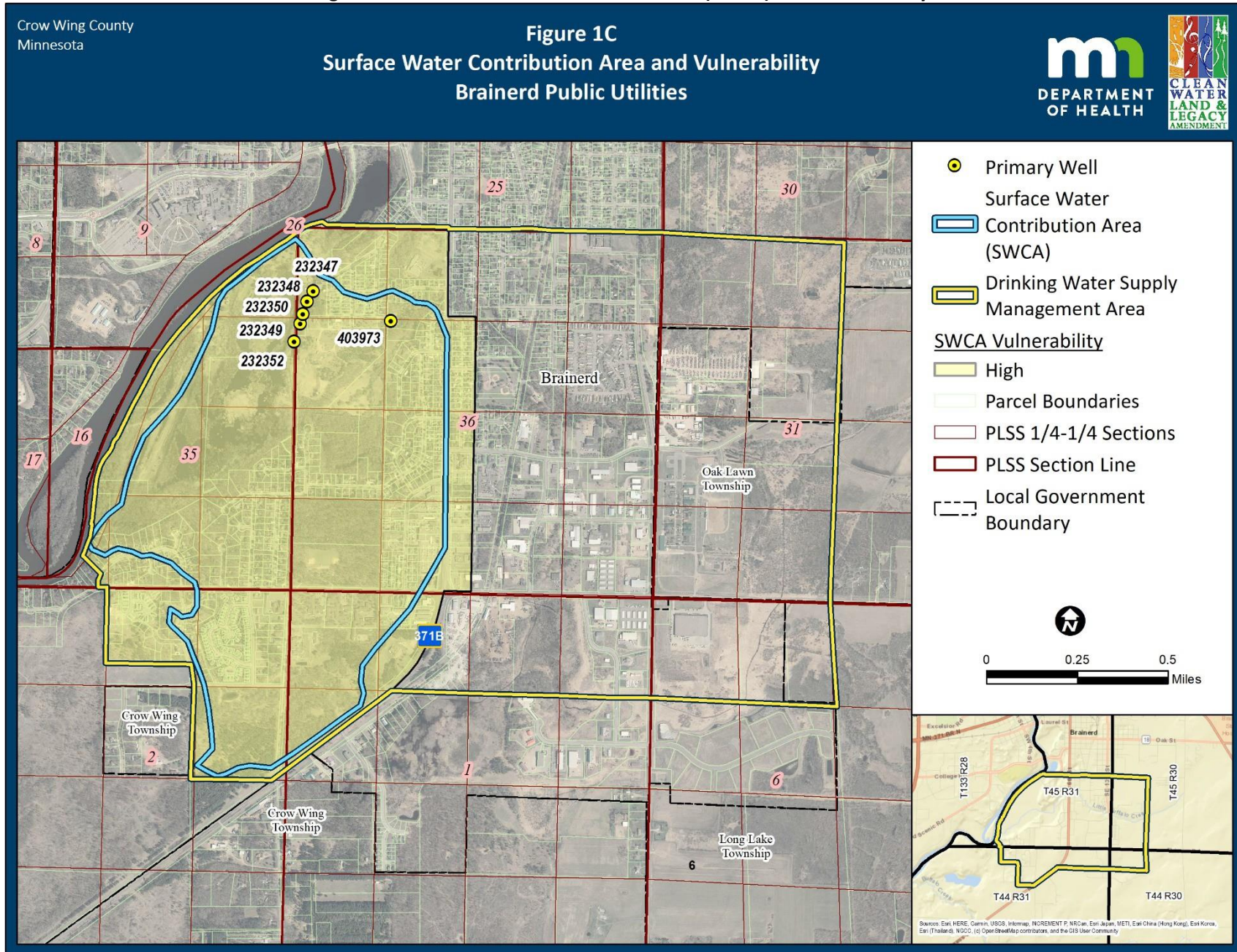
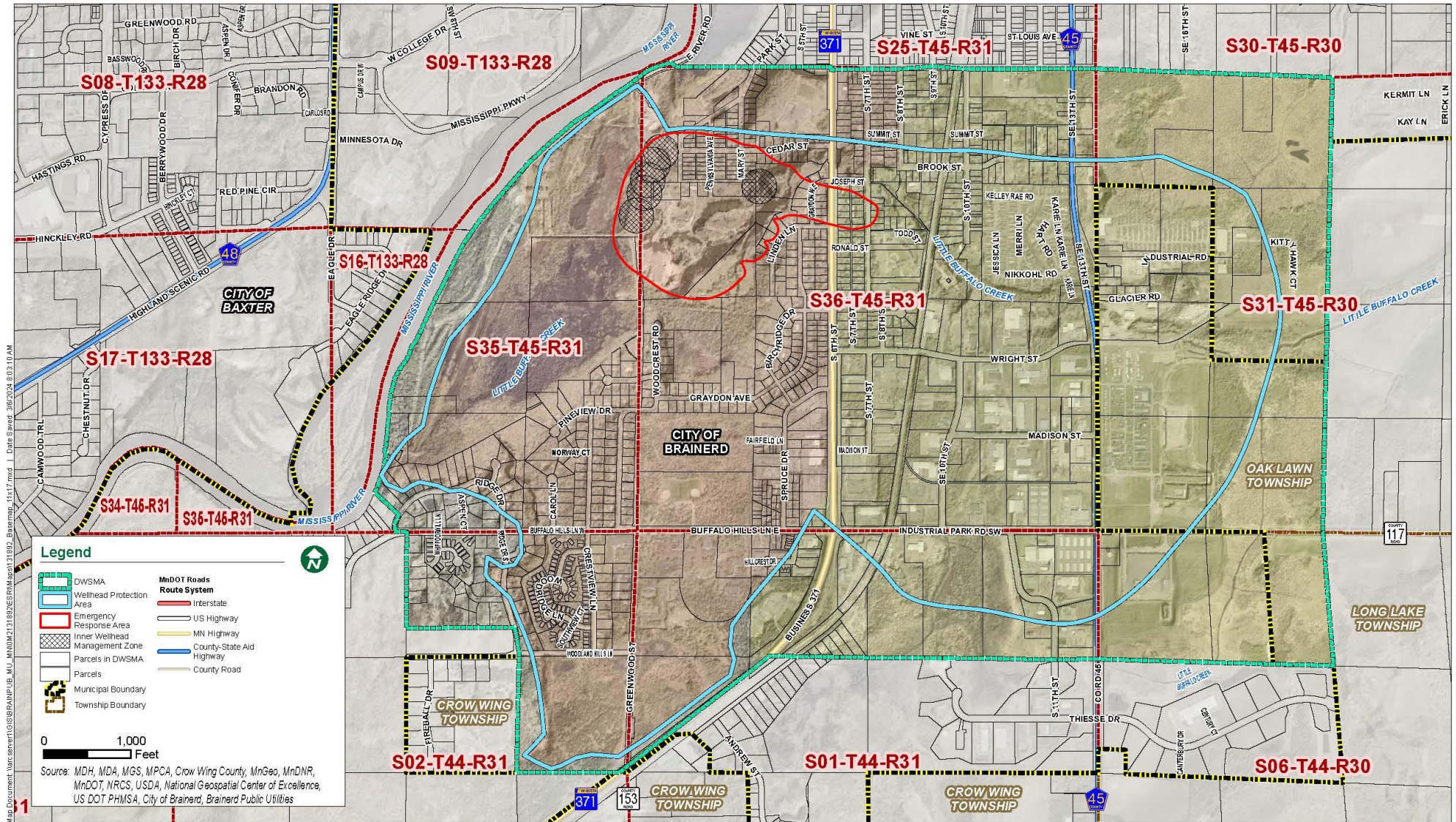




Figure 2: Section-Township-Range (Basemap)



CHAPTER 1: DATA ELEMENTS / ASSESSMENT

Minnesota Rules 4720.5200

I. REQUIRED DATA ELEMENTS

This Part 2 WHPP Amendment incorporates required data and other assessment elements as evaluated in the Part 1 WHPP (**Appendix A**) and outlined in the Part 2 Scoping Decision Notice (**Appendix B**).

A. Physical Environment Data Elements

1. Precipitation

According to the National Weather Service, average annual precipitation during the past five years in the City of Brainerd was 31.51 inches, with variation between 27.65 inches and 39.01 inches, as shown in **Table 1**. The majority of this precipitation occurs during the seven-month period from April to October.

Rain falling on the ground can filter through the layers of sediment and enter the aquifers containing the city's vulnerable wells. The city wells are vulnerable to contamination through groundwater infiltration. It is important to address areas where rainfall could cause infiltration of contaminants.

Table 1: Precipitation Data for Brainerd (inches)¹

	2018	2019	2020	2021	2022
JAN	0.24	0.4	1.24	0.64	0.27
FEB	1.21	1.54	0.03	0.24	1.07
MAR	2.27	1.86	0.72	1.53	1.14
APR	0.59	2.4	1.94	3.02	2.87
MAY	1.68	4.31	2.26	0.29	6.87
JUN	5.66	4.15	6.75	2.28	4.95
JUL	3.34	4.23	6.51	2.74	2.52
AUG	4.01	3.54	5.04	4.57	4.4
SEP	2.53	8.05	1.26	2.92	2.08
OCT	5.11	4.4	2.31	4.5	0.74
NOV	0.73	0.91	1.92	1.4	2.55
DEC	1.37	3.22	0.69	3.52	2.04
TOTAL	28.74	39.01	30.67	27.65	31.5

¹ Data Source: <https://climateapps.dnr.state.mn.us/hidenannual/HIDENannual.asp>

2. Geology

Geologic data elements pertinent to the Wellhead Protection Area (WHPA) delineation and vulnerability status are included in Part One of this Wellhead Protection Plan (WHPP) and were referenced throughout the delineation process. The 2011 Part 2 WHPP and the 2021 Part 1 WHPP are included in **Appendix A**. Additionally, they are on file with the Minnesota Department of Health (MDH) and the City of Brainerd. Potential impacts to the potential contaminant sources in the DWSMA from existing geological conditions were considered throughout the development of this plan.

Brainerd Public Utilities (BPU) has six primary wells screened in a sand and gravel aquifer, which is known generically as a Quaternary Water Table Aquifer (QWTA). At the location of BPU's wellfield, aquifer thickness ranges between approximately 105 to 140 feet. At the majority of wells, the depth-to-water is generally less than 20 feet. However, at the location of Well #8 (403973), where the land surface elevation is higher, the depth-to-water is about 75 feet. All six wells are located more than 50 feet from designated 100-year floodplains. Groundwater flows west-northwest, towards the Mississippi River.

There are no existing surface geophysical studies at this time.

3. Soils

Hydrologic soil groups within the DWSMA are depicted in **Figure 3** and **Table 2**. Approximately 46 percent of DWSMA soils are assigned to Group A, having a high infiltration rate when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission. Approximately 19.6 and 19.3 percent of soils within the DWSMA are assigned to dual class Group A/D and C/D, respectively. These soils typically have a relatively high infiltration rate (low runoff potential) when thoroughly wet and a very slow infiltration rate (high runoff potential) when thoroughly wet. The remainder of the DWSMA soils are assigned to either Group C/D or are Not Applicable (N/A) as they are covered by impervious surfaces.

The soil erodibility is shown in **Figure 4** for those soils within the DWSMA. Most of the DWSMA consists of loamy fine sand soils, which typically have low runoff potential and high infiltration rates. The soils' K factors (an indicator of susceptibility of a soil to sheet and rill erosion by water) are all low, less than 0.4, indicating a low likelihood of erosion issues. As annotated in **Table 3**, over 83 percent of the DWSMA soils are considered not highly erodible (NHEL) while less than 17 percent are designated as highly erodible land (HEL). While excessive erosion is not anticipated across the majority of the DWSMA, some areas along the creeks and waterways have the potential to erode; therefore, soils may serve as a significant transport of potential contaminants along waterways. Strategies to address land use will be discussed in Chapter 5.

Table 2: Hydric Soils in the DWSMA

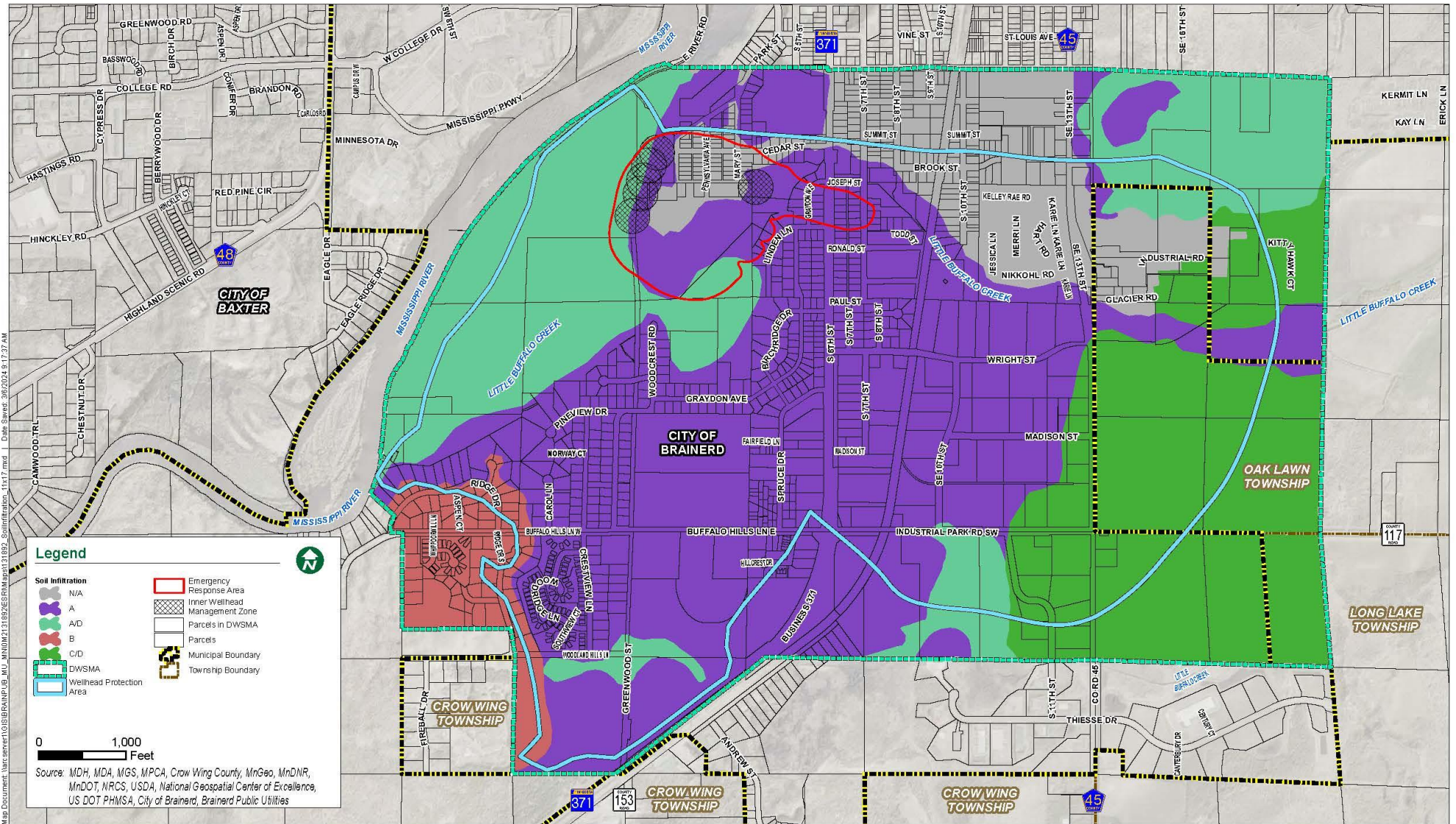
HYDROLOGICAL GROUP	ACRES	% of DWSMA
N/A	179.7	11.1%
A	742.2	45.9%
A/D	316.5	19.6%
B	67.8	4.2%
C/D	311.8	19.3%
TOTAL	1617.9	100.0%

Table 3: Erodible Soils within the DWSMA

Erodible Soil	ACRES	% of DWSMA
Highly Erodible Land	264.68	16.4%
Not Highly Erodible Land	1353.26	83.6%
TOTAL	1617.93	100.0%



Figure 3: Soil Infiltration



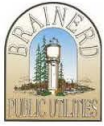
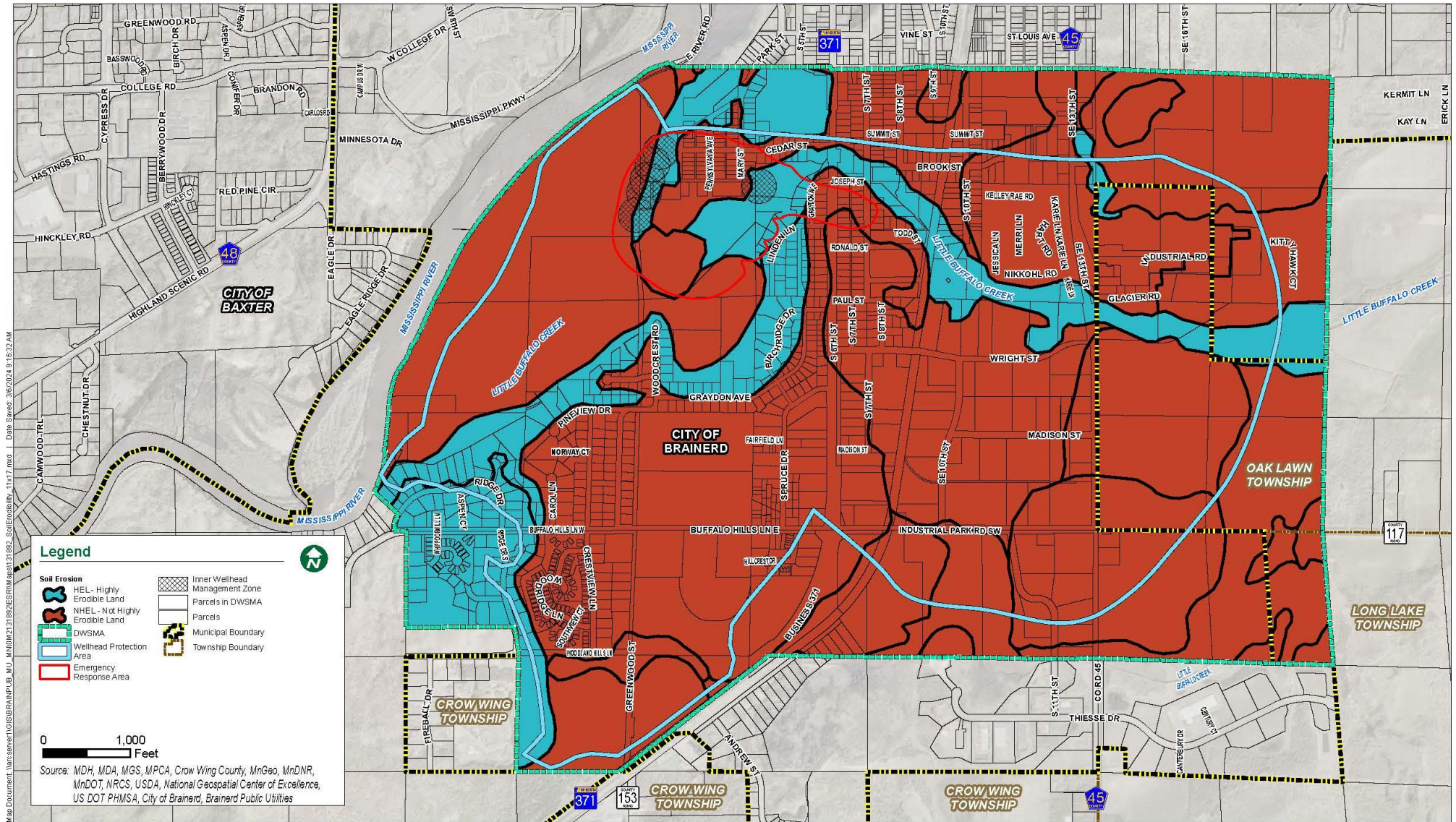


Figure 4: Soil Erodibility



4. Water Resources

The City of Brainerd is located in the Upper Mississippi River basin and the DWSMA is situated in the Mississippi River – Brainerd watershed (Hydrologic Unit Code 07010104). The Mississippi River – Brainerd One Watershed One Plan (1W1P) document can be found on Crow Wing County's website at <https://www.crowwing.gov/1476/One-Watershed-One-Plan-1W1P>.

Figure 5 shows the water resources in the vicinity of the DWSMA. The Mississippi River is the major discharge feature in the area, flowing southwest until it meets with the Crow Wing River. The confluence of the rivers is about six miles southwest of Brainerd. Two creeks, Little Buffalo Creek, and Buffalo Creek, drain west toward the river from the higher topographic areas. Little Buffalo Creek flows through the DWSMA, draining to the wetland immediately south of the wellfield and discharging to the river. Buffalo Creek is located south of the DWSMA and discharges to the Mississippi River a little more than a mile downstream from Little Buffalo Creek.

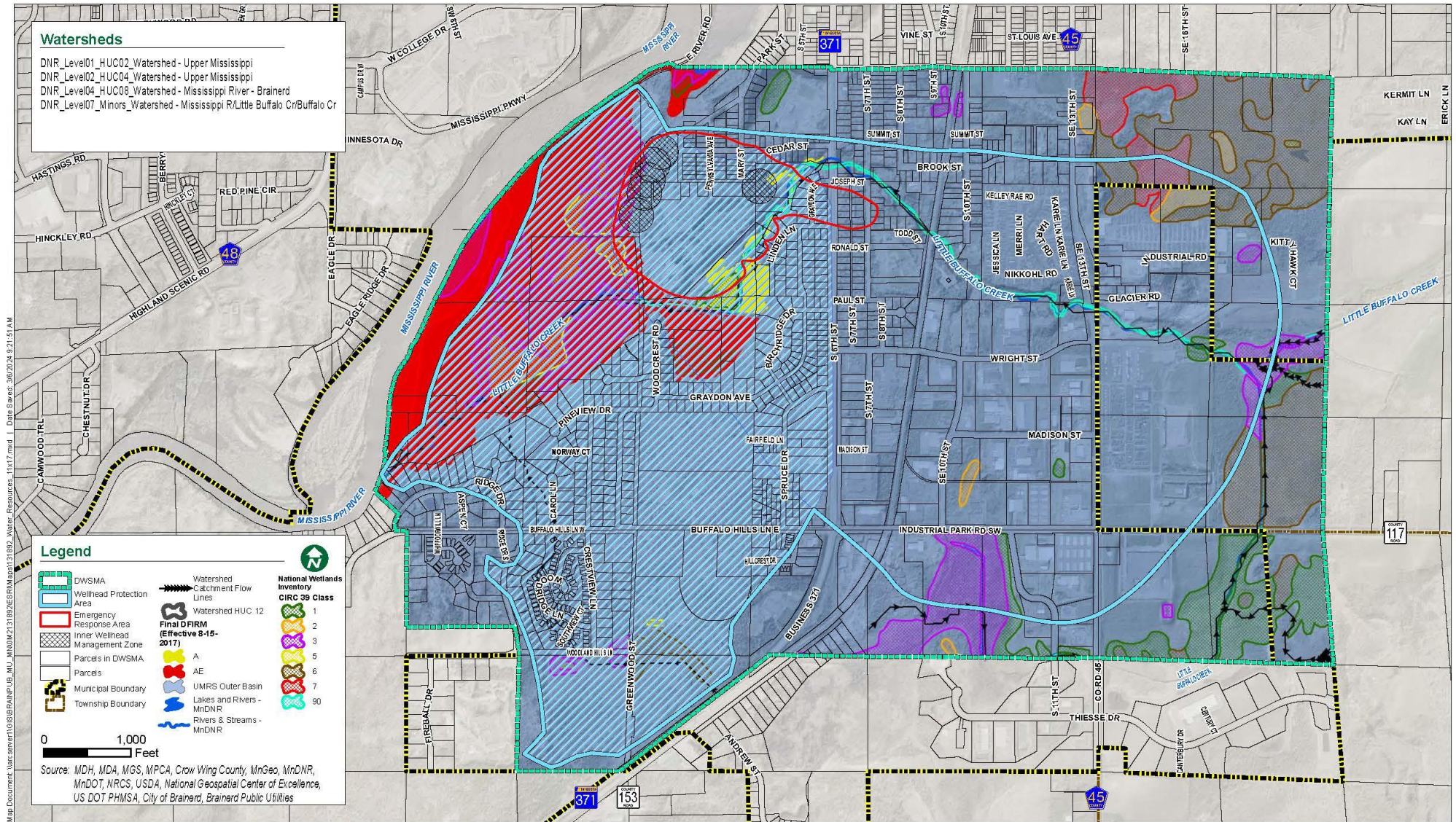
There are several National Wetlands Inventory (NWI) wetlands located within the DWSMA. Wetlands can provide a “nutrient sink” where the water flows into the wetland and is allowed to settle nutrients to the bottom while evaporation and movement through the soils takes some of the water out of the overland system.

There are Zone A and AE FEMA 100-year floodways located within the DWSMA. All of the wells are located more than 50 feet from the 100-year floodplain and are in compliance with the Well Code (Minnesota Rules 4725) isolation distances. No impacts to the public water supply wells are anticipated as a result of flooding events.

There are no public ditches presently identified within the DWSMA. Boom Lake is situated in the northwestern-most portion of the DWSMA, however, is not within the Surface Water Contribution Area (SWCA) and no in-depth assessment is required for this water body. The surface waters within the SWCA primarily serve as stormwater runoff channels during precipitation events.



Figure 5: Water Resources



B. Land Use Data Elements

1. Land Use

The City of Brainerd is located in Crow Wing County in central Minnesota. Land use within the DWSMA is a mix of developed, wetlands, tree cover, grass/pasture, wetlands, and some crops (**Table 4** and **Figure 6**). Future changes to land use are discussed in Chapter 2.

Table 4: Land Use within the DWSMA

Land Cover	Acres
Barren	1.6
Crops	6.7
Developed	865.3
Grass/Pasture	54.9
Open Water	8.8
Tree Cover	268.7
Wetlands	411.9
Total	1617.9

Continued development of Industrial, Residential, Business districts is anticipated to occur within the DWSMA. Additional information related to future growth within the City can be found in the Brainerd 2035 Comprehensive Plan Update. The plan is available for public review at:

<https://www.ci.brainerd.mn.us/DocumentCenter/View/6007/Comprehensive-Plan>.

2. Zoning

Official zoning in the DWSMA is shown in **Table 5** and **Figure 7**. Since the update in 2022, there have been no significant changes proposed to the city's future zoning.

Table 5: Zoning within the DWSMA

City of Brainerd Zoning	Acres
Contemporary Neighborhood 1 (CN-1)	107.3
Contemporary Neighborhood 2 (CN-2)	230.4
Garden Living (GL)	70.7
General Commercial (GC)	40.5
General Industrial (GI)	415.0
Park (P)	225.5
Public/Semi-Public (PSP)	112.7
Rural Living 1 (RL-1)	57.9
Right of Way	357.9
Total	1617.9

Zoning updates were adopted by the City of Brainerd in July 2022. Those updates can be viewed at <https://www.ci.brainerd.mn.us/212/Zoning-Code>. The city uses its Comprehensive Plan as the policy guide for responsible regulation of land use and development, and that document can be found here:

<https://www.ci.brainerd.mn.us/DocumentCenter/View/6007/Comprehensive-Plan>.

Future Growth Areas as identified in the image below (page 25 in the Comprehensive Plan) shall be evaluated prior to implementation to ensure potential contaminants are mitigated to protect the city's public water supply.

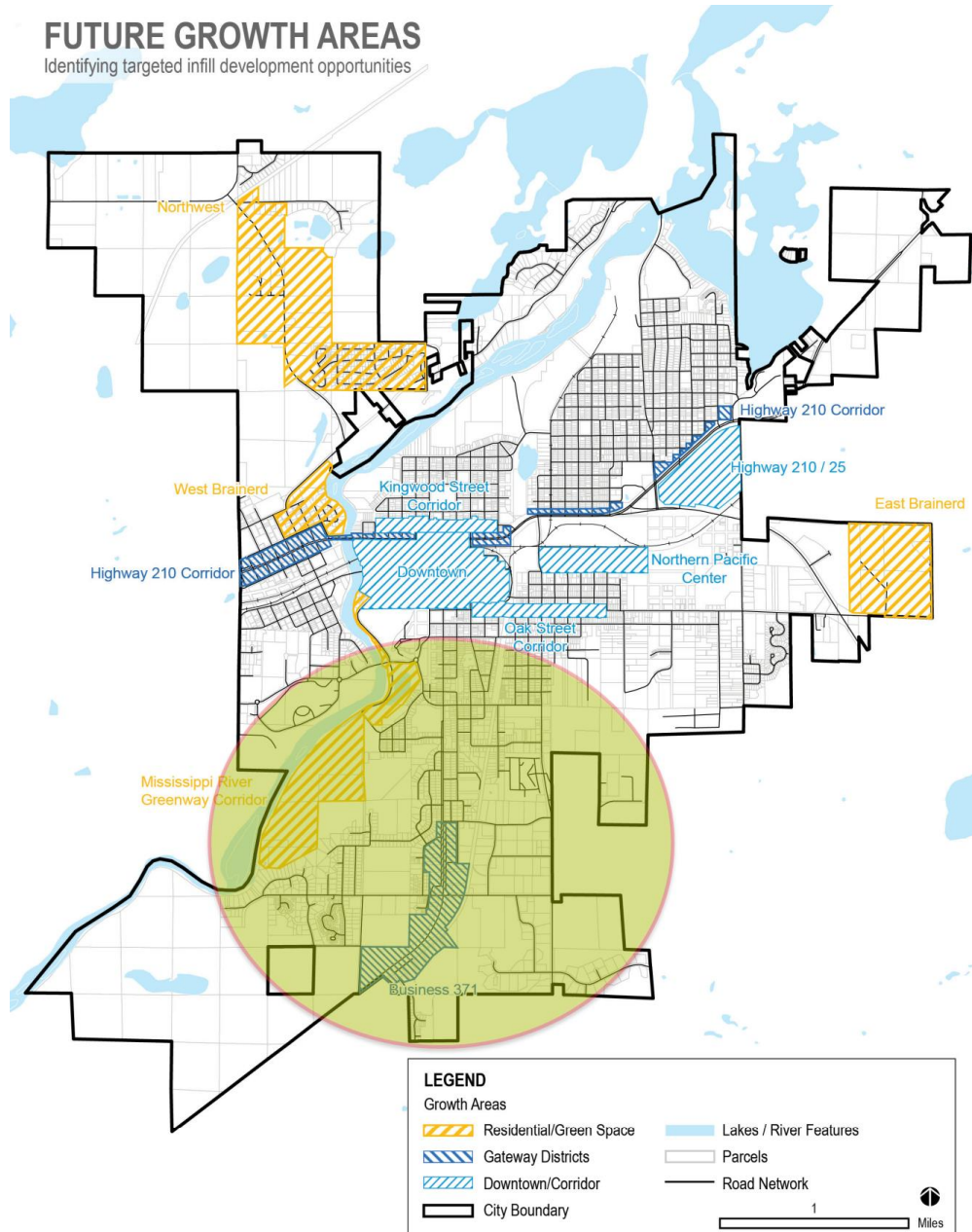




Figure 6: Land Cover within the DWSMA

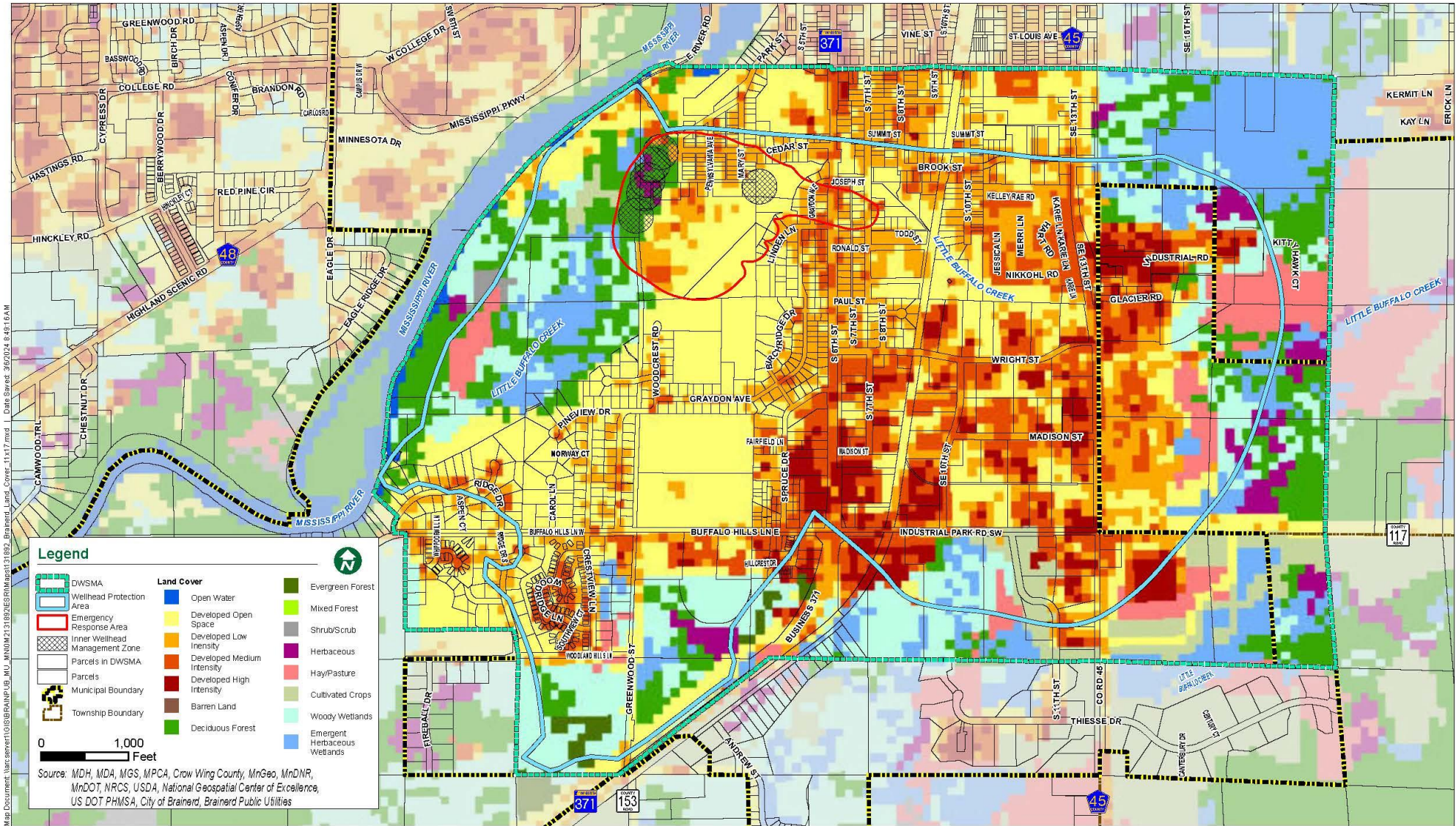
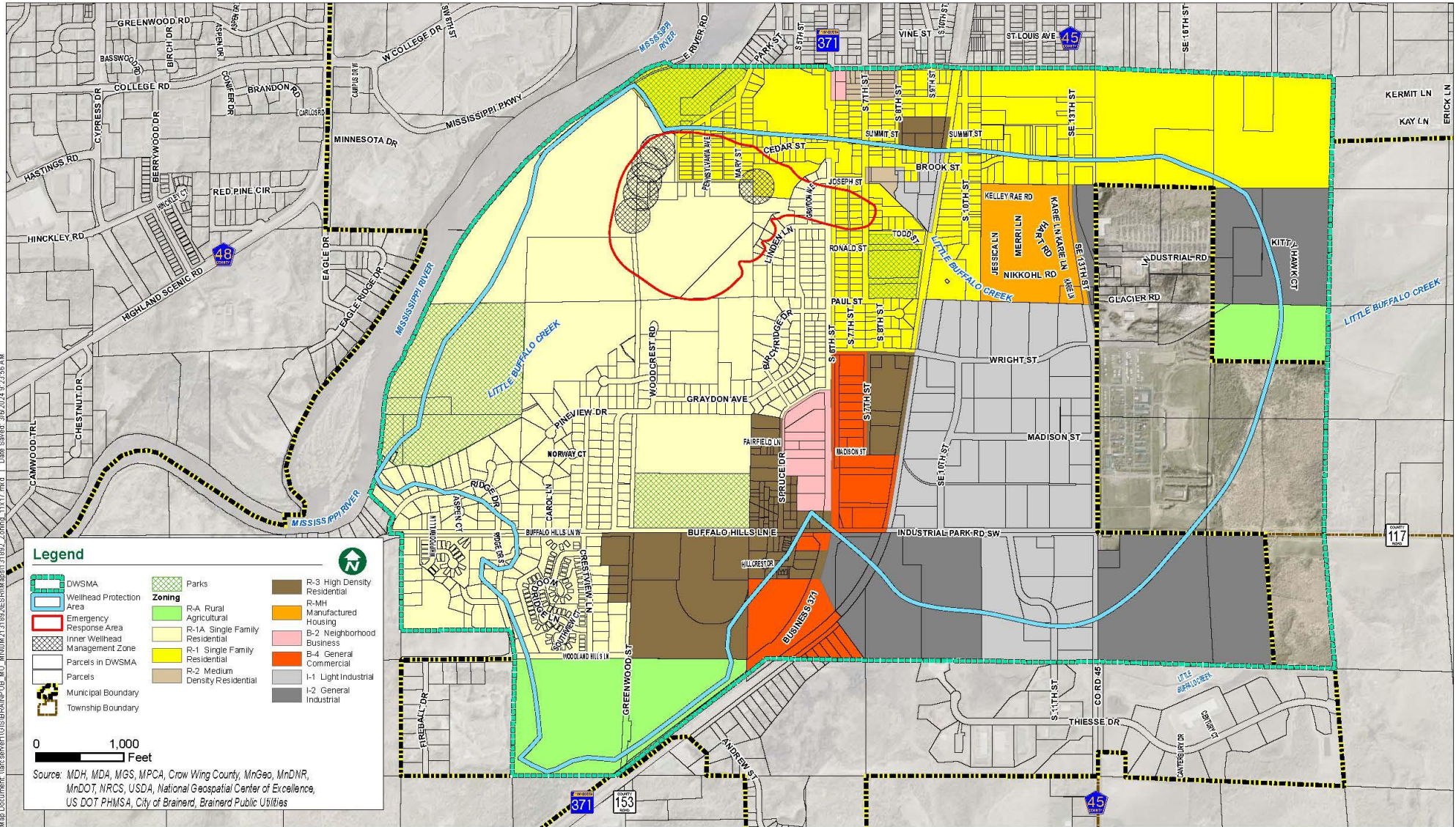




Figure 7: Zoning within the DWSMA



3. Potential Contaminant Source Inventory

Existing land uses, and potential sources of contamination located within the DWSMA were reviewed by the WHP Team. The Potential Contaminant Source Inventory (PCSI), utilizing State databases combined with local knowledge, ground verification, email and phone conversations were used to identify most of the contaminant sources.

Table 6 and **Figure 8A** through **8D** show the location of identified Potential Contaminant Sources. A listing of parcels identified as having potential contaminant sources is shown in **Appendix C**.

The DWSMA is characterized by three vulnerabilities as shown in **Figures 1A-1C**. These areas equate to 559 acres in SWCA High Vulnerability, 978 acres in GWCA Moderate Vulnerability, and 306 acres in GWCA High Vulnerability.

The city utilizes six (6) public water supply wells. According to the Part 1 WHPP recommendations, well locating and water quality monitoring will help with future delineations and vulnerability assessments. These results suggest a connection between the wells and land use activities. Additionally, planning for future replacement wells should be considered as some of the city's wells are more than 70 years old.

There are 86 total PCSI across the collection and vulnerability areas. This includes 11 known active domestic wells and 25 unknown wells located within the DWSMA. The city will work with MDH and verify the unknown wells during annual PCSI reviews. The city will explore ways to determine if other wells exist and opportunities to seal any unknown/unused wells identified within the DWSMA. Additionally, the city will request property owners inform the city should a well be installed within two miles of the DWSMA. This will help MDH identify updates to the DWSMA boundary following future assessments.

There are 7 potential contaminant sites and 5 hazardous waste sites. In some situations, these may pose a risk to underground sources of drinking water.

Class V injection wells are typically shallow disposal systems that are used to place a variety of fluids below the land surface. Examples of Class V injection wells include motor vehicle waste disposal wells, large capacity cesspools, stormwater drainage wells, aquifer remediation wells and large capacity septic systems. Class V wells are a concern because, in some situations, they may pose a risk to underground sources of drinking water. There are no known Class V wells located within the DWSMA. Management of Class V injection wells will be addressed in the management strategies of this plan.

While not specifically listed as a potential contaminant site, the city will work with MDH, Crow Wing County, and local emergency response agencies to identify and update emergency response measures should a spill occur along roadway corridors.

The city will coordinate and develop education strategies to address stormwater best

management practices for properties within the high vulnerability portion of the DWSMA. Cost-share incentive programs are available through MDH implementation and competitive grants.

Table 6 outlines the PCSI types and codes within the different collection and vulnerability areas. **Figures 8A to 8D** identify locations of PCSI within the DWSMA. These figures include the PCS overview (8A) and are then divided out to identify Wells (8B), Tanks (8C), and Other (8D) more easily.

Table 6: Potential Contaminant Sources and Assigned Risk

Potential Contaminant Source Type		Total	SWCA High Vulnerability: Status and Level of Risk A=Active, I=Inactive, U=Unknown, C=Closed, R=Removed L=Level of Risk: H=High, M=Medium, L=Low						GWCA Moderate Vulnerability: Status and Level of Risk A=Active, I=Inactive, U=Unknown, C=Closed, R=Removed L=Level of Risk: H=High, M=Medium, L=Low						GWCA High Vulnerability: Status and Level of Risk A=Active, I=Inactive, U=Unknown, C=Closed, R=Removed L=Level of Risk: H=High, M=Medium, L=Low					
PCS Codes	PCS Material	5	A	I	U	C	R	L	A	I	U	C	R	L	A	I	U	C	R	L
HWG	Hazardous Waste	5	2					L							2	1				L
PCS	Potential Contaminant Site	7		1				L	1			1		L	1			3		L
SWB	Stormwater Basin	3	2					L							1					L
SWMS	Solid Waste Management Site	4													4					M
WWDS	Wastewater Disposal Site	1													1					L
AST	Aboveground Storage Tanks	1							1					L						
UST	Underground Storage Tank	23							4				13	M	1	4			1	M
WEL	Public Water Supply Wells	6													6					L
	Domestic Wells	11	1					L	9					L	1					L
	Unknown Wells	25			1			L			24			M						
	Class V Wells	0																		
Totals		86	5	1	1	0	0	0	15	0	24	1	13	0	17	5	0	3	1	0

For all PCS within both the GWCA and SWCA, these are tracked in the GWCA High Vulnerability section within this table so as not to duplicate numbers.



Figure 8A: Potential Contaminant Sources within the DWSMA

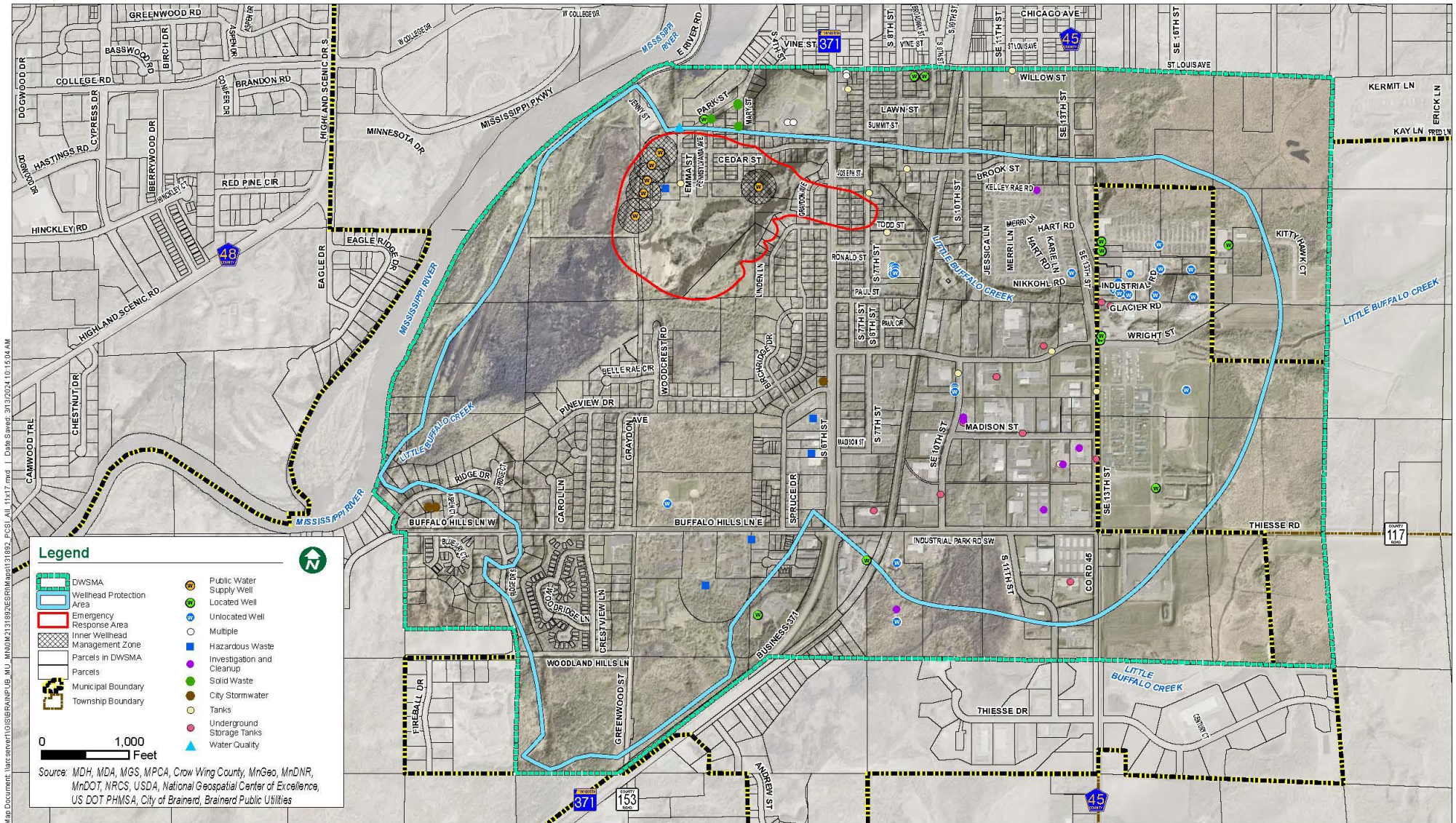




Figure 8B: Potential Contaminant Sources - Wells

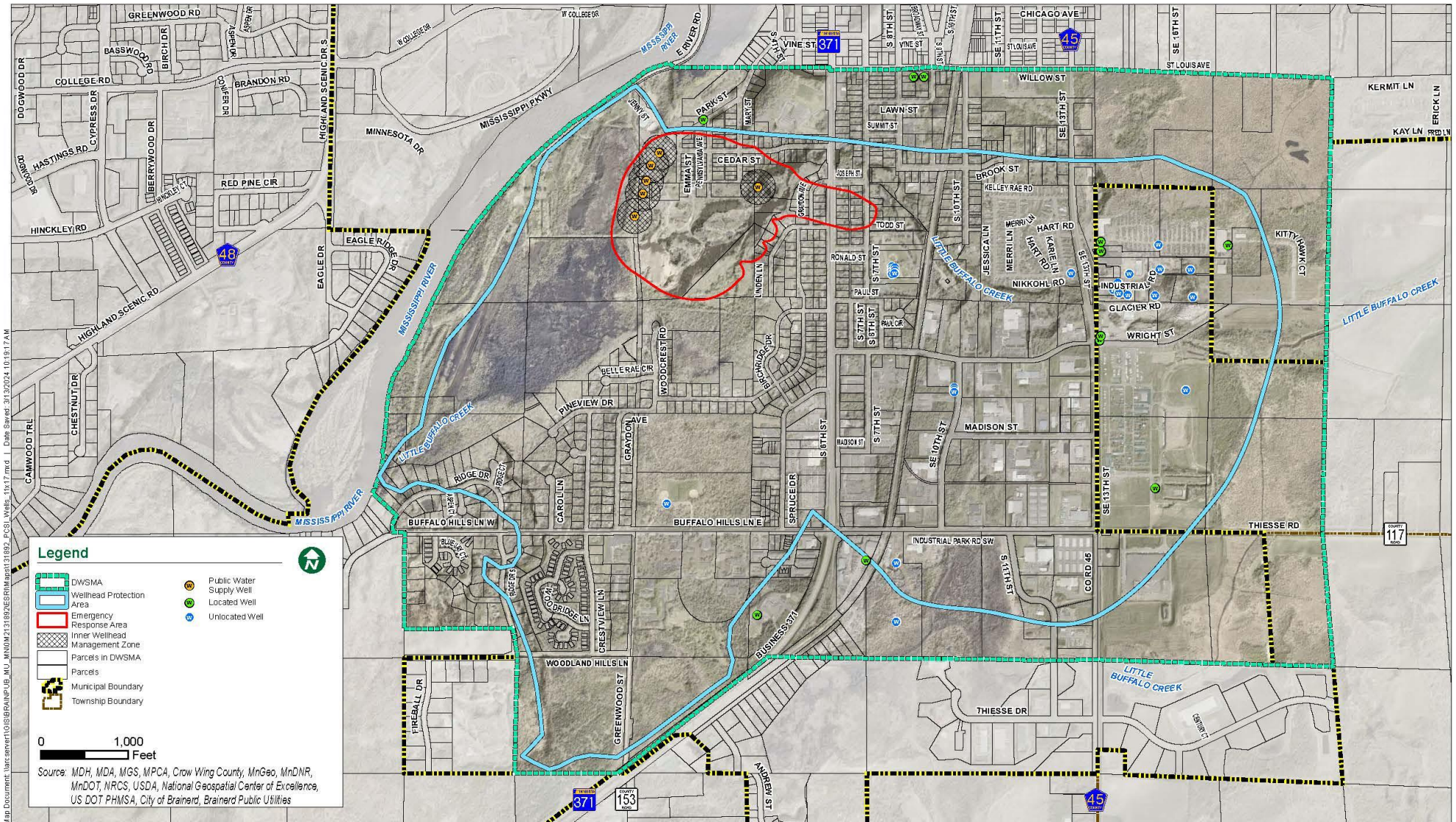




Figure 8C: Potential Contaminant Sources – Tanks

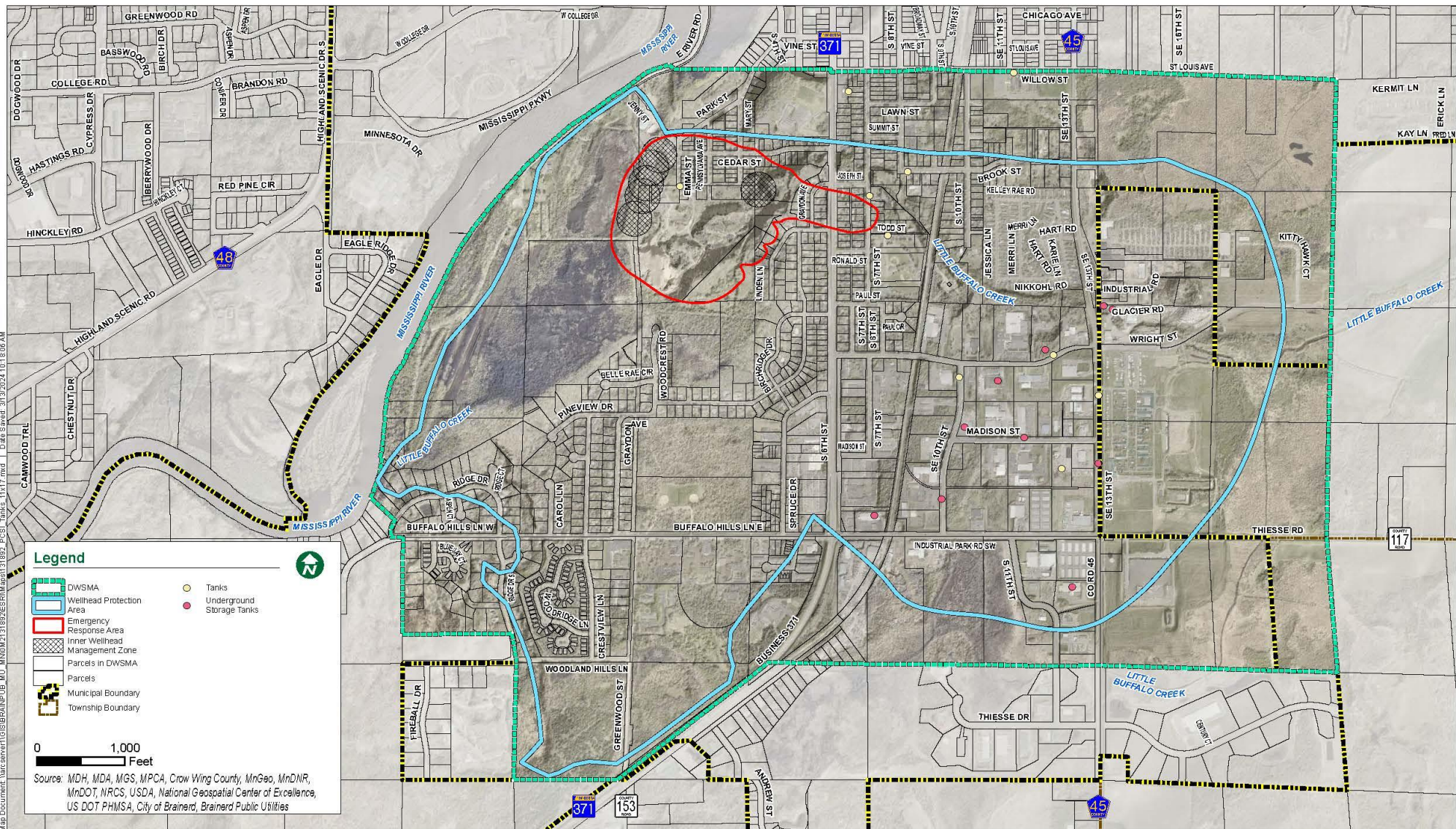
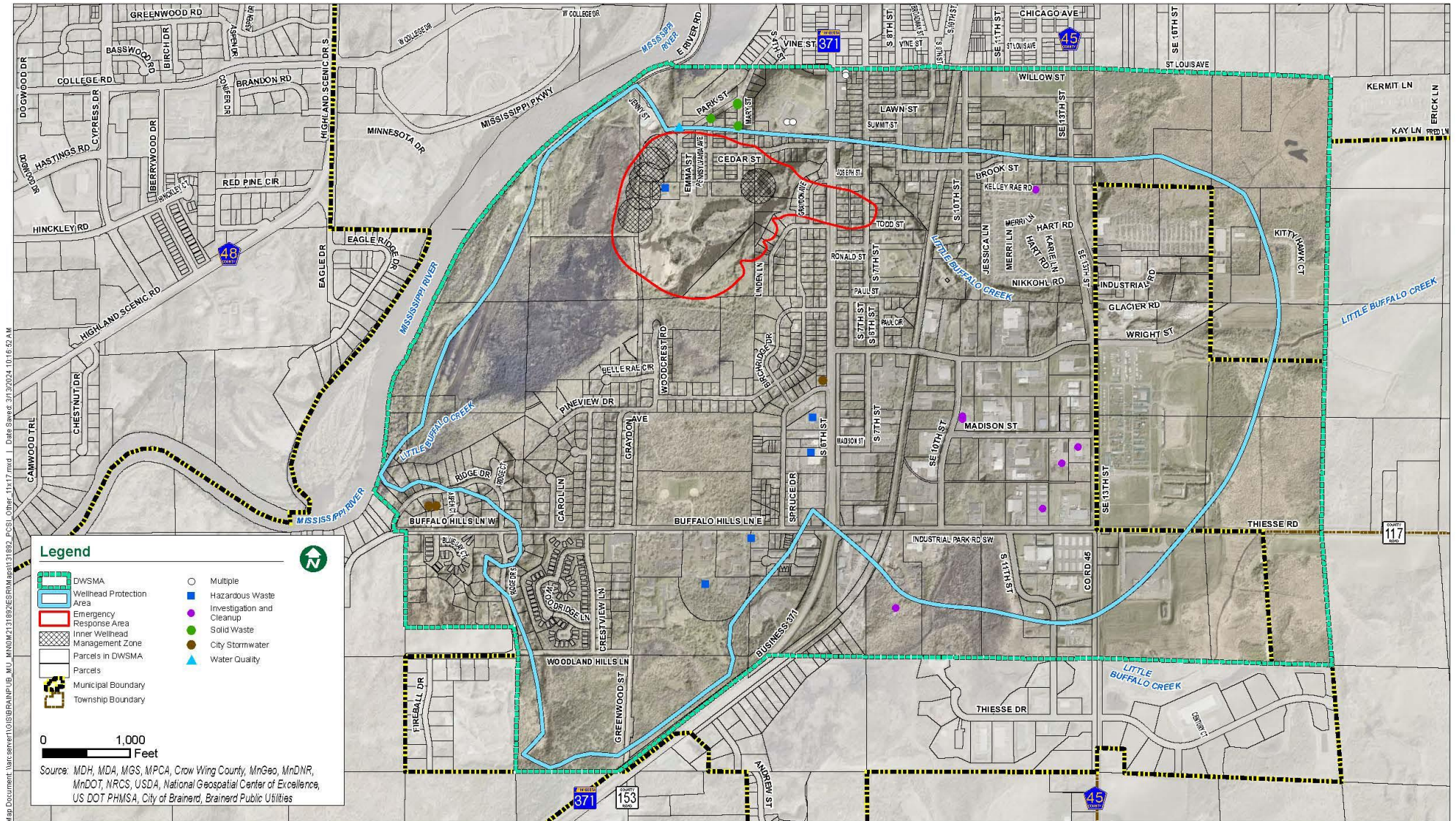




Figure 8D: Potential Contaminant Sources – Other



4. Inner Wellhead Management Zone (IWMZ)

Existing land uses, management and local land use controls within the Inner Well Management Zone (IWMZ or 200' radius around the public water supply wells) and the immediate one-year time of travel area as shown in **Table 7** and was reviewed and considered by the WHP team during the development of this plan. This is done to identify land use issues and related potential contaminants which may have the most immediate impact upon the public water supply wells.

Table 7: Potential Contamination Sources and Assigned Risk for the IWMZ

Source Type	Well 3	Well 4	Well 5	Well 6	Well 7	Well 8	Risk
SD1 – Storm water drainpipe, 8 inches or greater in diameter	Y 125'						L
GP1 – Gravel pocket or French drain for clear water drainage only	Y 170'	Y 164' 90'	Y 164' 102'	Y 179' 100'	Y 65'		L
WEL – Operating well	Y 172'	Y 172' 86'	Y 154'	Y 154' 186'			L
WT2 – Water treatment backwash disposal area	Y 185'	Y 149'			Y 75'		L

A copy of the IWMZ forms and measures that have been identified are included in **Appendix D** of this plan. The WHP team discussed the importance of on-going monitoring for land use changes and potential contaminants near the public water supply wells and awareness of State Well Code isolation distances and need to maintain these setback requirements.

5. Public Utility Services

Stormwater runoff and sanitary sewers can function as pathways for contaminants as well as be sources of contamination. **Figure 9** shows the storm sewer system, **Figure 10** shows the water distribution system, and **Figure 11** shows the sanitary sewer system.

Ground transportation corridors provide a potential source of contamination due to accidental spills and discharges. Significant transportation corridors within the DWSMA include State Highway 371 and CSAH 14, with both corridors traveling north-south within the DWSMA (**Figure 2**). Water from these corridors flows overland and infiltrates into the soil. The Minnesota Department of Transportation (MNDOT) has developed a protocol to address spills within the right of way, including notification of the state duty

officer who assigns clean up. The City of Brainerd Water Emergency Response Plan, found in **Appendix F**, details procedures if there is a threat or contamination to the water system.

There are no known pipelines within the DWSMA.

The construction and water quality obtained from each well that is used by the Public Water Supplier is included in the assessment of well vulnerability. The vulnerability of the city wells is designated as a result of the following conditions:

1. Well construction details, especially conformance with standards required by the state well code,
2. Geologic sensitivity of the aquifer, and
3. Previous monitoring results.

Except for Well #8 (403973), it is unknown whether the older wells meet current construction standards because grouting information is not known. The glacial aquifer is considered to have a high to very high geologic sensitivity due to the lack of any kind of protective geologic materials, such as clay-rich till, between the land surface and the sand and gravel aquifer.

All wells are considered vulnerable to contamination due to tritium being detected in the well water (See Park I Results). Detectable tritium indicates the presence of young (post-1953) water. This is reinforced by the chloride concentrations and chloride/bromide ratios presented below. Elevated concentrations or concentration ratios indicate human-impacted water quality from activities at the land surface, such as road salt or wastewater.



Storm Sewer System

March 2024

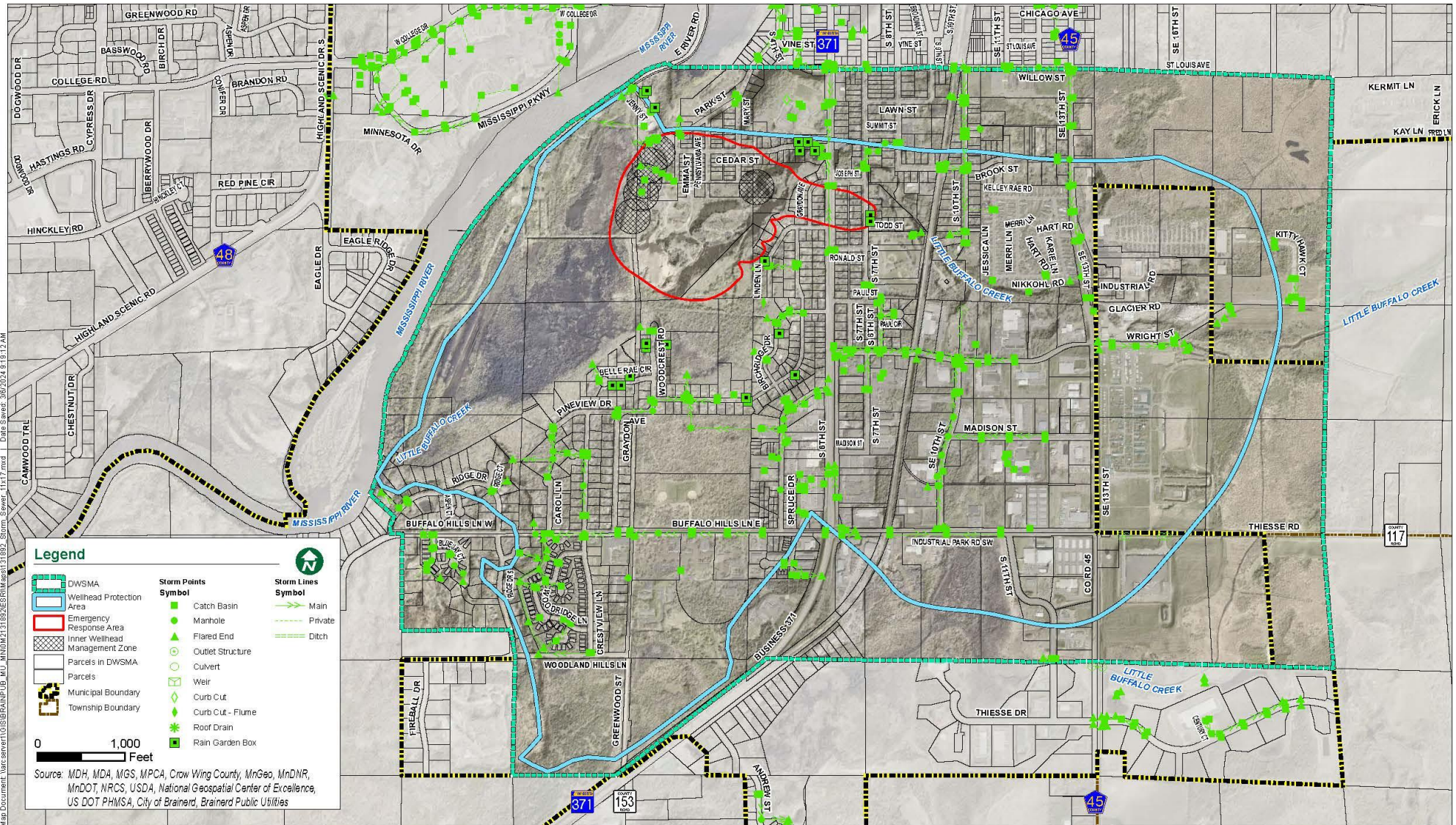
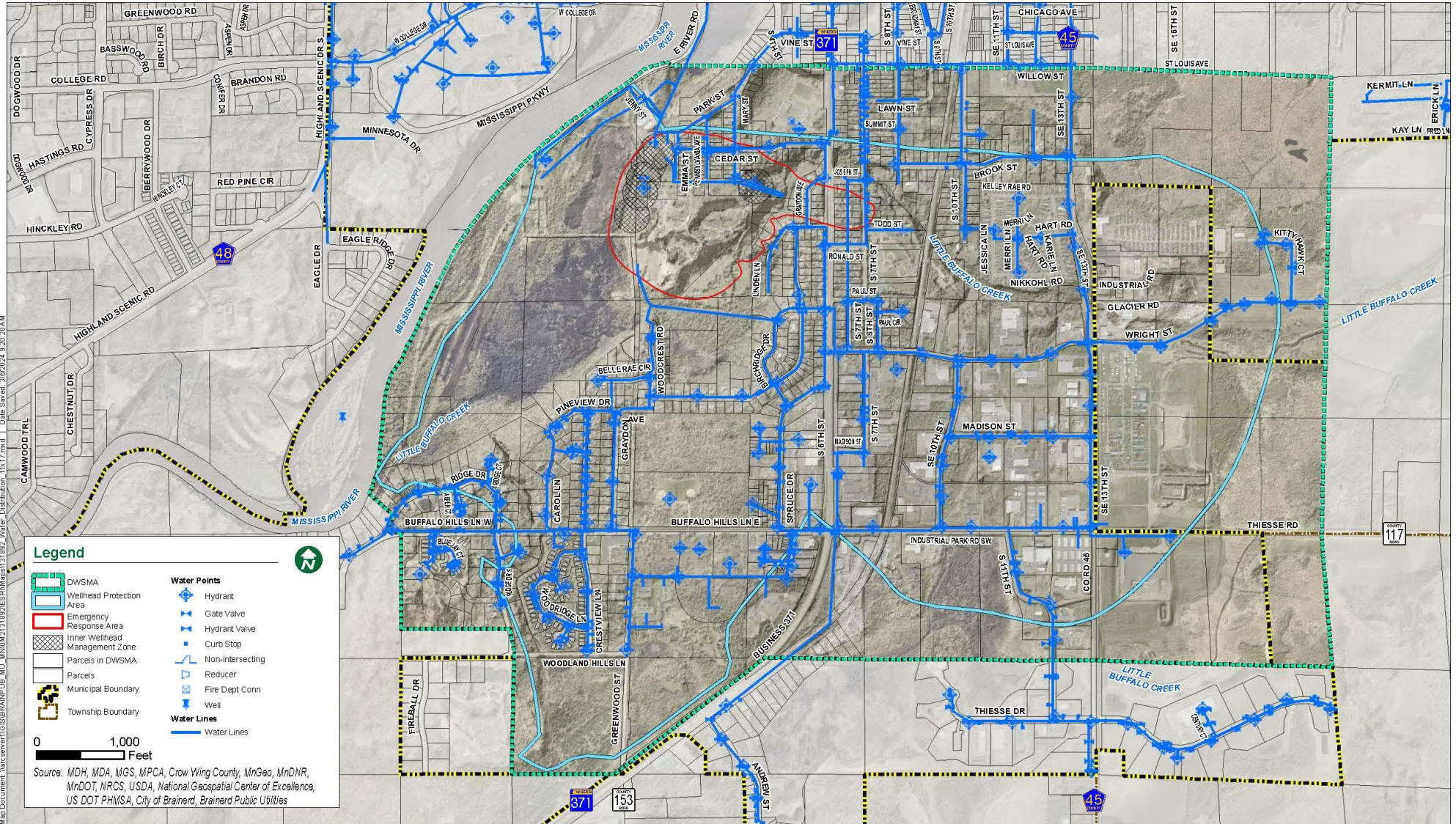




Figure 10: Water Distribution System



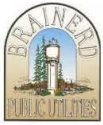
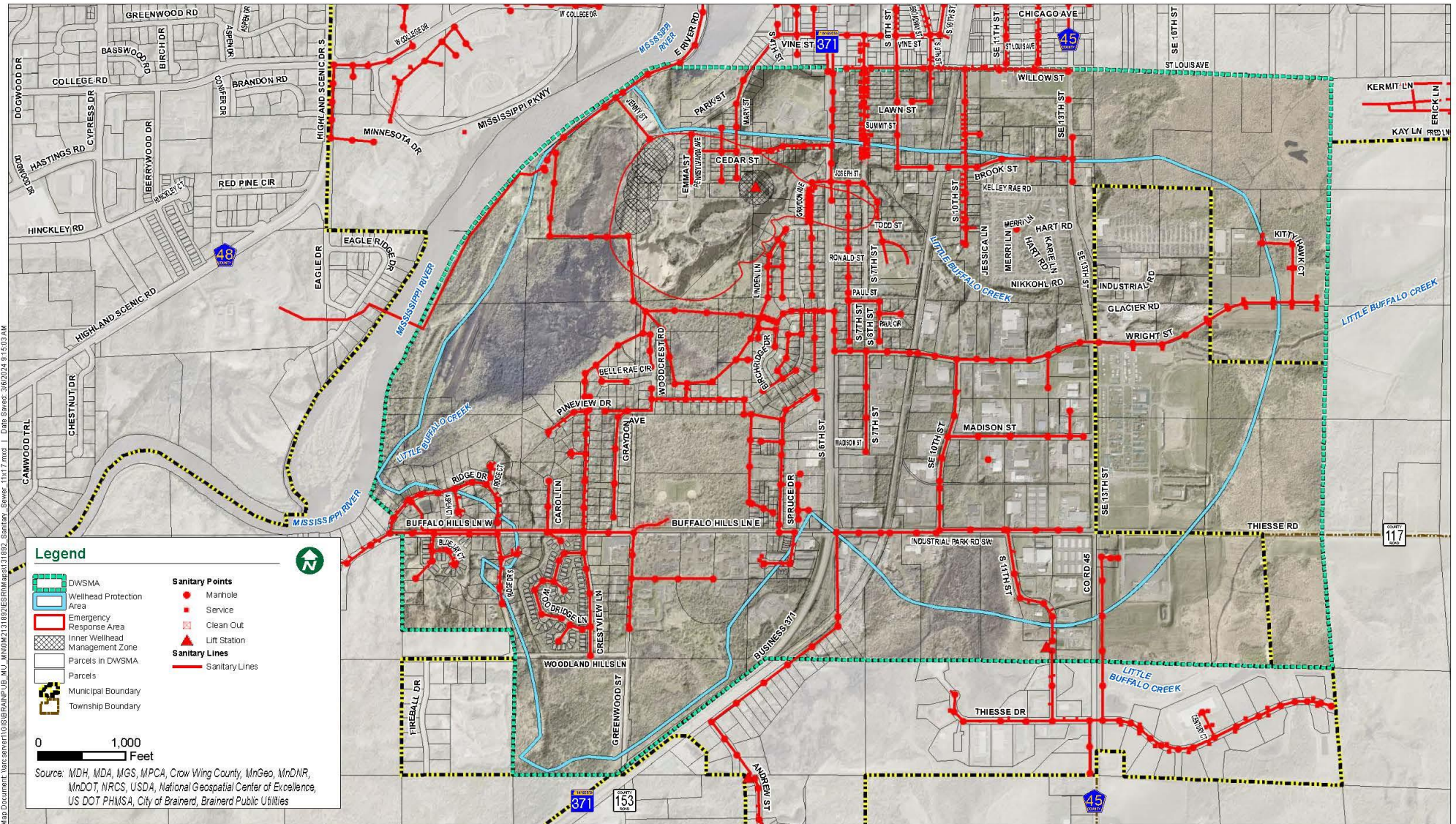


Figure 11: Sanitary Sewer System



C. Water Quantity Data Elements

1.Surface Water Quantity

Two creeks, Little Buffalo Creek and Buffalo Creek, drain west toward the river from the higher topographic areas. Little Buffalo Creek flows through the DWSMA, draining to the wetland immediately south of the wellfield and discharging to the Mississippi River. Buffalo Creek is located south of the DWSMA and discharges to the Mississippi River a little more than a mile downstream from Little Buffalo Creek. The closest USGS station (USGS 05242300) is located on the Mississippi River, north of the DWSMA, but within the City of Brainerd.

NWI wetlands are within the DWSMA. According to MnDNR's LakeFinder web mapper, Boom Lake—located in the northwestern portion of the DWSMA—is the only lake within the DWSMA.

The City does not withdraw any water from any lakes or streams and there are no known state-protected levels or flows for any nearby water bodies.

There are no known surface water use conflicts to the water supply within the DWSMA.

There are no expected changes in surface water quantity.

2.Groundwater Quantity

Table 8 is a list of the public water supply wells covered by state appropriation permits, including amounts of water appropriated, and aquifer source. There are no known well interference problems or water use conflicts. No state environmental bore holes exist within the DWSMA. The total average withdrawal per year is 739.1 million gallons per year (MGY) and the city's appropriations permit allows for up to 900 MGY.

Table 8: List of Wells

Well ID	Unique #	Use	Aquifer	2018-2022 Average Withdrawal (MGY) ²
#3	232347	Primary	QWTA	92.7
#4	232348	Primary	QWTA	102.9
#5	232349	Primary	QWTA	105.9
#6	232350	Primary	QWTA	111.0
#7	232352	Primary	QWTA	213.4
#8	403973	Primary	QWTA	113.4
TOTAL AVERAGE PER YEAR				739.1

² Data gathered from the city's MPARS reports 2018 through 2022.

Besides the wells used by the public water supplier, there are no active high-capacity wells in the DWSMA that may account for PWS wells’ pumping impacts on their capture areas.

3.Surface Water Quality

Figure 5 shows the water resources in the vicinity of the DWSMA. As stated above, Little Buffalo Creek flows through the DWSMA, draining to the wetland immediately south of the wellfield and discharging to the Mississippi River. Little Buffalo Creek is currently listed as impaired, although MDH modeling did not assess a strong connection between this and the public water supply.

NWI wetlands are within the DWSMA. The wetlands located near the city wells do seem to have an indirect connection to the public water supply, however, there is not any current water quality data for these wetlands.

According to MnDNR’s LakeFinder web mapper, Boom Lake—located in the northwestern portion of the DWSMA—is the only lake within the DWSMA and there is no indication of a strong connection between this resource and the public water supply.

No changes in surface water quality are anticipated.

4.Groundwater Quality

Brainerd Public Utilities distributes a Drinking Water Report to its citizens on an annual basis which includes water quality data for the city’s drinking water. These reports can be found on the city’s website: <https://bpu.org/drinking-water-reports/>.

The glacial aquifer is considered to have a high to very high geologic sensitivity due to the lack of any kind of protective geologic materials, such as clay-rich till, between the land surface and the sand and gravel aquifer.

The vulnerability of the city’s water supply wells has been assessed based on 1) well construction details, especially conformance with standards required by the state well code, 2) the geologic sensitivity of the aquifer, and 3) past monitoring results.

II. ASSESSMENT OF DATA ELEMENTS

A. Use of the Wells

The City of Brainerd utilizes six wells, varying in depth from 123 feet to 187 feet. An annual average of 739.1 MGY is pumped from these wells. Usage, as shown in **Table 9**, has varied between a low of 619.6 MGY in 2018 and a high of 1,099.2 MGY in 2021. The city has an annual appropriations allowance of 900 MGY.

Table 9: Annual Well Pumping Amounts (million gallons per year)

PWS Well	2018	2019	2020	2021	2022
Well #3	81.3	86.2	78.1	135.5	82.2
Well #4	87.5	84.1	73.1	156.4	113.3

PWS Well	2018	2019	2020	2021	2022
Well #5	89.4	98.9	98.5	152.0	90.8
Well #6	98.9	84.0	92.7	143.6	135.6
Well #7	174.4	176.0	196.1	334.5	185.8
Well #8	88.1	94.7	103.8	177.2	103.0
Totals	619.6	623.8	642.4	1,099.2	710.7

B. Wellhead Protection Area Delineation Criteria

The following data inputs were used in determination of the boundaries of the wellhead protection area (WHPA): flow boundaries, daily volume of water pumped, groundwater flow field, aquifer hydraulic conductivity, and time of travel.

A detailed discussion of the WHPA delineation is found in Part 1 of this WHPP. Part 1 of this WHPP is included in **Appendix A** of this plan.

Should volume of water pumped increase due to continued demand increase or installation of a new city water supply well, this could cause a change to the WHPA delineation.

C. Quality and Quantity of Water Supplying the Public Water Supply Well

The City of Brainerd's wells pumped an average of 739.1 million gallons per year between 2018 and 2022. A detailed discussion of the water quantity and quality supplying the public water supply wells is found in Part 1 of this WHPP.

At present, none of the contaminants for which the Safe Drinking Water Act has established health-based standards are found above maximum allowable levels in the utility's water supply, nor are any present at one-half of those levels. Naturally occurring arsenic has been detected at low levels in several wells, however, arsenic has not been detected in finished water that enters the distribution system.

There are no indications of significant water use conflict between the city's water supply and water usage. Should interference be a future concern, the city will coordinate with MDH to identify a new public water supply well assessment and proposed location.

Detectable tritium indicates the presence of young (post-1953) water. This is reinforced by the chloride concentrations and chloride/bromide ratios presented below. Elevated concentrations or concentration ratios indicate human-impacted water quality from activities at the land surface such as road salt or wastewater.

As a result of the detections of these contaminants and indicators of rapid recharge, the City's public water supply wells are considered vulnerable. Additionally, other than Well #8 (403973), it is unknown whether the older wells meet current construction standards because grouting information is not known.

Water quality is not anticipated to be a factor in future city water use.

D. Land and Groundwater Uses in the DWSMA

The land use in the DWSMA is primarily developed with some wetland and tree cover areas. The developed portions of the DWSMA may contribute to potential contamination of the city's public water supply through unused/unknown wells, previous contaminant sites, and the transportation corridors through the DWSMA.

Continued monitoring and well testing will identify the interaction between and the potential of surface contaminants reaching groundwater resources.

CHAPTER 2: IMPACT OF CHANGES ON PUBLIC WATER SUPPLY WELL

Minnesota Rules 4720.5220

As outlined in **Table 10**, the City estimates the following changes to the physical environment, land use, surface water, and groundwater may occur over the ten-year period that the WHPP is in effect. This information will help determine whether new potential sources of contamination may be introduced in the future and to identify future actions for addressing these anticipated sources. Land and water use changes may introduce new contamination sources or result in changes to groundwater use and quality. The land use changes may occur within the jurisdictional authority of the city although some may not. The following information describes anticipated or potential changes in relationship to their 1) Impact on the Source Water Aquifer, 2) Influence of Existing Programs and Regulations, and the 3) Administrative, Technical, and Financial Considerations.

Table 10: Expected Changes and Impacts within the DWSMA

Expected Change Area	Impact on Source Water Aquifer	Influence of Existing Government Programs and Regulations	Administrative, Technical, and Financial Considerations
Physical Environment Potential development projects are the only anticipated changes to the DWSMA's physical environment. These may include commercial, industrial, and residential development opportunities.	Potential contaminant source introductions in highly vulnerable GWCA and SWCA.	MNDOT engineers could incorporate stormwater best management practices to protect water quality and quantity during runoff events. Secondary containment could be constructed within the existing stormwater conveyance system, especially at the Little Buffalo Creek crossing.	City staff will maintain proactive communication and coordination with MNDOT and MDH staff during roadway development projects. Financial considerations will be identified and incorporated during the planning and pre-design phase prior to construction.
Land Use Potential development projects may increase impervious surfaces within the DWSMA.	An increase in water usage may occur depending on the industry or business development activities.	Land use and zoning controls could apply the performance standards necessary on any proposed industrial park and other permit holders within the DWSMA.	City and county planning and zoning officials will monitor and assess development project proposals. MDH planner and hydrogeologist may be available for reviews

Expected Change Area	Impact on Source Water Aquifer	Influence of Existing Government Programs and Regulations	Administrative, Technical, and Financial Considerations
			and technical assistance.
Surface Water MS4 stormwater plan implemented by the city may include additional industrial park plan development.	If there is higher quality surface water infiltrating the aquifer, this may have a positive impact towards wellhead protection. TMDL implementation projects should help facilitate these efforts.	The city's Stormwater plan and other TMDL implementation projects (watershed district, MPCA, etc.) would support improved water quality within the DWSMA.	Potential for cost-match or administrative approvals for water quality implementation projects within city limits.
Ground Water No additional high-capacity water users are expected within the ten year implementation period. The city may explore the need for a new public water supply well to replace aging infrastructure.	A new public water supply well may increase groundwater usage as the city grows and/or expands its service area.	MNDNR's water appropriation program should support groundwater use and conservation practices. BPU will work cooperatively with MDH to site any future wells, conduct preliminary sampling, and other associated activities.	WHP team will assist and guide the implementation plan. MDH can provide funds and technical assistance for a new public water supply well.

CHAPTER 3: ISSUES, PROBLEMS AND OPPORTUNITIES

Minnesota Rules 4720.5230

I. LAND USE ISSUES, PROBLEMS AND OPPORTUNITIES RELATED TO:

A. The Aquifer

The aquifers used as public water supply sources are vulnerable to groundwater contamination from land use activities, including storage tanks and abandoned wells. Based on this data, the WHPP identifies the need to manage land use practices and surface water contaminants throughout the DWSMA. Little Buffalo Creek is assumed to have minimal influence on the aquifer either by direct recharge or by surface runoff to downstream areas.

B. Well Water

Based on the Part 1 Well Vulnerability Assessment, the city's water supply wells were determined to be vulnerable to contamination from activities at the land surface. These potential contaminant sources, if used or maintained improperly, could convey pollutants to the aquifer. The WHP Team plans to use public education opportunities, both existing and proposed, to address potential contamination of the aquifer. The WHP Team also plans to continue identification of existing and potential contaminant sources in the future.

C. Drinking Water Supply Management Area

The new DWSMA is about 30 percent smaller than the previous delineation. This is primarily due to changes in the 10-year capture zone boundaries and the elimination of the SWCA for Little Buffalo Creek. Land use in the DWSMA has had some amount of residential and industrial development, and the City tries to connect as many new properties as possible to the water and wastewater utility system. There have been no significant changes in the City's highly vulnerable area, although additional development is anticipated in the next few years. The City's PCSI includes all identified contaminant sources as indicated in the MDH potential contaminant requirements by DWSMA vulnerability and capture area. The PCSI is included in **Table 6** and **Appendix C**.

II. IDENTIFICATION OF:

A. Problems and Opportunities

The WHP team has identified water- and land-use issues, problems and opportunities related to 1) the aquifer used by the city water supply wells, 2) the quality of the well water, or 3) land- or water-use within the DWSMA. The team assessed 1) input from public meetings and written comments that it received, 2) the data elements identified by the MDH during the scoping meetings, and 3) the status and adequacy of the city's official controls and plans on land use and water uses as well as those of local, state, and federal government programs. The results of this effort are presented in **Table 11** which defines the

nature and magnitude of contaminant source management issues in the city's DWSMA. Identifying the issues, problems, and opportunities, as well as resource needs, enables the city to: 1) take advantage of opportunities that may be available to make effective use of existing resources, 2) set meaningful priorities for source management and 3) solicit support for implementing specific source management strategies.

B. Comments Received

The city provided several occasions for local governments, state agencies and the general public to identify issues and comment on the city's WHPP. At the beginning of the planning process, local units of government were notified that the city was going to develop its WHPP and were given the opportunity to identify issues as well as to comment. A public hearing was held on **July 15, 2024**, to review the results of the delineation of the WHPA, DWSMA, and the vulnerability assessments, and the meetings of the WHP team were open to the public. **Table 11** summarizes the issues identified during meetings and comment periods.

Table 11: Issues, Problems, and Opportunities

Issues Identified	Impacted Feature	Problem Associated with the Identified Issue	Opportunity Associated with the Identified Issue	Adequacy of Existing Controls to Address the Issues
There are unlocated-unsealed wells within the DWSMA.	• Aquifer • Well Water Quality • DWSMA	Unused/unsealed wells present a threat to the aquifer based upon their depth, construction, and state of repair.	The city will pursue MDH grant funding to properly locate and seal unused-unsealed wells within the DWSMA. This may expand to financial partnerships with property owners.	The city does not have authority to require unused wells be properly sealed. MDH has authority to require well sealing.
Location and reporting of unlocated and/or new wells within two miles of the DWSMA.	• Aquifer • Well Water Quality • DWSMA	The city and MDH have limited visibility and information regarding wells accessing the same aquifer as the PWS.	The city can work with MRWA and MDH to verify unknown and new well locations. The city will update the well inventory on a 5-year cycle.	The city does not have authority over wells drilled within these areas but will make reporting requests. The city will continue to improve the inventory.
A portion of land within the DWSMA is outside the city limits.	• Aquifer • Well Water Quality • DWSMA	Proposed land use changes may occur that could impact the city's PWS.	The city can partner with the county to improve necessary administrative controls.	The county has zoning and conditional use permit requirements to provide adequate controls on these areas.

Issues Identified	Impacted Feature	Problem Associated with the Identified Issue	Opportunity Associated with the Identified Issue	Adequacy of Existing Controls to Address the Issues
High-Capacity Wells	• Aquifer • Well Water Quality • DWSMA	High-capacity wells have the potential to impact the existing WHPA and may cause a shortage of water for the city. The city recognizes increased regulations may ensure continued water capacity to meet demand.	City staff will coordinate with MDH and MNDNR to identify proposed high-capacity wells in the WHPA and annotate any major changes to groundwater appropriations for the existing high-capacity wells. Coordination with the high-capacity well owner will help identify impacts and controls or solutions.	MDH Well Management staff and MNDNR Water Appropriations Program staff have authority over high-capacity wells.
Transportation Corridors	• Aquifer • Well Water Quality • DWSMA	There are numerous roadways that travel through the DWSMA.	The city will coordinate with Crow Wing County, and MNDOT to update emergency response procedures for potential spills due to accidents or incidents.	The City will enhance its efforts to ensure collaborative emergency response options to prevent and/or respond to accidents or incidents within the DWSMA.
MPCA Permit Sites	• Aquifer • Well Water Quality • DWSMA	Activities and materials at sites with both active and non-active MPCA permits, especially those concerning hazardous waste and tanks, have the potential to cause groundwater contamination.	The city will coordinate with MPCA to identify these permit locations and ensure that appropriate spill response plans are in place.	The city currently has a contingency strategy and emergency response plan to address hazardous materials spills and other contamination concerns. The State of Minnesota has adequate regulations to address spill and leak concerns.

Issues Identified	Impacted Feature	Problem Associated with the Identified Issue	Opportunity Associated with the Identified Issue	Adequacy of Existing Controls to Address the Issues
Nonpoint Source Pollution (Sediment transport, Fertilizers/ Chemicals, Salt, Stormwater, etc.)	• Aquifer • Well Water Quality • DWSMA	Construction activities have the potential to cause increased sediment movement and potential groundwater contamination, especially in high vulnerability areas. Fertilizer applications at city facilities and on residential areas and businesses may impact PWS wells. Stormwater has the potential to carry contaminants when it infiltrates into the WHPA.	The city will encourage improved best management practices and seek to minimize infiltration within the WHPA. The city will work with city departments, businesses and residents to reduce use of fertilizers and chemicals. Additional BMPs will also include locations of fertilizer and chemical storage facilities. By regulating land use, the city hopes to reduce the contaminants with which stormwater may come into contact.	Road runoff is contained on streets with curb, gutters and storm sewer. Runoff is not contained on other streets without those. The city will improve the roads as road conditions warrant and as funding allows. BMPs will be encouraged and communicated with throughout the community. The city has planning and zoning authority over land use within its city limits. The city has a stormwater ordinance.
Physical and Cyber Security	• Aquifer • Well Water Quality	Minimal physical and cyber security measures for the existing public water supply wells and system could lead to tampering or other issues.	The City could update and improve its physical and cyber security measures to further protect the public water supply system.	The City has control over its existing wells and may apply for grant funding to update its physical and cyber security measures.
Municipal Sanitary Sewer Lines	• Aquifer • Well Water Quality • DWSMA	Sanitary sewer leaks and spills have the potential to contaminate the PWS system, especially in high-vulnerability areas.	The City performs continuous evaluation and monitoring of the sanitary sewer and update portions of the system as needed following this evaluation.	The City has a routine sanitary sewer maintenance program in place. Any future identified areas of concern will be addressed. The City has an emergency fund in place for sewer repairs.

Issues Identified	Impacted Feature	Problem Associated with the Identified Issue	Opportunity Associated with the Identified Issue	Adequacy of Existing Controls to Address the Issues
Aging Infrastructure	• Aquifer • Well Water Quality • DWSMA	The city's aging infrastructure could lead to failures within the system potentially introducing additional contaminants.	The city continuously evaluates its infrastructure system and can apply for state and/or federal grant dollars to make updates.	The city can access funding through MDH, MPCA, USDA, and other federal agencies to plan, design, and implement system updates and improvements.
Grant opportunities through MDH or other Clean Water Legacy funding	• Aquifer • Well Water Quality • DWSMA	The city will need funding to achieve many objectives identified in this WHPP.	The likelihood that the city will receive funding for an objective is increased by having an updated WHPP.	Opportunities for funding are always welcome. The city will continue to search for funding opportunities to achieve the objectives listed in this WHPP.
County programs or rules that could be potential partners	• Aquifer • Well Water Quality • DWSMA	The city will need cooperation from other agencies to achieve many objectives in this WHPP.	The likelihood that the city will receive cooperation for an objective is increased by having an updated WHPP and communicating needs to the partner agencies.	Technical and financial assistance from partner agencies are always welcome. The city will approach the identified partners for the objectives listed in this WHPP.
Public Outreach	• Aquifer • Well Water Quality • DWSMA	The city website and social media contains minimal information for water conservation efforts and wellhead protection education.	The city can apply for funding to create or update the website and social media platforms regarding water conservation and quality, frequently-asked-questions, and wellhead protection materials to the public-facing community.	The city maintains control over its website and social media account information.

CHAPTER 4: WELLHEAD PROTECTION GOALS

Minnesota Rules 4720.5240

Goals define the overall purpose for the WHP plan, as well as the end points for implementing objectives and their corresponding actions. The WHP team identified the following goals after considering the impacts that 1) changing land and water uses have presented to drinking water quality over time and 2) future changes that need to be addressed to protect the community's drinking water:

- Maintain a safe and adequate drinking water supply for community residents.
- Prevent contaminants from reaching levels that present a risk to people's health.
- Create public awareness and general knowledge about the importance of WHP for maintaining an adequate and safe drinking water supply.
- Continue collecting data and confirming its accuracy to improve future DWSMA delineations, WHP planning, and PCSI reviews.

The overall goal of the City of Brainerd's Wellhead Protection Plan is to promote public health, economic development and community infrastructure by maintaining a potable drinking water supply for all residents of the community, both now and into the future.

CHAPTER 5: OBJECTIVES AND PLANS OF ACTION

Minnesota Rules 4720.5252

Objectives provide the focus for ensuring that the goals of the WHP plan are met and that priority is given to specific actions that support multiple outcomes of plan implementation.

Both the objectives and the wellhead protection measures that support them are based on assessing 1) the data elements, 2) the potential contaminant source inventory, 3) the impacts that changes in land and water use present, and 4) issues, problems, and opportunities referenced to administrative, financial, and technical considerations.

I. OBJECTIVES

The following objectives have been identified to support the goals of the WHP plan for the City of Brainerd:

1. Collect and assess additional data to substantiate information contained within this WHPP, and to provide more detail for future plan amendments.
2. Prevent and manage potential contaminants from impacting the city's drinking water supply.
3. Develop and update administrative controls and guidelines to reduce potential contaminants from entering the city's public water supply system.
4. Improve education and outreach opportunities to increase public awareness about the importance of an adequate, efficient and safe drinking water supply.
5. Maintain communications with the MDH and other agencies able to assist with implementation of this plan.
6. Conduct regular evaluations of the WHPP implementation and effectiveness.

II. WHP MEASURES AND ACTION PLAN

Based upon this information, the WHP team has identified WHP measures that will be implemented by the city over the 10-year period that this WHPP is in effect. The objective that each measure supports is noted as well as 1) the lead party and any cooperators, 2) the anticipated costs for implementing the measure and 3) the year or years in which it will be implemented.

The following categories are used to further clarify the focus that each WHP measure provides, in addition to helping organize the measures listed in the action plan:

- Data Collection, Monitoring and Assessment
- Potential Contaminant Source Management
- Administrative Controls and Guidelines
- Public Education and Outreach
- WHP Coordination, Reporting and Evaluation

III. ESTABLISHING PRIORITIES

WHP measures reflect the administrative, financial, and technical requirements needed to address the risk to water quality or quantity presented by each type of potential contamination source. Not all these measures can be implemented at the same time, so the WHP team assigned a priority to each. A number of factors must be considered when WHP action items are selected and prioritized (part 4720.5250, subpart 3):

- Contamination of the public water supply wells by substances that exceed federal drinking water standards.
- Quantifiable levels of contamination resulting from human activity.
- The location of potential contaminant sources relative to the wells.
- The number of each potential contaminant source identified, and the nature of the potential contaminant associated with each source.
- The capability of geologic material to absorb a contaminant.
- The effectiveness of existing controls.
- The time needed to acquire cooperation from other agencies and cooperators.
- The resources needed, i.e., staff, money, time, legal, and technical resources.

The City of Brainerd defines a priority for implementing a WHP measure as maintaining the quantity and high-quality drinking water they have come to expect. The following **Table 12** lists each measure that will be implemented over the 10-year period that the city's WHP plan is in effect, including the priority assigned to each measure. It is difficult to foresee and plan for the future. The city will use its planning and management capabilities within this plan to respond to any new/unknown source water protection issues that may impact the quality or quantity of its drinking water in the future.

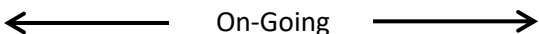
Table 12: WHP Action Plan

A. DATA COLLECTION, MONITORING AND ASSESSMENT

Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<u>WHP Measure #A1</u> <i>Groundwater Quality / Quantity Monitoring</i> Notify the MDH Hydrologist during year 6 for monitoring of the standard assessment package, which should include the primary wells and wetlands. BPU will collect samples to submit to MDH to pay for monitoring and analysis costs.	1, 5	M	Staff Time	Brainerd MDH Hydro						X				
<u>WHP Measure #A2</u> Coordinate with MDH on locating and verifying any known new wells, especially east of the Mississippi River, and within one mile of the city’s public water supply wells. Well details should include well owner, depth, use, and MDH well record.	1, 5	L	Staff Time	Brainerd MDH		X		X		X		X		X
<u>WHP Measure #A3</u> Coordinate with MDH and MNDNR to identify new high-capacity wells that are proposed for construction within one mile of the DWSMA. Request MDH and MNDNR provide an objective well evaluation identifying potential impacts.	1, 5	M	Staff Time	Brainerd MDH MNDNR Well Owners			X				X			
<u>WHP Measure #A4</u> <i>Class V Wells</i> Inventory locations of potential Class V wells via direct communication with the business or landowner. Provide a Fact Sheet and reporting requirements on Class V Wells and impacts on groundwater quality. Notify MDH of any Class V wells identified within the DWSMA. Information available at: https://www.epa.gov/uic/federal-requirements-class-v-wells .	1, 5	M	Staff Time	Brainerd EPA Landowners MDH	← As Needed →									

Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<u>WHP Measure #A5</u> <i>Aquifer Testing</i> The city may prepare to replace one or more of the existing wells due to infrastructure age. Work cooperatively with MDH for future well-siting, sampling, and analysis. To prepare for this, the city may consider water quality sampling of existing wells, construction of test wells, and well capacity testing to determine potential yield and suitability as a public water supply well.	1, 5	H	TBD	Brainerd MDH Hydro	← As Needed →									
<u>WHP Measure #A6</u> Coordinate with MDH, MNDNR, and/or MPCA to identify any surface-to-ground water connectivity between the public water supply wells and the adjacent wetland areas and/or other adjacent surface waters, including stormwater runoff. Apply for grant funding to perform water quality or infrastructure improvement projects as corrective measures.	1, 5	M	Staff Time	Brainerd MDH MNDNR MPCA			X				X			
<u>WHP Measure #A7</u> Investigate the integrity and construction of the older public water supply wells to make sure they are not serving as potential contaminant pathways. This could include scoping, televising, and other assessment methods.	1, 5	H	TBD	Brainerd MDH	← As Needed →									

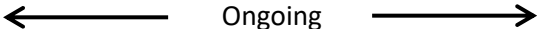
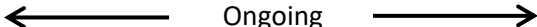
B. POTENTIAL CONTAMINANT SOURCE MANAGEMENT

Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<u>WHP Measure #B1</u> <i>Potential Contaminant Source Inventory</i> Update the PCSI, as needed, with a complete update during year six. Review status of existing potential contaminants and add any new ones identified within the DWSMA.	2, 6	M	Staff Time	Brainerd MDA MDH MRWA						X				
<u>WHP Measure #B2</u> <i>Unlocated-Unsealed Wells</i> Seal unlocated-unsealed or abandoned wells. Promote local abandonment and sealing of these wells within the DWSMA. The city may assist in finding funding sources for the homeowners. Wells in the Emergency Response Area are the priority.	2	M	TBD	Brainerd Crow Wing County MDH Well Owners										
<u>WHP Measure #B3</u> <i>Old Municipal Well Report</i> Review the OMWR and work with MDH to identify, locate, and seal any wells identified in this report.	2, 5	M	TBD	Brainerd MDH			X	X						
<u>WHP Measure #B4</u> <i>Inner Well Management Zone</i> Review and update the IWMZ survey and monitor setbacks for all public water supply (PWS) wells every 5 years. Perform any necessary corrective measures.	2, 5	M	Staff Time	Brainerd MDH				X					X	
<u>WHP Measure #B5</u> <i>Emergency Response Plan</i> Continue coordination between the city and local and county emergency responders to review the DWSMA Emergency Response Area as a high priority for response efforts. Identify training opportunities and equipment needs to improve response time and effectiveness.	3, 5	H	Staff Time	Brainerd Brainerd Fire Dept City of Baxter Crow Wing County		X					X			

Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame										
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	
<u>WHP Measure #B6</u> <i>Hazardous Materials</i> Conduct a survey to identify the current status of storage tanks, leak sites, and other MPCA-regulated permit locations within the moderate and high vulnerability areas of the DWSMA. Tanks within the ERA are the priority. Request MPCA assistance to help conduct this survey and apply for funds to facilitate corrective actions.	2	H	Staff Time / Special Studies (if needed)	Brainerd MDH MPCA				X						X	
<u>WHP Measure #B7</u> <i>Transportation Corridors</i> Coordinate with MnDOT, MDH, and contractors to address impacts of construction along transportation corridors within the moderate and high vulnerability areas of the DWSMA (GWCA and SWCA) to minimize chances of future contamination.	2, 5	H	Staff Time	Brainerd MNDOT MDH	← As Needed →										
<u>WHP Measure #B8</u> <i>City Infrastructure</i> Continue to evaluate water, sanitary and stormwater systems to identify components that have a potential to contaminate the water system. Make recommendations to the City Council as part of the Capital Improvement Plan to repair or replace failing infrastructure. The parts of the system within the ERA are the priority.	2	L	Staff Time	Brainerd WHP Team			X			X				X	
<u>WHP Measure #B9</u> Evaluate and identify PFAS/PFOS and other potential contaminants of concern (lead, copper, etc.) that may enter the water supply system and how to mitigate these concerns.	2, 5	M	TBD	Brainerd MDH MPCA	← As Needed →										

C. ADMINISTRATIVE CONTROLS AND GUIDELINES

Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame										
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	
<u>WHP Measure #C1</u> <i>Municipal Policy</i> Incorporate recognition of WHP and DWSMA in future updates of City Comprehensive Plan, Economic Development Plan, City Zoning and Ordinances, and other administrative controls. This may include a city well ordinance.	3	M	Staff Time	Brainerd MDH MRWA		X				X					X
<u>WHP Measure #C2</u> <i>Conservation Guidelines</i> Explore opportunities to promote water conservation measures and codify these in updated plans, policies, and education/outreach materials and programs.	3, 4	M	TBD	Brainerd WHP Team		X			X				X		
<u>WHP Measure #C3</u> <i>City Codes and Permits</i> Review and enforce applicable City Code and permits for public utilities and Minnesota Plumbing Code 4715.1920 banning cross connections, preventing contamination of city water via private wells. This may reduce the likelihood that pumping of other wells will impact contaminant movement to the city wells.	3	H	Staff Time	Brainerd	← Ongoing →										
<u>WHP Measure #C4</u> <i>Land Use, Zoning, and City Code</i> Identify and document any land use or zoning changes within the DWSMA (prioritize the ERA) that may affect the drinking water supply. Update land use, zoning, and city code as needed and address these changes in future comprehensive planning documents.	1, 2	M	Staff Time	Brainerd MDH WHP Team	← As Needed →										

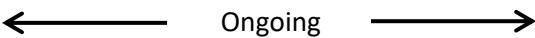
Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<u>WHP Measuer #C5</u> Work cooperatively with local, state, and federal agencies to provide long-term protection on vulnerable lands within the DWSMA.	2, 3	M	Staff Time	Brainerd BWSR Crow Wing County MDH MPCA MRWA										
<u>WHP Measure #C6</u> <i>New Wells</i> Coordinate with city staff to identify new wells drilled within the city limits.	2, 3	H	Staff Time	Brainerd Crow Wing County MDH WHP Team										
<u>WHP Measure #C7</u> <i>Best Management Practices</i> Provide Best Management Practices (BMPs) information for all land-use operations within the DWSMA. The city will work with city departments, businesses and residents to improve awareness, reduce use of fertilizers/chemicals, and address other nonpoint source pollutants.	3, 4	L	TBD	Brainerd Crow Wing County SWCD MRWA WHP Team										
<u>WHP Measure #C8</u> <i>Emergency Response, Physical and Cyber Security</i> Evaluate and document the city’s emergency response operations. Assess and improve physical and cyber security and backup power options for the city wells and water system.	2, 3, 6	H	Staff Time / TBD	Brainerd MDH MRWA WHP Team			X					X		

D. PUBLIC EDUCATION AND OUTREACH

Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<u>WHP Measure #D1</u> Develop and release periodic WHP educational materials to residents via newsletters, bill stuffers, and social media platforms. Provide public information explaining the WHPP and its purpose, especially to citizens served by the public water supply system.	2, 4	M	Staff Time	Brainerd Local Media MRWA		X			X			X		
<u>WHP Measure #D2</u> Coordinate with MPCA to provide educational materials directly to hazardous waste and solid waste permit holders. Direct landowners to household hazardous waste collection held by Crow Wing County Solid Waste Disposal Site.	2, 4	M	Staff Time	Brainerd Crow Wing County MPCA WHP Team			X		X		X		X	
<u>WHP Measure #D3</u> Maintain communication with Crow Wing County and adjoining townships to ensure that concerns regarding city water supply protection are addressed in local land-use decisions, including comprehensive land use plan, zoning ordinances, and other plan updates.	2, 3	H	Staff Time	Brainerd City of Baxter Crow Wing County Townships WHP Team	← Ongoing →									
<u>WHP Measure #D4</u> City staff will distribute MDH and/or MRWA brochures describing proper well maintenance and operation to private landowners within the DWSMA.	4	M	Staff Time	Brainerd MDH MRWA WHP Team		X			X			X		

Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<u>WHP Measure #D5</u> Provide information regarding effective road salt use to citizens, either by informational brochure, posting on the City website, or in the news or social media posts. Encourage less use of salt or a less damaging salt alternative. Provide MPCA Smart Salting training to the City’s street maintenance staff.	2, 4	M	Staff Time / Marketing Costs	Brainerd Local Media MPCA MRWA	X			X			X			X
<u>WHP Measure #D6</u> Provide information about PFAS/PFOS and other potential contaminants as future treatment or mitigation efforts are identified.	2, 4, 5	M	Staff Time	Brainerd MDH MPCA		X			X			X		

E. WHP COORDINATION, REPORTING AND EVALUATION

Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
<u>WHP Measure #E1</u> <i>Water Use Management</i> Review and update the Emergency / Contingency Strategy Plan portion of the City's WHP plan every 2.5 years to ensure it reflects any changes in the water supply system.	3, 6	M	Staff Time	Brainerd WHP Team			X			X		X		X
<u>WHP Measure #E2</u> <i>WHP Coordination</i> Coordinate a meeting with the WHP team annually. Discuss funding needs and pursuit of SWP Grant funds to help implement activities identified in the WHP Plan.	5, 6	H	Staff Time	Brainerd MDH MRWA WHP Team	X	X	X	X	X	X	X	X	X	X
<u>WHP Measure #E3</u> <i>Implementation Tracking and Reporting Activities</i> Maintain a "WHP folder" that contains documentation of annual WHP activities and dates completed.	6	H	Staff Time	Brainerd WHP Team	X	X	X	X	X	X	X	X	X	X
<u>WHP Measure #E4</u> Develop a spreadsheet that monitors plan implementation activities and completion dates.	6	H	Staff Time	Brainerd WHP Team										
<u>WHP Measure #E5</u> <i>WHP Program Evaluation Plan Reporting</i> Complete an Evaluation Report every 2.5 years that evaluates the "progress of plan of action and the impact of any contaminant release on the aquifer supplying the public water supply well" MN WHP Rule 4720.5270.	6	H	Staff Time	Brainerd MDH MRWA			X			X		X		X
<u>WHP Measure #E6</u> Summarize WHP Plan implementation efforts in a report to MDH in the year 8.	5, 6	M	Staff Time	Brainerd MDH MRWA								X		

Commitments from Cooperators

The city will coordinate with those agencies and organizations listed in **Table 13** to implement the WHP measures in which they are identified.

Table 13: Cooperating Agencies List

AGENCY	MEASURES
Brainerd First Responders	B5
City of Baxter	B5, D3
Crow Wing County (SWCD, Highway, etc.)	B2, B5, C5-C7, D2-D3
Environmental Protection Agency (EPA)	A4
Minnesota Department of Agriculture (MDA)	B1, C5
Minnesota Department of Health (MDH)	A1-A7, B1-B4, B6-B7, B9, C1, C4-C6, C8, D4, D6, E2, E5-E6
Minnesota Department of Natural Resources (MNDNR)	A3, A6
Minnesota Department of Transportation (MNDOT)	B7
Minnesota Pollution Control Agency (MPCA)	A6, B6, B9, C5, D2, D5-D6
Minnesota Rural Water Association (MRWA)	B1, C1, C5, C7-C8, D1, D4-D5, E2, E5-E6

CHAPTER 6: EVALUATION PROGRAM

Minnesota Rules 4720.5270

A successful Wellhead Protection Plan must identify a strategy for evaluating the progress of the measures and the impact of a contaminant release on the aquifer supplying the public water supply well. The evaluation strategy will be conducted throughout the DWSMA, will be based on the health risk the specific potential contaminant source presents to the public water supply well, and will specify the evaluation approach used for specific potential contaminant sources.

The evaluation strategy will include the following activities:

- Prepare an annual report or briefing for the Utility Commission and City Council on progress of the wellhead protection implementation actions.
- WHP Team will meet annually to discuss the implementation actions, address issues, and coordinate future activities.
- Document the implementation of wellhead protection measures via a self-assessment report every 2.5 years and submit reports to MDH and MRWA.

The wellhead protection team will meet on an as-needed basis, with a minimum of an assessment meeting every two and one-half years, to review the results of each strategy and identify whether modifications are required. The WHP Manager will complete an annual evaluation report regarding the progress in implementing the wellhead management evaluation strategies. These reports will be used to evaluate the progress of the wellhead protection management strategies when the WHPP is updated after 10 years. A copy of the annual report will be submitted to the city council, MDH and local units of government. In addition, an evaluation conducted when a WHPP is amended will be submitted to the MDH at the first scoping meeting held to amend the existing plan.

CHAPTER 7: ALTERNATIVE WATER SUPPLY; CONTINGENCY STRATEGY

Minnesota Rules 4720.5280

The City of Brainerd Water Emergency Plan and Water Supply Plan and the DNR approval letter are included in **Appendix F**. The Water Supply Plan was submitted to and approved by the MNDNR, Division of Ecological and Water Resources, as of January 30, 2017. The city will continue to implement the plan with the aid of local emergency management agencies.

Appendix A: 2022 Part 1 Wellhead Protection Plan (WHPP) and 2011 Part 2 WHPP

Appendix B: 2022 Part 2 Scoping Decision Notice

Appendix C: Potential Contaminant Source Inventory (PCSI) and DWSMA Parcel List

Appendix D: Inner Well Management Zone (IWMZ) Inventory

Appendix E: Old Municipal Well Inventory

Appendix F: Brainerd Public Water Supply Plan, Emergency Response and Contingency Plan, and DNR Approval Letter

Appendix G: Controls/Programs and Glossary of Terms

Appendix H: Implementation Schedule

Appendix I: LGU Review and Public Hearing

Hydrogeologic Assessment of the Drinking Water Source and Wells for the Brainerd Public Utilities

DELINEATIONS – WELLHEAD PROTECTION AREA AND DRINKING WATER
SUPPLY MANAGEMENT AREA

VULNERABILITY ASSESSMENTS – WELLS AND DRINKING WATER SUPPLY
MANAGEMENT AREA

June 16, 2021

Hydrogeologic Assessment of the Drinking Water Source and Wells for the Brainerd Public Utilities

Public Water Supply ID: 1180002

Brainerd Public Utilities
8027 Highland Scenic Rd
Brainerd, Minnesota 56401-0373
218-825-3213
smagnuson@bpu.org
<http://bpu.org/>

Contents

Contact Information.....	I
Glossary of Terms.....	II
Acronyms.....	III
Summary.....	1
Technical Report	7
Discussion	7
Assessment of the Data Elements	7
General Descriptions.....	8
Delineation of the Wellhead Protection Area	11
Delineation of the Drinking Water Supply Management Area	20
Vulnerability Assessments.....	21
Recommendations	23
Selected References.....	23
Figures	25
Appendix A: Data Elements Assessment.....	33
Appendix B: Wellhead Protection Monitoring Plan Results.....	36

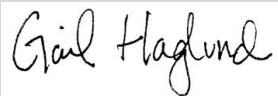
List of Tables

Table 1 - Water Supply Well Information.....	1
Table 2 - Isotope and Water Quality Results.....	2
Table 3 - Description of the Local Hydrogeologic Setting	9
Table 4 - Description of WHPA Delineation Criteria	11
Table 5 - Annual Volume of Water Discharged from Water Supply Wells	12
Table 6 - Other Permitted High-Capacity Wells.....	13
Table 7 - Model Parameters Used in MODFLOW Base Case and Uncertainty Runs	19

List of Figures

Figure 1A: WHPA and DWSMA	4
Figure 1B: Groundwater Protection Areas and Vulnerabilities	5
Figure 1C: Surface Water Contribution Area and Vulnerability	6
Figure 2: Observed vs Simulated Flow Field	26
Figure 3: Geologic Cross-Section Locations	27
Figure 4: Geologic Cross-Section A - A'	28
Figure 5: Geologic Cross-Section B - B'	29
Figure 6: Model Uncertainty Analysis: 10 Year Capture Zones	30
Figure 7: Amended and Prior Areas	31
Figure 8: Groundwater Capture Area Vulnerability	32

I hereby certify that this plan, document 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:  Date: 6/16/2021

Printed Name: Gail Haglund

License Number: 30098

I hereby certify that this plan, document 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: _____ Date: _____

Printed Name: Trent Farnum

License Number: 50326

Contact Information

Wellhead Protection Plan Manager

Scott Magnuson, Water Superintendent, Brainerd Public Utilities
218-825-3213
SMagnuson@bpu.org

State and Local Technical Assistance Planning Staff

Chad Anderson, Minnesota Department of Health Source Water Protection Planner
651-201-5847
Chad.R.Anderson@state.mn.us

Aaron Meyer, Minnesota Rural Water Association Planner
320-808-7293
aaron.meyer@mrwa.com

Licensed Hydrologist

Gail Haglund, Minnesota Department of Health, Source Water Protection
651-201-4691
gail.haglund@state.mn.us

Glossary of Terms

Data Element. A specific type of information required by the Minnesota Department of Health to prepare a wellhead protection plan.

Drinking Water Supply Management Area (DWSMA). The area delineated using identifiable land marks that reflects the scientifically calculated wellhead protection area boundaries as closely as possible (Minnesota Rules, part 4720.5100, subpart 13).

Drinking Water Supply Management Area Vulnerability. An assessment of the likelihood that the aquifer within the DWSMA is subject to impact from land and water uses within the wellhead protection area. It is based upon criteria that are specified under Minnesota Rules, part 4720.5210, subpart 3.

Emergency Response Area (ERA). The part of the wellhead protection area that is defined by a one-year time of travel within the aquifer that is used by the public water supply well (Minnesota Rules, part 4720.5250, subpart 3). It is used to set priorities for managing potential contamination sources within the DWSMA.

Groundwater Capture Area (GWCA). The subsurface area surrounding a well or well field through which water moves toward and reaches the well over a given span of time, commonly based on computer modeling of ground water flow. The terms ‘capture zone’ and ‘capture area’ are used interchangeably.

Inner Wellhead Management Zone (IWMZ). The land that is within 200 feet of a public water supply well (Minnesota Rules, part 4720.5100, subpart 19). The public water supplier must manage the IWMZ to help protect it from sources of pathogen or chemical contamination that may cause an acute health effect.

Surface Water Contribution Area (SWCA). The geographic area that may provide recharge to the aquifer within the groundwater capture zone, attributed to:

- a surface hydrologic feature and associated watershed; and/or
- overland flow and infiltration of precipitation or meltwater, with the contributing area defined by topography.

Wellhead Protection (WHP). A method of preventing well contamination by effectively managing potential contamination sources in all or a portion of the well’s recharge area.

Wellhead Protection Area (WHPA). The surface and subsurface area surrounding a well or well field that supplies a public water system, through which contaminants are likely to move toward and reach the well or well field (Minnesota Statutes, section 103I.005, subdivision 24).

Well Vulnerability. An assessment of the likelihood that a well is at risk to human-caused contamination, either due to its construction or indicated by criteria that are specified under Minnesota Rules, part 4720.5550, subpart 2.

Acronyms

CWI - County Well Index

DNR - Minnesota Department of Natural Resources

EPA - United States Environmental Protection Agency

FSA - Farm Security Administration

MDA - Minnesota Department of Agriculture

MDH - Minnesota Department of Health

MGS - Minnesota Geological Survey

MnDOT - Minnesota Department of Transportation

MnGEO - Minnesota Geospatial Information Office

MODFLOW - Three-Dimensional Finite-Difference Groundwater Model

MPCA - Minnesota Pollution Control Agency

NRCS - Natural Resource Conservation Service

PUC - Public Utilities Commission

SWCD - Soil and Water Conservation District

UMN - University of Minnesota

USDA - United States Department of Agriculture

USGS - United States Geological Survey

Summary

Protection Areas - The recharge area for the wells is known as the wellhead protection area, or WHPA, and represents the combined area of groundwater capture zones within a 10-year time period and the surface water contribution area (SWCA). The area that contributes groundwater water to the wells within a one-year time period is known as the emergency response area, or ERA. Practical reasons require the designation of a management area that fully envelops the wellhead protection area, called the drinking water supply management area, or DWSMA. The ERA, WHPA and DWSMA are shown in Figure 1A; the groundwater capture areas (GWCAs) and their vulnerabilities are shown in Figure 1B, and the SWCA and the SWCA vulnerability are shown in Figure 1C.

Geology and Groundwater Flow – Brainerd Public Utilities (BPU) has six primary wells screened in a sand and gravel aquifer, which is known generically as a Quaternary Water Table Aquifer (QWTA). At the location of BPU's wellfield, aquifer thickness ranges between approximately 105 to 140 feet. At the majority of wells, the depth-to-water is generally less than 20 feet. However, at the location of Well #8 (403973), where the land surface elevation is higher, the depth-to-water is about 75 feet. All well wells are located more than 50 feet from designated 100-year floodplains. Information about the construction of the wells and their vulnerability is provided in Table 1. Groundwater flow is to the west-northwest toward the Mississippi River.

Table 1 - Water Supply Well Information

Local Well ID	Unique Number	Use/ Status	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/ Reconstructed	Aquifer	Well Vulnerability
Well #3	232347	Primary	16	73	125	1939	QWTA	Vulnerable
Well #4	232348	Primary	16	73	123	1944	QWTA	Vulnerable
Well #5	232349	Primary	16	105	145	1947	QWTA	Vulnerable
Well #6	232350	Primary	16	107	156	1947	QWTA	Vulnerable

Local Well ID	Unique Number	Use/ Status	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/ Reconstructed	Aquifer	Well Vulnerability
Well #7	232352	Primary	20	88	157	1955	QWTA	Vulnerable
Well #8	403973	Primary	16	144	187	1984	QWTA	Vulnerable

Well Vulnerability - The vulnerability of each well has been assessed based on 1) well construction details, especially conformance with standards required by the state well code, 2) the geologic sensitivity of the aquifer, and 3) past monitoring results. Except for Well #8 (403973), it is unknown whether the older wells meet current construction standards because grouting information is not known. The glacial aquifer is considered to have a high to very high geologic sensitivity due to the lack of any kind of protective geologic materials, such as clay-rich till, between the land surface and the sand and gravel aquifer. In addition, all wells are considered vulnerable to contamination due to tritium being detected in the well water (Table 2). Detectable tritium indicates the presence of young (post-1953) water. This is reinforced by the chloride concentrations and chloride/bromide ratios presented below. Elevated concentrations or concentration ratios indicate human-impacted water quality from activities at the land surface such as road salt or wastewater.

Table 2 - Isotope and Water Quality Results
(Sample Date is May 15, 2018 unless otherwise noted)

Unique Number (Well Name)	Tritium ¹ (TU)	Nitrate (mg/L)	Chloride (mg/L)	Bromide (mg/L)	Chloride/ Bromide Ratio
232347 (Well #3)	6.03 (2016) Modern Age	0.24	33.5	0.0457	733
232348 (Well #4)	4.63 (2017) Modern Age	0.31	23.3	0.0431	541
232349 (Well #5)	7.99 (2015) Modern Age	0.07	25.2	0.0303	832
232350 (Well #6)	8.5 (2010) Modern Age	0.19	26.5	0.0336	789
232352 (Well #7)	7.0 (2010) Modern Age	< 0.05	14.7	0.022	668
403973 (Well #8)	4.9 (2010) Mixed Age	1.3	41.1	0.0286	1437

Note: 1. Tritium age reference: DNR-MDH, 2020.

DWSMA Vulnerability -The vulnerability of BPU's aquifer throughout the DWSMA is based on the geologic sensitivity ratings of wells and available isotopic and water quality data. Based on this information MDH has assigned a DWSMA vulnerability that ranges from moderate to high (Figure 1). the DWSMA vulnerability is classed as moderate, pathways exist where water and contaminants may travel from the land surface to the aquifer within a time span of years to decades. Moderately vulnerable aquifers are prone to a variety of contaminant threats, including chemical storage tanks and abandoned wells. Within the high vulnerability area, water and contaminants may travel from the land surface to the utility's aquifer within a time span of weeks to years. Highly vulnerable aquifers are prone to a wide variety of contaminant threats, including chemical storage tanks, road salt, and chemical applications to the land surface.

Water Quality Concerns - At present, none of the contaminants for which the Safe Drinking Water Act has established health-based standards is found above maximum allowable levels in the utility's water supply, nor are any present at one-half of those levels. Naturally occurring arsenic has been detected at low levels in several wells, however, arsenic has not been detected in finished water that enters the distribution system.

Recommendations - Recommendations have been generated to improve future delineations and vulnerability assessments and should be considered for inclusion as management strategies in the utility's wellhead protection plan. These activities include: well locating, planning measures for the future replacement of one of the older wells in the event of well failure, and water quality monitoring. Further details can be found in the Recommendations section of this report.

Figure 1A
Wellhead Protection Area and
Drinking Water Supply Management Area
Brainerd Public Utilities

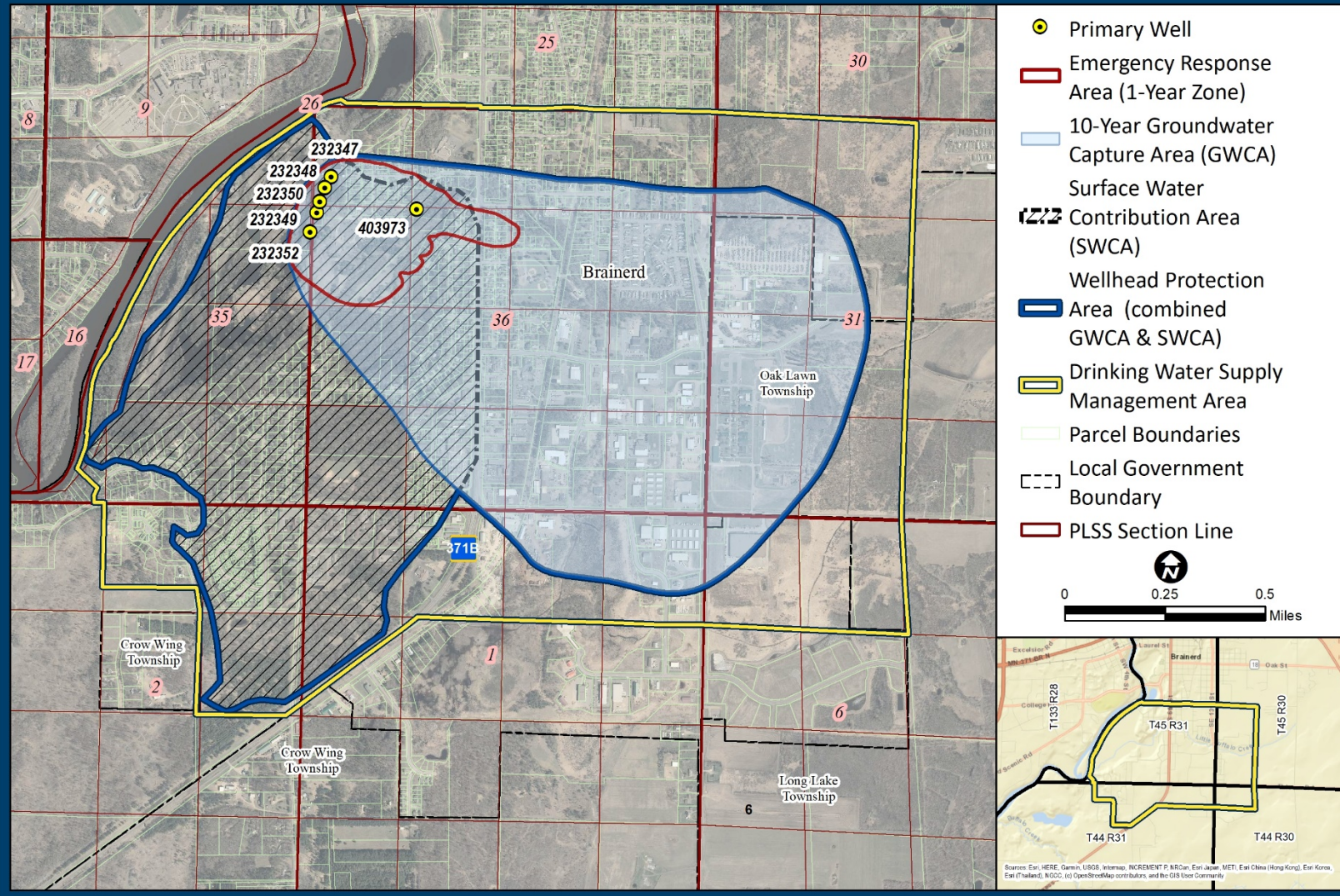


Figure 1B
Groundwater Protection Areas and Vulnerabilities
Brainerd Public Utilities

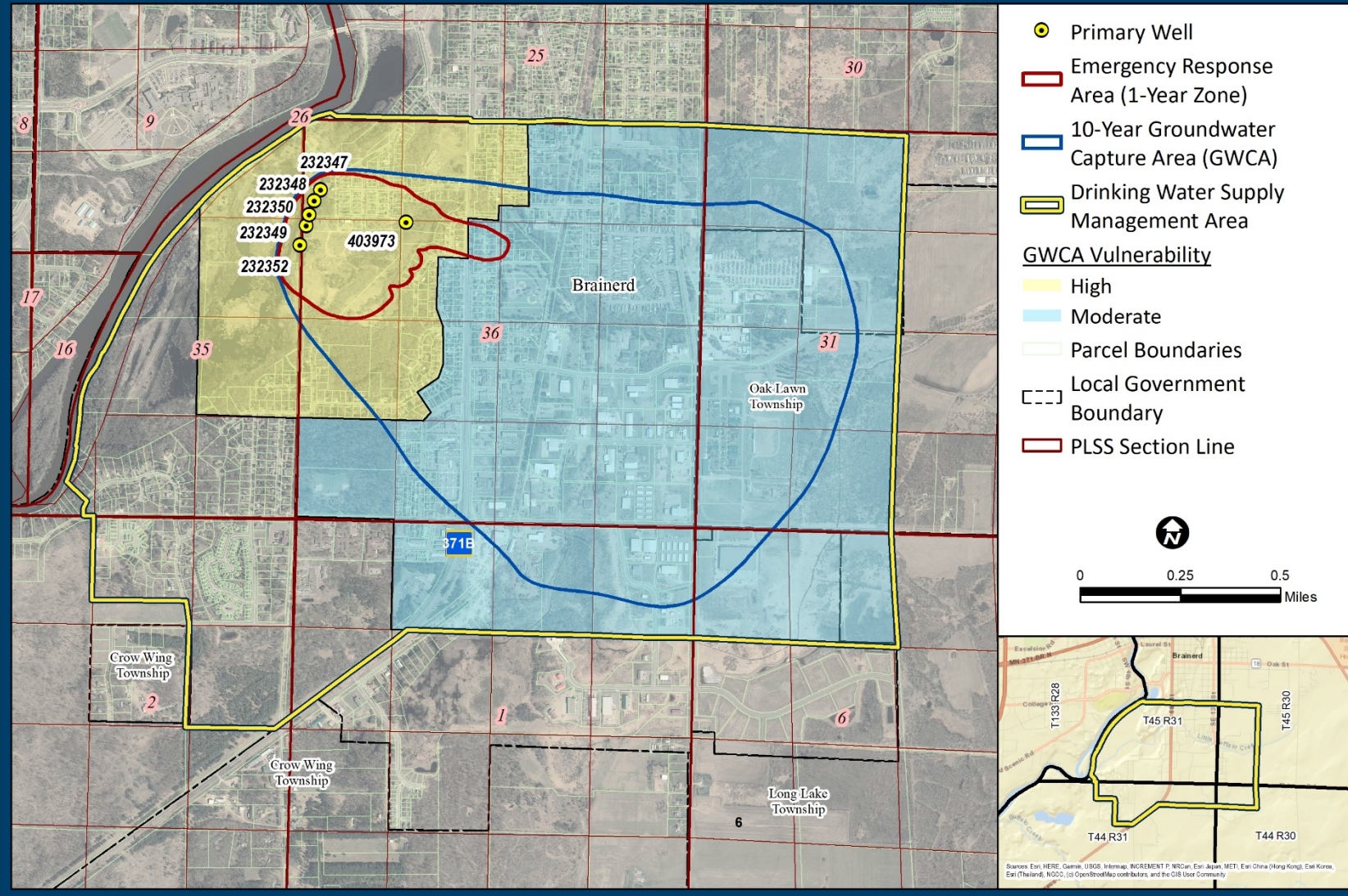
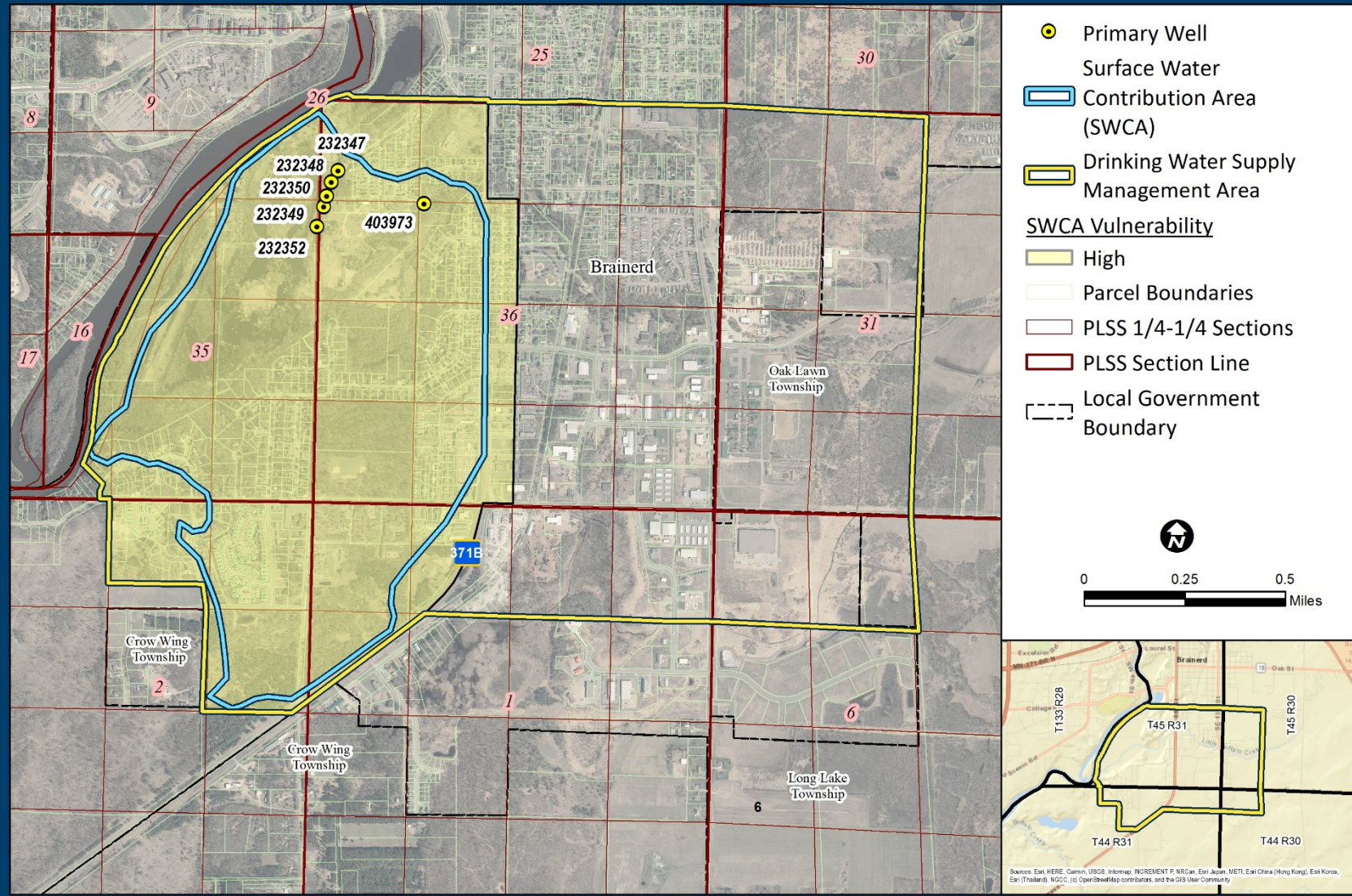


Figure 1C
Surface Water Contribution Area and Vulnerability
Brainerd Public Utilities



Technical Report

Discussion

This document describes the amendments to Part 1 of the wellhead protection (WHP) plan for Brainerd Public Utilities (PWSID 1180002). The purpose for amending the plan is to address the changes that have occurred since the plan was last approved, in order to update the WHP measures that are needed to protect public drinking water. The amended areas are somewhat smaller (Figure 8) because of changes to the location and size of the well capture zones and the surface water contribution area. The work was performed in accordance with the Minnesota Wellhead Protection Rule, parts 4720.5100 to 4720.5590.

This report presents delineations of the groundwater capture area (GWCA), the surface water contribution area (SWCA), the wellhead protection area (WHPA), and drinking water supply management area (DWSMA), and the vulnerability assessments for the public water supply wells and protection areas. Figure 1A shows the boundaries of the GWCA, SWCA, WHPA and DWSMA. The GWCA is defined by a 10-year time of travel. The SWCA is defined as the potential surface water contribution area to the wetlands located near the wellfield. The WHPA is defined as the combined area containing both the GWCA and SWCA. Figure 1A also shows the emergency response area (ERA), which is defined by a one-year time of travel. The vulnerabilities of the GWCA and SWCA are shown in Figures 1B and 1C, respectively. Definitions of rule-specific terms used are provided in the “Glossary of Terms.”

In addition, this report documents the technical information required to prepare this portion of the WHP plan in accordance with the Minnesota Wellhead Protection Rule. Additional technical information is available from MDH.

Table 1 lists all the wells in the public water supply system. Only wells listed as primary are required to be included in the WHP plan.

Assessment of the Data Elements

MDH staff met with representatives of the Brainerd Public Utilities on February 25, 2021, for a scoping meeting that identified the data elements required to prepare Part I of the WHP plan. Appendix A presents the assessment of these data elements relative to the present and future implications of planning items specified in Minnesota Rules, part 4720.5210.

General Descriptions

Description of the Water Supply System

The Brainerd Public Utilities obtains its drinking water supply from six primary wells. Table 1 summarizes information regarding them.

Description of the Hydrogeologic Setting

The Brainerd Public Utilities' six wells draw groundwater from a glacial sand and gravel aquifer. The wellfield is located in central Brainerd, along the east side of the Mississippi River. Five of the wells trend in a general north-south line, and are spaced from 150 to 275 feet apart. The wellfield is adjacent to floodplain wetlands that are located between the river and the wellfield. The sixth well, Well #8 (403973), is offset and is located about ¼ mile east, and at a higher topographic elevation compared to the main wellfield. All of the wells are located more than 50 feet from the 100-year floodplain and are in compliance with the Well Code (Minnesota Rules 4725) isolation distances. The wellfield overlies a relatively narrow bedrock valley structure that is filled with glacial channel deposits consisting of interbedded layers of sand and gravel, ranging in texture from fine sand to coarse gravel. The valley structure is offset from the river, trending northeast-southwest, and is about ½ mile wide at the wellfield. The thickest sequence of sand and gravel materials is found at Well #8, which is more centrally located within the bedrock valley compared to the larger wellfield. At Well #8, the channel fill deposits are 190 feet thick and are underlain by bedrock comprised of slate (Precambrian Metasedimentary rocks). Due to the higher topographic elevation of this well, static water levels are observed at approximately 75 feet below the land surface. At the larger wellfield, channel fill deposits are about 150 feet deep (as indicated by the well construction record for Well #7 [232350]). Static water levels are shallower compared to Well #8 and are observed less than 20 feet below the land surface. All of the wells are cased more than 55 feet below the static water level; the screen lengths range 42 feet to 63 feet, with the longest screen at Well #7.

The aquifer transitions from being a shallow water-table aquifer to a buried glacial aquifer (referred to as Quaternary Buried Artesian Aquifer [QBAA]) upgradient (east) of the wellfield and beyond the boundaries of the bedrock valley. Here the glacial aquifer significantly thins and is described primarily as sand on local well records. The sand layer is overlain by a thickness of clay-rich till that ranges between 30 to 80 feet. The till provides a degree of natural protection to the buried glacial aquifer from land use activities.

The Mississippi River is the major discharge feature in the area, flowing southwest until it meets with the Crow Wing River. The confluence of the rivers is about six miles southwest of Brainerd. Two creeks, Little Buffalo Creek and Buffalo Creek, drain west toward the river from the higher topographic areas. Little Buffalo Creek flows through the DWSMA, draining to the wetland immediately south of the wellfield and discharging to the river. Buffalo Creek is located south of the DWSMA and discharges to the Mississippi River a little more than a mile downstream from Little Buffalo Creek.

Similar to the creeks, groundwater flows east to west in the immediate vicinity of the wellfield. Further upgradient from the wellfield, the water table contours parallel the orientation of the river and there is more of a northwest component to the groundwater flow direction (Figure 2).

A description of the hydrogeologic setting for the aquifer used to supply drinking water is presented in Table 3.

Table 3 - Description of the Local Hydrogeologic Setting

Attribute	Descriptor	Data Source
Aquifer Material	Sand and Gravel	Interpreted from well records found in the CWI database.
Porosity Type and Value	0.25	Conservative estimate for glacial materials (Fetter, 1988; Freeze and Cherry, 1979).
Aquifer Thickness	In vicinity of the Brainerd wellfield – variable, ranges 105 to 140 feet	Interpreted from well records and inferred from information contained in the county geologic atlas (Setterholm, 2004; Peterson, 2007).
Stratigraphic Top Elevation	In vicinity of the Brainerd wellfield – variable, approx. 1150 ft., AMSL	Interpreted from well records and inferred from information contained in the county geologic atlas (Setterholm, 2004; Peterson, 2007).
Stratigraphic Bottom Elevation	In vicinity of the Brainerd wellfield – variable, ranges 1010 – 1035 feet, AMSL	Estimated from well records and information contained in the county geologic atlas (Setterholm, 2004; Peterson, 2007). The representative values are weighted toward the base elevation at the wellfield and within the contribution area to the wells.

Attribute	Descriptor	Data Source
Hydraulic Confinement	At Wellfield – Unconfined Upgradient - Confined	Aquifer tests, well records, and information contained in the county geologic atlas (Setterholm, 2004; Peterson, 2007).
Transmissivity	In vicinity of the Brainerd wellfield - Variable, ranges 51,000 to 55,230 ft ² /day	The representative range of transmissivity values shown here reflects changes in aquifer composition and thickness as well as uncertainties related to the quality of existing aquifer test data. Upgradient of the wellfield, aquifer thickness and transmissivity varies significantly.
Hydraulic Conductivity	In vicinity of the Brainerd wellfield - Representative: 394 ft/day Range: < 5 ft/d – 410 ft/d	The representative value was derived from an aquifer test and specific capacity data from the BPU wells. The model range of values was derived using specific capacity data obtained from well records in the Brainerd area.
Groundwater Flow Field	Groundwater flow is toward the northwest and the Mississippi River, with an approximate compass direction of 305° and gradient of 0.015 upgradient of the wellfield (Figure 2).	Defined by using static water level elevations from well records in the CWI database and documents listed in the “Selected References” section of this report.

The distribution of the aquifer and its stratigraphic relationships with adjacent geologic materials are shown in Figures 3, 4, and 5. They were prepared using well record data contained in the CWI database. The geological maps and studies used to further define local hydrogeologic conditions are provided in the “Selected References” section of this report.

Delineation of the Wellhead Protection Area

Delineation Criteria

The boundaries of the WHPA for the Brainerd Public Utilities are shown in Figure 1. Table 4 describes how the delineation criteria specified under Minnesota Rules, part 4720.5510, were addressed.

Table 4 - Description of WHPA Delineation Criteria

Criterion	Descriptor	How the Criterion was Addressed
Flow Boundary	A number of hydrologic flow boundaries were simulated, including the Mississippi River, Little Buffalo Creek, Buffalo Creek and numerous wetlands.	Perennial rivers, streams and ditches, lakes, wetlands and ponds were included in the model because these features influence the ambient groundwater flow field.
Flow Boundary	Other High Capacity Wells Table 6	Only a few high-capacity wells exist within 1.5 miles of Brainerd Public Utilities's wells and these were simulated in the model.
Daily Volume of Water Pumped	See Table 5	Pumping information was obtained from the DNR, Appropriations Permit Number 1977-3523, and was converted to a daily volume pumped by a well.
Groundwater Flow Field	Groundwater flow is toward the northwest and the Mississippi River, with an approximate compass direction of 305° and gradient of 0.015 upgradient of the wellfield.	The interpreted groundwater flow field was determined from local well data. The flow field was simulated in the MODFLOW groundwater model and capture zones were calculated based on the flow field.

Criterion	Descriptor	How the Criterion was Addressed
Aquifer Hydraulic Conductivity	Reference Value: 394 ft/day	The aquifer test plan was approved on March 31, 2021, and K was determined from an aquifer test and specific capacity data from the BPU wells. Uncertainty regarding aquifer transmissivity was addressed as described in the “Addressing Model Uncertainty” section.
Time of Travel	10 years	The public water supplier selected a 10-year time of travel.

Pumping data was obtained from the DNR Permit and Reporting System (MPARS) for the public water supply’s Appropriation Permit Number 1977-3523. These values, confirmed by the public water supplier, were used to identify the maximum volume of water pumped annually by each well over the previous five-year period, as shown in Table 5. An estimate of the pumping for the next five years is also shown. The maximum daily volume of discharge used as an input parameter in the model was calculated by dividing the greatest annual pumping volume by 365 days.

Table 5 - Annual Volume of Water Discharged from Water Supply Wells

Well Name	Unique Number	2015	2016	2017	2018	2019	5-Year Projected Pumping	Daily Volume (cubic meters)
Well #3	232347	92.339	89.895	82.247	81.300	86.221	92.339	957.7
Well #4	232348	67.777	77.212	82.039	87.535	84.085	87.535	907.8
Well #5	232349	96.021	92.086	63.917	89.395	98.854	98.854	1025.2
Well #6	232350	73.422	104.841	106.736	98.866	83.969	106.736	1107

Well Name	Unique Number	2015	2016	2017	2018	2019	5-Year Projected Pumping	Daily Volume (cubic meters)
Well #7	232352	221.064	184.690	184.715	174.402	176.0	221.064	2292.7
Well #8	403973	104.762	88.922	91.083	88.108	94.655	104.762	1086.5
Totals		655.385	637.646	610.737	619.606	623.79	711.29	7376.9

(Expressed as gallons. Bolding indicates greatest annual pumping volume.)

In addition to the wells used by the public water supplier, Table 6 shows other high-capacity wells included in the delineation to account for their pumping impacts on the capture areas for the public water supply wells. Pumping data was obtained from the DNR MPARS database.

Table 6 - Other Permitted High-Capacity Wells

DNR Permit	Unique No.	2015	2016	2017	2018	2019	Pumping (Year)	Pumping Amount Used in Previous Delineation
1976-2015 School district	116527	0	0	0	0	0	0	14.0905
1976-2015 School district	150830	7.644	5.517	10.766	6.656	4.1685	10.766 (2017)	15.7839
1990-2026 Atek Manufact.	437425	1.074	0.554	permit terminated				5.0
2011-0313 School district	717389 (near wellfield)	1.802	0.934	1.430	0.732	0	1.802 (2015)	0

(Expressed as millions of gallons. **Bold values** indicate highest annual rate from "5 most recent" selected years.)

Source: MN Dep't. of Natural Resources Division of Waters - MNDNR Permitting and Reporting System.

Method Used to Delineate the Wellhead Protection Area

The WHPA for the Brainerd Public Utilities' wells was determined using the software code MODFLOW (McDonald and Harbaugh, 1988; Harbaugh et al., 2000; Harbaugh, 2005). The resulting WHPA boundaries are a composite of the capture zones calculated from several different model scenarios (Figure 1).

MODFLOW was developed by the United States Geological Survey and is publicly available. The specific software code used for this delineation was MODFLOW-2005 (Harbaugh, 2005). The program has been thoroughly documented, is widely used by consultants, government agencies, and researchers and consistently accepted in regulatory proceedings. MODFLOW is also an extremely versatile program capable of simulating groundwater flow in up to three dimensions while offering a variety of boundary condition options, confined or unconfined aquifer conditions and allowing for vertical discretization through the use of layering.

The numerical groundwater model that was constructed consisted of 658 rows, 576 columns, and three layers. The model incorporates a variable areal grid spacing ranging from five meters near the utility's wells and grading to 640 meters at the boundaries of the model domain. Layer tops and bottoms were derived from CWI logs within the model domain. River head boundaries represent cells where water is flowing both into and out of the aquifer and were used to simulate the many lakes and rivers within the model domain within Layer 1. Vertical recharge was applied to Layer 1 of the model using modified values published by the U.S Geological Survey (Delin et al., 2007).

The Brainerd wells are served by a relatively thick water table aquifer. The wells are situated over a buried bedrock valley, and the thickness and base elevation of the sand aquifer is controlled by the topography of the underlying bedrock surface. The boundaries of the valley structure were estimated from bedrock topography provided in the Crow Wing County Geologic Atlas (Setterholm, 2004). Where Layer 1 consists of sand materials, the ratio of $K_x/K_z = 2$ was used; at other locations Layer 1 consists of clay-rich till, and the vertical ratio was increased to 10. Horizontal hydraulic conductivity (K_x) was estimated from either aquifer tests or specific capacity data from existing wells. Due to the heterogeneity of the unconsolidated sand and the lack of contiguous lenses for discretization of hydraulic conductivity zones, site specific data within the model domain was interpolated using the Parameter Estimation (PEST) tool. PEST is a calibration tool developed by John Doherty of Watermark Computing and is most commonly used to estimate aquifer hydraulic conductivity (Doherty, 2010). Typical zonation of hydraulic conductivity introduces zones of different hydraulic conductivity in the model domain at locations where the modeler feels they would do the most good. The parameter zonation process would then be repeated until the fit between model outcomes and field observations was acceptable. Characterization of geologic heterogeneity in the model domain by zones of piecewise uniformity is not in harmony with the nature of the alluvial material, therefore any zonation pattern that is finally decided upon is only defensible on the basis that it is better to employ such a zonation scheme than to ignore geologic heterogeneity altogether. To overcome this problem the distribution of hydraulic conductivity within the model domain was described by a set of pilot points. The pilot point locations and values in the model domain were derived from specific capacity data at domestic wells and aquifer test data for the utility's wells. These values were then smoothed with the geostatistical method of kriging and input into the model. The pilot point method allowed for hydraulic conductivity values to be representative of the utility's well data proximal to the well field and then be smoothed further away.

Other high capacity wells known to be screened in the glacial aquifer were also included in the model. Local rivers, creeks and wetland features were simulated in Layer 1.

To determine the WHPA, the groundwater flow model was used along with a particle tracking program called MODPATH (Pollock, 2012). MODPATH is used to evaluate advective transport of simulated particles moving through the simulated flow system. A series of 216 particles were launched at each well. A porosity of 25 percent was used and a reverse time of travel was calculated at 10 years.

Representative aquifer parameters were used in the base case model scenario. Additional modeling scenarios using MODFLOW were then simulated using reasonable estimations of parameters to demonstrate model sensitivity and to reflect uncertainty conditions, which are addressed in the next section. The model parameters for all model runs are listed in Table 6.

The combined output of all model results was composited to create the final WHPA (Figure 1).

Results of Model Calibration and Sensitivity Analysis

Model calibration is a procedure that compares the results of a model based on estimated input values to measured or known values. This procedure can be used to define model validity over a range of input values, or it helps determine the level of confidence with which model results may be used. As a matter of practice, groundwater flow models are usually calibrated using water elevation and/or flux. The sensitivity analysis quantifies the differences in model results produced by the natural variability of a particular parameter. Uncertainty analysis addresses the effects of poor data quality (lack of local detailed information or deficiencies in the data) on the model results. Together, sensitivity and uncertainty analyses are commonly

used to evaluate the effects that natural variability and uncertainties in the hydrogeologic data have on the size and shape of the capture zones. Regarding the WHPA delineation, these analyses are used to document that the delineation is optimal, conservative, and protective of public health based on existing information.

Model Calibration

A qualitative evaluation of the calibration can be made by comparing the simulated potentiometric surface (Figure 2) with observed water level targets obtained from the CWI database. Upon review the calibrated flow model generally captures the major features of the groundwater flow system along with the elevation, shape, magnitude, and gradient of the CWI database observed flow field.

A quantitative measure by which to evaluate the success obtained during calibration is to compare the root mean square of the residuals (RMSE) and the maximum observed head difference of the calibration dataset. The Brainerd model was refined from a larger regional model of the watershed. For this reason, the calibration dataset is relatively large and included water level information from more than 10,000 existing wells located throughout the watershed, including wells located in the vicinity of the Brainerd wellfield. The residual root mean square (RMS) error of the calibration well set was approximately 2.3 meters with a normalized RMSE of approximately four percent. It is noted that this error is less than the calibration target of 10 percent (Groundwater Calibration Policy, 2018). The calibration targets (wells) with the greatest residual difference between measured and simulated heads were generally at locations beyond the contribution area to the utility's wells.

Sensitivity Analysis

Model sensitivity is the amount of change in model results caused by the variation of a particular input parameter. The orientation and extent of modeled capture zones may be very sensitive to any of the input parameters:

- The **pumping rate** directly affects the volume of the aquifer that contributes water to the well. An increase in pumping rate leads to an equivalent increase in the volume of aquifer and an expanded capture zone, proportional to the porosity of the aquifer materials.

How Addressed and Results – The pumping rate is based on the results presented in Table 5 and, therefore, is not considered a variable factor that will influence the delineation of the WHPA. The modeled pumping rate is based on the largest annual pumping during the last five years of record, as shown in Table 5, and therefore the sensitivity of the delineation to this parameter is assumed to be minimal when compared with the other parameters discussed below.

- The **direction of groundwater flow** determines the orientation of the capture zone. Variations in the direction of groundwater flow will not affect the size of the capture zone but are important for defining the areas that are contributing water to the well.

How Addressed and Results – General flow direction was determined based upon static water levels of similarly screened wells in the area of the model. Overall, the sensitivity of the WHPA to the direction of groundwater flow should not be significant, given the current knowledge of the hydraulic head distribution in the aquifer.

- The **hydraulic gradient** (along with aquifer hydraulic conductivity) determines the rate at which water moves through the aquifer materials.

How Addressed and Results – The flow field shown in Figure 2 provides the basis for determining the extent to which each model run reflects the conceptual understanding of the orientation of the capture area for each well. The regional model has been calibrated to hydraulic heads. The sensitivity of the WHPA to the hydraulic gradient should not be significant given the current knowledge of the hydraulic head distribution in the aquifer.

- The **hydraulic conductivity** influences the size and shape of the capture zone. A decrease in hydraulic conductivity decreases the length of the capture zone and increases the distance to the stagnation point, making the capture zone more circular in shape and centered on the well.

How Addressed and Results – Initial hydraulic conductivity was calculated from specific capacity and aquifer tests conducted throughout the region and geostatistically smoothed across the model domain, with values near the well field reflecting those obtained from the utility's wells. Two additional model runs were performed wherein the hydraulic conductivity was decreased/increased by 50 percent within five miles of the wellfield to account for the reduced values generally observed for this parameter away from the utility's well field and the uncertainty in the specific capacity calculation. This resulted in capture zones that were 11 percent smaller and 14 percent larger than the initial calibrated case, respectively.

- The **aquifer porosity** influences the size and shape of the capture zone.

How Addressed and Results – Decreasing the porosity causes a linear, proportional increase in the areal extent of the capture zone. A literature value of 25 percent was used for the delineation and this value was not varied (Fetter, 2001).

- The **aquifer thickness** influences the size and shape of the capture zone.

How Addressed and Results – Final aquifer thicknesses used in this model were the result of a multi-step statistical analysis. A cross-sectional analysis was done to determine the thicknesses of the aquifer at well points throughout the modeled extent. Layer thicknesses were interpolated between wells and unrealistic values were identified and disposed of at all steps by comparing with

adjacent well data, where available, and by using hydrogeologic judgment. As a result, the model layering closely follows the overall stratigraphy through the region. For this reason, it was determined unnecessary to further assess aquifer thickness at this time.

Addressing Model Uncertainty

Using computer models to simulate groundwater flow involves representing a complicated natural system in a simplified manner. Local geologic conditions may vary within the capture areas of the public water supply wells, but the amount of existing information needed to accurately define this degree of variability is often not available for portions of the WHPA. In addition, the current capabilities of groundwater flow models may not be sufficient to represent the natural flow system exactly. However, the results are valid within a range defined by the reasonable variation of input parameters for this delineation setting.

The steps employed for this delineation to address model uncertainty were:

1. **Pumping Rate** – For each well, a maximum historical (five-year) pumping rate or an engineering estimate of future pumping, whichever is greater (Minnesota Rules, part 4720.5510, subpart 4).
2. **Aquifer Hydraulic Conductivity** – Hydraulic conductivity was adjusted plus and minus 50 percent within five miles of the Brainerd wellfield.
3. **Connectedness of Local Surface Water Features** - The connectedness of local surface water features, including Little Buffalo Creek, Buffalo Creek and area wetlands can have an impact on the orientation and shape of the capture zones. However, connectivity is challenging to characterize given available information. For this delineation, connectivity between local surface water features and the aquifer, as represented by conductance values, were adjusted plus and minus 50 percent.
4. **Aquifer Recharge** – For water-table aquifers, aquifer recharge due to precipitation can be variable from year to year. For example, from 2015 to 2019, precipitation in the Brainerd area ranged 28.7 to 39.8 inches/year. With potential climate change impacts, precipitation may even have sharper swings in the future. For this delineation, aquifer recharge was adjusted plus and minus 50 percent across the entire model domain.

Capture areas were developed for a range of hydraulic conductivities and times of travel of one and 10 years (Figure 6). As the model code uses constant input values for each run, several runs were required to include all variations in input parameters. Table 7 documents the variables used to address MODFLOW uncertainty.

Table 7 - Model Parameters Used in MODFLOW Base Case and Uncertainty Runs

Model Run	Capture Zone File Name (name_particle file)	Basin Discharge	Hydraulic Conductivity	Connectivity with Local Surface Water Features	Vertical Recharge	Comment
Calibrated Steady State (Base Case)	Base	None	Base Case	Base Case	Base Case	
Base Case with Treatment Plant Discharge to Basin	Base_Discharge	Water treatment plant (WTP) discharge to basin	Base Case	Base Case	Base Case	Capture zones very similar in size and location compared to base case.
Hydraulic Conductivity Decreased 50%	k50_Discharge	WTP discharge to basin	All hydraulic conductivities decreased 50% within 5 miles of the wellfield	Base Case	Base Case	One year zones of all the wells in the main wellfield (Wells 3–7) <u>intersect the basin.</u> Overall widest and shortest 10-year capture zones.
Hydraulic Conductivity Increased 50%	k150_Discharge	WTP discharge to basin	All hydraulic conductivities increased 50% within 5 miles of the wellfield	Base Case	Base Case	Overall longest 10-year capture zones.
Decreased Connectivity to Surface Water Features	C50_Discharge	WTP discharge to basin	Base Case	Decreased conductances 50% of local surface water features	Base Case	Overall smaller capture zones compared to the base case.
Increased Connectivity to Surface Water Features	C150_Discharge	WTP discharge to basin	Base Case	Increased conductances 50% of local surface water features	Base Case	Capture zone slightly narrower and longer compared to the base case.
Recharge Decreased 50%	R50_Discharge	WTP discharge to basin	Base Case	Base Case	Recharge decreased 50% across the model domain	Capture zone is slightly smaller and shifted to the north.
Recharge Increased 50%	R150_Discharge	WTP discharge to basin	Base Case	Base Case	Recharge increased 50% across the model domain	Capture zone is slightly larger in size and slightly shifted southward.

Conjunctive Delineation

The vulnerability of the DWSMA is high in the vicinity of the wellfield and the ERA; therefore, according to current MDH guidance, the need for a conjunctive delineation must be assessed.

Based on information from local well records, the geologic sensitivity of the water table aquifer is considered high. Isotopic and general chemistry data indicate that the Brainerd wells are receiving a significant portion of young water impacted by human activities (Table 2). A monitoring project was undertaken where the Brainerd wells, nearby wetlands, and Little Buffalo Creek were monitored seasonally for one year (from June 2017 to May 2018) for the stable isotopes of water and other general chemistry parameters. The results indicated that most of the wells by the wetlands were receiving a portion of surface water during at least one season of the year of monitoring. Well #7 received the largest percentage of surface water of all the wells, while Well #8 received little or no surface water during monitoring (Appendix B). In addition, the combined one-year capture zone boundaries for Wells #3- #7 also intersect the nearby wetlands. Consistent with MDH guidance regarding conjunctive delineations, a surface water contribution area was proven necessary and incorporated into the WHPA delineation (MDH, 2019). Local catchment area boundaries, lidar data, and soils information were used to map the SWCA to the wetlands.

The new SWCA is smaller than the previous one. This is primarily because the previous SWCA was mapped relative to the Little Buffalo Creek and potential runoff to the high vulnerable areas of the WHPA. Well #8 is located near the creek and previous modeling efforts indicated the possibility of surface water contribution to the well by the creek. However, the results of the monitoring project do not necessarily support a strong connection between Well #8 and the creek. In addition, the one-year particle tracking results of the recent modeling effort show that the pathlines do not terminate at the creek, rather they travel beneath the creek. For these reasons, a SWCA was not included for Little Rock Creek.

Delineation of the Drinking Water Supply Management Area

The boundaries of the Drinking Water Supply Management Area (DWSMA) were defined by the Brainerd Public Utilities using the following features (Figure 1):

- Center-lines of highways or roads
- Local Unit of Government boundaries
- Public Land Survey coordinates
- Property lines

Summary of Comparisons Between the Previous (2011) and Current WHPA and DWSMA Delineations

Overall, the new DWSMA is about 30 percent smaller than the previous delineation. This is primary due to changes in the 10-year capture zone boundaries and the elimination of the SWCA for Little Buffalo Creek. With the previous delineation effort, a single layer analytic

element groundwater model was used. The geometry of the water table aquifer was simulated using nested inhomogeneities that were oriented along the long axis of the buried bedrock valley. Under base case scenarios, the capture zones resembled the current ones in shape and location. However, under certain model scenarios, well capture zone pathlines corresponded to the boundaries of the inhomogeneities, allowing a north-south component of recharge to the wells. For the current delineation, a sophisticated 3-layer groundwater model was developed using MODFLOW. Kriging and PEST enhanced local geologic information to estimate the boundaries of the water table aquifer.

There has also been a significant change in the location of the SWCA. The former SWCA represented potential runoff to the highly vulnerable areas of the WHPA and to Little Buffalo Creek. However, the results of the monitoring project did not show a strong connection between Well #8 and Little Buffalo Creek, so it was determined that a SWCA for Little Rock Creek wasn't necessary for this amendment. On the other hand, monitoring did indicate a fairly strong connection between the main wellfield and the nearby wetlands. For this reason, the current SWCA represents the catchment area to the wetlands. Comparison between the old (2011) and the new (2021) protection areas are shown in Figure 7.

Vulnerability Assessments

The Part I wellhead protection plan includes the vulnerability assessments for the Brainerd Public Utilities wells and DWSMA. These vulnerability assessments are used to help define potential contamination sources within the DWSMA and select appropriate measures for reducing the risk that they present to the public water supply.

Assessment of Well Vulnerability

The vulnerability assessments for each well used by Brainerd Public Utilities are listed in Table 1 and are based upon the following conditions:

1. The construction record of Well #8 (403973) meets current State Well Code specifications (Minnesota Rules, part 4725), meaning that the well itself should not provide a pathway for contaminants to enter the aquifer used by the public water supplier. However, it is unknown whether construction standards are met for Wells #3 - #7 because information for these older wells is not available with respect to well grouting.
2. The geologic sensitivity of the aquifer at the well sites ranges from high to very high because of the lack of a significant thickness of clay-rich geologic materials over the aquifer.
3. Tritium isotopic results from the Brainerd wells indicate that the aquifer is dominated by modern recharge. Such aquifers have the potential to be impacted by human activities and are considered potentially vulnerable to contamination.
4. The chloride and chloride/bromide ratio results from water samples collected from the wells indicates impact by human activities occurring on the land surface (Table 2).

Assessment of Drinking Water Supply Management Area Vulnerability

The vulnerability of the DWSMA is shown in Figure 7 and is based upon the following information:

1. Well geologic sensitivity ratings, the surficial geologic map, and isotopic and water chemistry data from wells located within the DWSMA were used to delineate the boundaries between the high and moderate vulnerability areas (Figure 8). Wells with low geologic sensitivity ratings indicate the presence of at least 10 feet of clay between the land surface and the sand aquifer serving the city wells. Moderate geologic sensitivities correspond to wells that have at least 20-feet of mixed till, such as silty- or sandy-clay till. Wells with high sensitivity ratings indicate the absence of any significant till layer between the land surface and the aquifer.

There are a couple of wells within the high vulnerability area that have either a low or moderate geologic sensitivity rating. Rather than map isolated areas of alternate vulnerabilities, it was decided to place more weight on the outwash sand boundaries shown on the surficial geologic map and classify the entire region as highly vulnerable.

In the moderate vulnerability area, most of the wells have low geologic sensitivity ratings. However, isotopic data from several wells with similar geology, but located just beyond the DWSMA boundary, had measurable tritium indicating that there was young water present despite a significant thickness of clay-rich till. For this reason, the aquifer vulnerability rating was raised from low to moderate to reflect that the till is probably leaky.

2. Isotopic and water chemistry data from the Brainerd PWS wells indicate the aquifer used by the wells is dominated by modern recharge. This information, when combined with the geologic sensitivity ratings described above, suggest that the vertical time of travel for water moving from the land surface to the aquifer may be no more than a few years at most in the highly vulnerable areas, and years to decades where the vulnerability is moderate.

Therefore, given the information currently available, the vulnerability of the aquifer used by the BPU wells has been determined to be high in the western part of the DWSMA and moderate in the eastern part of the DWSMA.

Recommendations

The following recommendations have been generated to inform the next amendment of the Brainerd Public Utilities' Wellhead Protection Plan.

1. **Well Locating:** This delineation is based on very little well data. If new wells are constructed east of the Mississippi River and within one mile of the utility's wells, their locations should be verified. This information may allow a better understanding of the extent and thickness of the aquifer serving the BPU wells and could result in a more refined WHPA in the future.
2. **Planning for a Replacement Well(s):** - According to MDH records, several of the BPU wells are more than 70 years old. The BPU may want to include measures in their amended WHP Plan to take steps to prepare for the replacement of one or more of the older wells. The measures might include: the drilling of a test well(s), water quality sampling, and capacity testing.
3. **Water Quality Monitoring:** The standard assessment monitoring package should be analyzed during year six, including the primary wells and wetlands, contingent on funding assistance from MDH for sampling and analysis. The utility may need to collect the samples and ship them to MDH. Information generated by this sampling will be used to refine vulnerability assessments for the next amendment.

Selected References

Alexander, S.C., and Alexander, E.C., Jr. (1989), *Residence times of Minnesota groundwaters*, University of Minnesota, Minneapolis, Minn., 22 p.

Anderson, M.P., Woessner, W.W., and Hunt, R.J. (2015), *Applied groundwater modeling—simulation of flow and advective transport*, Academic Press, Inc., San Diego, Calif., 630 p.

Bowen, G.I. and Revenaugh, J. (2003), *Interpolating the isotopic composition of modern meteoric precipitation*, *Water Resources Research* 39, 1299, doi: 10.129/2003WR002086.

Delin, G.N., Healy, R.W., Lorenz, D.L., and Nimmo, J.R. (2007), *Comparison of local- to regional-scale estimates of ground-water recharge in Minnesota*, *Journal of Hydrology*, Vol. 334, No. 1-2, p. 231-249.

Doherty, J.E. and Hunt, R.J., (2010) *Approaches to highly parameterized inversion--A guide to using PEST for groundwater-model calibration*, U.S. Geological Survey, Scientific Investigations Report 2010-5169, Reston, Va., 37 p.

Fetter, C.W. (2001), *Applied hydrogeology*, Prentice Hall, Saddle River, N.J., 598 p.

Geologic Sensitivity Project Workgroup (1991), *Criteria and guidelines for assessing geologic sensitivity of ground water resources in Minnesota*, Minnesota Department of Natural Resources, Division of Waters, St. Paul, Minn., 122 p.

Harbaugh, A.W. (2005), *MODFLOW-2005, the U.S. Geological Survey modular groundwater model--the Ground-Water Flow Process*: U.S. Geological Survey Techniques and Methods 6-A16, U.S. Geological Survey, Reston, Va., 253 p.

Harbaugh, A.W., Banta, E.R., Hill, M.C., and McDonald, M.G. (2000), *MODFLOW-2000, the U.S. Geological Survey modular ground-water model--user guide to modularization concepts and the ground-water flow process*, U.S. Geological Survey, Open-File Report, 00-92, Reston, Va., 121 p.

McDonald, M.G., and Harbaugh, A.W. (1988), *A modular three-dimensional finite-difference ground-water flow model*, *Techniques of Water-Resource Investigation*, 06-A1, U.S. Geological Survey, 576 p.

Minnesota Department of Health (2019), *Draft Guidance for Preparing a Conjunctive Delineation*, St. Paul, Minn., 29 p.

Minnesota Department of Health (2020), *Wellhead Protection Monitoring Plan Results for the City of Brainerd*, St. Paul, Minn., 28 p.

Minnesota Department of Natural Resource and Minnesota Department of Health. (2020), *Tritium Age Classification: Revised Method for Minnesota*, GW-05., St. Paul, Minn.
https://files.dnr.state.mn.us/waters/groundwater_section/mapping/gw/gw-05-minnesota-tritium-age.pdf

Mullaney, J.R., Lorenz, D.L., and Arntson, A.D. (2009), *Chloride in groundwater and surface water in areas underlain by the glacial aquifer system, northern United States*, Scientific Investigations Report, 2009-5086, U.S. Geological Survey, Reston, Va., 41 p.

Niswonger, R.G., Panday, Sorab, and Ibaraki, Motomu, (2011), *MODFLOW-NWT, A Newton Formulation for MODFLOW-2005*: U.S. Geological Survey Techniques and Methods 6-A37, U.S. Geological Survey, Reston, Va., 44 p.

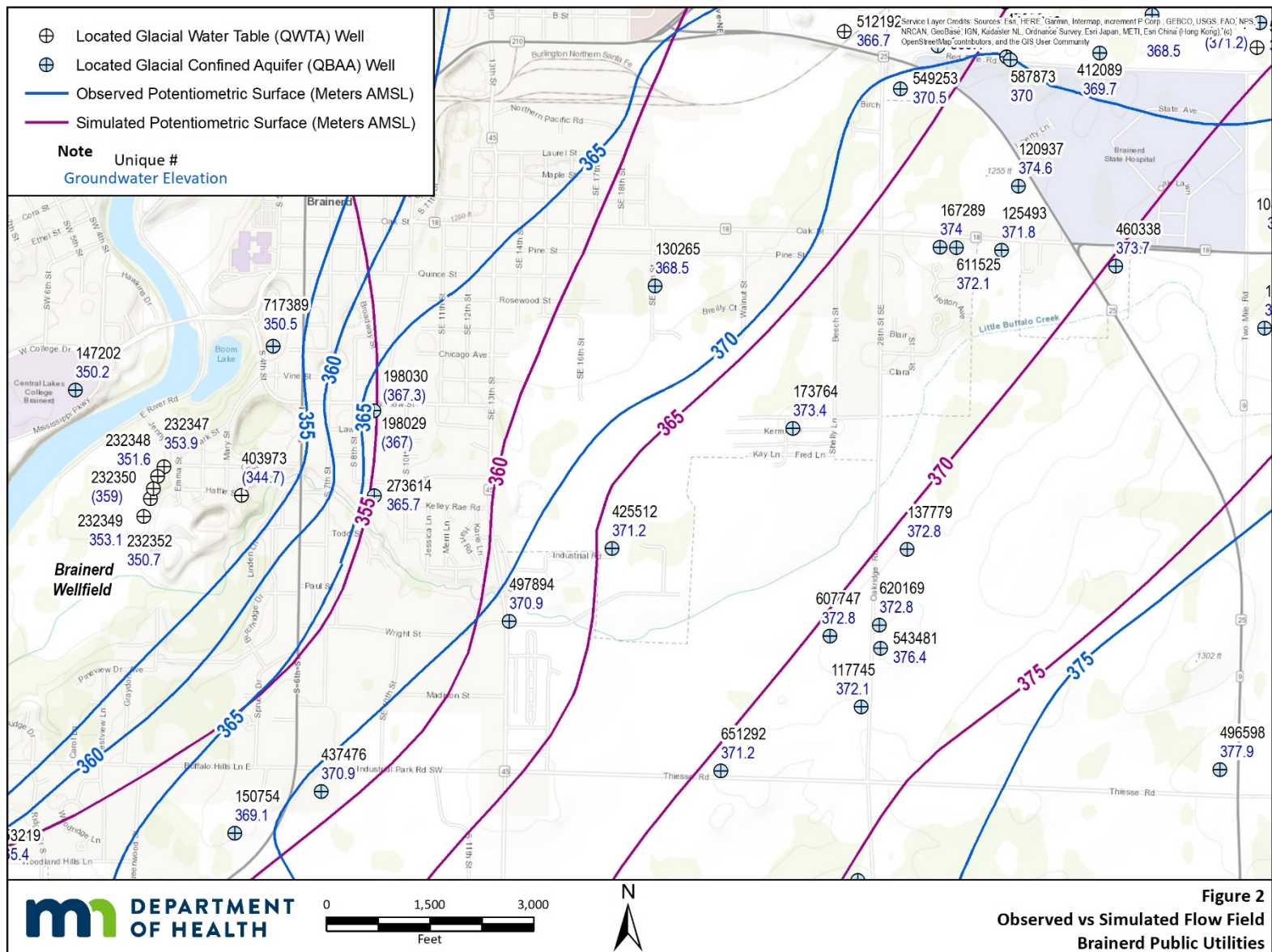
Payne, G. A. (1994), *Ground-Water Baseflow to the Upper Mississippi River Upstream of the Minneapolis-St. Paul Area, Minnesota, During July 1988*, Open-File Report 94-478, U.S. Geological Survey, Reston, Va., 28 p.

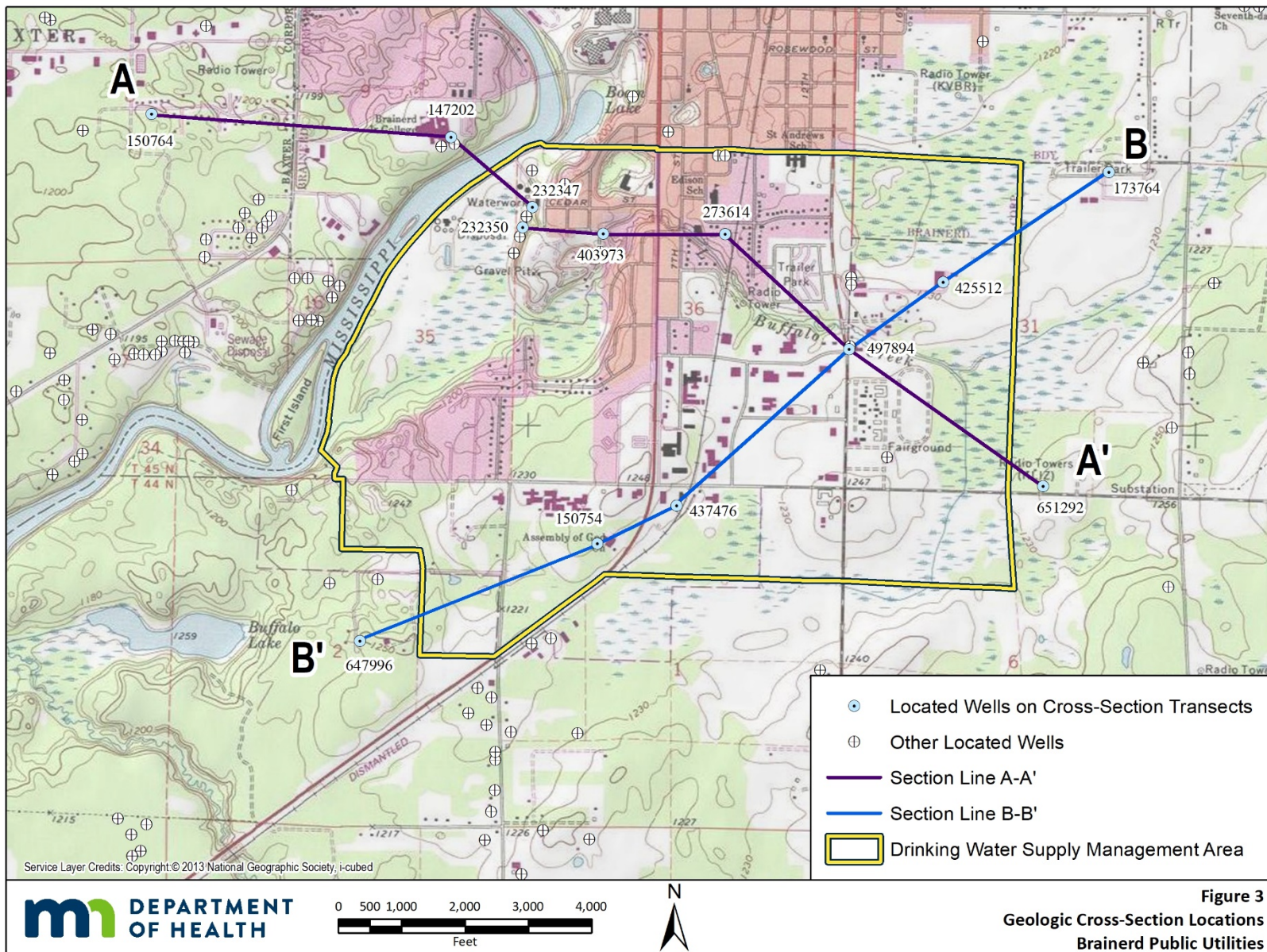
Petersen, T.A., and Solstad, J.A. (2007), *Geologic atlas of Crow Wing County, Minnesota*, Minnesota Department of Natural Resources, Division of Waters, County Atlas Series, C-16, Part B, St. Paul, Minn., 2 p., 4 plates, scale 1:125,000 and smaller.

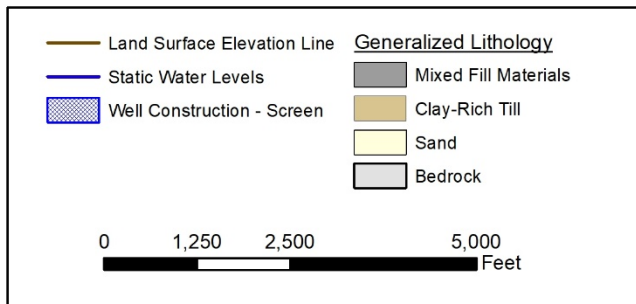
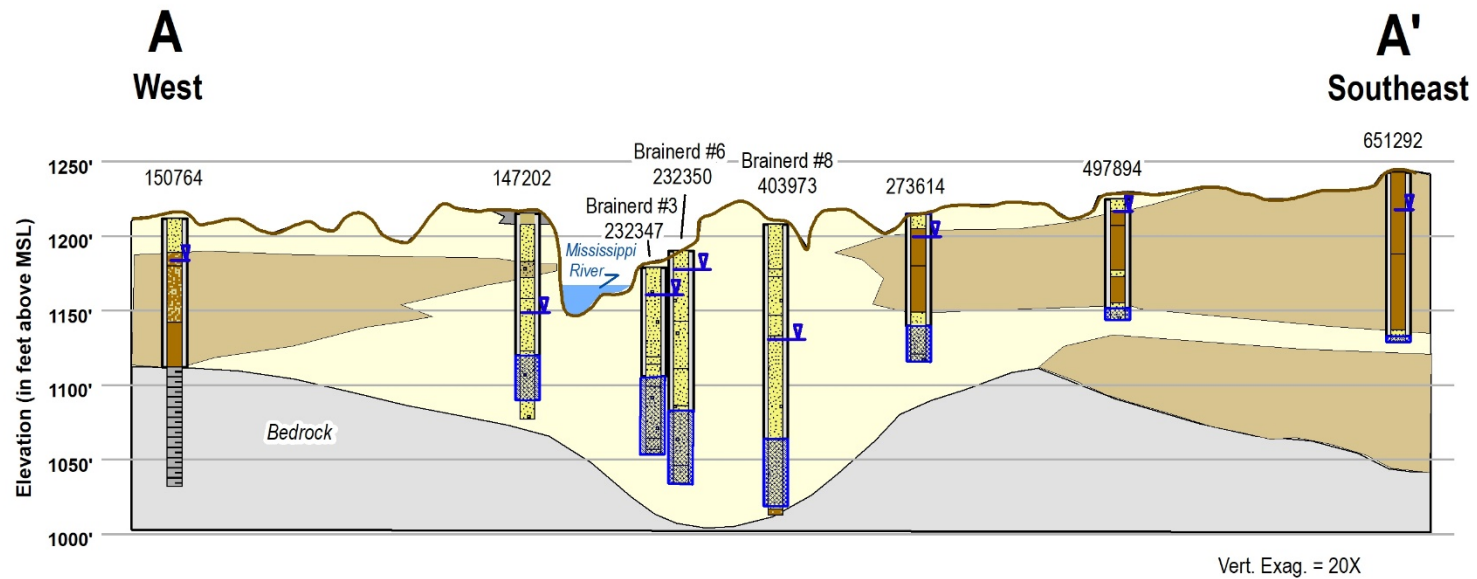
Pollock, D.W. (2012), *User guide for MODPATH version 6 – A particle-tracking model for MODFLOW*: U.S. Geological Survey Techniques and Methods 6-A41, U.S. Geological Survey, Reston, Va., 58 p.

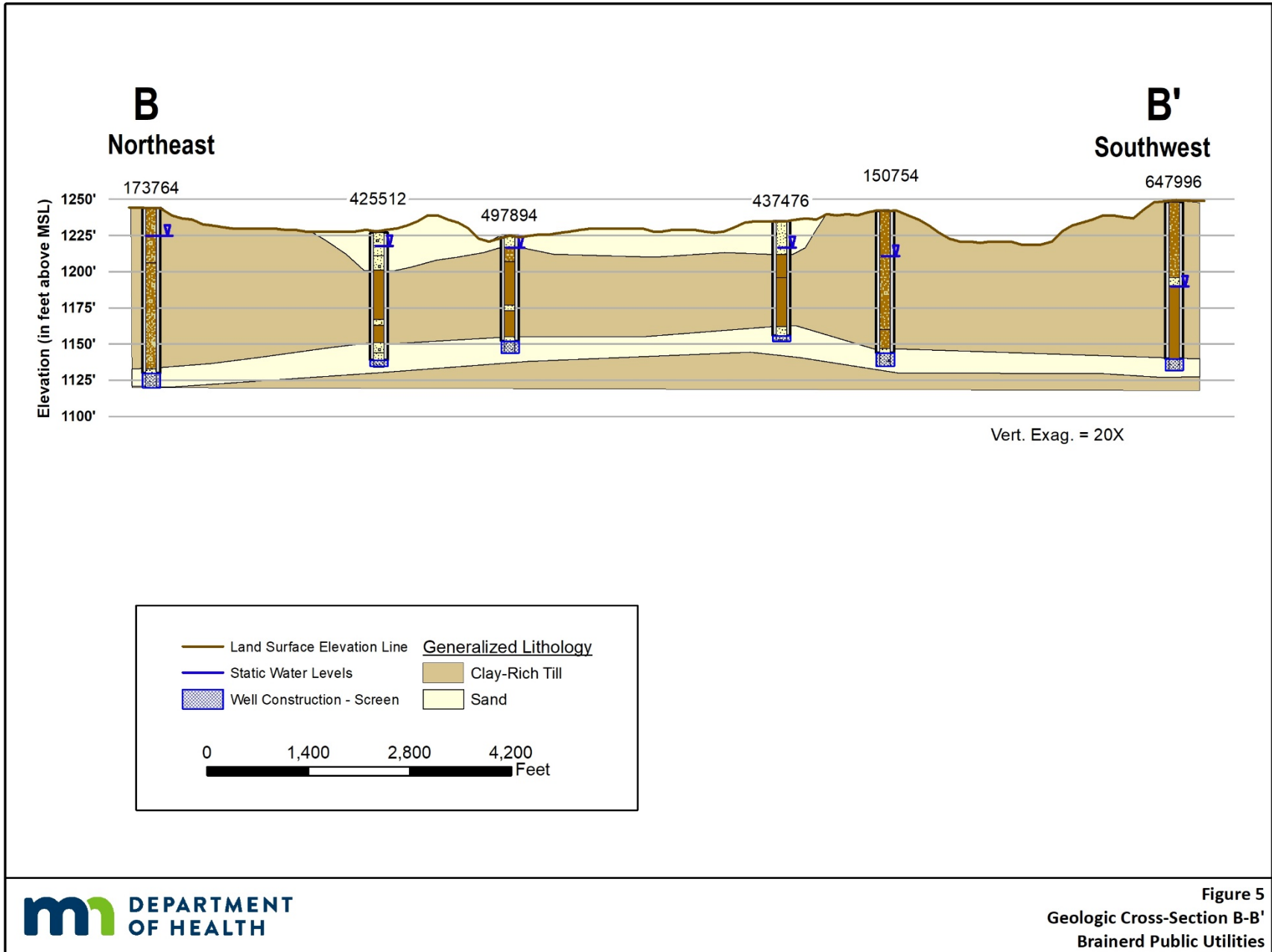
Setterholm, D.R. (Project mgr.) (2004), *Geologic atlas of Crow Wing County, Minnesota*, Minnesota Geological Survey, County Atlas Series, C-16, Part A, St. Paul, Minn., 6 plates, scales 1:100,000 and 1:200,000.

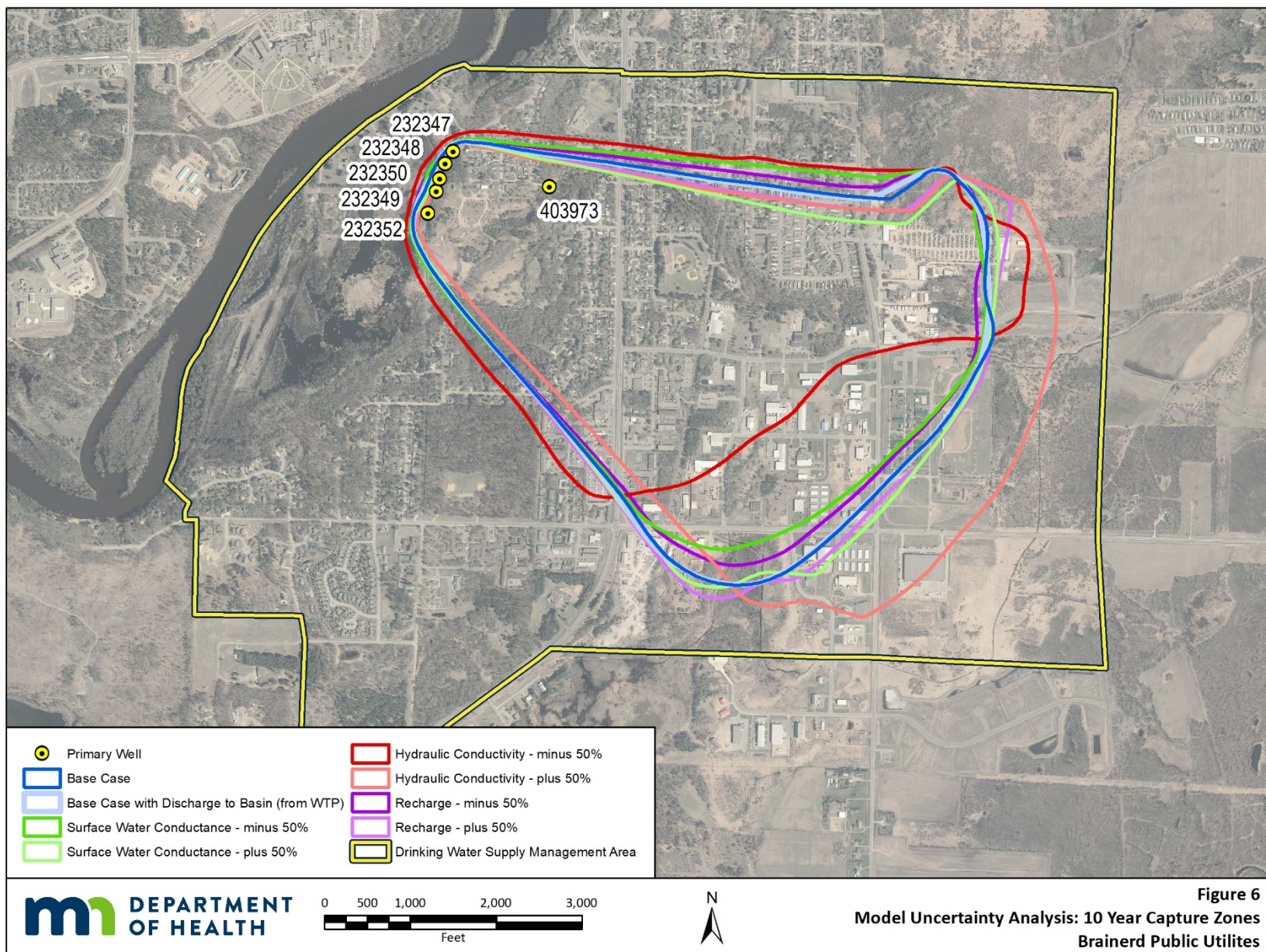
Figures

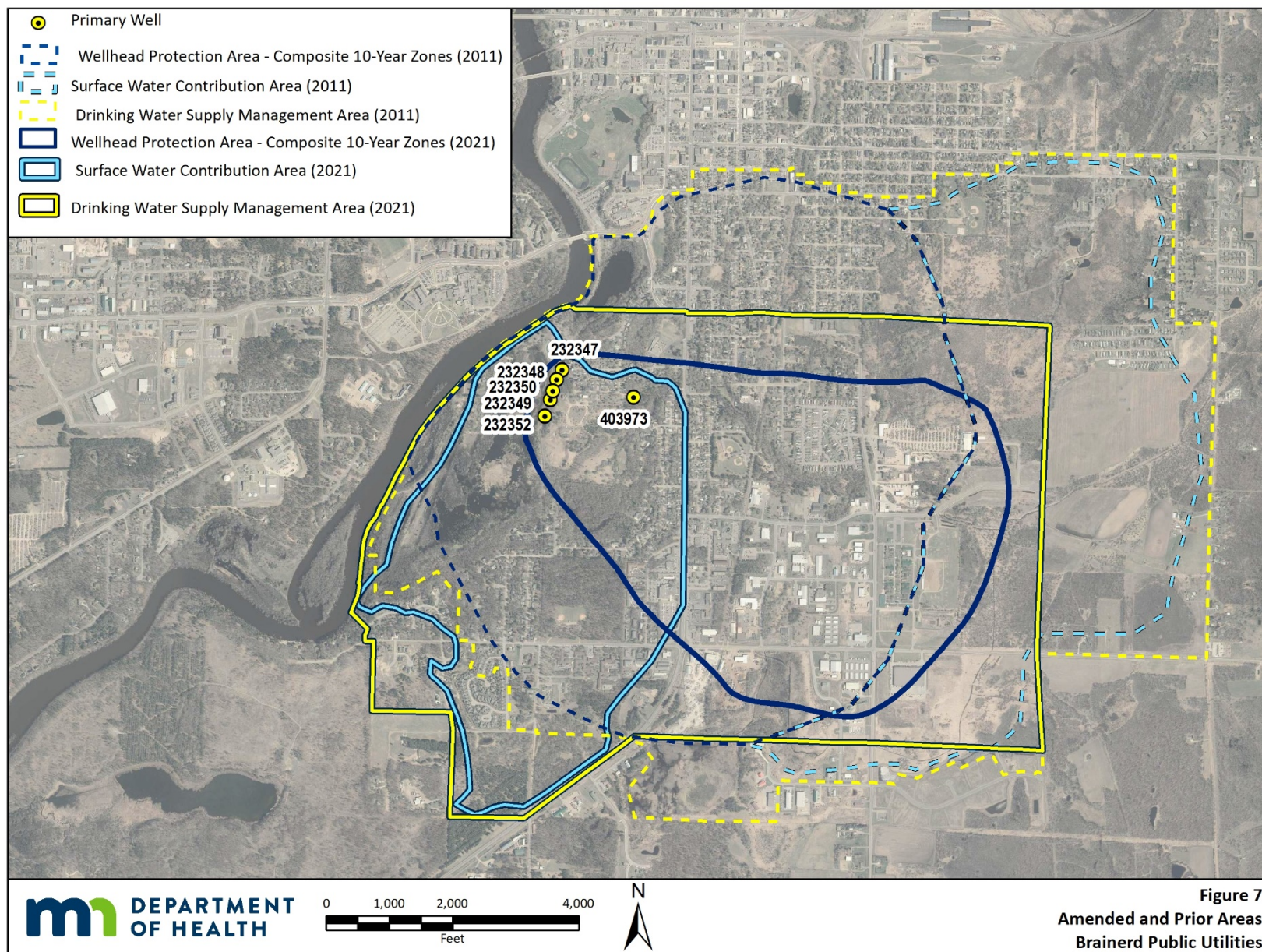


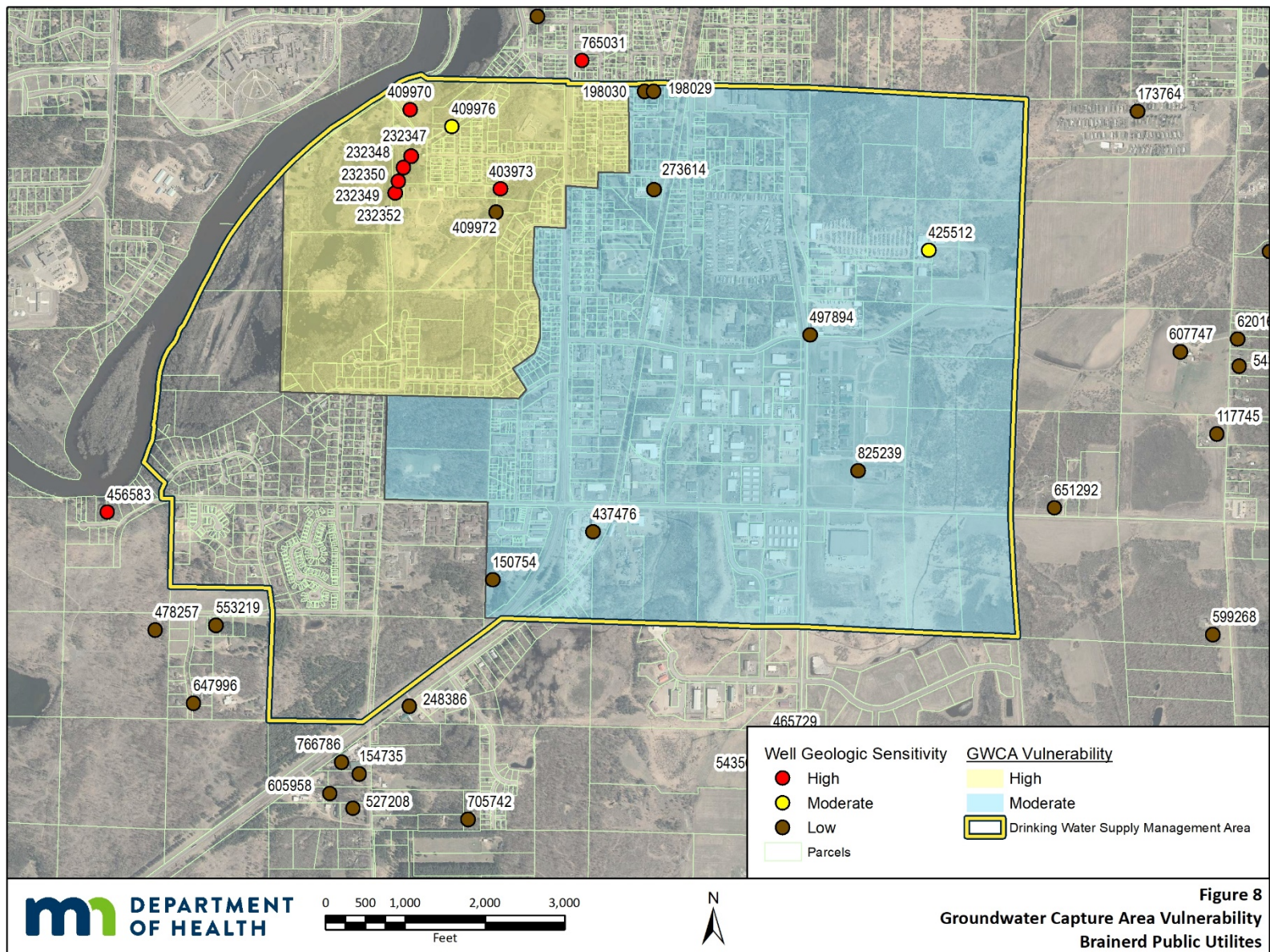












Appendix A: Data Elements Assessment

Data Type	Data Element	Use of the Well(s)	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	Data Source
Climate	Precipitation	M	M	M	M	MN Climatology Office
Geology	Maps and geologic descriptions	H	H	H	H	MGS, DNR, USGS
Geology	Subsurface data	H	H	H	H	MGS, MDH
Geology	Borehole geophysics	M	H	H	H	No relevant data found.
Geology	Surface geophysics	M	M	M	M	No relevant data found.
Soils	Maps and soil descriptions	M	H	M	M	NRCS
Soils	Eroding lands					
Water Resources	Watershed units	L	H	L	L	DNR, USGS
Water Resources	List of public waters	L	H	L	L	DNR
Water Resources	Shoreland classifications					
Water Resources	Wetlands map	L	H	L	L	USFWS
Water Resources	Floodplain map					
Land Use	Parcel boundaries map	L	H	L	L	Crow Wing County
Land Use	Political boundaries map	L	H	L	L	MnGEO, City
Land Use	Public Land Survey map	L	H	L	L	MnGEO
Land Use	Land use map and inventory					
Land Use	Comprehensive land use map					
Land Use	Zoning map					
Public Utility Services	Transportation routes and corridors	L	L	L	L	MnDOT, MnGEO
Public Utility Services	Storm/sanitary sewers and PWS system map					
Public Utility Services	Oil and gas pipelines map					
Public Utility Services	Public drainage systems map or list	L	H	L	L	MnGEO, DNR
Public Utility Services	Records of well construction, maintenance, and use	H	H	H	H	City, CWI, MDH
Surface Water Quantity	Stream flow data	L	H	H	H	USGS

Data Type	Data Element	Use of the Well(s)	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	Data Source
Surface Water Quantity	Ordinary high water mark data	L	H	L	L	DNR
Surface Water Quantity	Permitted withdrawals					
Surface Water Quantity	Protected levels/flows					
Surface Water Quantity	Water use conflicts	L	H	L	L	No relevant data found)
Groundwater Quantity	Permitted withdrawals	H	H	H	H	DNR
Groundwater Quantity	Groundwater use conflicts	H	H	H	H	No relevant data found)
Groundwater Quantity	Water Levels	H	H	H	H	No relevant data found)
Surface Water Quality	Stream and lake water quality management classifications					
Surface Water Quality	Monitoring data summary	L	H	L	L	MDH
Groundwater Quality	Monitoring data	H	H	H	H	MPCA, MDH, MDA, USGS
Groundwater Quality	Isotopic data	H	H	H	H	MDH, DNR
Groundwater Quality	Tracer studies	H	H	H	H	No relevant data found.
Groundwater Quality	Contamination site data	M	M	M	M	No relevant data found.
Groundwater Quality	Property audit data from contamination sites					
Groundwater Quality	MPCA and MDA spills/release reports	M	M	M	M	No relevant data found.

Definitions Used for Assessing Data Elements

- High (H): the data element has a direct impact
- Moderate (M): the data element has an indirect or marginal impact
- Low (L): the data element has little if any impact
- Shaded: the data element was not required by MDH for preparing this delineation

Acronyms used in this report are listed after the Glossary of Terms.

Appendix B:
Wellhead Protection
Monitoring Plan Results
(August 2020)

Wellhead Protection Monitoring Plan Results

FOR BRAINERD PUBLIC UTILITIES

August 2020

Minnesota Department of Health
Source Water Protection
PO Box 64975
St. Paul, MN 55164-0975
651-201-4691
gail.haglund@state.mn.us
www.health.state.mn.us

Upon request, this material will be made available in an alternative format such as large print, Braille or audio recording. Printed on recycled paper.

Monitoring, Data Collection and Assessment Measures

A monitoring plan was developed for Brainerd Public Utilities to outline a framework for addressing field monitoring, data collection, and assessment measures stated in the Wellhead Protection Plan. These measures are provided on page 14 of the Part 2 plan and are summarized below:

Measure 1: Prepare a groundwater and surface water monitoring plan to assess the relationship between the aquifer used by the Brainerd wells and potential sources of surface water recharge.

Measure 2: Implement and evaluate results of the groundwater quality or water level monitoring plan and assess results with the MDH.

* **Measure 3:** Prepare a groundwater monitoring plan to confirm the low vulnerable rating of the aquifer in the east portion of the DWSMA.

Measure 4: Implement and evaluate results of the groundwater monitoring plan and assess results with MDH.

*Note: Although the monitoring plan included an action step to address Measure 3, the monitoring team was unable to gain access to an existing well in the low vulnerable portion of the DWSMA during the period of monitoring. If deemed useful, this measure can be advanced to be included in the city's wellhead plan amendment.

Background: Well Construction and Use

The Brainerd public water supply obtains its drinking water supply from six primary wells. The wells range between 123 feet to 187 feet deep. Table 1 summarizes the construction information of the wells.

Table 1 - Water Supply Well Information

Local Well ID	Unique Number	Use/ Status ¹	Casing Diameter (inches)	Casing Depth (feet)	Well Depth (feet)	Date Constructed/ Reconstructed	Aquifer	Well Vulnerability
3	232347	P	16	73	125	1939	Sand & Gravel	Vulnerable
4	232348	P	16	73	123	1944	Sand & Gravel	Vulnerable
5	232349	P	16	105	145	1947	Sand & Gravel	Vulnerable
6	232350	P	16	107	156	1947	Sand & Gravel	Vulnerable
7	232352	P	20	88	157	1955	Sand & Gravel	Vulnerable
8	403973	P	16	144	187	1984	Sand & Gravel	Vulnerable

Note: 1. Primary (P) Well

The monitoring plan was implemented over four quarters, from June 2017 to May 2018. The water use for the wells prior to and during the monitoring period is provided in Table 2. Over the course of monitoring, the maximum pumping volume occurred at Well 7, while the lowest volume occurred at Well 5. The city's water appropriations permit number is 1977-3523.

Table 2 – Water Use Information

Well Name (Unique Well No.)	March – June 2017 (MG)	Percent Volume	June – September 2017 (MG)	Percent Volume	October-January 2017-198 (MG)	Percent Total Volume	February-May 2018 (MG)	Percent Volume	Total Pumping Volume (MG)
3 (232347)	23.2	11.1	27.8	11.4	26.7	14.6	27.718	14.5	105.43
4 (232348)	28.0	13.4	34.4	14.1	26.2	14.3	26.483	13.9	115.10
5 (232349)	23.1	11.1	21.6	8.8	14.9	8.1	25.641	13.4	85.28
6 (232350)	34.9	16.8	41.0	16.8	35.1	19.2	30.189	15.8	141.22
7 (232352)	64.5	30.9	78.3	32.1	53.6	29.3	52.349	27.4	248.79
8 (403973)	34.7	16.7	41.0	16.8	26.6	14.5	28.509	14.9	130.91
System Total	208.53		244.14		183.16		190.889		826.71

Treatment Plant Discharge - Another variable recognized during the period of monitoring is the discharge from the treatment plant to the seepage basin, located immediately adjacent to Wells 3-7. Although the seepage basin is also classed as a wetland, the public water supply reports that the treatment plant backwashes approximately 500,000 gallons weekly at a discharge location near Wells 3 and 4. The discharge volume is equivalent to approximately 26 million gallons/year. There is a gated culvert between the discharge basin and the south wetland. The public water supply reports that the gate is closed to prevent the wetland from flowing into the basin.

Field Monitoring

Quarterly water samples were collected at the Brainerd wells and several surface waters by MDH and Brainerd public works staff. The dates of monitoring were selected to be representative of Minnesota seasons, including: summer (June 13, 2017); fall (September 25, 2017); winter (January 10-19, 2018); and spring (May 15, 2018). Table 3 describes the monitoring sites and parameters; Figure 1 shows the locations of the wells and the surface water sites. Samples were not collected for all of the laboratory or field parameters during

every monitoring event. In addition, the full suite of field parameters were also not measured during every monitoring event.

Table 3. Sampling Locations and Analytes Relating to Measures 1, 2, and 4

Sample Site	Unique/SWS Number	Parameters
Well 3	232347	Chloride (EPA 300.1) Bromide (EPA 300.1) Nitrate/Nitrite (EPA Sm 4500-NO3F) Total Organic Carbon (SM 5310C) Ammonia Nitrogen (EPA 350.1) Sulfate (EPA 300.1) Alkalinity (SM 2320B) Bacteria (1 Q - surface water sites only) Tritium (Well 4 only) Stable Isotopes
Well 4	232348	
Well 5	232349	
Well 6	232350	
Well 7	232352	
Well 8	403973	
Little Buffalo Creek Near W8	SWS 261	
Little Buffalo Creek Upstream of W8	SWS 483	
Discharge Basin/Wetland	SWS 260	
Wetland South of the Wellfield	SWS 493	
Mississippi River	SWS 262	<u>Field Parameters</u> Temperature Conductivity Eh DO pH

Assessment of Monitoring Results

The results for the tritium isotopes and general chemistry from groundwater and surface water sources are presented in Table 4. Field parameter measurements are presented in Table 5, and bacteria results from the single round of sampling at surface water features are presented in Table 6. The quarterly results for a number of parameters are shown in Figures 2-10. For simplification, not all of the parameters are presented in table or chart format.

Table 4. Summary General Chemistry and Tritium

Sample Site	Date	Bromide (mg/l)	Chloride (mg/l)	Cl/Br Ratio	Nitrate + Nitrite Nitrogen (mg/L)	Ammonia Nitrogen (mg/l)	Total Organic Carbon (mg/l)	Sulfate (mg/l)	Alkalinity (mg/l)	Tritium (TU)
Well 3 (232347)	6/13/2017	0.0475	32.1	676	0.22	0.12	3.3	35.2	280	6.03 2/3/2016
	9/25/2017	0.0453	34.3	757	0.24	0.11	3.6	36.3	280	
	1/10/2018	0.0448	34.4	768	0.23	0.11	3.1	33.8	280	
	5/15/2018	0.0457	33.5	733	0.24	0.11	3.4	32.6	270	
Well 4 (232348)	6/13/2017	0.0415	21	506	0.32	0.09	2.3	33.5	260	4.6 6/13/2017
	9/25/2017	0.0405	22.1	546	0.36	0.08	2.2	33.5	270	
	1/10/2018	0.0405	22.9	565	0.34	0.08	2.1	30.3	260	
	5/15/2018	0.0431	23.3	541	0.31	0.09	2.3	36.1	260	
Well 5 (232349)	6/13/2017	0.0297	22.9	771	0.09	0.24	3.4	10.1	200	7.99 6/10/2015
	9/25/2017	0.0276	23.5	851	0.08	0.24	3.8	9.7	200	
	1/10/2018	0.0305	24	787	0.05	0.22	3.1	8.8	200	
	5/15/2018	0.0303	25.2	832	0.07	0.24	3.7	10.6	200	
Well 6 (232350)	6/13/2017	0.0351	26.8	764	0.13	0.1	2.2	15.5	210	8.5 9/20/2010
	9/25/2017	0.0322	27.9	866	0.18	0.1	2.2	16.3	220	
	1/10/2018	0.0344	28.9	840	0.17	0.1	1.9	15.0	210	
	5/15/2018	0.0336	26.5	789	0.19	0.1	2.2	15.6	220	
Well 7 (232352)	6/13/2017	0.0222	13.7	617	< 0.05	0.25	8	6.1	170	7.0 9/20/2010
	9/25/2017	0.0197	14.9	756	< 0.05	0.21	8.1	5.5	170	
	1/10/2018	0.0207	14.4	696	< 0.05	0.24	8	4.1	170	
	5/15/2018	0.022	14.7	668	< 0.05	0.22	8.4	4.3	170	
Well 8 (403973)	6/13/2017	0.0283	39	1378	1.2	< 0.05	1.2	16.8	190	4.9 9/20/2010
	9/25/2017	0.0277	40.9	1477	1.3	< 0.05	1.1	17.9	200	
	1/10/2018	0.0289	42.5	1471	1.3	< 0.05	1.3	10.6	200	
	5/15/2018	0.0286	41.1	1437	1.3	< 0.05	1.5	12.5	190	
Little Buffalo Creek Near W8 (SWS 261)	6/13/2017	0.0116	8.07	696	0.35	0.16	12	5.3	78	
	9/25/2017	0.0154	8.32	540	0.19	< 0.05	22	3.1	58	
	1/10/2018	0.0181	13.6	751	0.7	0.12	3.9	10.9	170	
	5/15/2018	0.0186	11.3	608	0.35	0.11	11	6.9	120	
Buffalo Creek Upstream of W8 (SWS 483)	6/13/2017	0.013	7.97	613	0.47	0.12	17	8.9	95	
	9/25/2017	0.0104	6.59	634	0.22	< 0.05	23	3.2	44	
	1/10/2018	0.0178	10.1	567	1.2	0.15	6	12.4	150	
	5/15/2018	0.0173	10.5	607	0.47	0.18	14	6.6	94	
Discharge Basin (SWS 260)	6/13/2017	0.0226	22.1	978	< 0.05	< 0.05	7	6.1	160	
	9/25/2017	0.0214	21.7	1014	< 0.05	< 0.05	6.7	33.0	160	
	*1/19/2018	*0.0131	*50	*3817	*< 0.05	*2.8	*140	*12	NS	
	5/15/2018	0.0207	22.4	1082	< 0.05	< 0.05	6.4	9.2	150	
Wetland South of Wellfield (SWS 493)	6/13/2017	0.0184	16.9	918	< 0.05	0.1	14	2.1	140	
	9/25/2017	0.0141	27.4	1943	0.11	0.07	23	16.2	62	
	1/19/2018	0.0241	21.1	876	0.51	0.26	11	21.0	NS	
	5/15/2018	0.0208	15.5	745	0.08	< 0.05	11	5.8	140	
Mississippi River (SWS 262)	6/13/2017	0.0081	4.48	553	0.05	0.09	12	3.6	100	
	9/25/2017	0.0111	4.57	412	0.13	< 0.05	16	3.8	100	
	1/19/2018	0.0089	6.6	742	0.11	0.08	9.8	5.1	NS	
	5/15/2018	0.0082	3.79	462	< 0.05	< 0.05	12	2.9	90	

Notes

< - Indicates result below detection limit.

NS - indicates sample not taken.

* - indicates a likely unrepresentative water sample; results are excluded from charts.

Table 5. Summary of Field Measurements

Sample Site	Date	Temperature (°C)	Specific Conductivity (umhos/cm)	pH	Dissolved Oxygen (mg/L)	Eh (mV)
Well 3 (232347)	6/13/2017	9.2	699	6.79	0.66	-39.9
	9/25/2017	9.4	700			
	1/10/2018	10.3	695			
	5/15/2018	9.8	695			
Well 4 (232348)	6/13/2017	9.4	626	6.99	0.94	-39.3
	9/25/2017	9.6	624			
	1/10/2018	11.5	632			
	5/15/2018	10.5	647			
Well 5 (232349)	6/13/2017	9.1	491	7.24	0.17	-94
	9/25/2017	10.1	485			
	1/10/2018	10.7	482			
	5/15/2018	9.5	499			
Well 6 (232350)	6/13/2017	8.9	538	7.15	0.49	-56.7
	9/25/2017	9	531			
	1/10/2018	9.9	530			
	5/15/2018	9.7	538			
Well 7 (232352)	6/13/2017	12.5	394	7.25	0.06	-119.5
	9/25/2017	9.4	384			
	1/10/2018	12.6	390			
	5/15/2018	13	403			
Well 8 (403973)	6/13/2017	10.6	547	7.2	7.79	77.7
	9/25/2017	9	542			
	1/10/2018	10.3	550			
	5/15/2018	11.4	543			
Little Buffalo Creek Near W8 (SWS 261)	6/13/2017	16	204	7.57	8.29	54.6
	9/25/2017	13	154			
	1/10/2018	3.8	373			
	5/15/2018	11.3	289			
Little Buffalo Creek Upstream of W8 (SWS 483)	6/13/2017	15.9	239	7.26	6.91	66.2
	9/25/2017	12.61	123			
	1/10/2018	4	358			
	5/15/2018	11.6	247			
Discharge Basin (SWS 260)	6/13/2017	20.4	402	7.47	4.61	10.5
	9/25/2017	12.7	371			
	1/19/2018	1	1216		2.56	74
	5/15/2018	15.9	394			
Wetland South of Wellfield (SWS 493)	6/13/2017	18.6	374	7.31	1.67	-110.9
	9/25/2017	12.2	159			
	1/19/2018	0.05	407		8.07	-59
	5/15/2018	13.1	348			
Mississippi River (SWS 262)	6/13/2017	21.5	224	7.4	6.85	120.4
	9/25/2017	16.3	225			
	1/19/2018	0.09	294		8.96	86
	5/15/2018	15.4	195			

Table 6. Summary of Coliform and E. Coli from Surface Waters

Sample Site	Date	PA TOTAL COLIFORM-DW (COLILERT)	MPN E COLI QT COLILERT (MPN/100mL)
Little Buffalo Creek Near W8 (SWS 261)	6/13/2017	24,000	2,800
Little Buffalo Creek Upstream of W8 (SWS 483)	6/13/2017	24,000	1,400
Discharge Basin (SWS 260)	6/13/2017	8,200	63
Wetland South of Wellfield (SWS 493)	6/13/2017	8,200	420
Mississippi River (SWS 262)	6/13/2017	14,000	460

Isotope Results

The analytical results indicate that most of the city wells are being recharged by modern age water, with concentrations and sampling dates ranging from 4.6 TU to 8.5 TU and from 2010 to 2017, respectively. The exception is Well 8, where the tritium results indicate that the well is being recharged by mixed age water. Mixed age water indicates a combination of modern and premodern water (Lindsey et. al, 2019).

The variability of the stable isotope results are indicating that most of the wells are subject to rapid or seasonal recharge of surface water from rainfall (Bowen and Revenaugh, 2003). In addition, the results indicate that during at least one or more monitoring event, the wells are likely receiving a contribution of water from a surface water feature(s). This is based on the evidence of evaporative signatures inferred by the isotope results, shown in Figures 2-4. The results from Wells 4 and 7 demonstrated the strongest evaporative signatures relative to surface water monitoring, though occurring during seasons off set compared to surface waters. The isotope results from Well 4 indicated an evaporative signature in all four monitoring events. The isotope results from Well 8 indicated an evaporative signature in only one of four monitoring events. A summary of the isotope results is provided in Appendix A.

Field Measurements

Field measurements of temperature and specific conductivity also suggest that several wells are more susceptible to seasonal variations and surface water contribution. Well 7 demonstrated the largest range in temperature, along with Wells 4 and 8. Well 6 demonstrated the lowest range in water sample temperature, along with Wells 3 and 5. The measurement range of specific conductivity was greatest in Well 4, followed by Wells 7 and 5. The specific conductivity values of water samples collected from Well 7 were the most similar to nearby surface waters, whereas the conductivity of water samples from the other wells were all significantly greater than Well 7 (ranging 24% to 82% higher).

Measurements of redox potential (Eh) and dissolved oxygen are useful for describing aquifer or surface water reducing or oxidizing capacity. The negative Eh and low dissolved oxygen measurements at Wells 3-7 are likely indicating that the aquifer is reducing and under anaerobic conditions at these locations. The positive Eh and higher dissolved oxygen measurements at Well 8 are indicating a significantly different aquifer environment compared to the other city wells, and is likely under aerobic conditions. All of the surface waters, except the wetland located south of the main wellfield, appear to also be under aerobic conditions. Measurements from the wetland indicate negative Eh values, but also higher dissolved oxygen measurements compared to the nearby city wells.

General Chemistry

During the period of monitoring, the chloride results from samples collected at Well 8 were consistently the highest, indicating a greater impact by chloride sources compared to other

wells and surface water features. The chloride results from Well 8 ranged 39 mg/l to 42.5 mg/l. The chloride results of the other wells ranged 13.7 mg/l to 34.4 mg/l. The results from the surface water features ranged 4.5 mg/l to 27.4 mg/l (excluding an anomalous result collected at the discharge basin during the winter quarter). All results are well below the secondary maximum contaminant levels (MCLs) and do not exceed safe drinking water standards.

The chloride/bromide ratio calculations follow a similar trend. The ratio of chloride to bromide can be used to assess whether or not water has been impacted by human activity. A chloride/bromide ratio above 250 suggests that the water has been impacted by human sources, but does not pose a direct threat to the safety of the drinking water source. The chloride/bromide ratio calculations vary between sample locations, but all are greater than 250, with the highest values measured at Well 8 and the discharge basin wetland feature near Wells 3-7. The chloride/bromide ratio at Well 8 exceeds 1300 and is indicative of aquifer contamination by road salt or water softener effluent. There was one occasion each where the chloride/bromide ratio exceeded 1300 at both the discharge basin and the south wetland features, though in different seasons. The lower values measured at Wells 3-7, Little Buffalo Creek, and the Mississippi River fall in the range of those expected when impacted by wastewater sources (septic systems or sewers) or agricultural sources such as potash fertilizer (Mullaney et. al, 2009).

Nitrate-nitrogen and ammonia nitrogen results are generally low among all samples sites. Nitrate results ranged from non-detectable (<0.05 mg/l) to 0.36 mg/l in Wells 3-7, with Well 7 consistently having no detectable nitrate-nitrogen. Nitrate values ranged 1.2 mg/l to 1.3 mg/l in Well 8. In comparison, ammonia nitrogen ranged between 0.08 mg/l to 0.25 mg/l in Wells 1-7, whereas there was no detectable ammonia nitrogen in samples collected from Well 8. These results are consistent with aquifer conditions characterized by the Eh and dissolved oxygen results at the wells.

The nitrate-nitrogen and ammonia nitrogen results for the surface water features were also low, though they varied between locations. Nitrate results from the combined surface water locations ranged between non-detectable (<0.05 mg/l) to 1.2 mg/l, with no detectable nitrate measured from the discharge basin (SWS 260) during all four sampling events. The highest nitrate result (1.2 mg/l) was measured during the winter quarter (January, 2018) from the Little Buffalo Creek site (SWS 483), which is located furthest upstream from Well 8. The highest nitrate results measured from the second Little Buffalo Creek site (SWS 261, near W8) and the wetland (SWS 493) also occurred during the winter season. The combined ammonia nitrogen results from the surface water locations ranged between non-detectable (<0.05 mg/l) to 0.26 mg/l, with no detectable ammonia measured from the discharge basin (SWS 260) [excluding the 1/19/2018 anomalous result]. The highest ammonia result (0.26 mg/l) was measured during the winter season from the wetland (SWS 493).

Total organic carbon (TOC) is a parameter that sometimes can be useful for identifying surface water contribution to wells, especially with respect to lakes and wetlands. For Wells 3-6 and 8, the TOC results were generally in the range found in Minnesota groundwater, with results ranging from 1.1 mg/l to 3.8 mg/l. Well 8 consistently had the lowest TOC result of all of the wells, followed by Wells 6 and 4. In comparison, Well 7 had consistently higher concentrations, ranging from 8.0 mg/l to 8.4 mg/l. The TOC results of the surface water features were higher than most of the wells and also more variable between seasons. The least variability as well as

the lowest TOC results were generally from the discharge basin wetland, ranging between 6.4 mg/l to 7 mg/l. The TOC results of the other surface water features were variable between monitoring events, ranging from 3.9 mg/l to 23 mg/l. TOC concentrations were lowest during the winter monitoring event (January 2018) for all of the surface water features, ranging between 3.9 mg/l to 11 mg/l. Except for the discharge basin, the TOC results were generally highest during the fall monitoring event, ranging from 16 mg/l to 23 mg/l.

Bacteria Monitoring of Surface Waters

In June 2017, the surface water features were also sampled for coliform bacteria and *E. coli*; the results are provided in Table 6. Coliform bacteria and *E. coli* were detected in all of the surface water features. The lowest concentrations were detected in the discharge basin wetland and the highest concentrations were detected in Little Buffalo Creek.

Monitoring for bacteria occurs regularly along the Brainerd water distribution system. During the period of monitoring that coincided with this plan (June 2017 to May 2018), no coliform bacteria was detected from distribution system sampling. The city wells are typically monitored for bacteria every 18 months, but the monitoring schedule did not coincide with the period of this monitoring plan. In general, coliform bacteria has not been detected from well water samples, except on two occasions. In 2019, coliform bacteria was detected in Well 7 using the PA Total Coliform-DW analytical technique (A.W. Research Laboratories). Well 7 was monitored again several times afterwards, and follow-up sampling indicated no presence of coliform bacteria. On another occasion in 2016, coliform bacteria was detected in Well 3 at a concentration of 1.0 MPN/100ml. This result was determined to be unconfirmed, because no coliform bacteria was detected when re-analyzed using the PA Total Coliform-DW technique.

Although the monitoring of bacteria was limited in scope, the results seem to point to an understanding that bacteria detected in nearby surface water features are not impacting the city wells. This scenario could potentially change under other circumstances. For example, if the pumping regimes were drastically altered, or perhaps if the concentration of bacteria in the surface waters escalated due to an unusually long, wet season.

Summary

The results of the monitoring plan are useful for informing the amendment to the city's wellhead protection plan. The results are indicating that the wells are being impacted by rapid recharge of young water. In addition, the results indicate that during at least one or more monitoring event, all of the wells are likely receiving a contribution of water from a surface water feature(s). This is based on the evidence of evaporative signatures inferred by the isotope results. The results from Well 7 and Well 4 demonstrated the strongest evaporative signatures, though occurring during seasons off set compared to nearby surface waters. The field measurements of temperature and specific conductivity, as well as elevated TOC results, suggest a fairly strong connection between Well 7 and the wetland located south of the city wells.

One year capture zones of past groundwater modeling efforts suggest a fairly strong connection between Wells 3-6 with the discharge basin. The stable isotope results indicate a degree of connection with surface water, but not necessarily a strong evaporative signature as compared to Well 7. The weakening of the evaporative signature could potentially be explained by the weekly occurrence of treatment plant discharge to the basin. The chemistry of the discharge water represents a potential mix from all six of the city wells. In addition, the regular contribution of the discharge water may disrupt the formation of an evaporative signature at the basin, especially during the summer and fall seasons.

Well 8 is offset from the other five city wells and is in close proximity to Little Buffalo Creek. Past modeling efforts indicated a potential connection between Well 8 and the creek. However, the results of the monitoring plan do not necessarily support a strong connection. An evaporative signature was observed in only one of the four monitoring events, even though the creek samples indicated a fairly strong evaporative signature during two of four monitoring events. The evaporative signature at Well 8 occurred in the spring season, while the evaporative signature of the creek samples occurred during the summer and fall seasons. This could be indicating a lag time between of the evaporative signature between the creek and the well. The monitoring results also indicate that Well 8 is being impacted by chlorides, whereas the impact of chlorides to the creek is significantly less. In addition, Well 8 consistently had the lowest TOC results of all the sampled waters, whereas the results of the creek samples ranged between 3.9 mg/l to 23 mg/l. All of this information will be useful for informing future groundwater modeling of this well's capture area.

Selected References

Bowen, G.J., and Revenaugh, J. (2003), *Interpolating the isotopic composition of modern meteoric precipitation*. Water Resources Research 29, 1299, doi:10.129/2003WR002086.

Lindsey, B.D., Jurgens, B.C., and Belitz, K., (2019), *Tritium as an indicator of modern, mixed, and premodern groundwater age*, U.S. Geological Survey Scientific Investigations Report 2019–5090, 18 p.

Mullaney, J.R., Lorenz, D.L., and Arntson, A.D. (2009), *Chloride in groundwater and surface water in areas underlain by the glacial aquifer system, northern United States*, Scientific Investigations Report, 2009-5086, U.S. Geological Survey, Reston, Va., 41 p.

WELLHEAD PROTECTION MONITORING PLAN RESULTS

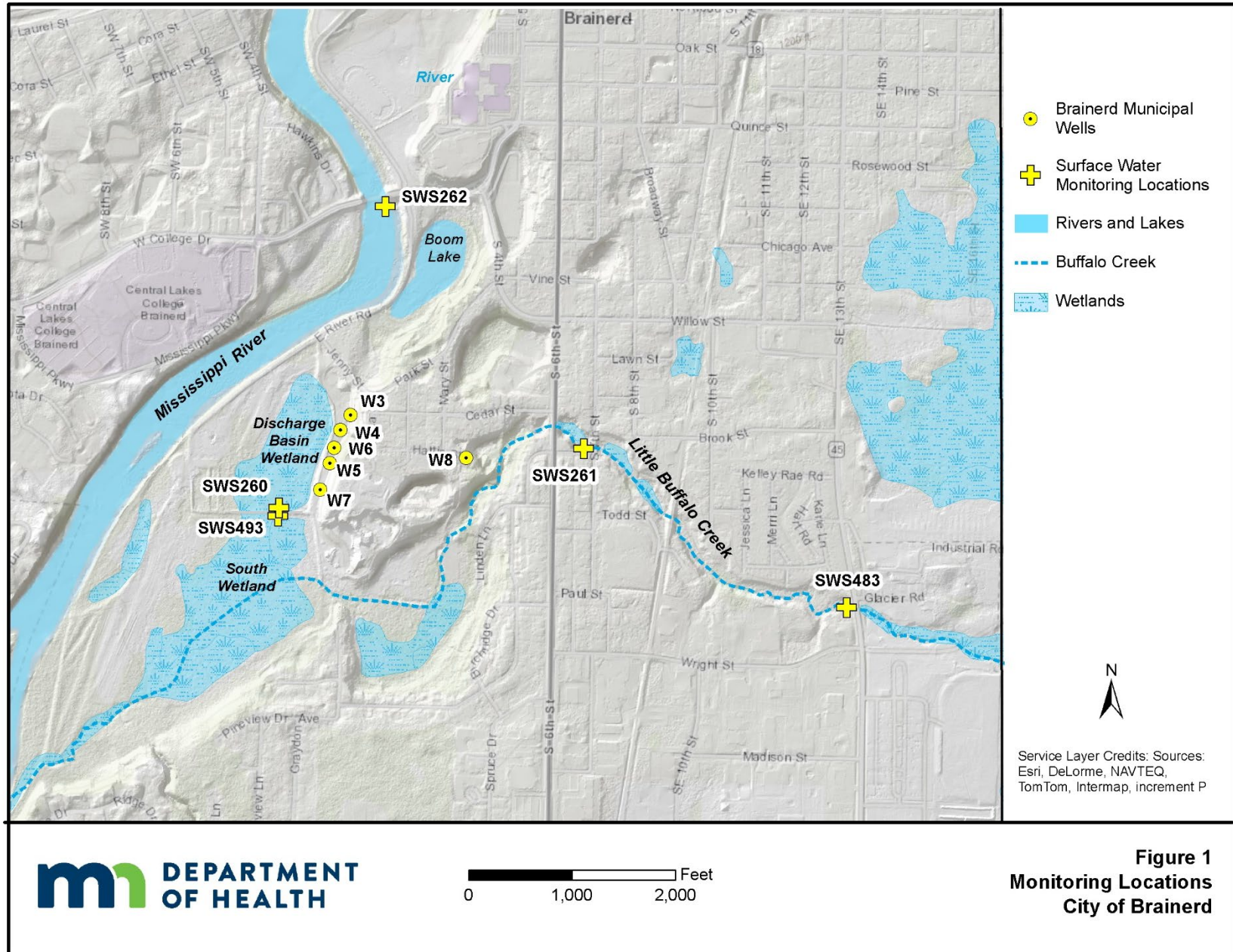


Figure 2. Plot of 18O Monitoring Results

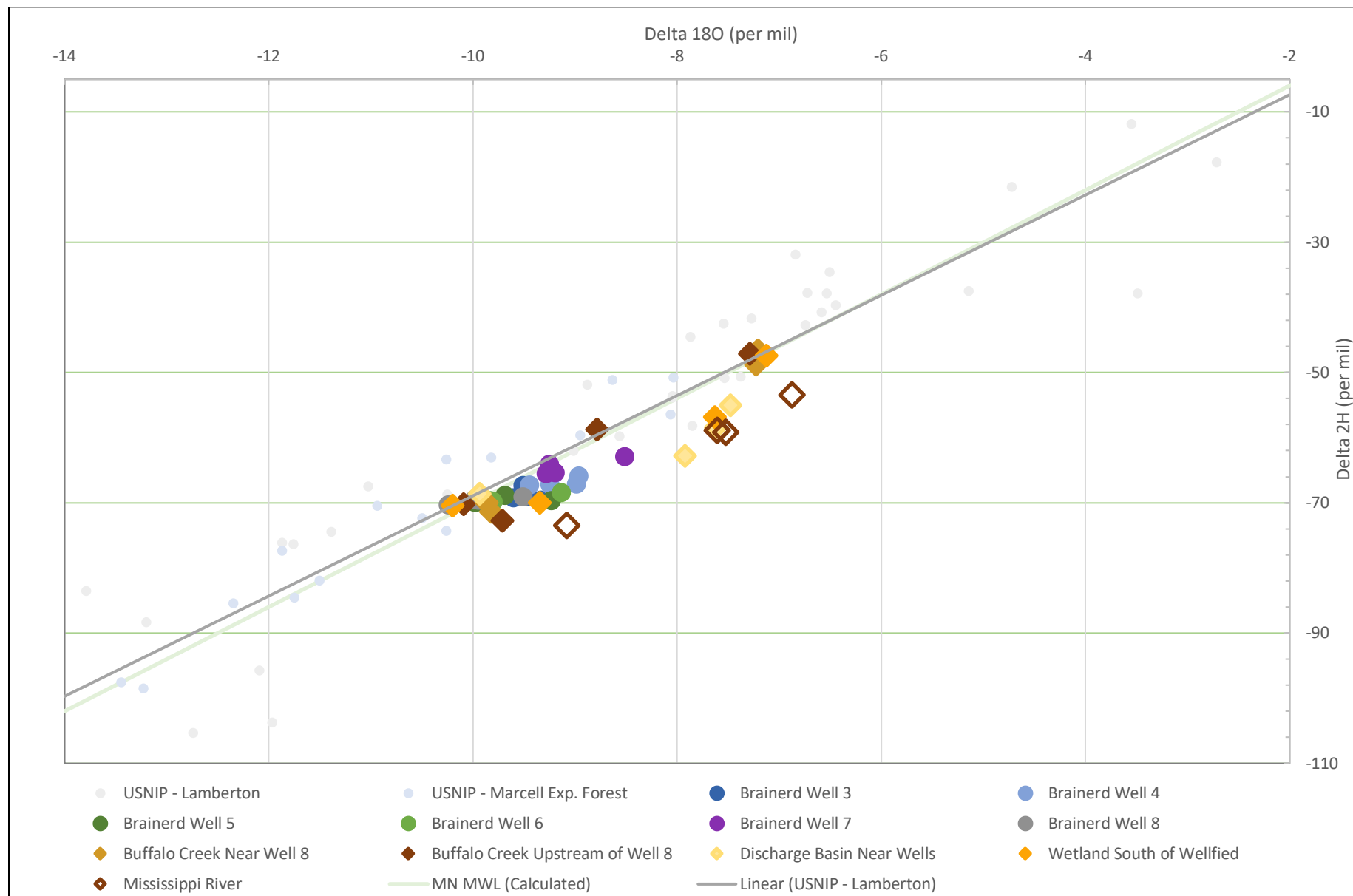
Figure 3. Combined Four Quarters of Stable Isotope Monitoring



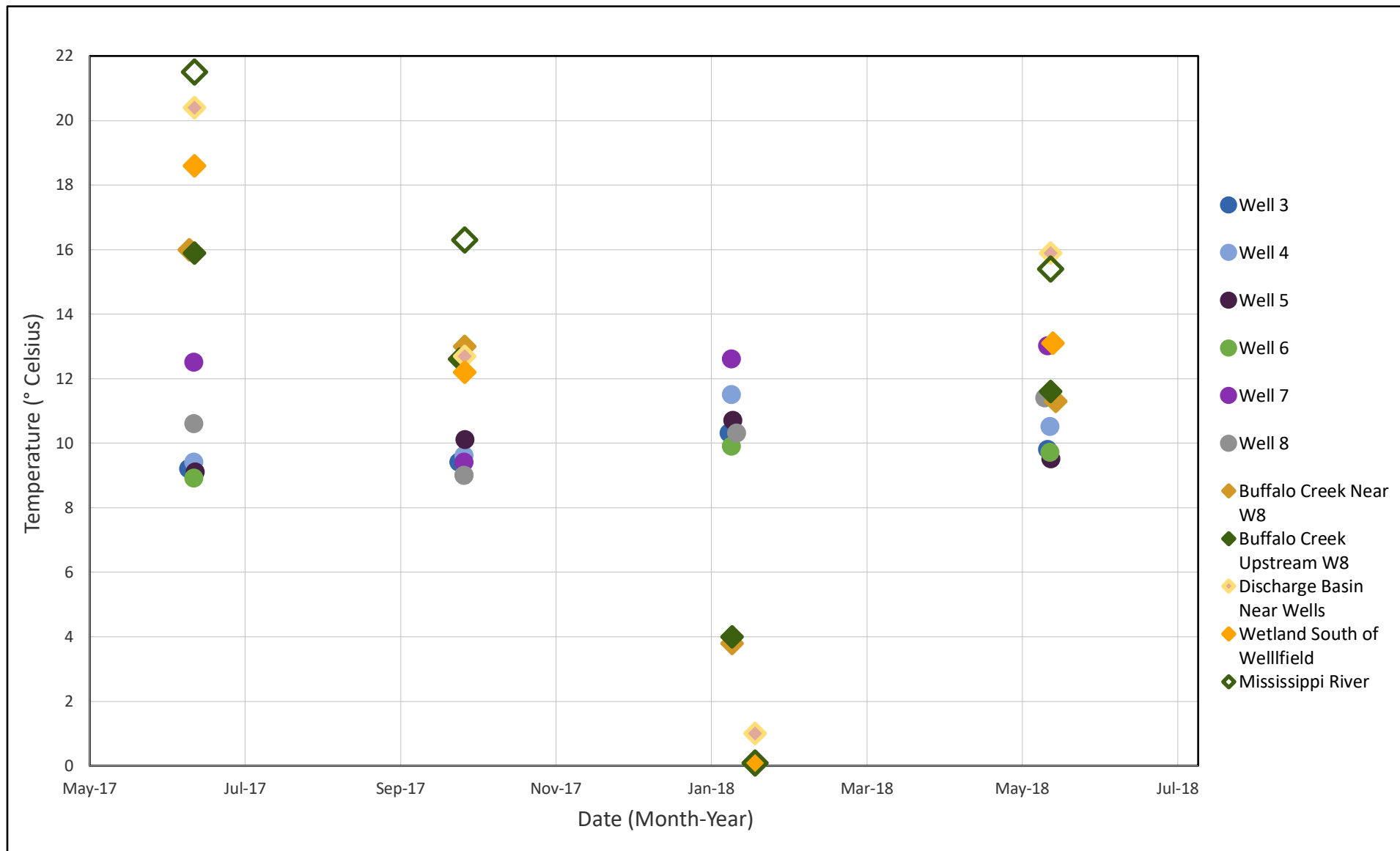
Figure 5. Plot of Field Temperature (°C) Results

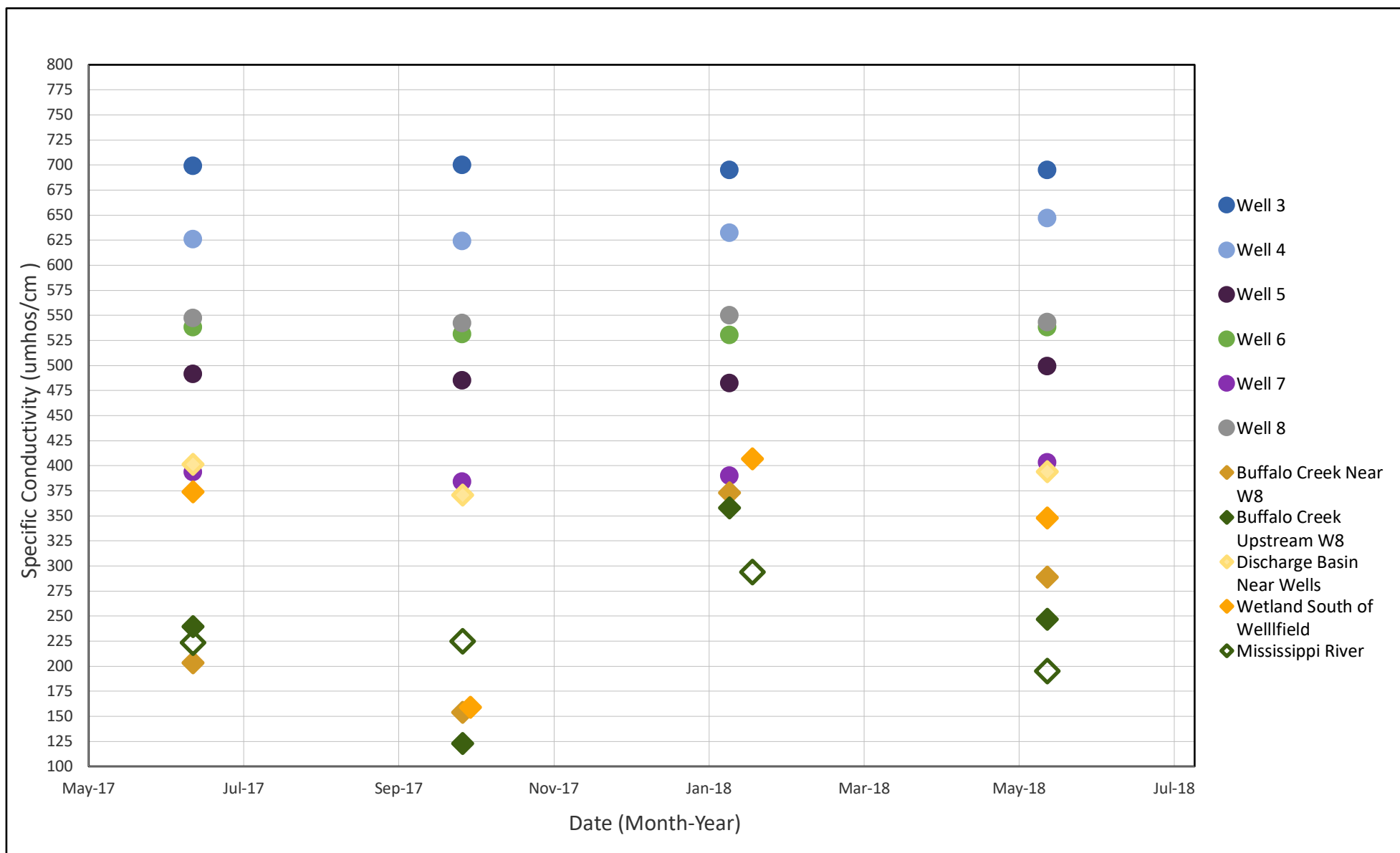
Figure 6. Plot of Field Specific Conductivity (umhos/cm) Results

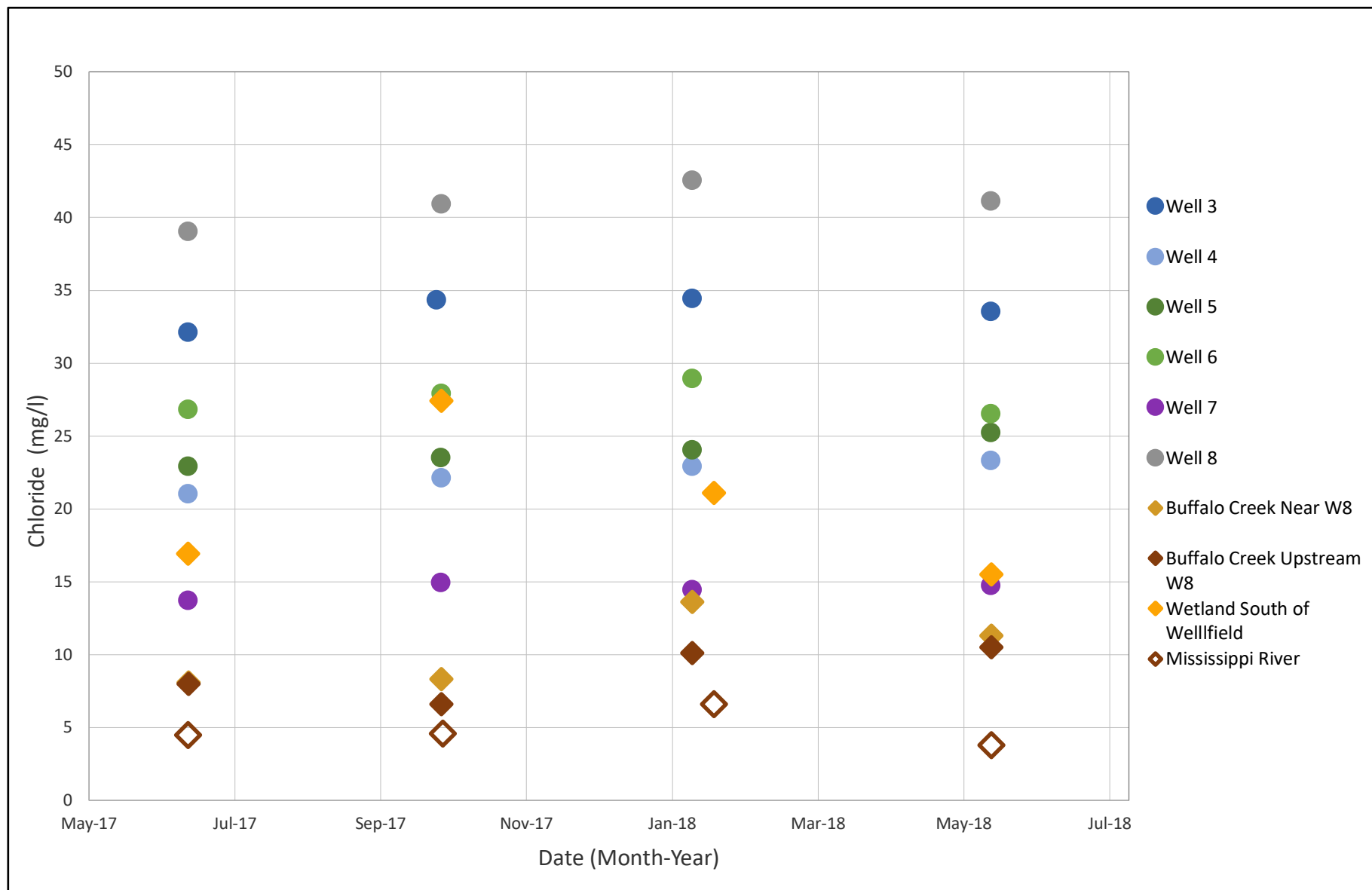
Figure 7. Plot of Chloride (mg/l) Results

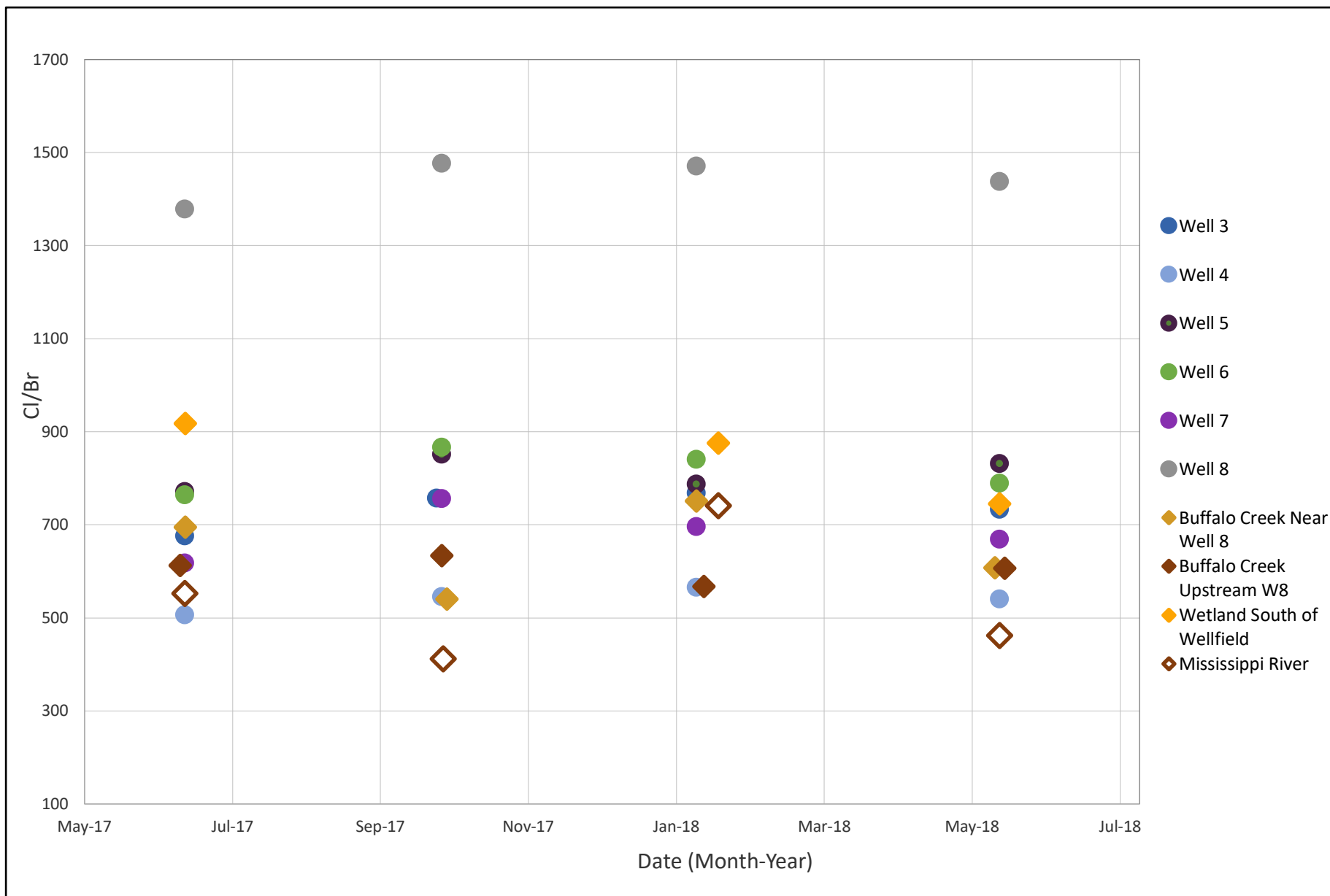
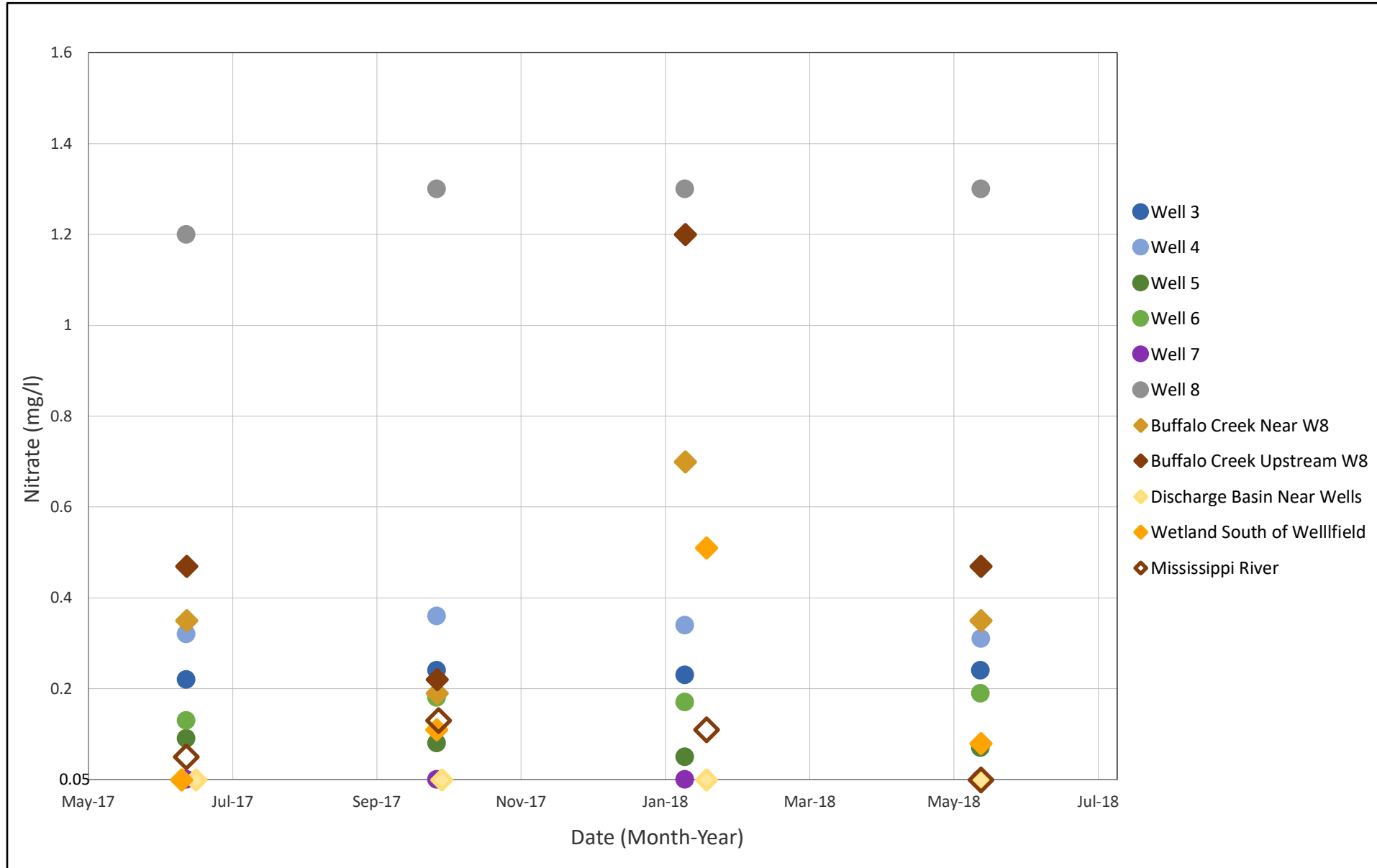
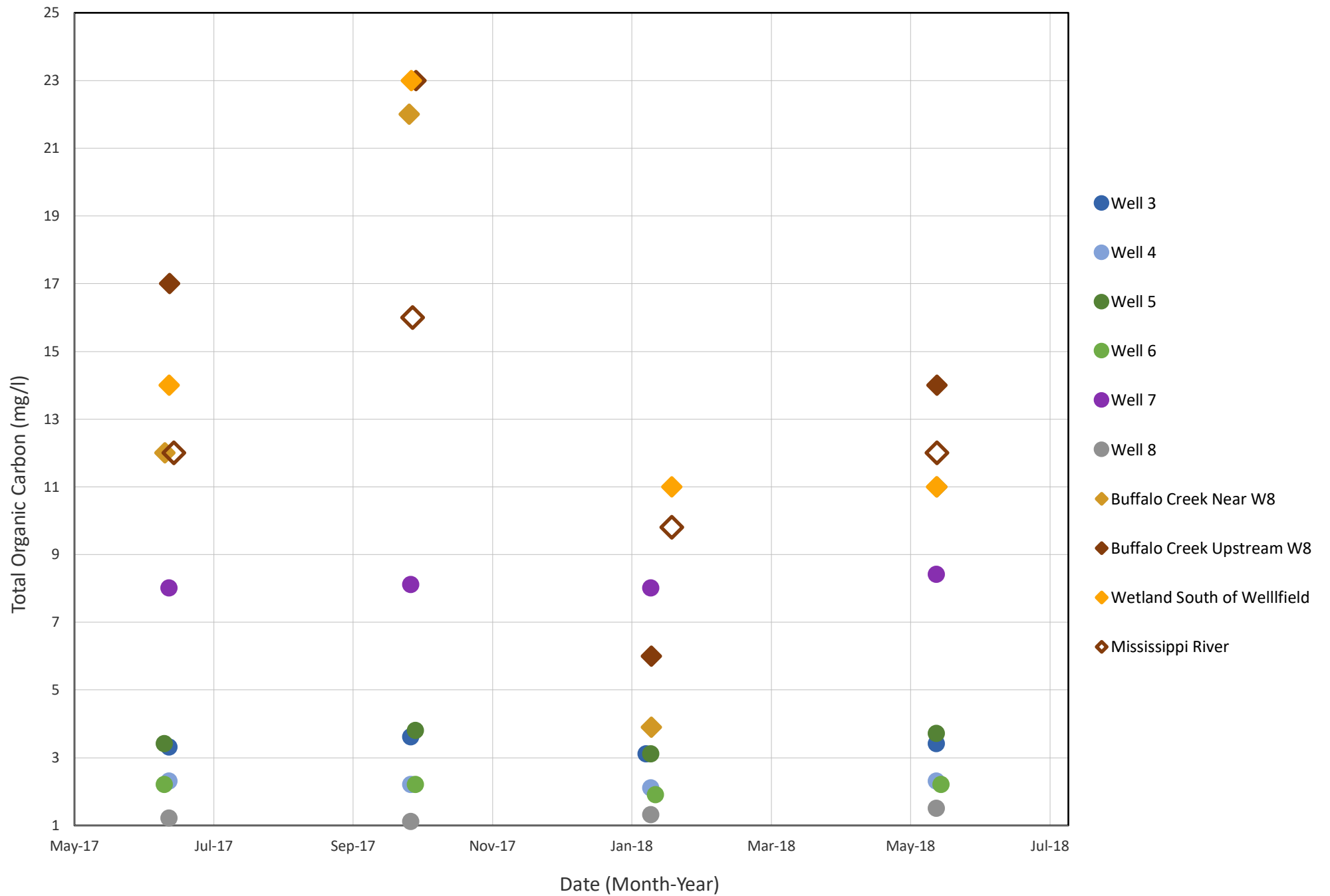
Figure 8. Plot of Chloride/Bromide Results

Figure 9. Plot of Nitrate (mg/l) Results

WELLHEAD PROTECTION MONITORING PLAN RESULTS



Appendix A

Summary of Isotope Analyses

Table 1: ¹⁸O Summary Information

ID (link to Table 2)	No. of Samples	Minimu m Value	Maximu m Value	Mean Value	Coeff. of variation (CV) ¹	Do 1 or more samples show evidence for evaporated surface water? (#)	% of samples showing evidence for evaporated surface water	% evap SW times the mean LC Excess*	% rank of the % evap SW times the mean LC Excess* (include s Virus Study wells: 91 wells total)	Open water (sq.m.) in 1 year Capture Zone	Open water (sq.m.) in 10 year Captur e Zone	Primary Groundwater Classification	Most conservative Geologic Sensitivity	Most recent Tritium result	Temporal Variability	Vertical Hydraulic Gradient Mean	Surface Water Impact Assessment
0000232347 (1180002S01)	4	- 9.596595	- 9.328805	-9.47420975	1%	Yes (3 of 4)	75%	1.6932016129864 6	53%	65,685	69,551	B2	VH	6.03	1	-0.209	possibly impacted by long- residence time surface water; surface water microbiologic al risk
0000232348 (1180002S02)	5	- 9.453232	- 8.958288	-9.2144826	3%	Yes (5 of 5)	100%	2.0956227056386 2	60%	n/a/	n/a		VH	4.634606 7991			possibly impacted by long- residence time surface water at long time of travel
0000232349 (1180002S03)	6	- 9.990148	- 9.229245	- 9.71968683333 333	3%	Yes (3 of 6)	50%	1.10811622260119 9	30%	n/a/	n/a		VH	7.991681 0736			possibly impacted by long- residence time surface water at long time of travel

WELLHEAD PROTECTION MONITORING PLAN RESULTS

ID (link to Table 2)	No. of Samples	Minimum Value	Maximum Value	Mean Value	Coeff. of variation (CV) ¹	Do 1 or more samples show evidence for evaporated surface water? (#)	% of samples showing evidence for evaporated surface water	% evap SW times the mean LC Excess*	% rank of the % evap SW times the mean LC Excess* (includes Virus Study wells: 91 wells total)	Open water (sq.m.) in 1 year Capture Zone	Open water (sq.m.) in 10 year Capture Zone	Primary Groundwater Classification	Most conservative Geologic Sensitivity	Most recent Tritium result	Temporal Variability	Vertical Hydraulic Gradient Mean	Surface Water Impact Assessment
0000232350 (1180002S04)	4	- 9.870392	- 9.131699	-9.65717125	4%	Yes (2 of 4)	50%	- 1.0846300400544 2	27%	n/a/	n/a		VH	8.5			possibly impacted by long- residence time surface water at long time of travel
0000232352 (1180002S05)	5	- 9.278754	-8.50924	-9.056461	4%	Yes (3 of 5)	60%	- 1.1911778071157 7	35%	n/a/	n/a		VH	7			possibly impacted by long- residence time surface water at long time of travel
0000403973 (1180002S06)	7	- 10.236448	-9.35403	- 9.88588257142 857	3%	Yes (2 of 7)	29%	- 0.6664677192266 36	10%	n/a/	n/a		H	4.9			possibly impacted by long- residence time surface water at long time of travel

⁽¹⁾ - A **highlighted** CV indicates it meets or exceeds the threshold value for high variability of 3% and may indicate rapid or seasonal recharge (https://dwpreports.web.health.state.mn.us/DWP_Reports/gw_categories_11.pdf).

Table 2: Isotope Analysis

¹⁸ O	² H	ID (link to Table 1)	Collection Date	LC Excess* (1)	Does the LC Excess* show that the sample is significantly different than the MWL? (2)	Evidence for evaporated surface water? (3)	Estimated Annual Precipitation (Bowen grid for North America for ¹⁸ O values) (4)	Is the sample ¹⁸ O value significantly different than the Estimated Annual Precipitation value (Bowen, 2003)? (5)	Precipitation month most closely matching ¹⁸ O	Precipitation for month most closely matching ¹⁸ O	Precipitation difference for month most closely matching ¹⁸ O
- 9.503944	- 67.427186	0000232347 (1180002S01)	6/13/2017	- 0.97605955	No	No	-10.6325	Yes	September	-9.5525	0.0486
- 9.596595	- 69.336381	0000232347 (1180002S01)	9/27/2017	- 1.63416348	Yes	Yes	-10.6325	Yes	September	-9.5525	0.0441
- 9.467495	- 69.170561	0000232347 (1180002S01)	1/10/2018	- 2.11160312	Yes	Yes	-10.6325	Yes	September	-9.5525	0.0850
- 9.328805	- 69.712493	0000232347 (1180002S01)	5/15/2018	- 3.02703985	Yes	Yes	-10.6325	Yes	September	-9.5525	0.2237
- 9.439783	- 67.400784	0000232348 (1180002S02)	6/13/2017	- 1.24465039	Yes	Yes	-10.6325	Yes	September	-9.5525	0.1127
- 9.453232	- 67.74152	0000232348 (1180002S02) (Replicate)	6/13/2017	- 1.37573367	Yes	Yes	-10.6325	Yes	September	-9.5525	0.0993
- 9.240956	- 67.322388	0000232348 (1180002S02)	9/27/2017	- 2.07889230	Yes	Yes	-10.6325	Yes	September	-9.5525	0.3116
- 8.958288	- 66.009034	0000232348 (1180002S02)	1/10/2018	- 2.59303320	Yes	Yes	-10.6325	Yes	September	-9.5525	0.5942
- 8.980154	- 67.242156	0000232348 (1180002S02)	5/15/2018	- 3.18580397	Yes	Yes	-10.6325	Yes	September	-9.5525	0.5724
- 9.972591	- 70.099673	0000232349 (1180002S03)	6/13/2017	- 0.40037026	No	No	-10.6325	Yes	September	-9.5525	0.4201
- 9.949658	- 69.949335	0000232349 (1180002S03)	9/27/2017	- 0.41760627	No	No	-10.6325	Yes	September	-9.5525	0.3971

WELLHEAD PROTECTION MONITORING PLAN RESULTS

¹⁸ O	² H	ID (link to Table 1)	Collection Date	LC Excess* (1)	Does the LC Excess* show that the sample is significantly different than the MWL? (2)	Evidence for evaporated surface water? (3)	Estimated Annual Precipitation (Bowen grid for North America for ¹⁸ O values) (4)	Is the sample ¹⁸ O value significantly different than the Estimated Annual Precipitation value (Bowen, 2003)? (5)	Precipitation month most closely matching ¹⁸ O	Precipitation for month most closely matching ¹⁸ O	Precipitation difference for month most closely matching ¹⁸ O
- 9.990148	- 70.174775	0000232349 (1180002S03) (Replicate)	9/27/2017	- 0.36481773	No	No	-10.6325	Yes	September	-9.5525	0.4376
- 9.680022	- 69.006036	0000232349 (1180002S03)	1/10/2018	- 1.08106183	Yes	Yes	-10.6325	Yes	September	-9.5525	0.1275
- 9.229245	- 69.745838	0000232349 (1180002S03)	5/15/2018	- 3.48536055	Yes	Yes	-10.6325	Yes	September	-9.5525	0.3233
- 9.496457	- 69.346897	0000232349 (1180002S03) (Replicate)	5/15/2018	- 2.08227497	Yes	Yes	-10.6325	Yes	September	-9.5525	0.0561
- 9.870392	- 69.684501	0000232350 (1180002S04)	6/13/2017	- 0.61961678	No	No	-10.6325	Yes	September	-9.5525	0.3179
- 9.797609	- 69.955902	0000232350 (1180002S04)	9/27/2017	- 1.09276133	Yes	Yes	-10.6325	Yes	September	-9.5525	0.2451
- 9.828985	- 69.75567	0000232350 (1180002S04)	1/10/2018	- 0.84226448	No	No	-10.6325	Yes	September	-9.5525	0.2765
- 9.131699	- 68.546612	0000232350 (1180002S04)	5/15/2018	- 3.24575883	Yes	Yes	-10.6325	Yes	September	-9.5525	0.4208
- 9.244059	- 64.184088	0000232352 (1180002S05)	6/13/2017	- 0.31082569	No	No	-10.6325	Yes	September	-9.5525	0.3085
- 9.278754	- 65.663033	0000232352 (1180002S05)	9/27/2017	- 0.98435983	No	No	-10.6325	Yes	September	-9.5525	0.2738
- 9.192517	- 65.49562	0000232352 (1180002S05)	1/10/2018	- 1.27161591	Yes	Yes	-10.6325	Yes	September	-9.5525	0.3600
- 9.057735	- 65.366775	0000232352 (1180002S05) (Replicate)	1/10/2018	- 1.79481825	Yes	Yes	-10.6325	Yes	September	-9.5525	0.4948

WELLHEAD PROTECTION MONITORING PLAN RESULTS

¹⁸ O	² H	ID (link to Table 1)	Collection Date	LC Excess* (1)	Does the LC Excess* show that the sample is significantly different than the MWL? (2)	Evidence for evaporated surface water? (3)	Estimated Annual Precipitation (Bowen grid for North America for ¹⁸ O values) (4)	Is the sample ¹⁸ O value significantly different than the Estimated Annual Precipitation value (Bowen, 2003)? (5)	Precipitation month most closely matching ¹⁸ O	Precipitation for month most closely matching ¹⁸ O	Precipitation difference for month most closely matching ¹⁸ O
-8.50924	- 62.99181	0000232352 (1180002S05)	5/15/2018	- 2.88945487	Yes	Yes	-10.6325	Yes	May	-8.1525	0.3567
- 10.236448	- 70.441109	0000403973 (1180002S06)	6/13/2017	0.57401553	No	No	-10.6325	No	April	-10.6925	0.4561
- 10.169263	- 70.567916	0000403973 (1180002S06) (Replicate)	6/13/2017	0.20642357	No	No	-10.6325	Yes	April	-10.6925	0.5233
- 9.980446	-69.56	0000403973 (1180002S06)	9/27/2017	- 0.06399436	No	No	-10.6325	Yes	September	-9.5525	0.4279
- 9.943204	- 69.705809	0000403973 (1180002S06)	1/10/2018	- 0.30997347	No	No	-10.6325	Yes	September	-9.5525	0.3907
- 10.013678	- 70.503508	0000403973 (1180002S06) (Replicate)	1/10/2018	- 0.44467107	No	No	-10.6325	Yes	September	-9.5525	0.4612
- 9.504109	- 69.218059	0000403973 (1180002S06)	5/15/2018	- 1.97645931	Yes	Yes	-10.6325	Yes	September	-9.5525	0.0484
-9.35403	- 69.306735	0000403973 (1180002S06) (Replicate)	5/15/2018	- 2.68881472	Yes	Yes	-10.6325	Yes	September	-9.5525	0.1985

[\(1\)](#) - Bowen GJ, Revenaugh J (2003) Interpolating the isotopic composition of modern meteoric precipitation. Water Resources Research 39, 1299, doi:10.129/2003WR002086

[\(2\)](#) - Absolute values of LC Excess* that are greater than 1 are considered significant deviations from the Minnesota MWL.

[\(3\)](#) - Evidence of evaporated surface water is set to 'Yes' only for those samples where the LC Excess* was both negative and significant, and ¹⁸O is heavier than the Estimated Annual Precipitation.

[\(4\)](#) - Landwehr, J.M. and Coplen, T.B. (2004) Line-conditioned excess: A new method for characterizing stable hydrogen and oxygen isotope ratios in hydrologic systems. In Isotopes in Environmental Studies, Edition: 1, Chapter: IAEA-CN-118/56, Publisher: IAEA, pp.132-135. See pp. 99-100 in: http://www.iaea.org/inis/collection/NCLCollectionStore/_Public/36/003/36003223.pdf

[\(5\)](#) - Differences between ¹⁸O and Estimated Annual Precipitation that are greater than 0.4 are considered significantly different.

DECEMBER 2011

City of BRAINERD



Wellhead Protection Plan Part II



VARIABLE VULNERABILITY SETTING

**This plan is in effect from:
Estimated Dates=
April 2012-April 2022**

THIS PAGE INTENTIONALLY LEFT BLANK

Forward

This document presents the wellhead protection (WHP) plan for the Public Water Supplier that will help provide for an adequate and safe drinking water supply for community residents. It contains the following components:

- Assessment of the data elements used to prepare the plan;
- Delineation of the wellhead protection area and the drinking water supply management area, and assessments of well and drinking water supply management area vulnerabilities;
- Impact of land and water use changes on the public water supply well(s) used by the water supplier;
- Issues, problems, and opportunities affecting the well(s), well water, and the drinking water supply management area;
- Wellhead protection goals for this plan;
- Objectives and plan of action for achieving the wellhead protection goals;
- Evaluation program for assessing the effectiveness of this plan; and
- Contingency strategy to address an interruption of the water supply.

Water Supply Wells Included in This Plan

Unique Number	Well Name or Number	Well Depth (ft.)	Date of construction	Use/Status ¹
232347	3	125	1939	P
232348	4	123	1944	P
232349	5	145	1947	P
232350	6	156	1947	P
232352	7	157	1955	P
403973	8	187	1984	P

¹P = Primary Water Supply Well

WHP Plan Manager:

Darwin Cole, Water Supervisor – Brainerd Public Utilities
8027 Highland Scenic RD, P.O.Box 373, Brainerd, MN 56401
Phone 218-825-3218

WHP Team Members:

Darwin Cole/BPU, Scott Magnuson/BPU, Todd Wicklund/BPU, Mark Ostergarden/City Planner-Brainerd, Jesse Freihammer/Asst. City Engineer-Brainerd, Shawn Strong/GIS, IT-Brainerd, Mitch Brinks/Crow Wing Co. Water Planner, Mark Wettlaufer/MDH

Written By:

Mike Howe, Water Resource Planner
studio e architects/planners
efficiency+energy+environmental design
609 1/2 Broadway Street, Alexandria, MN 56308

Table of Contents

Page Number

Forward	i
Table of Contents	ii
Acronyms found in this Plan	iii
Chapter 1 –City of Brainerd DWSMA (Figure 1), Introduction	1
Chapter 2 – The Protection Area – Summary of the Part 1 Report of February 2011	2
Chapter 3 – Data Elements and Assessments	3
Chapter 4 – Impact of Changes on Public Water Supply Wells	11
Chapter 5 – Issues, Problems and Opportunities	12
Chapter 6 – Wellhead Protection Goals	13
Chapter 7 – Objectives and Plan of Action	13
Chapter 8 – Evaluation Program	19
Chapter 9 – Alternative Water Supply; Contingency Strategy	19
References for this plan	20

Appendix I—WHP Part 1 Report

Appendix II—Potential Contaminant Source Inventory (tables, figures)

Appendix III—Water Supply Plan letter; June 2011-Water Report 2010; Brainerd “letter of intent”; Brainerd Scoping II letter from MDH; Old PCSI map (1998 plan); Part 2 Recommendations GLH; swp00528; EPA Class V well information; MDH wells information

Tables:

• Table 1 – Assessment of Data Elements	4
• Table 2 – Land Cover Statistics	7
• Table 3 –Potential Contaminant Source Inventory (PCSI) Summary: Potential contaminants identified in the <u>Highly Vulnerable DWSMA</u>	8
• Table 4 – Potential Contamination Sources identified as <u>wells in entire DWSMA</u>	9
• Table 5 – Expected Land and Water Use Changes	11
• Table 6 – Issues, Problems & Opportunities	12
• Table 7 – Management Strategies – Actions to Implement Wellhead Protection	14
• Table 8 – Old Municipal Wells	Appendix II
• Table 9- Tanks, Spills in the Vulnerable DWSMA	Appendix II
• Table10- Multiple Activities in the Vulnerable DWSMA	Appendix II
• Table 11—Potential Contaminant Source Inventory-LIST	AppendixII

Figures:

➤ Figure 1 – Brainerd Drinking Water Supply Management Area	pg. 1
➤ Figure 2 – Brainerd DWSMA Land Cover	Appendix II
➤ Figure 3 – Brainerd Zoning	Appendix II
➤ Figure 4 – Oaklawn Twp./County Zoning	Appendix II
➤ Figure 5 – Existing Land Use	Appendix II
➤ Figure 6 – DWSMA Parcels	Appendix II
➤ Figure 7 – PCSI What’s In My Neighborhood	Appendix II
➤ Figure 8 – PCSI Wells & Septics	Appendix II
➤ Figure 9 – PCSI Storm Sewer	Appendix II

Acronyms found in this Plan:

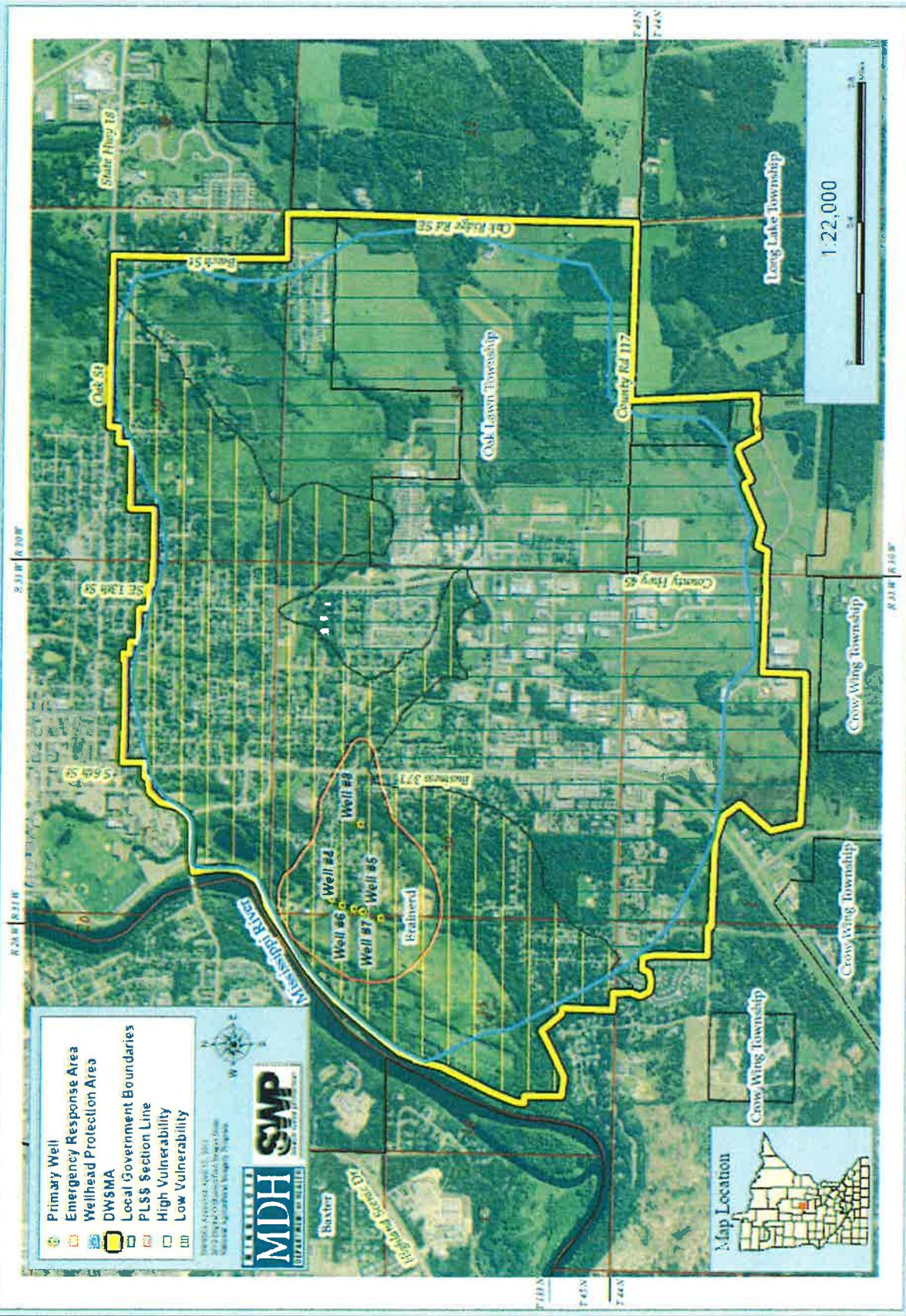
CWI-County Well Index
DWSMA-drinking water supply management area
ERA-emergency response area
IWMZ-inner well management zone
MS4-municipal storm-water plan
NPDES-National Pollutant Discharge Elimination System
PCSI-potential contaminant source inventory
PWS-public water supply
SWP-Source Water Protection
TMDL-total maximum daily load
WHPA-wellhead protection area
WHP-wellhead protection

AGENCIES:

BPU-Brainerd Public Utilities
EPA-Environmental Protection Agency
DNR (MDNR)-Minnesota Department of Natural Resources
MDA-Minnesota Department of Agriculture
MDH-Minnesota Department of Health
MGS-Minnesota Geological Survey
MNTAP-Minnesota Technical Assistance Program
MPCA-Minnesota Pollution Control Agency
MRWA-Minnesota Rural Water Association
NRCS-Natural Resources Conservation Service
SWCD-Soil and Water Conservation District
USDA-United States Department of Agriculture
MNDOT-Minnesota Department of Transportation
USGS-United States Geological Survey

Chapter 1 - FIGURE 1

**Brainerd Drinking Water Supply Management Area
(DWSMA) MN-00528 - Variable Vulnerability**



Chapter 1 - Introduction

1.1 Background

The wellhead protection (WHP) plan for the Public Water Supplier was prepared in cooperation with the Minnesota Department of Health (MDH). It contains specific actions that the city will take to fulfill WHP requirements that are specified under Minnesota Rules 4720.5510 to 4720.5590. Also, the support that Minnesota state agencies, federal agencies, and local units of government may provide is presented to identify their roles in protecting the city's drinking water supply. The plan is effective for 10 years after the approval date specified by the MDH and the City is responsible for implementing its WHP plan of action as described in Table 7 of this report. The city will evaluate the status of plan implementation at least every two and one half years to identify whether this plan is being implemented on schedule.

The drinking water supply management area (DWSMA) for which this plan has been developed is found in Figure 1. This wellhead protection area delineation is summarized in Chapter 2 of this plan and included in its entirety in Appendix I of this plan.

1.2 Plan Appendices

Much of the technical information that was used to prepare this plan is contained in the appendices but is summarized in the main body of this plan. In particular –

- Included in Appendix I is the first part of the WHP plan, commonly called the Part 1 Report consisting of the delineation of the wellhead protection area (WHPA), the drinking water supply management area (DWSMA), and the vulnerability assessments for the public water supply wells, the aquifer, and the DWSMA. This is summarized in Chapter 2 of this plan.
- Appendix II contains the inventory of potential contamination sources that may present a risk to the city's drinking water. Additional information relevant to understanding of the potential contaminants (including a summary of "Old Municipal Wells") is also found in Appendix II. This part of the plan is discussed in Chapter 3 under 3.1 B (Land Use Data Elements) in terms of assigning risk to the city's water supply and is discussed as issues, problems or opportunities in Chapter 5.
- Appendix III contains the contingency strategy (or verification thereof) to provide for an alternate water supply if there is a disruption caused by contamination or mechanical failure. This part of the plan is discussed in Chapter 9. The most current "Consumer Confidence Report" on water quality is found in this Appendix.

Chapter 2

Summary of Part 1 Report - Delineations & Vulnerability Assessments

2.1 Delineation of the Wellhead Protection Area

The wellhead protection area (WHPA) delineation was completed based upon application of five required criteria: flow boundary, volume of water pumped, groundwater flow field, aquifer transmissivity, and time of travel. The WHPA was delineated using an analytic element computer model called MLAEM. The

delineation is a conjunctive delineation that includes the surface water contribution of Little Buffalo Creek. This new information was not used on the original WHPA delineation (1997). The major uncertainty for the current delineation is regarding an understanding of the interaction between the surface waters (Little Buffalo Creek) and the aquifer into which the wells are constructed. Further work is contemplated in this plan to address those issues. For a complete description of the current WHPA delineation, look to the complete Part 1 report in Appendix I.

2.2 Delineation of the Drinking Water Supply Management Area (DWSMA)

The boundaries of the DWSMA were defined by utilization of the following features:

- Highways, streets, roads, or railroad rights-of-ways;
- Public Land Survey coordinates; and
- Property parcel boundaries.

The DWSMA is a boundary of parcels or fractions thereof that totally encompass the WHPA delineation.

2.3 Vulnerability assessments

All of the Brainerd wells were determined to be vulnerable because of the geologic sensitivity of the aquifer at the well sites, because of tritium detections indicating recharge from weeks to years, and because results of the water chemistry analysis of the chloride/bromide ratio shows that human activity at the land surface has impacted ground water quality.

The vulnerability of the aquifer used by the City is determined to be low in the southeastern part of the DWSMA and high in the northwestern part of the DWSMA due to the differences in underlying geology. The result is a DWSMA with “variable vulnerability”. For a complete description of the vulnerability assessments, look to the complete Part 1 Report in Appendix I.

Chapter 3

Data Elements and Assessment (4720.5200)

The data elements that are included in this plan were used to 1) delineate the WHPA and the DWSMA and to assess DWSMA and well vulnerability and 2) document the need for the WHP measures that will be implemented to help protect the city’s water supply from potential sources of contamination. The city met with representatives from MDH on two occasions to discuss data elements that are specified in Minnesota Rules, part 4720.5400, for preparing a WHP plan.

The first scoping meeting addressed the data elements that were needed to support the delineation of the WHPA, the DWSMA, and the well(s) and DWSMA vulnerability assessments. The second scoping meeting, held on June 23, 2011 discussed the data elements required to 1) identify potential risks to the public water supply and 2) develop effective management strategies to protect the public water supply in relation to well and DWSMA vulnerability. The results of each meeting were communicated to the city by MDH through a formal scoping decision notice.

Table 1 provides a summary of the data elements required by the Minnesota Department of Health and is followed in section 3.1 with a discussion of the elements and their importance to the management of the Brainerd DWSMA.

Table 1 - Assessment of Data Elements

Present and future implications as found in the table are based on the following:

High (H) - the data element has a direct impact

Moderate (M) - the data element has an indirect or marginal impact

Low (L) - the data element has little if any impact

Data Element	Present and Future Implications				Data Source
	Use of the Well (s)	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Precipitation *	M	M	M	M	MN Climatology Officer
Map of local precipitation gauging stations #	L	L	L	L	MGS
Ave. monthly & annual precip. Past 5 yrs.#	L	L	M	L	MGS
Geology					
Maps and geologic descriptions* #	H	H	H	H	MGS, DNR, USGS,
Subsurface data* #	H	H	H	H	MGS, MDH, MPCA, DNR
Borehole geophysics* #	M	H	H	H	MGS, Consultant Reports
Surface geophysics* #	H	H	H	H	DNR, MPCA, Consultant Reports
Maps and soil descriptions*	M	M	L	M	NRCS
Eroding lands #	L	L	L	M	NRCS, wastewater plants
Water Resources					
Watershed units* #	L	M	M	M	DNR, USGS
List of public waters* #	M	M	M	M	DNR
Shoreland classifications #	L	L	L	M	DNR, COUNTY, CITY
Wetlands map* #	M	H	M	M	DNR
Floodplain map #	H	L	M	M	DNR, COUNTY, CITY
Land Use					
Parcel boundaries map* #	L	H	L	L	City, Crow Wing County
Political boundaries map* #	L	H	L	L	MNGEO, City
PLS map* #	L	H	L	L	MNGEO
Land use map and inventory #	M	M	H	H	MDH,MPCA,EPA, Historical Society, City Records, County
Comprehensive land use map #	L	L	L	H	City, County
Zoning map #	L	L	H	H	City, County
Public Utility Services					
Transportation routes and corridors* #	L	H	H	H	MNGEO
Storm/sanitary sewers and PWS system map* #	M	M	M	H	City
Oil and gas pipelines map #	L	L	M	L	MNGEO
Public drainage systems map or list* #	H	H	H	H	City, SWCD
Records of well construction, maintenance, and use* #	H	H	H	H	City, CWI, MDH files
Surface Water Quantity					
Stream flow data* #	L	H	M	L	DNR, USGS

Data Element	Present and Future Implications				Data Source
	Use of the Well (s)	Delineation Criteria	Quality and Quantity of Well Water	Land and Groundwater Use in DWSMA	
Ordinary high water mark data* #	L	H	L	L	DNR, USGS
Permitted withdrawals* #	L	L	L	L	DNR
Protected levels/flows* #	L	L	L	L	DNR
Water use conflicts* #	L	L	L	L	DNR
Groundwater Quantity					
Permitted withdrawals* #	H	H	H	H	DNR
Groundwater use conflicts* #	H	H	H	H	DNR
Water levels*	H	H	H	H	DNR, MPCA, MDH, City
List of environmental bore holes #	L	M	L	L	DNR, MPCA, MDA, MDH
Surface Water Quality					
Stream and lake water quality management classification #	L	L	L	L	DNR, MPCA
Monitoring data summary* #	L	L	M	L	MPCA, MDH
Groundwater Quality					
Monitoring data* #	H	H	H	H	MPCA, MDH
Isotopic data* #	M	M	M	M	MDH
Tracer studies* #	H	H	H	H	DNR, MPCA
Contamination site data* #	M	M	M	M	MPCA, MDA
Property audit data from contamination sites #	M	M	H	M	City, Private party
MPCA and MDA spills/release reports* #	L	L	M	M	MPCA, MDA

Notes:

* Data elements that were also assessed in the Part 1 Wellhead Protection Plan dated February, 2011.

Data elements that are required to be assessed for Part 2 Wellhead Protection Plan as stated in the second scoping decision notice dated June 23, 2011.

Data elements herein do not necessarily have the same implications as found in the Part 1 WHP Plan.

3.1 Required Data Elements

A. Physical Environment Data Elements

1. **Precipitation** –Recharge to the aquifer occurs from precipitation in the area where the wells are located and from run-off received from upland till areas. Based on local precipitation data collected from 1971-2011, utilization of USDA-NRCS methodology indicates that Brainerd has a mean of 27.19 inches of precipitation annually.
2. **Geology** – Detailed geologic information, data and maps used in the delineation of the recharge area for the City of Brainerd can be found in the Part I Report (Appendix I). The primary concerns related to geology and the protection of Brainerd wells and aquifer is the vulnerability of the DWSMA to potential contaminant sources. The groundwater aquifer used by the City has a high vulnerability to land use contaminant sources in the

northwestern portion of the DWSMA where potential contaminants can vertically enter the aquifer during recharge events. The southeastern portion of the DWSMA exhibits low vulnerability because there is little or no direct vertical recharge to the aquifer (see Figure 1). During run-off periods and precipitation events, potential contaminants can be transported with surface water run-off from upland areas and infiltrate into the groundwater aquifer further down-gradient. BPU staff and MDH will collaborate on future monitoring to better identify the contribution of surface waters (specifically Little Buffalo Creek watershed) to the aquifer the City uses.

3. Soils –the soils of the vulnerable portion of the DWSMA generally allow infiltration while the soils of the non-vulnerable portion of the DWSMA generally promote runoff.
4. Water Resources – The Brainerd DWSMA is located in the Mississippi River Watershed and also includes the majority of the Little Buffalo Creek sub-watershed. Little Buffalo Creek is considered to have a significant influence on the aquifer either by direct recharge to the aquifer or by surface runoff to downstream areas which provide direct recharge. Little Buffalo Creek is listed as impaired water by the Minnesota Pollution Control Agency as follows:

Buffalo Creek (Little Buffalo Creek)	Headwaters to Mississippi R2006 Aquatic life UMiss07010104-52307010104-523	Aquatic macroinvertebrate bioassessments	2016-start	2022- complete
--	---	--	------------	-------------------

The Crow Wing SWCD is currently conducting water quality monitoring at the South 7th street intersection for several parameters. It is expected that the two year monitoring program will further clarify the future TMDL study. One of the actions of this WHP Plan will be to further explore and understand the influences of this water body on the aquifer and City wells. An item needed by the City to help accomplish this is a flow gauge to determine flow volumes. This will reinforce the need and priority for future management strategies necessary to help the City of Brainerd protect their drinking water supply. A partnership between the City's MS4 project team, BPU's wellhead team, and the SWCD could be very productive in accomplishing what is needed for this stream.

B. Land Use Data Elements

Land use - The City of Brainerd is a mid-sized community located in the southwest quadrant of Crow Wing County. The County is in the heart of north-central Minnesota's lake country and the City and surrounding area reflects the importance of the water-based recreation that exists there. The Brainerd DWSMA is 2,359 acres in size. The majority of the DWSMA is located within the corporate limits of the City, while a smaller portion is in part of Oak Lawn Township. Land use controls are administered by the City in the majority of the DWSMA; however the portion that is in Oak Lawn Township is administered by Crow Wing County. Figures 3 and 4 (found in Appendix II) show the current zoning within the protection area.

Table 2 shows a breakdown of overall land use /land cover found in the Brainerd DWSMA. A corresponding land cover / land use map is in Figure 2 found in Appendix II. A general summary of the table indicates that 44.39% of the DWSMA is urban developed while 22.66% is wooded/grassland, 17.59% is water/wetland and 15.37% is farmland. The majority of the highly vulnerable portion of the DWSMA is located in a residential area while the commercial and industrial development is mostly located in the area of low vulnerability. There are some agricultural lands in the far eastern portion of the DWSMA which is of low vulnerability.

Because the delineation of the protection area is conjunctive (meaning a connection between surface and ground-water), it is important to recognize that the area of high vulnerability creates issues to the aquifer because of potential vertical infiltration of contaminants. While the DWSMA portion which is of low vulnerability exhibits a threat mostly through poorly managed wells or through EPA class V wells, there can be overland transmission of contaminants to the vulnerable area through surface and storm water runoff towards Little Buffalo Creek.

Table 2 Land Cover Statistics (from 2001 National Land Cover dataset).

LAND COVER	ACRES	PERCENT	YEAR
Open Water	12.23	0.52	2001
Developed, Open Space	631.45	26.76	2001
Developed, Low Intensity	362.65	15.37	2001
Developed, Medium Intensity	39.13	1.66	2001
Developed, High Intensity	14.23	0.60	2001
Deciduous Forest	452.91	19.19	2001
Evergreen Forest	24.45	1.04	2001
Shrub/Scrub	3.11	0.13	2001
Grassland/Herbaceous	54.25	2.30	2001
Pasture/Hay	212.11	8.99	2001
Cultivated Crops	150.52	6.38	2001
Woody Wetlands	163.42	6.92	2001
Emergent Herbaceous Wetlands	239.46	10.15	2001
Total	2,359.95	100.00	2001

1. **Public Water Supply Wells Inner Well Management Zone (IWMZ)** - As part of the assessment of contaminant sources which could quickly impact the public water supply wells, land use within a 200' radius of the wells was reviewed in relation to State well code setback requirements and potential contaminant threats.

Concerns identified in the IWMZ of the City's wells include:

- An electric substation with transformers located 85' from Well # 3 poses the risk of an oil leak which could impact groundwater. However, the substation and transformers will be removed in late 2011 or 2012 and will no longer pose a risk to the well or water supply.
- BPU has an NPDES permit for a seepage basin, which is used by the water treatment plant for backwash discharge adjacent to several City wells. This could become an issue if a future discharge is of contaminant character.

These items and other are being addressed in the management sections of this plan. The MDH IWMZ forms are updated and are on file with the MDH and BPU.

2. **Potential Contaminant Source Inventory (PCSI)** - The City of Brainerd and WHP Team completed a potential contaminant source inventory in the DWSMA. The inventory was completed from data files kept by the MDH, the Minnesota Pollution Control Agency (MPCA), and the Environmental Protection Agency (EPA) and from local knowledge of contaminant threats supplied by the WHP Team.

The immediate area near the wells and area of the aquifer identified as having a high vulnerability to contaminants is considered a high priority for implementing wellhead protection strategies identified in Chapter 5. The potential contaminant sources identified in the highly vulnerable portion of the DWSMA are summarized below in Table 3. Potential sources identified as wells will be found in Table 4.

Table 3: Potential Contaminant Source Inventory (PCSI) Summary: Potential contaminants identified in the Highly Vulnerable DWSMA

Contaminant Source Type	Total number/size of potential contaminant	No. in ERA ¹	No. in IWMZ ²	Level of Contaminant Risk ³
Petroleum Tanks:	(9 sites)			
Above Ground:	0			L
Below Ground	11 tanks (70,000 gals.+)	1	0	M
EPA Class V wells	?			H
Known Spill Sites:	1	0	0	L
Haz. waste generators	7	0	0	L
Multiple activities ⁴	8	1	0	M
Storm water Outfall ⁵	14+-		0	M
Septic tanks	4	0	0	L
Agricultural tilled	0 ac.	0	0	L
Gravel Pits	1	1	0	M
WT Backwash Basin	1	1	1	L

1-Emergency Response Area (ERA) is the one-year time-of-travel area for a municipal well.

2-IWMZ is the inner well management zone, a 200 foot radius around the public water supply well.

3-Risk categories are HIGH (H), MODERATE (M), or LOW (L); based on existing land use.

4-Multiple activities are potential contaminant sites that could have more than one regulated activity. See Appendix II for a list of these sites.

5-These were counted from City Engineering map of storm-water system, points in the storm-shed adjacent to Little Buffalo Creek ravine.

An automobile salvage yard (without sanitary sewer connection) exists on the East end of the vulnerable portion of the DWSMA and may be a potential site for an EPA Class V injection well. A known spill site in the vulnerable portion of DWSMA has been closed since 1994. Of the tank sites found, only one still has an active tank while all of the rest have been removed. There are three industrial storm water permits in the Little Buffalo Creek watershed and two construction storm water permits (one in vulnerable area). The trunk highway 371 crossing of Little Buffalo Creek has no spill containment should a spill occur in that area. The City of Brainerd does have an MS4 storm water plan which has been in implementation phase for the past 5 yrs. The gravel pit located adjacent to the City well-field is currently inactive and is potentially open to different ownership and a new land use. For this reason, BPU should consider acquisition of the property. There are no oil or gas pipelines in the DWSMA and no public drainage systems other than the City's storm water system.

For the entire DWSMA, the potential contaminant sources identified as wells are shown in Table 4.

Table 4: Potential Contamination Sources identified as wells in the entire DWSMA.

Potential Source Type	Total Number	Emergency Response Area ¹	In IWMZ ²	Level of Risk ³
Total Wells in DWSMA (active)	55	9	6	H
Well <100 feet deep	33			H
Well >100 feet deep	17			H
Monitoring Well	11			L
Municipal Well	6	6	6	L
Municipal Test Well	7	?		H
Municipal Well Sealed	5			L
Total Wells Sealed	35			L
Unused, unsealed well	?			H
Old Municipal Wells	18			H
EPA Class V wells	?			H

¹-Emergency Response Area (ERA) is the one-year time-of-travel area for a municipal well.

²-IWMZ is the inner well management zone, a 200 foot radius around the public water supply well.

³-Risk is categorized as HIGH (H), MODERATE (M), or LOW (L).

Not all wells identified have complete information attached to them, thus not all figures will add evenly in the above table. The City should consider whether the municipal test wells are still needed because all are of greater depth than 100 feet. There are only 4 private wells greater than 100 ft. depth which need to be managed properly. Research needs to occur on the status of 18 old municipal wells to determine if they are properly sealed. The MDH summary of old municipal wells is found as Table 8 in Appendix II of this plan.

Items for priority management of potential contaminant sources in the DWSMA will include the following:

- Wells that are located within the DWSMA will be high priority for management with a focus on sealing unused/unsealed wells.
- Education of well owners for proper management of their well(s), particularly the wells that area greater than 100 ft. deep (17 identified).
- Consideration whether municipal test wells should be sealed if no longer needed.
- Appropriateness of the City to ensure that Old Municipal Wells are properly sealed wherever they are located.
- Spill prevention and response improvements and awareness.
- High priority management will exist for potential contaminants found in the ERA and the IWMZ.
- Class V injection wells will be high priority if any are found.
- Recognition of the potential impact of storm water outfalls and the influence of Little Buffalo Creek waters on the aquifer.
- Consideration of acquisition of the gravel pit property.

See Appendix II for maps of the potential contaminants, a listing of parcels, ownership and addresses.

C. Water Quantity Data Elements

1. Surface water quantity – Surface water quantity directly impacts recharge of the aquifer and static water levels of the Brainerd Wells. It is considered important to determine the volume of surface water being contributed to the aquifer used by the City through Little Buffalo Creek. A stream gauge could help determine this.
2. Groundwater quantity - Groundwater quantity is influenced by surface water recharge of the aquifer. Groundwater quantity is sufficient for the amounts of water presently pumped and used by the City of Brainerd. No high capacity wells were identified in the DWSMA which may cause an interference problem with the city wells. BPU maintains an inter-connect with the City of Baxter for contingency purposes. Although none are expected, new high capacity wells could impact the public water supply. Consideration and cooperation of MDNR's water appropriations program will be important in this regard.

D. Water Quality Data Elements

1. Surface water quality – Surface water quality impacts groundwater quality and the City of Brainerd's water supply. Further study is contemplated in this plan to provide a better understanding of that impact contributed to the aquifer through Little Buffalo Creek.
2. Groundwater quality - The City of Brainerd groundwater quality currently meets or exceeds all Federal drinking water quality standards. A copy of the most recent City of Brainerd Consumer Confidence Report (Appendix III) provides a summary of groundwater quality.

3.2 Assessment of Data Elements

- A. Use of the Well – there are six primary wells in use at Brainerd with a more than adequate supply, especially since Baxter installed their own system in 2008. There are no competing high capacity wells in the DWSMA. There is an inter-connect with the City of Baxter which is helpful for contingency planning.
- B. Quality and Quantity of Water Supplying the Public Water Supply Well – No significant changes in either water quality or quantity are expected based on the review of data elements, current or future water uses. Additional monitoring and assessment of data elements regarding the influence of surface water features in the DWSMA will assist the city in future planning and management of their water supply and distribution system.
- C. The Land and Groundwater Uses in the Drinking Water Supply Management Area – BPU, the City and WHP Team will focus on educating citizens about their source of drinking water and wellhead protection concerns, issues and activities identified in this plan. In order for this plan to be effective in protecting and improving the City water supply, continued good working relationships with local residents and businesses; city, county and State resource staff will be needed in order to take the necessary steps to improve the city water and help avoid potential contamination of the public water supply. BPU, the City and WHP Team will work with Federal, State and local agencies and programs available to protect the wells and aquifer and in the management of potential contaminants identified in the DWSMA. City of Brainerd, Crow Wing County, and MDH will continue to provide technical support and assistance to BPU for WHP activities identified in this plan.

Chapter 4 - Impact of Land and Water Use Changes on the Public Water Supply Well(s) (4720.5220)

The city estimates that the following changes to the physical environment, land use, surface water, and groundwater may occur over the ten-year period that the WHP plan is in effect. This is needed to determine whether new potential sources of contamination may be introduced in the future and to identify future actions for addressing these anticipated sources. Land and water-use changes may introduce new contamination sources or result in changes to groundwater use and quality. The anticipated changes may occur within the jurisdictional authority of the city although some may not. The following table describes anticipated or potential changes to the physical environment, land use, and surface water or groundwater in relationship to their 1) the influence that existing governmental land and water programs and regulations may have on the anticipated change, and 2) the administrative, technical, and financial considerations of the public water supplier and property owners within the DWSMA.

Table 5 - Expected Land and Water Use Changes

Expected Change (Physical Environment, Land Use, Surface Water, Ground Water)	Impact of the Expected Change On the Source Water Aquifer	Influence of Existing Government Programs and Regulations on the Expected Change	Administrative, Technical, and Financial, Considerations due to the Expected Change
<u>Physical Environment</u> There is potential for a realignment of Business Highway 371.	With consideration of the DWSMA during design & construction there could be improvements to reduce impacts upon the aquifer.	The MNDOT engineers, upon knowledge of the City's DWSMA could incorporate rain gardens and other features to minimize the impacts of runoff. Secondary containment could be built into the storm system at the point of T.H.371 crossing of Little Buffalo Creek.	The City/BPU staff needs to be in communication with the MNDOT well in advance of the project design. MDH staff will be available to assist if desired. Financial considerations will need to be worked into the plan early in the realignment design.
<u>Land Use</u> – No significant change is expected. Minor change could include park plan development in the Kiwanis Park area and additional fill-in development in the City's industrial park.	Minimal or no impact is expected.	Land use controls could apply the performance standards necessary on any proposed industrial park users.	City and County planning & zoning officials need to be on top of new developments to identify issues as they come up. The MDH planner & hydro-geologist will be available to review and assist with technical issues.
<u>Surface Water</u> –The MS4 storm water plan being implemented by the City could result in improvement to the surface water quality. A TMDL study on Little Buffalo Creek is scheduled to occur in 2016.	If there is higher quality surface water infiltrating to the aquifer, this would be positive to wellhead protection. The TMDL study should lead to the same improvements as previously cited.	Existing government programs mostly through MPCA or EPA will be supportive. The Legacy Amendment funding should be supportive of the TMDL plan and implementation.	None expected.
<u>Ground Water</u> – No additional high capacity water users are expected within the ten year implementation period	None expected.	None expected, however, the DNR's water appropriation program should be supportive of the public water supply if anything comes up.	None expected.

Chapter 5- Issues, Problems, and Opportunities (4720.5230)

5.1 Identification of Issues, Problems and Opportunities - The Public Water Supplier has identified water- and land-use issues, problems and opportunities related to 1) the aquifer used by the city water supply wells, 2) the quality of the well water, or 3) land- or water-use within the DWSMA. The city assessed 1) input from public meetings and written comments that it received, 2) the data elements identified by the MDH during the scoping meetings, and 3) and the status and adequacy of the city's official controls and plans on land use and water uses as well as those of local, state, and federal government programs. The results of this effort are presented in the following table which defines the nature and magnitude of contaminant source management issues in the city's DWSMA. Identifying the issues, problems and opportunities as well as resource needs enables the city to: 1) take advantage of opportunities that may be available to make effective use of existing resources, 2) set meaningful priorities for source management and 3) solicit support for implementing specific source management strategies.

5.2 Comments Received – There have been several occasions for local governments, state agencies and the general public to identify issues and comment on the city's WHP plan. At the beginning of the planning process, local units of government were notified that the city was going to develop its WHP plan and were given the opportunity to identify issues as well as to comment. A public information meeting was held to review the results of the delineation of the WHP area, DWSMA, and the vulnerability assessments and the meetings of the WHP protection team provided public opportunity. Also, a public hearing was held (Dec. 20, 2011) before the completed WHP plan was sent to MDH for state agency review and approval. No significant comments were received at the public hearing. The following issues were identified during plan development and from comment periods –

Table 6 – Issues, Problems and Opportunities

Issue Identified	Impacted Feature	Problem Associated with the Identified Issue	Opportunity Associated with the Identified Issue	Adequacy of Existing Controls to Address the Issue
There are wells, some of which may be unused and unsealed within the DWSMA.	-Aquifer -Well Water Quality	All or some of the wells present a threat to the aquifer based upon their depth, construction, and state of repair.	The city can partner with the County to help property owners pay for the costs of sealing unused wells. The city can apply for SWP grant funds to help identify and seal wells through the MDH.	The city does not have authority to require that unused wells be properly sealed. The Minnesota Department of Health has authority to require well sealing.
A portion of the DWSMA is outside of the City's land use controls authority.	Aquifer DWSMA Well Water Quality	A proposed land use could occur which is detrimental to protection of the PWS aquifer.	The city can partner with the County to provide the necessary controls.	The city will be assured of protection if the text of the City & County ordinances recognizes the DWSMA.
Construction of new wells within the City Limits may impact the PWS.	Aquifer DWSMA Well Water Quality	Uncontrolled construction of new wells in the City could impact the City's ability to provide the public's water needs	A recent interpretation of State rules appears to have made it possible for cities to regulate wells through land use controls.	The City may have new authority to regulate wells within the corporate limits through land use controls.
There are above and below ground storage tanks, leaks and spills inside of the DWSMA.	Aquifer DWSMA Well Water Quality	The tanks, leaks, and spills could lead to contamination of the aquifer that the City uses.	The City can work with the MPCA to determine status of the various issues. The MNTAP program at the U of M can be accessed to support operators in reducing the impact of problems. MDH staff will be supportive of other agencies when the issue affects a PWS.	The State of Minnesota has adequate regulations to address this type of problem. Due to fiscal issues with the state budget, there could be a shortage of resources to carry them out.

Chapter 6

Wellhead Protection Goals (4720.5240)

The City of Brainerd has enjoyed a sufficient and safe water supply in the past and proposes, through the implementation of this WHP Plan, to continue supplying safe, potable water for its customers into the future. The city water supply is classified as mixed vulnerability by the Minnesota Department of Health based upon the geology and characteristics of the aquifer. Actions found in this plan focus on education and implementation of activities relative to the potential contaminant sources identified in order to prevent well or aquifer contamination. Efforts will also be focused upon water quality monitoring and data collection efforts to increase knowledge about the Little Buffalo Creek watershed. The goals of this wellhead protection plan are:

- *Maintain a safe and adequate drinking water supply for community residents;*
- *Prevent contaminants from reaching levels that present a risk to people's health.*

These goals will be achieved through efforts of the WHP Manager, BPU Staff, WHP Team and City Council by:

- Educating the public and businesses about WHP issues and concerns in the City of Brainerd.
- High priority focus will be on the land uses and activities within:
 - One year time of travel area/emergency response area, and
 - The vulnerable portion of the DWSMA.
- Working with MDH, MPCA, Crow Wing County, SWCD & others on investigation to better understand the contribution of the Little Buffalo Creek to the aquifer the City uses.
- Promote and encourage adoption of practices that reduce potential contaminant threats identified in this plan.
- Develop partnerships with other units of government, non-profits, and individuals to address current and potential issues for the public water supply of the City.

Brainerd Public Utilities recognizes that the City and County land use planning and a variety of Federal, State and local resource programs are available to assist them in protecting their drinking water supply.

Chapter 7

Objectives and Plan of Action (4720.5250)

7.1 ESTABLISHING PRIORITIES -- The aquifer providing water to the public water supply system has been identified as vulnerable to contamination from land use activities in the northwestern portion of the DWSMA. A number of factors must be considered when WHP measures are selected and prioritized. Such factors include:

- Potential contamination of the public water supply wells by substances that exceed federal drinking water standards.
- Contamination resulting from human activity.
- The location of potential contaminant sources relative to the PWS wells.
- The numbers of each potential contaminant source identified and the nature of the potential contaminant associated with each source.
- The capability of the geologic material to absorb a contaminant.
- The effectiveness of existing controls.
- The time required to get cooperation from other agencies and cooperators.
- The resources needed: staff, money, and time, legal, technical.

Based upon these factors, the WHP Team will concentrate management efforts on the following categories and subsequent strategies to create awareness about groundwater protection and help prevent future contamination of the aquifer:

- ❖ Monitoring, Data Collection & Assessment
- ❖ Wells and IWMZ Management
- ❖ Land Use Management – transportation, residential and other issues
- ❖ Potential Contamination Source Management – tanks & leaks, spill sites
- ❖ Public Education and Outreach
- ❖ Land Use Planning & Zoning
- ❖ Reporting and Evaluation

7.2 OBJECTIVES

The following objectives have been identified to support the goals of the WHP plan for the Public Water Supplier:

1. *Create public awareness and general knowledge about the importance of WHP for maintaining an adequate and safe drinking water supply;*
2. *Implement actions that will reduce the potential for contamination of the City's ground water source.*

7.3 WHP MEASURES AND ACTION PLAN

Based upon the factors discussed herein, the WHP team has identified WHP measures that will be implemented by the city over the 10-year period that its WHP plan is in effect. The objective that each measure supports is noted as well as 1) the lead party and any cooperators, 2) the anticipated cost for implementing the measure and 3) the year or years in which it will be implemented.

Table 7: Management Strategies/Actions to Implement Wellhead Protection

MEASURE	<u>--Monitoring, Data Collection & Assessment--</u>	Responsible Party/ Cooperators	Cost	Implementation time frame										
				2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
1	Prepare a <u>groundwater and surface water monitoring plan</u> to assess the relationship between the aquifer used by the Brainerd wells and potential sources of surface water recharge.	WHP Mgr. MDH DNR Co. Water Plan SWCD	Estimate = 50 hrs.	X										
2	Implement and evaluate results of the groundwater quality or water level monitoring plan and assess results with MDH.	WHP Mgr. MDH	Estimate = 50 hrs.		X	X	X							
3	Prepare a <u>groundwater monitoring plan</u> to confirm the low vulnerable rating of the aquifer in the <u>east</u> portion of the DWSMA.	WHP Mgr. MDH	Estimate = 20 hrs.		X									
4	Implement and evaluate results of the groundwater monitoring plan and assess results with MDH.	WHP Mgr. MDH Private Well Owners	Estimate = 30 hrs.			X	X							

5	Initiate discussions with interested groups to explore the possibility of establishing a gaging station on Little Buffalo Creek and utilize SWP grants program to accomplish the station and monitoring plan implementation.	WHP Mgr. MDH/ DNR USGS/Co. Water Planning SWCD	Estimate = 40 hrs.	X	X	X	There is potential that the gauge reading will be continuous.				
---	--	--	-----------------------	---	---	---	---	--	--	--	--

MEASURE	<u>--Well Inventory & Management--</u>	Responsible Party/ Cooperators	Cost	Implementation time frame										
				2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
6	Provide information on the proper management and sealing of wells to landowners located in the DWSMA and why this is important.	WHP Mgr. & staff Co. Water Plan	\$100 staff time, paper & mailing		X							X		
7	Provide additional information on well management to owners of wells twice during implementation period	WHP Mgr. & staff Co. Water Plan	\$100 staff time, paper & mailing				X						X	
8	Assign responsibility to WHP Team members (2 or more) to review and document the <u>MDH unlocated wells</u> list to determine if any of the wells are found inside of the DWSMA. If any of the wells from MDH list fall into the DWSMA, add them to the PCSI list for wells and assign a level of risk as in Table 4.	WHP Mgr. & staff	10 hrs. staff time		X									
9	Prioritize unused wells for sealing based on their construction, condition, distance, depth and threat to the aquifer and public water supply wells.	WHP Mgr. & staff	10 hrs. staff time	This will occur as unused wells are located on a continual basis.										
10	Pursue SWP and other Grant funds to seal priority wells.	WHP Mgr.	10 hrs. staff time	Occurrence-- as needed										
11	Complete a historical review of land uses and areas in the DWSMA suspected to have unused unsealed wells using Sanborn Fire Maps, local resources or other available information.	WHP Mgr. & WHP Team	10 to 20 hrs. staff time.	X				X						
12	Establish a policy and a line item in the BPU water utility budget to subsidize the sealing of private wells at the time a resident is hooked up to the municipal water supply.	WHP Mgr.	10 hrs.						X					
MEASURE	<u>--IWMZ & Municipal Well Management & Old Municipal Wells--</u>	Responsible Party/ Cooperators	Cost	Implementation time frame										
				2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
13	Implement WHP measures identified on the IWMZ Inventory forms. Continual review of well code setback for new activities that occur in the IWMZ.	WHP Mgr. & staff	In kind.	BPU staff during well site visits-continual.										
14	Evaluate the test wells under BPU control to determine if they are needed and seal if not needed.	WHP Mgr. & staff	10 Hrs. staff time						X					
15	Work with MDH to review old municipal well records to help locate and determine efforts needed to address old city wells that lack sealing records. If any old municipal or test wells are determined in need of sealing, apply for SWP funds at MDH to accomplish.	WHP Mgr. & staff	10 to 50 hrs. staff time					X						

MEASURE	<u>--Class V Wells & High Capacity Wells--</u>	Responsible Party/ Cooperators	Cost	Implementation time frame									
				2012	2013	2014	2015	2016	2017	2018	2020	2017	2021
16	Collect information about any known or suspected EPA Class V wells in the DWSMA. Contact MDH Planner for assistance working with a suspected owner of a Class V well.	WHP Mgr. & WHP Team	10 hrs. staff time			X	This to occur once initially, but continual follow-up						
17	Be aware of potential for new high capacity wells and communicate with DNR, MDH hydrogeologist and the owner of proposed well in advance of construction activity.	WHP Mgr.,BPU staff, City staff, MDH, MDNR	20 hrs. staff time when it is proposed										
				Continual activity.									
MEASURE	<u>--PCSI Management, Tanks & Spills--</u>	Responsible Party/ Cooperators	Cost	Implementation time frame									
				2012	2013	2014	2015	2016	2017	2018	2020	2017	2021
18	Start a dialogue with MPCA tanks and spills staff to determine if there is reason to be concerned about any of the sites located inside of the DWSMA.	WHP Mgr. MPCA	10 hrs. staff time						X				
19	Pending results of Measure 18, communicate with tank owners to determine if BPU can provide assistance to address specific issues regarding the tanks, leaks or spills.	WHP Mgr. Tank owners	10 hrs. staff time							X			
20	For the list of tanks, & spills property owners, prepare and send a memorandum advising them of the wellhead protection area as well as other tank educational information.	WHP Mgr.	10 hrs. staff time					X					
21	Meet with local spill response and emergency response people from the Brainerd area to make them aware of the protection area.	WHP Mgr.	10 hrs. staff time			X							
MEASURE	<u>--Land Use Issues: Transportation, Residential & Storm Water--</u>	Responsible Party/ Cooperators	Cost	Implementation time frame									
				2012	2013	2014	2015	2016	2017	2018	2020	2017	2021
22	Develop a dialogue with the City Planner, City Engineer and MNDOT regarding the potential rebuild of Business 371 Hwy. to discuss the potential to create secondary containment of any spills in the vicinity of the Little Buffalo Creek area.	WHP Mgr. MNDOT, City	10 to 50 hrs. staff time				X						
23	Request the County Solid Waste Department to host a household hazardous waste collection at a location sponsored by BPU in the DWSMA to highlight the potential for residential activities that can impact the public water supply.	WHP Mgr. Co. Solid Waste	10 hrs. staff time			X							
24	Meet annually with the City MS4 implementation staff to discuss options for storm water improvement activities in the DWSMA. Identify storm-water practices that can be implemented to improve the water quality of storm-water outfalls to Little Buffalo Creek.	WHP Mgr. MS4 Mgr.	10 hrs. staff time each year		X	X	X	X	X	X	X	X	X

MEASURE	--Education and Outreach--	Responsible Party/ Cooperators	Cost	Implementation time frame										
				2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
25	Distribute the MN Rural Water Association's "Where Does My Drinking Water Come From?" brochure to landowners in the DWSMA.	WHP Mgr. & Staff	\$100 staff time & materials		X									
26	Post and highlight WHP education information on the city or utility website.	WHP Mgr. City web Mgr.	In-kind	Continuous as material is developed										
27	Select wellhead protection education items from the MN Rural Water Association source water protection website to use to educate the public about WHP in your community.	WHP Mgr. & staff	In-kind	Continuous to support measure 25 & others.										
28	Annually provide the MRWA Water Week educational materials to the local 4 th Grade School Teacher and obtain their participation.	WHP Mgr. & Staff 4 th Grade Teachers	10 hrs. staff time per yr.	X	X	X	X	X	X	X	X	X	X	X
29	Provide a tour of the city water treatment plant and educate students about their source of drinking water, what WHP is and steps the city is taking to protect the local water supply.	WHP Mgr. & staff School Officials	10 hr. staff time each year		X		X		X		X			X
30	Display WHP information at your Utility Department Open House, County Fair or other local event. Highlight practices or activities that citizens can do to support WHP efforts.	WHP Mgr. & staff Co. Water Plan	In-kind	This is a continuous activity as opportunity arises.										
31	Put the MDH public service announcement about WHP and drinking water protection on the local radio. Obtain the audio clip from the MDH Planner.	WHP Mgr. & Staff MDH Planner	10 Hrs. staff time	X										
32	Use the local city cable channel as a media outlet to provide WHP information to citizens.	WHP Mgr. & staff	10 hrs. staff time per yr.	This will be continuous as information is located.										
33	Provide city residents with a pamphlet or article in the city newsletter that explains the need to seal priority unused wells and to implement a cross connection control program.	WHP Mgr. & staff	In-Kind					X						
34	Help sponsor a children's water festival, in particular a session that describes the impacts that improperly constructed or sealed wells may have on drinking water quality.	WHP Mgr. SWCD Co. Water Plan	\$100	This activity will occur when opportunity arises.										
35	Educate the public on water conservation practices they can implement to reduce water use.	WHP Mgr. & staff	10 hrs. staff time/yr.		X			X			X			

Measure	--Land Use Planning & Zoning--	Responsible Party/ Cooperators	Cost	Implementation time frame										
				2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2021
36	Request City and County Planning incorporate a map of the DWSMA and support of Brainerd WHP in the comprehensive plan.	WHP Mgr. & staff Planning staff	10 hrs. staff time		X									
37	Request the County Water Plan Coordinator to incorporate the DWSMA Map and local WHP issues when the County Water Management Plan is updated.	WHP Mgr. & Staff Co. Water Plan	10 hrs. staff time			X								
38	Request to be notified by all jurisdictions with land use authority in the DWSMA about proposed zoning, rezoning, conditional use permits in the DWSMA.	WHP Mgr. & staff Zoning authorities	In-kind	X										
39	Work with MDH, League of Minnesota Cities, and city planning staff to develop an ordinance that specifies the circumstances which control the placement of wells within the city's jurisdiction.	WHP Mgr. & staff	40 hrs. staff time						X					
Measure	-WHP Coordination, Reporting & Evaluation-	Responsible Party/ Cooperators	Cost	Implementation time frame										
				2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2021
40	Hold annual meeting with the WHP Team and local resource partners involved in plan implementation to discuss new WHP issues, past year's accomplishments and activities planned for the upcoming year.	WHP Mgr.	5 hrs. staff time	X	X	X	X	X	X	X	X	X	X	X
41	Regularly coordinate an internal meeting with the City Administrator, Public Works Director, Mayor and appropriate staff to discuss WHP Plan implementation and coordination. Discuss funding needs and pursuit of SWP Grant funds to help implement activities identified in the WHP Plan.	WHP Mgr. City staff	10 hrs. staff time	X		X		X		X		X		
42	Maintain a "WHP folder" that contains documentation of WHP activities completed and a date that it was done. Record cost to complete the activity.	WHP Mgr. BPU staff	10 hrs. staff time per yr.	X	X	X	X	X	X	X	X	X	X	X
43	Complete an Evaluation Report every 2.5 years that evaluates the progress of implementing the WHP Measures identified in this plan of action (Table 7) and the impact of any contaminant release on the aquifer supplying the public water supply well.	WHP Mgr. & staff	20 hrs./yr.			X			X			X		

Notes to Table 7: Dates noted in the table are a guide to implement the WHP action and may be varied to fit the schedule of the WHP Manager. The WHP Manager is the lead responsible party for all actions so that implementation activity can be tracked. The cost for each action is an estimate and could vary significantly from what is indicated. The in-kind cost means that BPU is already conducting a related activity and the action is carried out as an item already budgeted through normal BPU activity. Completion of all action items herein is subject to the availability of resources adequate to complete such actions.

Chapter 8

Evaluation Program (4720.5270)

Evaluating Plan Implementation

Plan evaluation provides a means to determine whether WHP action items are achieving the intended result or whether they need to be modified to address changing administrative, technical, or financial resource conditions within the DWSMA. Evaluation is used to support plan implementation and is required under MR 4720.5270 prior to amending the city's WHP plan. The Public Water Supplier has identified the following procedures that it will use to evaluate the success with implementing its WHP plan –

1. Prepare an annual report or briefing for the Utility Commission and City Council on the progress of the wellhead protection implementation actions and actions the City would like to implement in the upcoming year;
2. The WHP Team will meet annually to discuss implementation efforts and coordinate activities. New WHP issues, opportunities or changes needed in existing strategies identified in this plan will also be discussed.
3. Brainerd Public Utilities will prepare a written self-assessment report every 2.5 years that documents what plan implementation activities have been completed. The reports will be submitted to MDH when completed and made available at the first scoping meeting at the time the City will begin amending this wellhead protection plan.

Chapter 9

Water Supply Contingency Plan (4720.5280)

Under the wellhead protection rule, this plan must include a plan to address the events and responses that must occur when a water supply emergency arises or is threatening. The rule provides as an option to allow the WHP plan to include as contingency plan the "Water Supply Plan" that is completed as part of the water appropriation from the Minnesota DNR. The Water Supply Plan must be current and must be accompanied by an approval letter from DNR.

BPU has chosen the Water Supply Plan option in lieu of a separate contingency plan for this WHP plan and keeps a copy available for viewing in the BPU office. Persons who need to view the contingency plan referenced herein may do so by contacting the Wellhead Protection Manager identified in this plan. The letter from Minnesota DNR stating that the Water Supply Plan is current and approved is found in Appendix III.

REFERENCES for this PLAN:

- Climatology information for Minnesota was found at: <http://climate.umn.edu/>.
- Impaired waters information is from <http://www.pca.state.mn.us/index.php/water/water-types-and-programs/minnesotas-impaired-waters-and-tmdls/assessment-and-listing/303d-list-of-impaired-waters.html?menuid=&redirect=1>
- MPCA tanks detail found at: <http://www.pca.state.mn.us/index.php/waste/waste-and-cleanup/waste-management/tank-compliance-and-assistance/minnesota-aboveground-/underground-storage-tank-site-search-data.html>)
- MPCA multiple activities sites detail found at: <http://pca-gis02.pca.state.mn.us/wimn2/index.html>
- Information found in potential contaminant source inventory from Brainerd City Engineering is at: <http://www.ci.brainerd.mn.us/engineering/dwsma/>
- Wellhead Protection Rule at: <http://www.health.state.mn.us/divs/eh/water/swp/whp/rules.htm>

WELLHEAD PROTECTION PLAN

FOR

BRAINERD PUBLIC UTILITIES

PART 2

CONTAMINANT SOURCE MANAGEMENT STRATEGY

Prepared by
Brainerd Public Utilities Staff
with assistance from the
Minnesota Department of Health
And the Minnesota Rural Water Association

Introduction

The intent of Part 2 of the Wellhead Protection Plan is to solidify a contaminant source management strategy based on the delineation of the Wellhead Protection Area (WPA), the Contaminant Source Inventory database itself, and future changes expected to be seen either in the WPA or the well supplier itself. With these three collections of data we can begin to identify our Goals, Plans, and Objectives for this strategy.

The following report has been laid out in format of the Wellhead protection rule prepared by the Minnesota Department of Health (MR4720.5100 to 4720.5980).

Impact of Changes on the Public Water Supply Well(s)

Changes identified.

Expansion of Industrial Park Area - slow at this time

Expansion of Residential Area - slow at this time

Impact of Changes

Possibility of introducing new possible contaminant sources

Not likely due to our slow growth in area

Possibility of larger capture zones due to growth or expanded water sales

Not likely due to our slow growth in water sales.

Issues, Problems, and Opportunities.

Agricultural sources

Continuously cropped fields

General activities

Domestic water supply wells

On-site sewage treatment systems

Fuel storage

Industrial activities

Brainerd Industrial Park

Transportation corridors

City, county and township roads

Wellhead Protection Goals.

To protect our aquifer from potential contaminant sources whether they are contaminant sources that are there at present or will appear in some fashion in the future.

Make the community of Brainerd aware of the DWSMA and possible impacts that they could have on it through their land use or that commuters could have on it while traveling and or staying in Brainerd.

Objectives and Plan of Action.

Educate the local community about the need for a wellhead protection plan

Through the use of our monthly newsletter we will distribute educational material on wellhead protection in general and its specifics as applied to Brainerd Public Utilities.

Educate landowners regarding private wells and onsite sewage systems on the impact to the municipal drinking water system.

Provide Education material to land owners in the industrial park about the potential contaminate hazards that would impact the municipal drinking water system

Work with other city departments to protect our DWSMA

Have spill management Plan with Brainerd Fire Department to keep contaminants relating to transportation accident from impacting the DWSMA.

Create a pamphlet for the zoning department to hand out to land owners that are expecting to or going to construct new facilities within the DWSMA

Evaluation Program.

?

Alternate Water Supply; Contingency Strategy.

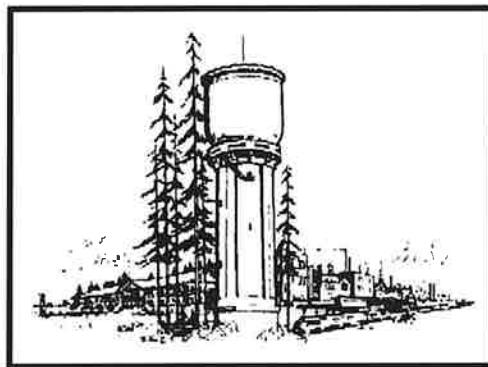
(See Brainerd's Water Emergency and Conservation Plan as prepared for the DNR)

Brainerd Public Utility's Wellhead Protection Plan

WELLHEAD PROTECTION PLAN

FOR

BRAINERD PUBLIC UTILITIES



**Including the delineation of the
Wellhead Protection Area
and the
Drinking Water Supply Management Area**

Prepared by
Brainerd Public Utilities Staff
with assistance from the
Minnesota Department of Health

January 1997

Table of contents

	Page
List of Tables	4
List of Figures	4
Introduction	5
Hydrogeological Setting	6
City Water Supply	7
Criteria used to delineate the Wellhead Protection Area	8
Method used to delineate the Wellhead Protection Area	10
References	12
Appendix 1: Boring logs used in this report	
Appendix 2: Pumping test analysis	
Appendix 3: Precipitation data	

List of Tables

Table 1 - Well data for municipal wells

Table 2 - Annual water pumped from city wells and well coordinates

Table 3 - Precipitation Data

List of Figures

Figure 1. - Wellhead Protection Area

Figure 2. - Drinking Water Supply Management Area

Figure 3. - Geologic map

Figure 4. - Municipal well field map

Figure 5. - Static level contour map

~~Note~~ -- All Tables and Figures may be found attached at the end of this report.

Introduction

This report documents the delineation of the Wellhead Protection Area (WHP) and the Drinking Water Supply Management Area (DWSMA) for the City of Brainerd, Minnesota. These delineations were performed in accordance with draft rules for preparing and implementing wellhead protection measures for public water supply wells which were prepared by the Minnesota Department of Health (MR4720.5100 to 4720.5980).

The wellhead protection area for the water supply for the city Brainerd was determined by 1) using an analytical element groundwater flow model to identify the capture zone for the wells and 2) incorporating the land surface drainage area which contribute recharge to the well's capture zone. The drinking water supply management area was determined by overlaying the boundaries of the wellhead protection area on a map showing property parcel boundaries. All property parcels which are partially or completely within the capture zone or which are likely to contribute surface water run off to it were included in the drinking water supply management area.

Figure 1. Shows the boundaries of the wellhead protection area.

Figure 2. Shows the boundaries of the drinking water supply management area.

Hydrogeological Setting

The City of Brainerd is located approximately 14 miles due east of the geographical center of the State of Minnesota. The Mississippi River enters the city limits in north and exits in the southwest. The City of Brainerd covers approximately 6,300 acres of land and water. The topography of the city can be described as relatively flat in the northeast, east, and central portions of the city and gently rolling in the west and south.

The geologic map Figure 3 shows the material everywhere in and near Brainerd that overlies the solid rock, or crust, of the earth is a thick mantle of unconsolidated material which is the contribution of several layers of material left by the invasions of glaciers. It is irregular in thickness and hereabouts ranges from 90 to 250 feet and possibly more. The greater depths indicate the gouged out areas in the underlying rock ledge that became filled. The flat bottomed lands are at an elevation which is 40 feet lower than the general highland level. Each glacial invasion left a characteristic assortment of material but all of it is always ground up rock of varying finesse. It is a combination of flat lenses of limited dimensions which in one area tend to be so finely grained as to be clay and elsewhere so coarse as to be boulders. Between these two extremes are the fine, medium and coarse sand and the small or large gravel. These several kinds or sizes occur inter-layered and seldom is any one kind present to the complete exclusion of the other. The general pattern of the glacial drift mantle at the well field is fortunately simple. It consists of a thick mass of gray material overlain by a thinner mass of brownish-red material. The top brownish red layer is 60 to 100 feet thick and is dominantly a medium-grained sand but it contains huge boulders and lenses of clay and masses of hardpan and gravely sands. The underlying gray material is preponderantly a clean fine sand and is always gray in color.

City Water Supply

The City of Brainerd withdraws water from one or more of the six (6) wells, each constructed in the Mississippi River Alluvial sand and gravel. All six wells are located linearly along the river, upstream from the water treatment plant location except for Well #8 which is located easterly away from the river as shown on the attached map Figure 4. Well data for the wells are included in Table 1. Well logs for each of the six wells are attached within this report.

The six wells capacities are 8,850 gallons per minute (GPM) or 4651 million gallons per year (MGY). However the nominal treatment capacity of the water treatment plant remains at 4,583 (GPM), or 2,409 (MGY).

Brainerd's average daily demand is 1.8 Million gallons per day (MGPD) and the maximum projected peak day demand is 4.4 MGPD, Brainerd's well capacity can meet the average daily demand of 1.8 MGPD and with three (3) to four (4) wells out of service Brainerd's well capacity is capable of meeting the projected peak demand of 4.4 MGPD.

It should be noted that all of Brainerd's water supply is from ground water sources. Brainerd does not have a surface water source or the facilities to treat surface water.

For more information regarding the City water supply please refer to our report completed for the DNR called Water Emergency and Conservation Plan for the City of Brainerd.

Criteria used to delineate the Wellhead Protection Area

The following values were used to address the five criteria for delineating the wellhead protection area which are specified in draft rule MR4720.

Time of travel - The minimum time of travel of 10 years was used to characterize groundwater movement in the aquifer supplying the city's well field.

Flow boundaries - The following flow boundaries were considered.

Surface water features - The Mississippi River enters the city limits in north and exit in the southwest corner of the city limits. The Mississippi River does not affect the configuration of the WPA area and was not incorporated in the ground flow model but it does provide a natural barrier from infiltration to the west of our well field. With help from the Department Health and using a more sophisticated computer algorithm it was determined that a creek running near our Well Head Protection area does effect the capture zones of our wells and needed to be added to our WHP area. So we then used a topographical map to incorporate a surface water shed area that contributes to our DWSMA area. This area includes the surface water shed that contributes to the creek's water supply.

Geological boundaries - Boring logs (Appendix 4) were used to define the subsurface geologic conditions in the Brainerd area.

High capacity wells- There are no high capacity wells other than the city wells located in the calculated wellhead protection area. There are a small number of residential wells located in the eastern area of the wellhead protection area whose pumping will have little or no influence on the movement of the groundwater toward the city wells.

Overland drainage- There is likely to be some recharge to the wellhead protection area, recharge was used in the calculation of the capture zone.

Daily volume of water pumped - Water log data records were used to identify the annual water pumped by the utility wells for the previous five years as shown in Table 2. The city estimates that their projected annual water use for the next five years will not exceed that for the previous five years. The daily volume of water pumped for the six wells is 275.7 cubic feet per minute, 16542 cubic feet per hour or 397,008 cubic feet per day.

Groundwater flow field- The groundwater flow field was determined using the Modular Semi- Analytical Model for Delineation of The Wellhead Protection Area. Modeling results were compared with the static level contour map (Figure 5) that was developed using boring logs (Appendix 1) from various locations through out the area of the city of Brainerd.

Aquifer transmissivity-The transmissivity of the materials pumped by well #8 is 61,000 ft. squared per day and was determined using the early time data from a pumping test on this well conducted by the Minnesota Department of Health. The analysis of the pumping test is presented in Appendix 2.

Methods used to delineate the Wellhead Protection Area

The Single Layer Analytical Element Model (SLAEM) version 2.21 developed by Dr. Otto Strack at the University of Minnesota was used to determine the capture zone for City of Brainerd.

The following assumptions were used to construct the model :

- 1) There is no vertical resistance to groundwater flow within the geologic materials defined in the model. This is a basic assumption incorporated into SLAEM.
- 2) The hydraulic conductivity of the aquifer was determined from the pumping test of City Well #8 was used throughout the model.
- 3) The hydraulic head assigned to linesink elements was determined from the survey of static water level elevations. Figure 5
- 4) A rainfall function was used to simulate infiltration because the aquifer is unconfined throughout the area modeled.

The aquifer module was used to define the hydrogeologic characteristics of the principle geologic materials identified as the aquifer. The following parameters and their corresponding values were used.

Permeability = 544 feet per day

Aquifer thickness = 195'

Base elevation of the aquifer = 1013

Aquifer porosity = 25% (estimated)

Rain function used to simulate infiltration = .0017 feet per day

The following provides the information and logic to assign the values to the model parameters listed above.

Permeability - was derived by dividing the aquifer transmissivity value of 61000 ft² per day by the estimated aquifer saturated thickness of 112'

Aquifer thickness- was derived by subtracting the base elevation of the aquifer from the ground elevation at Well #8

Base elevation of the aquifer - was derived from the Water-Bearing Stratum Report prepared by Carl Zapffe for the City of Brainerd

Aquifer porosity - was estimated and based on the assumption that the terrace deposits consist of interlayer beds of sand and gravel with lenses of fine grained red and gray sand.

Rain function - was derived from precipitation data logs for the period 1990 through 1995 Table 3. The six year average precipitation amount would more accurately reflect long-term precipitation and infiltration amounts. The average annual amount of precipitation for the six year period was 29.47 inches. An infiltration rate of 25% or 7.37 inches/year (.0017 feet/day) was determined using an estimated aquifer thickness of 25%.

References Cited

Zapffe, Carl, 1947, The Water Bearing Stratum in the City of Brainerd

Toltz, King, Duvall, Anderson and Associates, 1993, Water System Study for the City of Brainerd

Brainerd Public Utility, 1996, Water Emergency and Conservation Plan for the City of Brainerd

BRAINERD WELL DATA

TABLE 1.

	WELL 3	WELL 4	WELL 5	WELL 6	WELL 7	WELL 8
Unique well number	232347	232248	232349	232350	232352	403973
Location	See Fig. #B2	See Fig. #B2	See Fig. #B2	See Fig. #B2	See Fig. #B2	See Fig. #B2
Year Installed	1938	1944	1947	1947	1955	1987
Casing Diameter	16"	16"	16"	16"	20"	20"
Casing Depth	73'	73'	105'	100'	88'	144'
Screen Length	52'	47'-8"	45'	42'	63'	45'
Well Depth	120' - 6"	120'	150'	145'	150'	187'
Water Bearing Formation	Mississippi River Alluvial	Mississippi River Alluvial	Mississippi River Alluvial	Mississippi River Alluvial	Mississippi River Alluvial	Mississippi River Alluvial
Pump Type	Vertical 60 HP Turbine	Vertical 60 HP Turbine	Vertical 100 HP Turbine	Vertical 100 HP Turbine	Vertical 150 HP Turbine	Vertical 125 HP Turbine
Capacity	1250 GPM	1000 GPM	1200 GPM	1200 GPM	2600 GPM	1600 GPM
Total Dynamic Head	160'	148'	210'	248'	220'	220'
Casing Type	Steel	Steel	Steel	Steel	Steel	Steel
Driller	McCarthy	McCarthy	McCarthy	McCarthy	McCarthy	Inwin
Service Type	Permanent	Permanent	Permanent	Permanent	Reserve	Perm./Emerg.

Annual water pumped from city wells and Well Coordinates

Table 2.

	<i>Well # 3</i>	<i>Well # 4</i>	<i>Well # 5</i>	<i>Well # 6</i>	<i>Well # 7</i>	<i>Well # 8</i>
			Est.			
1990	235,161,000	182,997,000	73,326,000	242,555,000	25,088,000	* 0
1991	170,660,000	192,291,000	94,942,000	268,573,000	17,922,000	* 0
1992	141,397,000	109,193,000	93,217,000	148,745,000	28,808,000	67,035,000
1993	68,474,000	72,653,000	102,350,000	111,496,000	160,487,000	92,464,000
1994	89,115,000	82,474,000	92,923,000	130,516,000	139,250,000	110,305,000
	298,986,000	264,320,000	288,490,000	390,757,000	328,545,000	269,804,000
			Meter Not Accurate			* Not in Service
County coordinate system						
	Well # 3	Well # 4	Well # 5	Well # 6	Well # 7	Well # 8
X-Coord.	565191.2	565109.0	565012.7	565050.3	564926.2	566324.1
Y-Coord.	168083.9	167931.5	167603.3	167749.0	167393.2	167680.4

Precipitation Data

Table 3.

Precipitation

	1990	1991	1992	1993	1994	1995	Average
Jan	0.21	0.41	0.48	1.19	1.37	0.96	0.77
Feb	0.70	1.11	0.42	0.11	0.65	0.75	0.62
Mar	2.76	1.67	1.44	1.38	1.39	2.91	1.93
Apr	3.64	3.69	1.75	1.85	4.20	2.02	2.86
May	1.73	4.44	2.72	6.68	2.87	3.17	3.60
Jun	4.43	6.53	4.42	4.67	4.27	0.87	4.20
Jul	4.14	3.34	3.10	4.15	2.71	6.08	3.92
Aug	1.78	1.64	4.60	4.71	3.48	6.83	3.84
Sep	1.91	3.78	1.91	2.18	3.56	2.83	2.70
Oct	3.84	1.11	0.61	0.52	4.46	5.72	2.71
Nov	0.44	2.40	2.02	2.22	1.63	0.89	1.60
Dec	0.80	0.50	0.92	0.66	0.32	1.17	0.73
Average	2.20	2.55	2.03	2.53	2.58	2.85	2.46
Total	26.38	30.62	24.39	30.32	30.91	34.20	29.47

February 14, 2022

Mr. Scott Magnusson, Superintendent
Brainerd Public Utilities
P.O. Box 373
Brainerd, Minnesota 56401-0373

Dear Mr. Magnusson:

Subject: Scoping 2 Decision Notice and Meeting Summary – Brainerd Public Utilities – PWSID 1180002

This letter provides notice of the results of the second scoping meeting held with you and I at the Brainerd Public Utilities Office, and Aaron Meyer (Minnesota Rural Water Association via phone), on January 21, 2022, regarding Part II of your wellhead protection (WHP) plan. During the meeting, we discussed data elements that must be compiled and assessed to prepare the part of the WHP plan related to the management of potential contaminants in the approved drinking water supply management area. The enclosed Scoping 2 Decision Notice lists the data elements discussed at the meeting. The data elements must be compiled and assessed in terms of their present and future implications on the 1) use of the well(s), 2) quality and quantity of water supplying the public water supply wells(s), and 3) land and groundwater uses in the drinking water supply management areas. We also discussed a summary of planning issues identified during the Part I WHP Plan development process which should be considered for inclusion in your Part II WHP Plan.

Brainerd Public Utilities has met the requirements to distribute copies of the first part of the WHP plan to local units of government and hold an informational meeting for the public. Brainerd Public Utilities will have until July 1, 2024, to complete its WHP plan.

If a data element is marked on the enclosed notice as a data element that must be used and it does not exist, it is helpful if your plan notes this. MDH understands a consultant, not determined yet, will be working with you to develop a draft of the remainder of the WHP plan. Chris Parthun, recently assigned as MDH Planner to Crow Wing County will be contacting you to review the progress of the development of Part II of your plan. If you have any questions regarding the enclosed notice, please contact Chris by email at chris.parthun@state.mn.us or by phone at 218-308-2109.

Sincerely,



Chad Anderson, Planner
Source Water Protection Unit
3333 Division Street, Suite #212
St. Cloud, Minnesota 56301

CA:ds-b

Enclosures: Scoping 2 Decision Notice, PCSI Requirements, WHP Planning Issues Summary

cc: Jennifer Soltys, MDH Engineer, MDH St. Cloud District Office
Aaron Meyer, Groundwater Specialist, Minnesota Rural Water Association
Luke Stuewe, Minnesota Department of Agriculture
Chris Parthun, MDH Planner, MDH Bemidji District Office

SCOPING 2 DECISION NOTICE – GROUNDWATER AND SURFACE WATER
CONTRIBUTION AREA DWSMA

Date: February 11, 2022

Name of Public Water Supply: Brainerd Public Utilities

PWSID: 1180002

Name of the Wellhead Protection Manager: Mr. Scott Magnusson, Superintendent

Address: P.O. Box 373

City: Brainerd

Zip: 56401-0373

Phone: 218-829-8276

Primary Unique Well Numbers: 232347 (Well #3), 232348 (Well #4), 232349 (Well #5),
232350 (Well #6), 232352 (Well #7), 403973 (Well #8)

DWSMA Vulnerability: ☐ Low ☐ Moderate ☐ High

☒ Surface Water Contribution Area (SWCA)

The purpose for the second scoping meeting, as required by Minnesota Rules, part 4720.5340, is to discuss the information necessary for preparing Part 2 of a Wellhead Protection Plan. The Part 1 Plan identifies the area that provides the source of drinking water for the public water supply (PWS) and assesses how vulnerable that area is to contamination. The PWS can utilize that information to develop land use and management practices that protects their groundwater resource from contamination.

The wellhead rule (Minnesota Rules, part 4720.5340) refers to the information required for wellhead planning as data elements. This notice lists the data elements that are stated in Minnesota Rules, part 4750.5400 and are selected for the PWS because of the vulnerability of the drinking water supply management area (DWSMA) as determined in Part 1.

Scoping 2 Data Elements Needed for the Part 2

Data Elements are pieces of information in the form of a map, a list, records, tables, and inventories. Where appropriate, they should be reviewed and assessed in terms of their present and/or future implications on the 1) use of the well(s), 2) quality and quantity of water supplying the public water supply wells(s), and 3) land and groundwater uses in the DWSMA. It is important to discuss the relevance of the data elements to management of the DWSMA. Check the technical assistance comments for guidance on reviewing the data elements and conducting these assessments. Clearly identify in the plan which data elements are associated with which tables/figures. If a data element does not exist, state that in the narrative.

Submit –

The following information, highlighted with an **asterisk* with blue text**, MUST be submitted in the Part 2 by including it in the plan narrative and/or appendix.

- ☐ ***A map that indicates the vulnerability and includes the DWSMA, WHP Area, and Emergency Response Area must be included in the Part 2.** This map with vulnerability is a product of the Part 1 and provides a basis for planning activities in Part 2. SWP Planner can provide the DWSMA figure.

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT –

Soils

- ☐ ***Existing maps of the soils and a description of soil infiltration characteristics.**
- ☐ ***A description or an existing map of known eroding lands that are causing sedimentation problems.**

Technical Assistance Comments: Infiltration characteristics and active erosion sites, along with land cover/land use and potential contaminant source information, should be assessed to determine the potential for the transport of contaminants into vulnerable areas of a DWSMA. The review of soils, infiltration, and erosion characteristics may identify opportunities for management strategies or targeted practices that reduce contaminant migration into groundwater.

DATA ELEMENTS ABOUT THE LAND USE –

Land Use

- ☐ ***An existing map of political boundaries.**
- ☐ ***An existing map of public land surveys including township, range, and section.**

Technical Assistance Comments: A map or maps showing updated political boundaries and township, range, section with labels is required for determining land use authorities for the land within the DWSMA. DWSMA figure map provided by SWP Planner will also contain political boundaries with township, range, and section. Determine and discuss how the various land use authorities may affect the management of the DWSMA.

SCOPING 2 DECISION NOTICE – GROUNDWATER AND SURFACE WATER
CONTRIBUTION AREA DWSMA

- A map and an inventory of the current and historical agricultural, residential, commercial, industrial, recreational, and institutional land uses and potential contaminant sources.
 - *The Potential Contaminant Source Inventory (PCSI) data in both a table and a map format must be created and included in the Part 2. Include potential contaminant sources as listed on the PCSI attachment provided for each existing vulnerability within the DWSMA. The Scoping 2 Meeting WHP Planning Issues Summary may also be used to provide guidance on the PCSI.

Surface Water Contribution Area:

- Inventory potential contaminant sources in the surface water contribution area as identified in the *Highly Vulnerable Surface Water Contribution Area* PCSI attachment.

Groundwater Contribution Area(s):

- Inventory potential contaminant sources in the highly vulnerable area as identified in the *Highly and Very Highly Vulnerable DWSMA* PCSI attachment.
- Inventory potential contaminant sources in the moderately vulnerable area as identified in the *Moderately Vulnerable DWSMA* PCSI attachment.

The inventory should include your community wells but not include any wells that are known to have been sealed according to the Minnesota Well Code (MN Rules 4725).

- *A land use/land cover map and table. SWP Planner can provide a land cover map and data/table from federal sources. This data set should be used unless an alternative electronic data set that is more current and detailed is available. Assess and discuss changes in land use that could impact management of the DWSMA.
- *An inventory of the Inner Wellhead Management Zone (IWMZ). A recent IWMZ inventory (within six years) for each primary well with management recommendations on the MDH form, or a table that summarizes the number and type of contaminant sources with the management recommendations must be included. Incorporate or reference the recommendation(s) from the IWMZ into the Part 2. IWMZ will be completed by the SWP Planner with assistance from the PWS staff. A copy will be provided to the PWS.

Technical Assistance Comments: This section encompasses the Potential Contaminant Source Inventory known as the PCSI. See the Scoping 2 Decision Notice Potential Contaminant Source Inventory Requirement Attachment(s) and endorsement procedures/fact sheets for further information. Utilize the PCSI geodatabase attribute template provided by SWP Planner. Management strategies must be developed for potential sources of contamination that pose a risk to the drinking water supply.

SCOPING 2 DECISION NOTICE – GROUNDWATER AND SURFACE WATER
CONTRIBUTION AREA DWSMA

- ☐ *An existing comprehensive land-use map.
- ☐ *An existing zoning map.

Technical Assistance Comments: This information can indicate areas in the DWSMA where growth or the addition of potential contaminant sources is likely to occur. Furthermore, the review of local zoning and comprehensive land-use maps facilitates the evaluation of the degree of compatibility current and future land uses have with the PWS goals of protecting the drinking water wells and aquifer.

Public Utility Services

- ☐ *An existing map of transportation routes or corridors.

Technical Assistance Comments: Highway and railroad corridors can be used to move hazardous materials. These corridors should be evaluated to determine the level of risk they pose for spills in the DWSMA, considering their proximity to the wells, the local topography, and geologic conditions.

- ☐ *An existing map of storm sewers, sanitary sewers, and public water supply systems.

Technical Assistance Comments: Storm sewer systems and sanitary systems can be sources of contamination. Storm sewers are generally considered a public utility element designed to convey storm water runoff and use constructed features such as pipes and ponds. Evaluate the integrity and condition (age, type of material, any investigative work, etc.) of these systems in the DWSMA, noting the location of the water supply system and public water supply wells in relation to these potential contaminant sources. It is not necessary to include a map of your public water supply system in the Part 2 if you believe it would pose a threat to the security of your system.

- ☐ *An existing map of the gas and oil pipelines used by gas and oil suppliers.

Technical Assistance Comments: Petroleum pipelines can be sources of contamination (excluding liquefied natural gas pipelines). If possible, describe what is generally known about the condition of these pipelines in the DWSMA, and the readiness of the PWS to respond to an emergency. It is not necessary to include a map in the Part 2 if you believe it would pose a security threat.

Required to be discussed in the plan-

The following information (if existing) MUST be reviewed and discussed in the development of the Part 2. The Part 2 narrative must contain a description identifying whether/how the information may influence the management of the DWSMA. The data element may be located in the public domain. While the map or document reviewed is not required to be included in the Part 2, the source of the data element must be provided in the plan narrative by indicating a web address or reference to its location. Provide a statement in the plan narrative if the data element does not apply or does not exist.

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT –

Precipitation

- An existing map or list of local precipitation gauging stations.
- An existing table showing the average monthly and annual precipitation in inches for the preceding five years.

Technical Assistance Comments: Assess and describe any issues and management needed in the DWSMA based on precipitation. Precipitation data can be reviewed but maps and tables are available in the public domain and do not need to be attached unless there are management implications for the DWSMA. Highlight any issues or concerns for the DWSMA from high intensity precipitation events.

Water Resources

- An existing map of the boundaries and flow directions of major watershed units and minor watershed units.

Technical Assistance Comments: Identify/list the major and minor watershed(s) in the Part 2 in order to become aware of local water planning efforts such as One Watershed One Plan (1W1P), Watershed Restoration and Protection Strategies (WRAPS), and/or Groundwater Restoration and Protection Strategies (GRAPS).

- An existing map and a list of public waters as defined in Minnesota Statutes, section 103G.005, subdivision 15, and public drainage ditches.

Technical Assistance Comments: Public waters and public drainage ditches/systems can help mobilize and transport contaminants. Use the Department of Natural Resources Buffer Protection Map and/or other available maps of ditches that have been publicly recorded (county/judicial ditches). Include a summary or excerpt of any relevant information from the Part 1. Public drainage systems and public waters should be assessed to determine the level of risk they pose in the DWSMA. Identify land uses that could contribute contaminants to the public drainage system and identify any ongoing remediation activities.

SCOPING 2 DECISION NOTICE – GROUNDWATER AND SURFACE WATER CONTRIBUTION AREA DWSMA

- The shoreland classifications of the public waters listed under subitem (2), pursuant to part 6120.3000 and Minnesota Statutes, sections 103F.201 to 103F.221.

Technical Assistance Comments: Assess and describe any issues or opportunities for potential contaminant source or land use management in the DWSMA based on the shoreland classification and existing regulations. Surface waters should be assessed for their likelihood of being a potential transporter of contaminants. Public waters classifications provide an indicator of likely potential contaminant sources based on the land development in proximity to, and density around, those public waters. Other land use tools, such as shoreland overlay districts or setback requirements from the shoreline for contaminants may also provide an opportunity to address drinking water protection concerns.

- An existing map of wetlands regulated under Chapter 8420 and Minnesota Statutes, section 103G.221 to 103G.2373.

Technical Assistance Comments: Assess and describe any issues and management needed based on the proximity of wetlands in the DWSMA. Wetland data sets and/or maps are available in the public domain, and while not required, can be included if beneficial and relevant to plan development. Depending on the results of the Part 1, specific wetland features may have been identified as an important recharge feature to the wellfield. Wetlands are often lower in elevation than surrounding landscapes and may serve as natural catchment basins for overland flow and stormwater runoff. The catchment area of runoff should be assessed, since stormwater runoff can contain various potential contaminants depending on the landscape.

- An existing map showing those areas delineated as floodplain by existing local ordinances.

Technical Assistance Comments: Assess and describe any issues and management needed in the DWSMA based on the Federal Emergency Management Agency (FEMA) Floodplain 100-year FIRM (Flood Insurance Rate Map) and (or) other State and local floodplain or flooding information. Consult with the WHP Manager to evaluate any potential or historical flooding impacts on the public water supply wells or aquifer. The Inner Well Management Zone report and Sanitary Survey may be used to identify flooding issues and impacts.

DATA ELEMENTS ABOUT THE LAND USE –

Land Use

- An existing map of parcel boundaries.

Technical Assistance Comments: Parcel boundaries may have been used for delineation of the DWSMA in Part 1. In Part 2, parcel identification information must be included or linked and must be used for education or targeting activities or practices in addressing potential contaminants. In the narrative, indicate if parcel data is available from the public domain (i.e. county GIS or associated website such as Beacon).

Part 1 -

The following information was reviewed and assessed in developing the Part 1. Some data elements may be in the public domain or non-existent, and others may have been determined by the MDH hydrogeologist to be not applicable to the physical setting, so discussion was not included in the Part 1. The Part 1 should be used as a data source for the Part 2. The technical assistance comments provide the requirements for how this information must be discussed and/or included in the Part 2. Include relevant excerpts or summaries from the Part 1 where indicated.

DATA ELEMENTS ABOUT THE PHYSICAL ENVIRONMENT –

- An existing geologic map and a description of the geology, including aquifers, confining layers, recharge areas, discharge areas, sensitive areas as defined in Minnesota Statutes, section 103H.005, subdivision 13, and groundwater flow characteristics.
- Existing records of the geologic materials penetrated by wells, borings, exploration test holes, or excavations, including those submitted to the department.
- Existing borehole geophysical records from wells, borings, and exploration test holes.
- Existing surface geophysical studies.

Technical Assistance Comments: Provide a summary in the plan narrative (few sentences/paragraph) of the Description of the Hydrologic Setting from Part 1. Provide the conclusions regarding the Well and DWSMA Vulnerabilities related to the geologic conditions and how these conditions influence the management of the DWSMA.

DATA ELEMENTS ABOUT THE LAND USE –

Public Utility Services

- An existing record of construction, maintenance, and use of the public water supply well and other wells within the DWSMA.

Technical Assistance Comments: Well construction records indicate what is known about the well(s) and can indicate if the well(s) have structural integrity or groundwater protection issues. Briefly summarize in the plan narrative what is discussed about each well from the Assessment of Well Vulnerability in Part 1.

DATA ELEMENTS ABOUT WATER QUANTITY –

Surface Water Quantity

- An existing description of known water-use conflicts, including those caused by groundwater pumping.
- An existing description of high, mean, and low flows on streams.
- An existing list of lakes where the state has established ordinary high-water marks.
- An existing list of permitted withdrawals from lakes and streams, including source, use, and amounts withdrawn.
- An existing list of lakes and streams for which state protected levels or flows have been established.

Technical Assistance Comments: This information, if known, was incorporated into the Part 1 and was used to assist in model development and the delineation of the protection areas. Provide a summary from Part 1 in the plan narrative about the interactions between surface water features and the groundwater and if there are water use or pumping conflicts. Provide a summary of any impacts from a surface water quantity perspective that surface water features may have on management of the DWSMA. Additional technical assistance can be provided by contacting the MDH hydrologist.

Groundwater Quantity

- An existing list of wells covered by state appropriation permits, including amounts of water appropriated, type of use, and aquifer source.
- An existing description of known well interference problems and water use conflicts.
- An existing list of state environmental bore holes, including unique well number, aquifer measured, years of record, and average monthly levels.

Technical Assistance Comments: This information, if known, was incorporated into the Part 1 and was used to assist in determining hydrologic boundary conditions and area static water levels. In Part 2, information about Department of Natural Resources appropriation permit holders and any known well interference problems or water use conflicts must be discussed, including how this information could affect the management of the DWSMA.

DATA ELEMENTS ABOUT WATER QUALITY –

Surface Water Quality

- An existing summary of lake and stream water quality monitoring data, including: bacteriological contamination indicators, inorganic chemicals, organic chemicals, sedimentation, dissolved oxygen, and excessive growth or deficiency of aquatic plants.

Technical Assistance Comments: If available, provide a summary from Part 1 in the plan narrative. In Part 2, include any additional references to relevant sources of information (i.e., Total Maximum Daily Load (TMDL) Reports, Watershed Restoration and Protection Strategy (WRAPS), Minnesota Pollution Control Agency watershed information, or state and local agency data). Consider if any contaminants or identified trends have management implications. Provide a summary of any impacts from a surface water quality perspective that surface water features may have on management of the DWSMA.

Groundwater Quality

- An existing summary of water quality data, including: 1. bacteriological contamination indicators; 2. inorganic chemicals; and 3. organic chemicals.
- An existing list of water chemistry and isotopic data from wells, springs, or other groundwater sampling points.
- An existing report of groundwater tracer studies.

Technical Assistance Comments: This information, if known, was incorporated into the Part 1. Provide a summary of the assessment of well vulnerability and/or any relevant chemistry and isotopic composition data available from PWS wells and other wells/sources.

- An existing site study and well water analysis of known areas of groundwater contamination.
- An existing property audit identifying contamination.
- An existing report to the Minnesota Department of Agriculture and the Minnesota Pollution Control Agency of contaminant spills and releases.

Technical Assistance Comments: This information, if known, was incorporated into the Part 1. Discuss whether there are groundwater contamination areas that could pose a risk to the public water supply well(s) now or in the future. Include any relevant data and how this information may affect the management of the DWSMA.

Revised: 01/2022

To obtain this information in a different format, call: 651-201-4570. Printed on recycled paper.



Scoping 2 Meeting Wellhead Protection (WHP) Plan Amendment Summary of Planning Issues

This planning issues summary is intended to guide plan writers and WHP teams when developing their amendment. It highlights key issues identified to date that you should consider and discuss. It should not be considered a list of complete requirements for the amendment.

Public Water Supplier: Brainerd Public Utility (“BPU”, or “Utility”)

Summarize the management implications from minor changes in DWSMA or vulnerability:

- Overall, the new DWSMA is about 30 percent smaller than the previous delineation. This is primary due to changes in the 10-year capture zone boundaries and the elimination of the SWCA for Little Buffalo Creek.
- There has also been a significant change in the location of the SWCA. The former SWCA represented potential runoff to the highly vulnerable areas of the WHPA and to Little Buffalo Creek. However, the results of the monitoring project did not show a strong connection between Well #8 and Little Buffalo Creek, so it was determined that a SWCA for Little Rock Creek wasn’t necessary for this amendment. On the other hand, monitoring did indicate a fairly strong connection between the main wellfield and the nearby wetlands. For this reason, the current SWCA represents the catchment area to the wetlands.
- In the moderate vulnerability area, most of the wells have low geologic sensitivity ratings. However, isotopic data from several wells with similar geology, but located just beyond the DWSMA boundary, had measurable tritium indicating that there was young water present despite a significant thickness of clay-rich till. For this reason, the aquifer vulnerability rating was raised from low to moderate to reflect that the till is probably leaky.

Community changes and implications for management:

- Brainerd has experienced population growth, with 13,178 people in 2000, 13,590 in 2010, and a population of 14,395 in 2020. Assuming the growth rate of approximately 6 percent from 2010 to 2020 remains the same, the population over the next 10 years will grow to 15,259.

Key management activities to carry forward:

Note to plan writer: Update current language so management strategies are SMART (Specific, Measurable, Achievable, Relevant/Realistic, Timing). Consider using the MDH Management Strategy Catalog.

- An evaluation of the activities proposed in the WHP Plan of Action from the 2012 WHP Plan (Table 7) suggests that nine of the activities proposed were not completed as of the time the evaluation was conducted (July 14, 2021). The activities not listed as complete in the evaluation include Measures 5 (Monitoring, Data Collection & Assessment), 9, 10,11 (Well Inventory & Management), 15 (IWMZ & Municipal Well Management & Old Municipal Wells), 23 (Land Use Issues: Transportation, Residential & Stormwater), 34 (Education and Outreach), 37 (Land Use Planning & Zoning), and 40 (WHP Coordination, Reporting & Evaluation). MDH recommends that BPU review each Measure to confirm that the activity was not completed, and to determine whether each Measure should be a part of the next WHP Plan of Action.
- The July 2021 evaluation of the activities proposed in the 2012 WHP Plan indicates that Measures 1, 2, 3, 4, 6, 7, 8, 13, 16, 18, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 35, 36, 38, 39, 41, 42 and 43 were all completed. Measures 12, 14, 17 and 19 were marked as “NA” for the evaluation. The nature of some of these measures is such that once they are complete, they may be eliminated, while the amended WHP Plan may be better with the continuation of several of the measures. MDH recommends that BPU analyze the management strategies that were written/included previously to determine which should be carried over to the new WHP Plan and if the language should be refined to fall in line more closely with the BPU’s experience with implementing the measure and their success/failure with it.

New management strategies to consider:

- Well Locating: The delineation in Part 1 of the Plan is based on very little well data. If new wells are constructed east of the Mississippi River and within one mile of the utility's wells, their locations should be verified. This information may allow a better understanding of the extent and thickness of the aquifer serving the BPU wells and could result in a more refined WHPA in the future.
- Planning for a Replacement Well(s): According to MDH records, several of the BPU wells are more than 70 years old. The BPU may want to include measures in their amended WHP Plan to take steps to prepare for the replacement of one or more of the older wells. The measures might include: the drilling of a test well(s), water quality sampling, and capacity testing.
- Water Quality Monitoring: The standard assessment monitoring package should be analyzed during year six, including the primary wells and wetlands, contingent on funding assistance from MDH for sampling and analysis. The utility may need to collect the samples and ship them to MDH. Information generated by this sampling will be used to refine vulnerability assessments for the next amendment.

SCOPING 2 DECISION NOTICE – GROUNDWATER AND SURFACE WATER CONTRIBUTION AREA DWSMA

- The 2012 WHP Plan mentions that research is needed on the status of 18 old municipal wells to determine if they are properly sealed (Section 3.1, part B, page 9). It doesn't appear that this was completed over during the life of the 2012 WHP Plan, and the evaluation conducted in July 2021 indicates that no old municipal wells were sealed.
- The 2012 WHP Plan mentions that there are four private wells greater than 100 ft. depth which need to be managed properly. It isn't clear if the owners have been engaged, and if not, the BPU may consider including this as an action item.

Old municipal wells that need to be sealed:

- The Old Municipal Well report for Brainerd lists 18 old municipal wells, none of which have a record of having been sealed. BPU might consider reviewing which of the old municipal wells should be sealed at this time – grant funding may be available to cover costs.

Important partnerships to maintain or establish:

- City of Brainerd
- Brainerd FD
- Crow Wing County, SWCD, Highway Department
- City of Baxter
- Lake Association?
- MDH, DNR, MNDOT, MPCA, MRWA

Water quantity issues and implications:

- Existing data do not suggest water quantity issues.

Water quality issues and implications:

- All wells are considered vulnerable to contamination due to tritium being detected in the well water. This is reinforced by the chloride concentrations and chloride/bromide ratios presented below. Elevated concentrations or concentration ratios indicate human-impacted water quality from activities at the land surface such as road salt or wastewater.
- At present, none of the contaminants for which the Safe Drinking Water Act has established health-based standards is found above maximum allowable levels in the utility's water supply, nor are any present at one-half of those levels.
- Naturally occurring arsenic has been detected at low levels in several wells, however, arsenic has not been detected in finished water that enters the distribution system.

Sanborn Maps:

- ☒ Sanborn Maps are available for this area.
- ☐ Sanborn Maps are not available for this area

Figure 1A
Wellhead Protection Area and
Drinking Water Supply Management Area
Brainerd Public Utilities

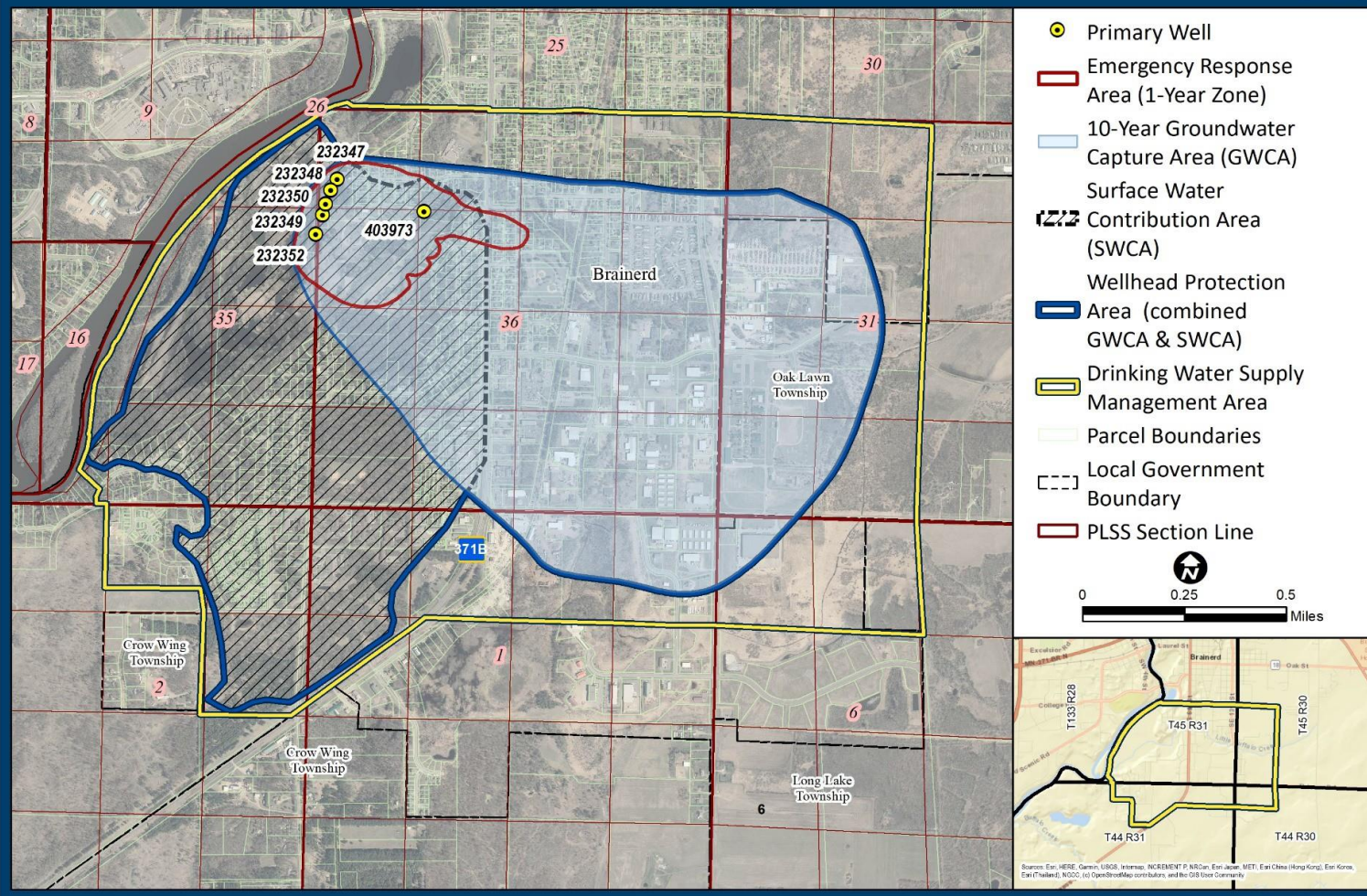


Figure 1B
Groundwater Protection Areas and Vulnerabilities
Brainerd Public Utilities

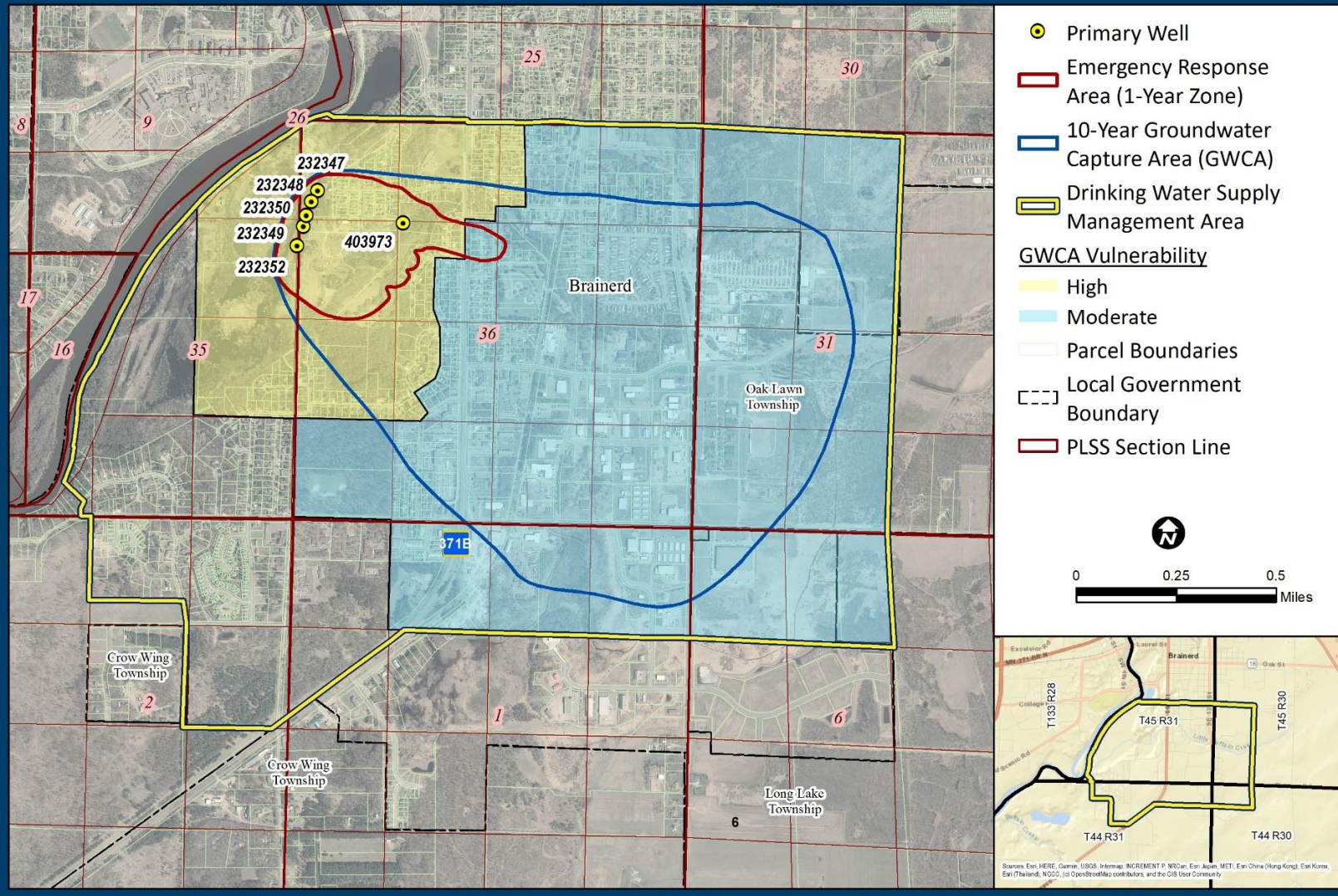
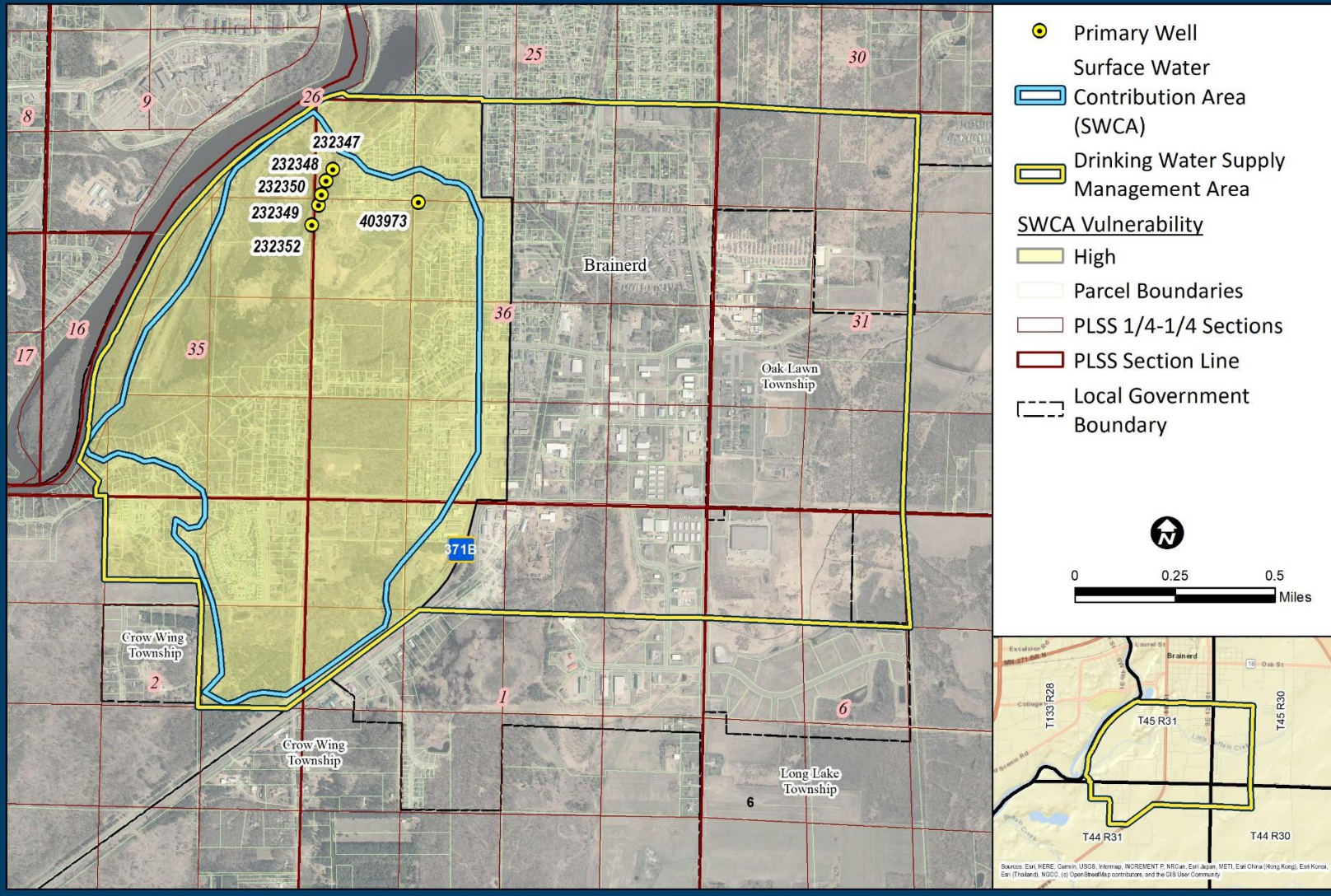


Figure 1C
Surface Water Contribution Area and Vulnerability
Brainerd Public Utilities



PIN	CITY/ TOWNSHIP	OWNER NAME	OWNER ADDRESS	CITY-STATE-ZIP	Acres
41010500	CITY OF BRAINERD	COMMON AREA			0.30
41010501	CITY OF BRAINERD	WARTHEN, ROBERT L	2405 HILLCREST DR	BRAINERD, MN 56401	0.04
41010502	CITY OF BRAINERD	BROWNE, CAROL M	2403 HILLCREST DR	BAXTER, MN 56425	0.03
41010503	CITY OF BRAINERD	NELSON, DONALD (50% INTEREST)	2401 HILLCREST DR	BRAINERD, MN 56401	0.04
41010552	CITY OF BRAINERD	JOHNSON, STEPHEN A & EILEEN A	1360 120TH ST SW	EAST GULL LAKE, MN 56401	1.44
41010553	CITY OF BRAINERD	JOHNSON, S & E FAMILY TRUST	1360 120TH ST SW	EAST GULL LAKE, MN 56401	1.45
41010554	CITY OF BRAINERD	AMERIGAS PROPANE LP	P O BOX 858	VALLEY FORGE, PA 19482	2.43
41010555	CITY OF BRAINERD	TAZ PROPERTIES OF BRAINERD LLC	5044 MARY ALLEN LANE	BRAINERD, MN 56401	2.33
41010556	CITY OF BRAINERD	BDT GROUP LLC	11869 COUNTY RD 45	BRAINERD, MN 56401	3.50
41010557	CITY OF BRAINERD	THOMPSON, KATHERINE	23493 HAVEN RD	LITTLE FALLS, MN 56345	4.80
41010558	CITY OF BRAINERD	NEW EARTH TECHNOLOGIES LLC	7756 COLLEGE RD	BAXTER, MN 56425	3.81
41010559	CITY OF BRAINERD	STERADIAN, LLC	1120 INDUSTRIAL PARK RD SW	BRAINERD, MN 56401	0.58
41010561	CITY OF BRAINERD	C & B INVESTMENTS LLC	11198 BRAYTON RD	BRAINERD, MN 56401	2.02
41010562	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	4.49
41010564	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	26.26
41010565	CITY OF BRAINERD	BUFFALO HILLS TOWNHOMES OWNERS ASSC	1100 COUNTY ROAD 44	BRAINERD, MN 56401	0.25
41010566	CITY OF BRAINERD	HILL, MARGARET J	2310 HILLCREST DR	BRAINERD, MN 56401	0.08
41010567	CITY OF BRAINERD	VAN ESSEN, JOHN	2308 HILLCREST DR	BRAINERD, MN 56401	0.05
41010568	CITY OF BRAINERD	KIRSCHNER, BETTY K	2306 HILLCREST DR	BRAINERD, MN 56401	0.05
41010569	CITY OF BRAINERD	KRAUTKREMER, GERALDINE A & LEANN G MCDONALD	2220 SPRUCE RD	BRAINERD, MN 56401	0.05
41010570	CITY OF BRAINERD	RIDER, KRISTIE	2302 HILLCREST DR	BRAINERD, MN 56401	0.08
41010584	CITY OF BRAINERD	FRANKLIN PROPERTIES LLC	20092 EDISON CIRCLE E	CLEARWATER, MN 55320	1.07
41010585	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.57
41010586	CITY OF BRAINERD	THOMPSON, ROXANNE D	12701 NORTH PELICAN LN	MERRIFIELD, MN 56465	0.56
41010587	CITY OF BRAINERD	THOMPSON, ROXANNE D	12701 NORTH PELICAN LN	MERRIFIELD, MN 56465	0.66
41010588	CITY OF BRAINERD	THOMPSON, ROXANNE D	12701 NORTH PELICAN LN	MERRIFIELD, MN 56465	0.84
41010589	CITY OF BRAINERD	THOMPSON, ROXANNE D	12701 NORTH PELICAN LN	MERRIFIELD, MN 56465	1.09
41010594	CITY OF BRAINERD	CAUGHEY, RUSSELL L JR & KATHRYN	3234 COUNTY ROAD 121	FORT RIPLEY, MN 56449	0.91
41010595	CITY OF BRAINERD	HALF MILE LLC	9292 EDGEWATER CIRCLE S	PEQUOT LAKES, MN 56472	0.63
41010596	CITY OF BRAINERD	DK INVESTMENTS LLC	1107 6TH ST S	BRAINERD, MN 56401	0.64
41010597	CITY OF BRAINERD	DK INVESTMENTS LLC	1107 6TH ST S	BRAINERD, MN 56401	0.70
41010598	CITY OF BRAINERD	BUFFALO HILLS, CONDOMINIUM ASSOC %E	2401 HILLCREST DR	BRAINERD, MN 56401	0.04
41010599	CITY OF BRAINERD	HALF MILE LLC	9292 EDGEWATER CIRCLE S	PEQUOT LAKES, MN 56472	0.43
41010600	CITY OF BRAINERD	HOMESTEAD GROUP LLC	15244 STATE HWY 371	BAXTER, MN 56425	0.68
41010601	CITY OF BRAINERD	HALF MILE LLC	9292 EDGEWATER CIRCLE S	PEQUOT LAKES, MN 56472	0.59
41010602	CITY OF BRAINERD	HALF MILE LLC	9292 EDGEWATER CIRCLE S	PEQUOT LAKES, MN 56472	0.57
41010603	CITY OF BRAINERD	ALMOND, STEPHEN R AND BONNIE	502 BUFFALO HILLS LANE E	BRAINERD, MN 56401	0.29
41010604	CITY OF BRAINERD	MANION, MICHAEL & SHARON	504 E BUFFALO HILLS LN	BRAINERD, MN 56401	0.26
41010605	CITY OF BRAINERD	EVANGELICAL LUTHERAN GOOD SAMARITAN	100 BUFFALO HILLS LN	BRAINERD, MN 56401	4.83
41010606	CITY OF BRAINERD	EVANGELICAL LUTHERAN GOOD SAMARITAN	100 BUFFALO HILLS LN	BRAINERD, MN 56401	12.62
41010607	CITY OF BRAINERD	EVANGELICAL LUTHERAN GOOD SAMARITAN	100 BUFFALO HILLS LN	BRAINERD, MN 56401	6.65
41010608	CITY OF BRAINERD	MINNESOTA TEEN CHALLENGE INC	1619 PORTLAND AVE S	MINNEAPOLIS, MN 55404	9.37
41010609	CITY OF BRAINERD	THOMPSON, ROXANNE D	12701 NORTH PELICAN LN	MERRIFIELD, MN 56465	8.51
41010612	CITY OF BRAINERD	MINNESOTA TEEN CHALLENGE INC	740 E 24TH ST	MINNEAPOLIS, MN 55404	19.82
41010613	CITY OF BRAINERD	MINNESOTA TEEN CHALLENGE INC	740 E 24TH ST	MINNEAPOLIS, MN 55404	19.93
41010614	CITY OF BRAINERD	THOMPSON, ROXANNE D	12701 NORTH PELICAN LN	MERRIFIELD, MN 56465	2.49
41010615	CITY OF BRAINERD	DK INVESTMENTS LLC	1107 6TH ST S	BRAINERD, MN 56401	0.99
41010617	CITY OF BRAINERD	VANWYNGEEREN PROPERTIES BRAINERD LLC	17134 JOHNSON RD	BRAINERD, MN 56401	17.30
41010618	CITY OF BRAINERD	VANWYNGEEREN PROPERTIES INDUST PARK	714 INDUSTRIAL PARK RD	BRAINERD, MN 56401	24.74
41020500					0.29
41020501	CITY OF BRAINERD	CRESCENT HILLS ESTATES HOMEOWNERS	PO BOX 7	AVON, MN 56310	2.46
41020502	CITY OF BRAINERD	SCHUPPEL, EDITH M TRUST AGR	2319 WHIPPOORWILL LN	BRAINERD, MN 56401	0.08
41020503	CITY OF BRAINERD	ERICKSON, LOIS	2315 WHIPPOORWILL LANE	BRAINERD, MN 56401	0.09
41020504	CITY OF BRAINERD	MILLER, ROGER B & VERNA M	504 BLUE JAY COURT	BRAINERD, MN 56401	0.08
41020505	CITY OF BRAINERD	SCEARCY, LOWELL G TRUST AGR(1/2 INT	500 BLUE JAY CT	BRAINERD, MN 56401	0.08
41020506	CITY OF BRAINERD	NORDBY, JOY & DALE	488 BLUE JAY CT	BRAINERD, MN 56401	0.09
41020507	CITY OF BRAINERD	NELSON FAMILY TRUST	484 BLUE JAY CRT	BRAINERD, MN 56401	0.09
41020508	CITY OF BRAINERD	GREEN, BETTY E	14890 BEAVER DAM RD	BRAINERD, MN 56401	0.09
41020509	CITY OF BRAINERD	RIOS, EUSEBIA DENISE	469 BLUE JAY CT	BRAINERD, MN 56401	0.09
41020510	CITY OF BRAINERD	LAMBERT, WILFRED & CATHERINE TRUST	473 BLUE JAY CT	BRAINERD, MN 56401	0.09
41020511	CITY OF BRAINERD	WORDEN, FRANK E & CAROLA A	481 BLUE JAY COURT	BRAINERD, MN 56401	0.09
41020512	CITY OF BRAINERD	BOUDIN, DAVID R & SHARON B	485 BLUE JAY CT	BRAINERD, MN 56401	0.09
41020513	CITY OF BRAINERD	SCHILLER, DANIEL A & JANICE E	489 BLUE JAY CT	BRAINERD, MN 56401	0.09
41020514	CITY OF BRAINERD	SOPER, HAROLD G TRUST &	PO BOX 802	BRAINERD, MN 56401	0.09
41020515	CITY OF BRAINERD	HELSETH, HELEN A	PO BOX 772	DADE CITY, FL 33526-0772	0.09
41020516	CITY OF BRAINERD	LEMOND, JUDITH V	3071 S FAIRFAX ST	DENVER, CO 80222	0.08
41020517	CITY OF BRAINERD	TANK, ELIZABETH A	505 BLUE JAY CT	BRAINERD, MN 56401	0.09
41020518	CITY OF BRAINERD	KURZ, STEPHANIE A	435 BUFFALO HILLS LANE W	BRAINERD, MN 56401	0.10
41020519	CITY OF BRAINERD	LIPSKI, CHELSEA ANN	431 BUFFALO HILLS LN W	BRAINERD, MN 56401	0.12
41020520	CITY OF BRAINERD	COMMON AREA		BRAINERD, MN 56401	0.34
41020521	CITY OF BRAINERD	MCMULLEN, DIANNE L	2316 WHIPPOORWILL LANE	BRAINERD, MN 56401	0.09
41020522	CITY OF BRAINERD	TAUTGES FAMILY TRUST AGR 3-23-10	2312 WHIPPOORWILL LANE	BRAINERD, MN 56401	0.08
41020523	CITY OF BRAINERD	OWENS, BARBARA E	2308 WHIPPOOR WILL LN	BRAINERD, MN 56401	0.09
41020524	CITY OF BRAINERD	KUHN, ROGER A & MARY JO O FAMILY TRUST	2304 WHIPPOORWILL LANE	BRAINERD, MN 56401	0.08
41020525	CITY OF BRAINERD	SENN FAMILY TRUST	2300 WHIPPOORWILL LANE	BRAINERD, MN 56401	0.09
41020526	CITY OF BRAINERD	FORTUNE, MARLOWE A	2531 RIDGE DR S	BRAINERD, MN 56401	1.04
41020527	CITY OF BRAINERD	SOUTHVIEW COURT, PATIO HOME ASSN	1511 NORTHERN PACIFIC RD #101	BRAINERD, MN 56401	2.22
41020528	CITY OF BRAINERD	ROHLFING, ERIC R AND ELIZABETH ROHLFING	P O BOX 1009	BRAINERD, MN 56401	0.06

PIN	CITY/ TOWNSHIP	OWNER NAME	OWNER ADDRESS	CITY-STATE-ZIP	Acres
41020529	CITY OF BRAINERD	PETERSON, DONALD E & ALVINA	2606 CRESTVIEW LN	BRAINERD, MN 56401	0.06
41020530	CITY OF BRAINERD	FENN, KAREN	2604 CRESTVIEW LN	BRAINERD MN 56401	0.06
41020531	CITY OF BRAINERD	SCHIRMER, EMILY R	2602 CRESTVIEW LN	BRAINERD, MN 56401	0.06
41020532	CITY OF BRAINERD	LITTLE, WAYNE G & JOAN D LIVING TRUST	13852 MISSION PARK DR	MERRIFIELD, MN 56465	0.06
41020533	CITY OF BRAINERD	LEIN, MARY JW	2895 230TH ST E	PRIOR LAKE, MN 55372	0.06
41020534	CITY OF BRAINERD	NELSON, MICHAEL B &	9704 FOREST HEIGHTS DR	BRAINERD, MN 56401	0.06
41020535	CITY OF BRAINERD	PAYNE, ROSEANN	2610 SOUTHVIEW COURT	BRAINERD, MN 56401	0.06
41020536	CITY OF BRAINERD	DICKOVER, LINDA M BUCK	2608 SOUTHVIEW COURT	BRAINERD, MN 56401	0.06
41020537	CITY OF BRAINERD	ALLEN, LINDA M	2606 SOUTHVIEW CT	BRAINERD, MN 56401	0.06
41020538	CITY OF BRAINERD	JOHNSON FAMILY TRUST	8565 HEATHER DR	RAPID CITY, SD 57702	0.06
41020539	CITY OF BRAINERD	PERSON, TODD M & JENNIFER A	2602 SOUTHVIEW CT	BRAINERD, MN 56401	0.06
41020540	CITY OF BRAINERD	EMMONS, CHERI M FAMILY TRUST	2538 WOODRIDGE LANE	BRAINERD, MN 56401	0.06
41020541	CITY OF BRAINERD	SCHWANTZ, JOYCE L REVOCABLE TRUST	973 VIA CANALE DR	BRAINERD, MN 56401	0.06
41020542	CITY OF BRAINERD	SOUTHVIEW COURT, PATIO HOME ASSN	1511 NORTHERN PACIFIC RD #101	BRAINERD, MN 56401	0.98
41020543	CITY OF BRAINERD	JOHNSON, MITCHELL D	PO BOX 1058	BRAINERD, MN 56401	0.06
41020544	CITY OF BRAINERD	RODSETH, CAROL MCKINNIE REV TRUST	2518 CRESTVIEW LN	BRAINERD, MN 56401	0.06
41020545	CITY OF BRAINERD	REZAC, BARBARA ANN REVOCABLE TRUST	2535 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020546	CITY OF BRAINERD	LELAND, MARY L 1998 LIVING TRUST	901 CHICKADEE DR	VENICE, FL 34285	0.06
41020547	CITY OF BRAINERD	GOBLE, ANDREW K & MELISSA M	21420 DIVISION RD	BRAINERD, MN 56401	0.06
41020548	CITY OF BRAINERD	MORYN, SHELLEY I & BRENDA K WALLACE	2529 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020549	CITY OF BRAINERD	BERG REVOCABLE TRUST	2527 WOODRIDGE LANE	BRAINERD, MN 56401	0.06
41020551	CITY OF BRAINERD	JEREMIASON, DAVID J & CORRIE J	2600 RIDGE DR S	BRAINERD, MN 56401	1.36
41020552	CITY OF BRAINERD	JEREMIASON, DAVID J & CORRIE J	2600 RIDGE DR S	BRAINERD, MN 56401	0.94
41020553	CITY OF BRAINERD	JEREMIASON, DAVID J & CORRIE J	2600 RIDGE DR S	BRAINERD, MN 56401	0.28
41020554	CITY OF BRAINERD	CRESSENT HILLS ESTATES OF BRD LLC	PO BOX 7	AVON, MN 56310	0.62
41020555	CITY OF BRAINERD	CRESSENT HILLS ESTATES OF BRD LLC	PO BOX 7	AVON, MN 56310	0.33
41020556	CITY OF BRAINERD	CRESSENT HILLS ESTATES OF BRD LLC	PO BOX 7	AVON, MN 56310	0.33
41020557	CITY OF BRAINERD	CRESSENT HILLS ESTATES OF BRD LLC	PO BOX 7	AVON, MN 56310	0.20
41020558	CITY OF BRAINERD	CRESSENT HILLS ESTATES OF BRD LLC	PO BOX 7	AVON, MN 56310	0.32
41020559	CITY OF BRAINERD	LEACH, EMMA FAYE & DENNIS	2501 RIDGE DR S	BRAINERD, MN 56401	0.66
41020560	CITY OF BRAINERD	JEREMIASON, DAVID J & CORRIE J	2600 RIDGE DR S	BRAINERD, MN 56401	0.55
41020561	CITY OF BRAINERD	KRAFT, ETHAN T & DANIELLE M	2422 RIDGE DR	BRAINERD, MN 56401	0.59
41020562	CITY OF BRAINERD	SOUTHVIEW COURT, PATIO HOME ASSN	1511 NORTHERN PACIFIC RD #101	BRAINERD, MN 56401	0.44
41020563	CITY OF BRAINERD	TOWNSEND, EMAJANE J	2525 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020564	CITY OF BRAINERD	HARTING, ROBERT P & JUDITH M REV TR	2523 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020565	CITY OF BRAINERD	ELNESS, JODI	2521 WOODRIDGE LANE	BRAINERD, MN 56401	0.06
41020566	CITY OF BRAINERD	GOCKEN, LYNETTE MARIE	2519 WOODRIDGE LANE	BRAINERD, MN 56401	0.06
41020567	CITY OF BRAINERD	MILLER, JUDY A	2517 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020568	CITY OF BRAINERD	SOUTHVIEW COURT, PATIO HOME ASSN	1511 NORTHERN PACIFIC RD #101	BRAINERD, MN 56401	2.12
41020569	CITY OF BRAINERD	STANG, SHIRLEY S REVOCABLE TRUST	2534 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020570	CITY OF BRAINERD	DAVIES, KATHLEEN M	2532 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020571	CITY OF BRAINERD	KNOLL, WILLIAM V 2019 REV TRUST	212 PRESTON DR	CLEBURNE, TX 76033	0.06
41020572	CITY OF BRAINERD	HERD, KENNETH G REVOCABLE TRUST	2528 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020573	CITY OF BRAINERD	NORAKER, DUANE O & GAYLE	2526 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020574	CITY OF BRAINERD	DEROSIER, JOSEPH M & PHYLLIS TRUST	2524 WOODRIDGE LANE	BRAINERD, MN 56401	0.06
41020575	CITY OF BRAINERD	FALCONER, JAMES A & MARY LEE	2522 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020576	CITY OF BRAINERD	WITHAM, JOAN C	2520 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020577	CITY OF BRAINERD	MARCHEL, RENEE M	2518 WOODRIDGE LANE	BRAINERD, MN 56401	0.06
41020578	CITY OF BRAINERD	DOUCETTE, DEBORAH M &	2516 WOODRIDGE LANE	BRAINERD, MN 56401	0.06
41020579	CITY OF BRAINERD	KRATTENMAKER, ROBERT & BEVERLEY J	2514 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020580	CITY OF BRAINERD	BONGIOVANNI, MICHAEL & YVETTE	22327 512TH LN	MC GREGOR, MN 55760	0.06
41020581	CITY OF BRAINERD	PETERSON, ARTHUR D JR & SHERYL M	2510 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020582	CITY OF BRAINERD	SCHMIDT/RAMSDALL TRUST	2508 WOODRIDGE LANE	BRAINERD, MN 56401	0.06
41020583	CITY OF BRAINERD	AXVIG, KEITH ODIN & ANN MARIE LINDA	2506 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020584	CITY OF BRAINERD	THESING, PETER W & LAVONNE A LIVG TRUST	2308 RIDGE DR S	BRAINERD, MN 56401	1.20
41020585	CITY OF BRAINERD	PRASKA, HENRY D &	402 BUFFALO HILLS LN W	BRAINERD, MN 56401	0.45
41020586	CITY OF BRAINERD	PRASKA, HENRY D &	402 BUFFALO HILLS LN W	BRAINERD, MN 56401	0.51
41020587	CITY OF BRAINERD	DESHAW, ADAM L & JESSICA A ISEBRAND	2402 S RIDGE DR	BRAINERD, MN 56401	0.39
41020588	CITY OF BRAINERD	KRAFT, ETHAN T & DANIELLE M	2422 RIDGE DR	BRAINERD, MN 56401	0.71
41020589	CITY OF BRAINERD	LEAF, JAMIN K & JOHNATHAN D	167 BUFFALO HILLS LANE W	BRAINERD, MN 56401	0.44
41020590	CITY OF BRAINERD	MD INVESTMENTS LLC	1107 6TH ST S	BRAINERD, MN 56401	0.42
41020591	CITY OF BRAINERD	MCFARLAND, DONALD W & KATHY F	2403 CRESTVIEW LN	BRAINERD, MN 56401	0.38
41020592	CITY OF BRAINERD	HASKINS, SUSAN L	2417 CRESTVIEW LN	BRAINERD, MN 56401	0.58
41020593	CITY OF BRAINERD	DOYLE, KAREN J	2423 CRESTVIEW LN	BRAINERD, MN 56401	0.49
41020594	CITY OF BRAINERD	DOYLE, KAREN J	2423 CRESTVIEW LN	BRAINERD, MN 56401	0.42
41020595	CITY OF BRAINERD	SULLIVAN, LARISSA R	PO BOX 307	MERRIFIELD, MN 56465	0.40
41020596	CITY OF BRAINERD	SULLIVAN, LARISSA R	PO BOX 307	MERRIFIELD, MN 56465	0.44
41020597	CITY OF BRAINERD	HOLST, CHARLES A & ARLENE	2521 CRESTVIEW LANE	BRAINERD, MN 56401	0.45
41020598	CITY OF BRAINERD	WILLIAMS, ALYSSA &	2539 CRESTVIEW LANE	BRAINERD, MN 56401	0.47
41020599	CITY OF BRAINERD	WILLIAMS, ALYSSA &	2539 CRESTVIEW LANE	BRAINERD, MN 56401	0.46
41020600	CITY OF BRAINERD	SHEPHERD, CODY	2603 CRESTVIEW LANE	BRAINERD, MN 56401	0.54
41020601	CITY OF BRAINERD	WHITE, AMBER LAFAY	2536 GREENWOOD ST SW	BRAINERD, MN 56401	1.95
41020602	CITY OF BRAINERD	SULLIVAN, ROBERT J	29935 COUNTY RD 3 PO BOX 307	MERRIFIELD, MN 56465	0.69
41020603	CITY OF BRAINERD	SOUTHVIEW COURT, PATIO HOME ASSN	1511 NORTHERN PACIFIC RD #101	BRAINERD, MN 56401	2.10
41020604	CITY OF BRAINERD	STEFFEN, VERNON A & BEVERLY A	2516 CRESTVIEW LN	BRAINERD, MN 56418	0.06
41020605	CITY OF BRAINERD	BBLLRR LLC	11610 ANDREW ST	BRAINERD, MN 56417	0.06
41020606	CITY OF BRAINERD	YOUNT, KATHLEEN J	2508 CRESTVIEW LN	BRAINERD, MN 56416	0.06
41020607	CITY OF BRAINERD	JENDRO PROPERTIES LLC	2506 CRESTVIEW LN	BRAINERD, MN 56415	0.06

PIN	CITY/ TOWNSHIP	OWNER NAME	OWNER ADDRESS	CITY-STATE-ZIP	Acres
41020608	CITY OF BRAINERD	PETERSEN, JEROME W & MARY R	2504 CRESTVIEW LANE	BRAINERD, MN 56414	0.06
41020609	CITY OF BRAINERD	JOURDAN, JOHN J & JUDITH A	2502 CRESTVIEW LANE	BRAINERD, MN 56413	0.06
41020610	CITY OF BRAINERD	HABERKORN, KATHERINE ROSE	2424 CRESTVIEW LANE	BRAINERD, MN 56412	0.06
41020611	CITY OF BRAINERD	PECARICH, JOHN & PAULA	2420 CRESTVIEW LN	BRAINERD, MN 56411	0.06
41020612	CITY OF BRAINERD	HERTEL, GAYLE A	2418 CRESTVIEW LN	BRAINERD, MN 56410	0.06
41020613	CITY OF BRAINERD	NELSON, BEVERLY G	2416 CRESTVIEW LN	BRAINERD, MN 56409	0.06
41020614	CITY OF BRAINERD	HABIGHORST, LEE ROY D	2501 WOODRIDGE LANE	BRAINERD, MN 56408	0.06
41020615	CITY OF BRAINERD	BUBALO, KEITH & LORI	2503 WOODRIDGE LN	BRAINERD, MN 56407	0.06
41020616	CITY OF BRAINERD	PRALL, JANET B	2505 WOODRIDGE LN	BRAINERD, MN 56406	0.06
41020617	CITY OF BRAINERD	TERTIN, DEBRA	2507 WOODRIDGE LN	BRAINERD, MN 56405	0.06
41020618	CITY OF BRAINERD	PIHLAJA, HOWARD E & GABRIELE A	2509 WOODRIDGE LN	BRAINERD, MN 56404	0.06
41020619	CITY OF BRAINERD	ERICKSON, MARGO M	2511 WOODRIDGE LN	BRAINERD, MN 56403	0.06
41020620	CITY OF BRAINERD	JOHNSON, BERT F	2513 WOODRIDGE LN	BRAINERD, MN 56402	0.06
41020621	CITY OF BRAINERD	JENSEN, DONNA J	2515 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020622	CITY OF BRAINERD	CRESCENT HILLS ESTATES OF BRD LLC	PO BOX 7	AVON, MN 56310	0.76
41020623	CITY OF BRAINERD	CRESCENT HILLS ESTATES OF BRD LLC	PO BOX 7	AVON, MN 56310	0.76
41020624	CITY OF BRAINERD	CRESCENT HILLS ESTATES OF BRD LLC	PO BOX 7	AVON, MN 56310	0.76
41020625	CITY OF BRAINERD	CRESCENT HILLS ESTATES OF BRD LLC	PO BOX 7	AVON, MN 56310	0.75
41020626	CITY OF BRAINERD	ANDERSON, BRETT & JULIE	521 BUFFALO HILLS LN	BRAINERD, MN 56401	0.78
41020627	CITY OF BRAINERD	SOUTHVIEW COURT, PATIO HOME ASSN	1511 NORTHERN PACIFIC RD #101	BRAINERD, MN 56401	2.14
41020628	CITY OF BRAINERD	TRUSTY REVOCABLE TRUST	2424 WOODRIDGE LANE	BRAINERD, MN 56401	0.06
41020629	CITY OF BRAINERD	STROMBACK REVOCABLE TRUST	2420 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020630	CITY OF BRAINERD	ENDERSBE, SHARON	2414 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020631	CITY OF BRAINERD	SHELL, RICHARD W	2412 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020632	CITY OF BRAINERD	DOBMEIER, MARY PATRICIA	2406 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020633	CITY OF BRAINERD	DOLS, LAWRENCE D & DONNA M	2404 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020634	CITY OF BRAINERD	PATRICK, JANE	219 BUFFALO HILLS LN W	BRAINERD, MN 56401	0.06
41020635	CITY OF BRAINERD	EASTMAN, BRUCE C & DONNA A SALLI	215 BUFFALO HILLS LN W	BRAINERD, MN 56401	0.06
41020636	CITY OF BRAINERD	PARK, CAROL & RICHARD	209 BUFFALO HILLS LANE	BRAINERD, MN 56401	0.06
41020637	CITY OF BRAINERD	OLSEN, WOLFRED A IND TRUST 9-27-93	205 BUFFALO HILLS LN W	BRAINERD, MN 56401	0.06
41020638	CITY OF BRAINERD	HOWE, ROBERT W	2304 CRESTVIEW LN	BRAINERD, MN 56401	0.06
41020639	CITY OF BRAINERD	GAFFEY, VICKI & LEO J	2302 CRESTVIEW LANE	BRAINERD, MN 56401	0.06
41020640	CITY OF BRAINERD	SOUTHVIEW COURT, PATIO HOME ASSN	1511 NORTHERN PACIFIC RD #101	BRAINERD, MN 56401	0.71
41020641	CITY OF BRAINERD	HAGENSON, MARGARET	2419 WOODRIDGE LANE	BRAINERD, MN 56401	0.06
41020642	CITY OF BRAINERD	SWANSON, JOHN C & JANE L	2415 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020643	CITY OF BRAINERD	WOLF, JOHN HOWARD & JOANNE RUTH	2409 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020644	CITY OF BRAINERD	FORT, MAE A	2405 WOODRIDGE LN	BRAINERD, MN 56401	0.06
41020645	CITY OF BRAINERD	REICHMANN, THERESA	2404 CRESTVIEW LN	BRAINERD, MN 56401	0.06
41020646	CITY OF BRAINERD	COLLINS, LYNDIA	2402 CRESTVIEW LN	BRAINERD, MN 56401	0.06
41020647	CITY OF BRAINERD	DILLEY, THOMAS N & LAURA L	2523 RIDGE DR S	BRAINERD, MN 56401	0.64
41020648	CITY OF BRAINERD	LEACH, EMMA FAYE & DENNIS	2501 RIDGE DR S	BRAINERD, MN 56401	0.64
41020649	CITY OF BRAINERD	GALLAGHER, CURTIS L & TRICIA L	2423 RIDGE DR S	BRAINERD, MN 56401	0.53
41020650	CITY OF BRAINERD	METZGER, TERRY & JANET	2303 SOUTH RIDGE DR	BRAINERD, MN 56401	0.62
41020651	CITY OF BRAINERD	LANGE, GREGORY J & MARY	323 TANAGER CIR	BRAINERD, MN 56401	1.17
41020652	CITY OF BRAINERD	JASKEN, TAYLOR M	301 TANAGER CIR	BRAINERD, MN 56401	0.58
41020653	CITY OF BRAINERD	HUBERT, SCOTT	302 TANAGER CIRCLE	BRAINERD, MN 56401	0.43
41020654	CITY OF BRAINERD	DITON, ALEXIS	321 BUFFALO HILLS LN	BRAINERD, MN 56401	0.33
41020655	CITY OF BRAINERD	HAYES, RICHARD L & BETTY J	322 TANAGER CIR	BRAINERD, MN 56401	0.69
41020656	CITY OF BRAINERD	SULLIVAN, ROBERT J	29935 COUNTY RD 3 PO BOX 307	MERRIFIELD, MN 56465	0.51
41020657	CITY OF BRAINERD	SULLIVAN, ROBERT J	29935 COUNTY RD 3 PO BOX 307	MERRIFIELD, MN 56465	0.51
41020658	CITY OF BRAINERD	SULLIVAN, ROBERT J	29935 COUNTY RD 3 PO BOX 307	MERRIFIELD, MN 56465	0.51
41020659	CITY OF BRAINERD	SULLIVAN, ROBERT J	29935 COUNTY RD 3 PO BOX 307	MERRIFIELD, MN 56465	0.61
41020660	CITY OF BRAINERD	JEREMIASON, DAVID J & CORRIE J	2600 RIDGE DR S	BRAINERD, MN 56401	0.39
41020661	CITY OF BRAINERD	CRESCENT HILLS ESTATES OF BRD LLC	PO BOX 7	AVON, MN 56310	6.32
41020663	CITY OF BRAINERD	HOWARD, JEFFREY L & LYNNE	324 WOODLAND HILLS LN	BRAINERD, MN 56401	1.05
41020679	CITY OF BRAINERD	CORP OF THE PRESIDING BISHOP OF THE	DAY SAINTS A UTAH CORP	BRAINERD, MN 56401	2.45
41020691	CITY OF BRAINERD	LIVELY AUTO CO	C/O MILLS PROPERTIES, P O BOX 826	BRAINERD, MN 56401	38.11
41040512	CITY OF BRAINERD	KOSTEK, ADAM ROBERT CHARLES &	JENNIFER MARIA, 1024 BROOK ST	BRAINERD, MN 56401	0.57
41040513	CITY OF BRAINERD	WLASIUK, PATRICIA, & TIMOTHY & MICHAEL &	1018 BROOK ST	BRAINERD, MN 56401	0.36
41040514	CITY OF BRAINERD	WLASIUK, PATRICIA, & TIMOTHY & MICHAEL &	1018 BROOK ST	BRAINERD, MN 56401	0.30
41060516	CITY OF BRAINERD	G J R INVESTMENTS, LLP	1330 115TH AVE NW	COON RAPIDS, MN 55448	41.18
41060517	CITY OF BRAINERD	G J R INVESTMENTS, LLP	1330 115TH AVE NW	COON RAPIDS, MN 55448	23.62
41060523	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	1.15
41250845	CITY OF BRAINERD	GULL LAKE SANDBLASTING & POWDER	818 BROOK ST	BRAINERD, MN 56401	0.57
41300994	CITY OF BRAINERD	SWEDBERG, BERNICE A	1331 PARK ST	BRAINERD, MN 56401	0.26
41300995	CITY OF BRAINERD	MCCORMICK, RANDY D	1325 PARK ST		0.31
41300996	CITY OF BRAINERD	HIPPERT, KIMBERLY S	1319 PARK ST	BRAINERD, MN 56401	0.35
41310500	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	19.52
41310501	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	26.01
41310502	CITY OF BRAINERD	TRETTER, GARTH & KATIE ISEBRAND FAM TRST	15461 IRONWOOD LANE	BRAINERD, MN 56401	4.17
41310503	CITY OF BRAINERD	ALEXIS INVESTMENTS LLC	PO BOX 7190	SAINT CLOUD, MN 56302	7.62
41310504	CITY OF BRAINERD	JOHN DAN LUKE LLC	C/O JOHN THELEN, 4376 MISSION RD	NISSWA, MN 56428	10.18
41310505	CITY OF BRAINERD	JOHN DAN LUKE LLC	C/O JOHN THELEN, 4376 MISSION RD	NISSWA, MN 56428	30.77
41310506	CITY OF BRAINERD	JOHN DAN LUKE LLC	C/O JOHN THELEN, 4376 MISSION RD	NISSWA, MN 56428	35.06
41310507	CITY OF BRAINERD	JOHN DAN LUKE LLC	C/O JOHN THELEN, 4376 MISSION RD	NISSWA, MN 56428	5.05
41310510	CITY OF BRAINERD	ALEXIS INVESTMENTS LLC	PO BOX 7190	SAINT CLOUD, MN 56302	0.32
41310514	CITY OF BRAINERD	ALEXIS INVESTMENTS LLC	PO BOX 7190	SAINT CLOUD, MN 56302	2.74
41350500	CITY OF BRAINERD	FORREST, JOHN F & JOANNE F	159 PINE VIEW DR	BRAINERD, MN 56401	0.37

PIN	CITY/ TOWNSHIP	OWNER NAME	OWNER ADDRESS	CITY-STATE-ZIP	Acres
41350501	CITY OF BRAINERD	JOHNSON, THADDEUS F & MARY	218 RIDGE DR	BRAINERD, MN 56401	0.44
41350502	CITY OF BRAINERD	MORRISON, ELDON L & LI, LIVI	124 BELLE RAE CIR	BRAINERD, MN 56401	0.39
41350503	CITY OF BRAINERD	JUDD, DAN W & SARAH S	158 PINEVIEW DR	BRAINERD, MN 56401	1.26
41350504	CITY OF BRAINERD	BIESER, WILLIAM J & TONI M	160 PINEVIEW DR	BRAINERD, MN 56401	1.78
41350505	CITY OF BRAINERD	THESING, GERY P & LINDA M FAMILY TRUST	502 W BUFFALO HILLS LN	BRAINERD, MN 56401	0.71
41350506	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.23
41350507	CITY OF BRAINERD	CONRAD, JAMES W & JULIE M	520 BUFFALO HILLS LANE	BRAINERD, MN 56401	0.53
41350508	CITY OF BRAINERD	STORBAKKEN, ERIC R & TRUDI E	524 BUFFALO HILLS LN W	BRAINERD, MN 56401	0.61
41350509	CITY OF BRAINERD	RITTER, CONSTANCE A & KENNETH N	221 RIDGE DR	BRAINERD, MN 56401	0.63
41350510	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.64
41350511	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.46
41350512	CITY OF BRAINERD	SCHULTZ, JAYSON D	302 ASPEN CT	BRAINERD, MN 56401	0.60
41350513	CITY OF BRAINERD	SIMOTA, TIMOTHY C & JENNIFER J	318 ASPEN CT	BRAINERD, MN 56401	0.49
41350514	CITY OF BRAINERD	RUTMAN, BRADY P & ASHLEY S	332 ASPEN CT	BRAINERD, MN 56401	0.67
41350515	CITY OF BRAINERD	PRASKA, HENRY D &	402 BUFFALO HILLS LN W	BRAINERD, MN 56401	0.69
41350516	CITY OF BRAINERD	ANDERSON, DAVID R & ANNETTE M	323 ASPEN CT	BRAINERD, MN 56401	0.52
41350517	CITY OF BRAINERD	HIGHUM, THOMAS M & DOROTHY M	313 ASPEN CT	BRAINERD, MN 56401	0.41
41350518	CITY OF BRAINERD	TOUSIGNANT, MARSHALL E (1/2 INT)	303 ASPEN CT	BRAINERD, MN 56401	0.40
41350519	CITY OF BRAINERD	ERICKSON, NICHOLAS E & TRINA M	123 RIDGE DR	BRAINERD, MN 56401	0.42
41350520	CITY OF BRAINERD	ANDERSON, HOWARD E	115 RIDGE DR	BRAINERD, MN 56401	0.41
41350521	CITY OF BRAINERD	MIKKELSON, STEVEN & LYNN	111 RIDGE DR	BRAINERD, MN 56401	0.46
41350522	CITY OF BRAINERD	PRASKA, HENRY D &	402 BUFFALO HILLS LN W	BRAINERD, MN 56401	0.46
41350523	CITY OF BRAINERD	PRASKA, HENRY D &	402 BUFFALO HILLS LN W	BRAINERD, MN 56401	0.46
41350525	CITY OF BRAINERD	ISMIR, MARILYN K TRUST AGR	222 RIDGE DR	BRAINERD, MN 56401	1.08
41350526	CITY OF BRAINERD	ISMIR, MARILYN K TRUST AGR	222 RIDGE DR	BRAINERD, MN 56401	1.14
41350527	CITY OF BRAINERD	JOHNSON, THADDEUS F & MARY	218 RIDGE DR	BRAINERD, MN 56401	1.29
41350528	CITY OF BRAINERD	OLSTAD, SHANE M & EMILEE C	216 RIDGE DR	BRAINERD, MN 56401	0.97
41350529	CITY OF BRAINERD	OLSTAD, SHANE M & EMILEE C	216 RIDGE DR	BRAINERD, MN 56401	0.79
41350530	CITY OF BRAINERD	HAMRE, JOSHUA T & KARMEN A	212 RIDGE DR	BRAINERD, MN 56401	0.72
41350531	CITY OF BRAINERD	ANDERSON, GARY M & MARY KAY	210 RIDGE DR	BRAINERD, MN 56401	0.71
41350532	CITY OF BRAINERD	BOOTH, GALEN & NICOLE	208 RIDGE RD	BRAINERD, MN 56401	0.77
41350533	CITY OF BRAINERD	O'GRADY, KEVIN J & JILL R	206 RIDGE DR	BRAINERD, MN 56401	0.81
41350534	CITY OF BRAINERD	SMITH, BAXTER A III TRUST AGR	204 RIDGE DR	BRAINERD, MN 56401	0.83
41350535	CITY OF BRAINERD	DEBLOCK, RYAN J & SEIPP DEBLOCK, KATIE	202 RIDGE DR	BRAINERD, MN 56401	0.49
41350536	CITY OF BRAINERD	KNOWLEN, GLENDON D & CONNIE L	223 RIDGE COURT	BRAINERD, MN 56401	2.15
41350537	CITY OF BRAINERD	SCHIRMER, CARL K JR & KAREN	222 RIDGE CT	BRAINERD, MN 56401	0.61
41350538	CITY OF BRAINERD	DEHEN, SHANNON D TRUST	212 RIDGE CT	BRAINERD, MN 56401	1.10
41350539	CITY OF BRAINERD	PLOOF, CHAD L & KIMBERLY J	118 RIDGE RD	BRAINERD, MN 56401	0.57
41350540	CITY OF BRAINERD	EMBRETSON, LORRAINE E	114 RIDGE DR	BRAINERD, MN 56401	0.59
41350541	CITY OF BRAINERD	EATON, BRYCE R & MARY JEAN	110 RIDGE DR	BRAINERD, MN 56401	0.46
41350542	CITY OF BRAINERD	DEHNING, KURT & KELLY	106 RIDGE DR	BRAINERD, MN 56401	0.46
41350543	CITY OF BRAINERD	BERGER, TERRY W & KATHLEEN P	102 RIDGE DR	BRAINERD, MN 56401	0.46
41350544	CITY OF BRAINERD	LUNDEEN, BENJAMIN J & MELISSA A	143 CAROL LN	BRAINERD, MN 56401	0.63
41350545	CITY OF BRAINERD	SCHIRMER, CARL K JR & KAREN	222 RIDGE CT	BRAINERD, MN 56401	2.47
41350546	CITY OF BRAINERD	ABRAHAMSON, FAYE A	308 BUFFALO HILLS LN W	BRAINERD, MN 56401	1.03
41350547	CITY OF BRAINERD	THOMPSON, BRUCE C & CYNTHIA	113 CAROL LN	BRAINERD, MN 56401	0.51
41350548	CITY OF BRAINERD	COOK, VINCE	123 CAROL LN	BRAINERD, MN 56401	0.55
41350549	CITY OF BRAINERD	MARSHALL, SARAH & MARC	133 CAROL LN	BRAINERD, MN 56401	1.17
41350550	CITY OF BRAINERD	LUNDEEN, BENJAMIN J & MELISSA A	143 CAROL LN	BRAINERD, MN 56401	1.48
41350551	CITY OF BRAINERD	CARLSON, JAMES M & ELSE M	153 CAROL LN	BRAINERD, MN 56401	0.89
41350552	CITY OF BRAINERD	OWEN FAMILY REV LIVING TRUST (THE)	154 CAROL LN	BRAINERD, MN 56401	0.56
41350553	CITY OF BRAINERD	BRUSSEAU, MICHAEL A & KARI L	144 CAROL LN	BRAINERD, MN 56401	0.68
41350554	CITY OF BRAINERD	STEINHAUSER, SCOTT & JULIE	124 CAROL LN	BRAINERD, MN 56401	0.60
41350555	CITY OF BRAINERD	BRUSSEAU, MICHAEL A & KARI L	144 CAROL LN	BRAINERD, MN 56401	0.14
41350556	CITY OF BRAINERD	STEINHAUSER, SCOTT & JULIE	124 CAROL LN	BRAINERD, MN 56401	0.69
41350557	CITY OF BRAINERD	KRUEGER, PATRICK M & HELEN J	114 CAROL LN	BRAINERD, MN 56401	0.62
41350558	CITY OF BRAINERD	MASKE, JOHN W & YVONNE M	162 PINE VIEW DR	BRAINERD, MN 56401	1.92
41350559	CITY OF BRAINERD	KRUPKE, STEVEN B	161 PINEVIEW DR	BRAINERD, MN 56401	1.50
41350560	CITY OF BRAINERD	NICHOLS, MARC C & CARRIE M	157 PINE VIEW DR	BRAINERD, MN 56401	0.35
41350561	CITY OF BRAINERD	NELSON, DARREN & SWANSON, KATE MARIE	2134 CRESTVIEW LN	BRAINERD, MN 56410	0.27
41350562	CITY OF BRAINERD	PETERSON, BROCK	8968 WISE RD	BRAINERD, MN 56410	0.27
41350563	CITY OF BRAINERD	UNSER, BRADLEY J & JYNELL D	2120 CRESTVIEW LN	BRAINERD, MN 56410	0.31
41350564	CITY OF BRAINERD	PETRICH, NICOLE L	2112 CRESTVIEW LN	BRAINERD, MN 56410	0.31
41350565	CITY OF BRAINERD	PELTOMA, RODNEY G & SUSAN	2104 CRESTVIEW LN	BRAINERD, MN 56410	0.31
41350566	CITY OF BRAINERD	ORR, MATTHEW T	2030 CRESTVIEW LN	BRAINERD, MN 56410	0.31
41350567	CITY OF BRAINERD	BETKER, AMANDA	2026 CRESTVIEW LN	BRAINERD, MN 56410	0.31
41350568	CITY OF BRAINERD	HIGGINS, SEAN T & SARAH E WINGE	2022 CRESTVIEW LN	BRAINERD, MN 56410	0.31
41350569	CITY OF BRAINERD	WUSSOW, PATRICK D	2018 CRESTVIEW LN	BRAINERD, MN 56410	0.66
41350571	CITY OF BRAINERD	POMMERENING, MICHAEL & AMANDA	107 NORWAY CT	BRAINERD, MN 56410	0.42
41350572	CITY OF BRAINERD	CORTINAS, ESTEVAN J & KAYLI M	106 NORWAY CT	BRAINERD, MN 56410	0.39
41350573	CITY OF BRAINERD	AGRE, JOHN D & ANDREA F	102 NORWAY CT	BRAINERD, MN 56410	0.34
41350574	CITY OF BRAINERD	ROBERTS, GREGORY M & DIANE M	2014 CRESTVIEW LN	BRAINERD, MN 56410	0.32
41350575	CITY OF BRAINERD	DUHN, DAVID A & LORA L	2010 CRESTVIEW LN	BRAINERD, MN 56410	0.32
41350576	CITY OF BRAINERD	CHARPENTIER, RAYMOND A	2006 CRESTVIEW LN	BRAINERD, MN 56410	0.32
41350577	CITY OF BRAINERD	TOTTEN, JEANNE L	153 PINEVIEW DR	BRAINERD, MN 56410	0.31
41350578	CITY OF BRAINERD	SCHAFER, REBECCA A & PATRIC C	4747 WEST 177 ST	COUNTRY CLUB HILLS, IL 60478	0.27
41350579	CITY OF BRAINERD	SCHAFER, REBECCA A & PATRIC C	4747 WEST 177 ST	COUNTRY CLUB HILLS, IL 60478	0.27
41350580	CITY OF BRAINERD	ADERMAN, THOMAS & RATHY, REBECCA	2131 CRESTVIEW LN	BRAINERD, MN 56410	0.27

PIN	CITY/ TOWNSHIP	OWNER NAME	OWNER ADDRESS	CITY-STATE-ZIP	Acres
41350581	CITY OF BRAINERD	OSAFO, MAMFE & ANDREA	2123 CRESTVIEW LN	BRAINERD, MN 56410	0.27
41350582	CITY OF BRAINERD	PRUSAK, THOMAS K & MARTHA	2117 CRESTVIEW LN	BRAINERD, MN 56409	0.34
41350583	CITY OF BRAINERD	JENSEN, JENNIFER	2109 CRESTVIEW LN	BRAINERD, MN 56408	0.31
41350584	CITY OF BRAINERD	RASMUSSEN, DONALD A & CHRISTINE	2103 CRESTVIEW LANE	BRAINERD, MN 56407	0.32
41350585	CITY OF BRAINERD	WICKLUND, BEVERLEY A REV TRUST	2029 CRESTVIEW LN	BRAINERD, MN 56406	0.32
41350586	CITY OF BRAINERD	SWARTHOUT, ZACHARY & EMILY	2025 CRESTVIEW LN	BRAINERD, MN 56405	0.31
41350587	CITY OF BRAINERD	LAUGHLIN, REBECCA A	2021 CRESTVIEW LANE	BRAINERD, MN 56404	0.31
41350588	CITY OF BRAINERD	RUEN, KEVIN A	2017 CRESTVIEW LN	BRAINERD, MN 56403	0.31
41350589	CITY OF BRAINERD	WARD, DENNIS R & BARBIE J	2013 CRESTVIEW LANE	BRAINERD, MN 56402	0.31
41350590	CITY OF BRAINERD	ERLANSON, BRITTA J	2009 CRESTVIEW LN	BRAINERD, MN 56401	0.35
41350591	CITY OF BRAINERD	BOONE, MARK & MARY	2001 CRESTVIEW LN	BRAINERD, MN 56401	0.62
41350592	CITY OF BRAINERD	HALVERSON, MARC & JACQUELYN REV	156 PINEVIEW DR	BRAINERD, MN 56401	1.81
41350593	CITY OF BRAINERD	LIMVERE, ENNO J & JOAN R	152 PINEVIEW DR	BRAINERD, MN 56401	0.39
41350594	CITY OF BRAINERD	KARLSON, JAMES T	139 BELLE RAE CIR	BRAINERD, MN 56401	0.28
41350595	CITY OF BRAINERD	HALVERSON, MARC & JACQUELYN REV	156 PINEVIEW DR	BRAINERD, MN 56401	0.68
41350596	CITY OF BRAINERD	MOLINE, RUSSELL W & JENNIFER L	2006 GRAYDON AVE	BRAINERD, MN 56401	0.32
41350597	CITY OF BRAINERD	HARTING, SAMANTHA L	2010 GRAYDON AVE	BRAINERD, MN 56401	0.31
41350598	CITY OF BRAINERD	ANDERSON, MARY JO & STEPHEN HESSE	2014 GRAYDON AVE	BRAINERD, MN 56401	0.31
41350599	CITY OF BRAINERD	MCLAIN, COLIN & AMY	2331 DANCING WIND RD SW	PINE RIVER, MN 56474	0.31
41350600	CITY OF BRAINERD	POOL, JOSHUA R & ANDREA T	2022 GRAYDON AVE	BRAINERD, MN 56401	0.31
41350601	CITY OF BRAINERD	SMOLKE, EDWARD F & NANCY	2026 GRAYDON AVE	BRAINERD, MN 56401	0.30
41350602	CITY OF BRAINERD	HANSSEN, HEATHER S	2030 GRAYDON AVE	BRAINERD, MN 56401	0.32
41350603	CITY OF BRAINERD	PARK UNITED, METHODIST CHURCH	315 N 6TH ST	BRAINERD, MN 56401	0.32
41350604	CITY OF BRAINERD	BURNETT, JOAN H	1926 GRAYDON AVE	BRAINERD, MN 56401	0.31
41350605	CITY OF BRAINERD	PATRICK, AARON	2120 GRAYDON AVE	BRAINERD, MN 56401	0.32
41350606	CITY OF BRAINERD	REITHER, RANDALL LEE & KAREN L	2131 GRAYDON AVE	BRAINERD, MN 56401	0.37
41350607	CITY OF BRAINERD	SULLIVAN, TRISH A	2123 GRAYDON AVE	BRAINERD, MN 56401	0.29
41350608	CITY OF BRAINERD	JORGENSEN, ERNEST C & RACHEL J	2117 GRAYDON AVE	BRAINERD, MN 56401	0.29
41350609	CITY OF BRAINERD	FLANAGAN, BRIAN K	2109 GRAYDON AVE	BRAINERD, MN 56401	0.29
41350610	CITY OF BRAINERD	ROBERTS, JAMES M	2103 GRAYDON AVE	BRAINERD, MN 56401	0.32
41350611	CITY OF BRAINERD	LEMKE, SAMANTHA LYNN	2029 GRAYDON AVE	BRAINERD, MN 56401	0.32
41350612	CITY OF BRAINERD	RUEN, MICHELLE A	2025 GRAYDON AVE	BRAINERD, MN 56401	0.31
41350613	CITY OF BRAINERD	MULLENIX, DARRELL H	2021 GRAYDON AVE	BRAINERD, MN 56401	0.31
41350614	CITY OF BRAINERD	HASTINGS, MARK A & BRITTNEY A SMITH	2017 GRAYDON AVE	BRAINERD, MN 56401	0.31
41350615	CITY OF BRAINERD	QUALLEY, MATTHEW W & VERONICA	2013 GRAYDON AVE	BRAINERD, MN 56401	0.31
41350616	CITY OF BRAINERD	KARELIS, ZACHARY P & NICOLE G	2009 GRAYDON AVE	BRAINERD, MN 56401	0.31
41350617	CITY OF BRAINERD	TORFIN, JAMES N & NEDRA	2005 GRAYDON AVE	BRAINERD, MN 56401	0.32
41350618	CITY OF BRAINERD	PELKEY, STEVEN A & LAURIE	2001 GRAYDON AVE	BRAINERD, MN 56401	0.33
41350619	CITY OF BRAINERD	HORN, VERA L	2002 GRAYDON AVE	BRAINERD, MN 56401	0.38
41350620	CITY OF BRAINERD	SWANSON, PHILLIP C & DIANE	140 PINEVIEW DR	BRAINERD, MN 56401	0.32
41350621	CITY OF BRAINERD	SCHILLER, ERIC J & LEAH L	132 PINEVIEW DR	BRAINERD, MN 56401	0.32
41350622	CITY OF BRAINERD	HOCHHALTER, CASEY & KELLIE	124 PINEVIEW DR	BRAINERD, MN 56401	0.31
41350623	CITY OF BRAINERD	JOHNSON, BRUCE A REV LIVING TRUST	16348 AHRENS RD	BRAINERD, MN 56401	0.32
41350624	CITY OF BRAINERD	OAKLEY, JEROME D & JANICE M	1948 GRAYDON AVE	BRAINERD, MN 56401	0.31
41350625	CITY OF BRAINERD	DEWITT, GARY L & BRENDA BARTELS DEW	107 BELLE RAE CIR	BRAINERD, MN 56401	0.32
41350626	CITY OF BRAINERD	POWERS, JEFFREY K & KIMBERLY A	115 BELLE RAE CIR	BRAINERD, MN 56401	0.32
41350627	CITY OF BRAINERD	ENDRES, KYUNG	123 BELLE RAE CIR	BRAINERD, MN 56401	0.31
41350628	CITY OF BRAINERD	BEST, REBECCA	131 BELLE RAE CIRCLE	BRAINERD, MN 56401	0.29
41350629	CITY OF BRAINERD	KARLSON, JAMES T	139 BELLE RAE CIR	BRAINERD, MN 56401	0.58
41350630	CITY OF BRAINERD	TURCOTTE, CHERYL KAY	140 BELLE RAE CIRCLE	BRAINERD, MN 56401	0.46
41350631	CITY OF BRAINERD	GAMMELLO, WENDY K	132 BELLE RAE CIR	BRAINERD, MN 56401	0.29
41350632	CITY OF BRAINERD	MORRISON, ELTON L & LI, LIVI	124 BELLE RAE CIR	BRAINERD, MN 56401	0.32
41350633	CITY OF BRAINERD	SJOSTRAND, WHITNEY J & KIRSTEN J	108 BELLE RAE CIRCLE	BRAINERD, MN 56401	0.87
41350635	CITY OF BRAINERD	FREEMAN, ANDREW & MISHA	1934 WOOD CREST RD	BRAINERD, MN 56401	0.33
41350636	CITY OF BRAINERD	SEIWERT, BRADLEY JOHN & LINDA JEAN	102 BELLE RAE CIR	BRAINERD, MN 56401	0.43
41350637	CITY OF BRAINERD	KLEINSCHMIDT, HUNTER & RACHEL	1912 WOODCREST RD	BRAINERD, MN 56401	0.84
41350638	CITY OF BRAINERD	MADISON, JULIE M REVOCABLE TRUST	1927 WOODCREST RD	BRAINERD, MN 56401	0.34
41350639	CITY OF BRAINERD	MADISON, JULIE M REVOCABLE TRUST	1927 WOODCREST RD	BRAINERD, MN 56401	0.34
41350640	CITY OF BRAINERD	WYNN, CHARLES & JOAN	1923 WOODCREST RD	BRAINERD, MN 56401	0.36
41350641	CITY OF BRAINERD	SJOSTRAND, KIRSTEN	108 BELLE RAE CIR	BRAINERD, MN 56401	0.39
41350642	CITY OF BRAINERD	MAJKA, MATTHEW J & HILLARY SWANSON	1909 WOODCREST RD	BRAINERD, MN 56401	0.41
41350643	CITY OF BRAINERD	OLSON, CATHERINE	1901 WOODCREST RD	BRAINERD, MN 56401	0.37
41350644	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	2.91
41350646	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	11.74
41350647	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	3.37
41350648	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	36.72
41350649	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	24.21
41350652	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	2.91
41350653	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	20.53
41350654	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.89
41350655	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	65.81
41350656	CITY OF BRAINERD	KLEINSCHMIDT, HUNTER & RACHEL	1912 WOODCREST RD	BRAINERD, MN 56401	0.58
41350657	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.09
41360500	CITY OF BRAINERD	PUERINGER, DAVID F	616 1/2 FRONT ST	BRAINERD, MN 56411	0.67
41360501	CITY OF BRAINERD	BRAINERD LAKES INTEGRATED HEALTH	2024 SOUTH 6TH ST	BRAINERD, MN 56411	1.44
41360502	CITY OF BRAINERD	KLANG REVOCABLE TRUST 12/10/13	2109 SPRUCE DR	BRAINERD, MN 56411	0.18
41360503	CITY OF BRAINERD	BRAINERD LAKES INTEGRATED HEALTH	2024 SOUTH 6TH ST	BRAINERD, MN 56408	0.39
41360504	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.44

PIN	CITY/ TOWNSHIP	OWNER NAME	OWNER ADDRESS	CITY-STATE-ZIP	Acres
41360505	CITY OF BRAINERD	LUND PROPERTIES LLC	1676 MISSISSIPPI RIVER BLVD S	SAINT PAUL, MN 55116	1.25
41360506	CITY OF BRAINERD	BRAINERD SNODEOS	701 CHARLES ST	BRAINERD, MN 56401	0.99
41360507	CITY OF BRAINERD	LENDOBEJA, STEVEN	313 CEDAR ST	BRAINERD, MN 56401	0.77
41360508	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	5.33
41360509	CITY OF BRAINERD	SWITZER, LOY D	1502 7TH ST S	BRAINERD, MN 56401	0.23
41360510	CITY OF BRAINERD	JENKINS, ERICH M	PO BOX 792	BRAINERD, MN 56401	0.21
41360511	CITY OF BRAINERD	MOORES PROPERTIES, INC	605 LAUREL ST	BRAINERD, MN 56401	0.62
41360512	CITY OF BRAINERD	LAZY H PROPERTIES LLC	501 EAST BROADWAY	LITTLE FALLS, MN 56345	0.47
41360513	CITY OF BRAINERD	ROBERTS, KEITH W & JAN D	1700 EMMA ST	BRAINERD MN 56401	1.45
41360514	CITY OF BRAINERD	FITZPATRICK, JOHN	415 BLUFF	BRAINERD, MN 56401	1.37
41360515	CITY OF BRAINERD	DESPOT, ROBERT L REV TRUST	1302 POISSANT RD	FORT RIPLEY, MN 56449	1.27
41360516	CITY OF BRAINERD	LEE, FRANK C & MELINDA M	1205 BROOK ST	BRAINERD, MN 56401	0.95
41360517	CITY OF BRAINERD	BEHYMER, GLADYS E	2206 SPRUCE DR	BRAINERD, MN 56401	0.10
41360518	CITY OF BRAINERD	ADAMSON, DOROTHY E	2204 SPRUCE DR	BRAINERD, MN 56401	0.12
41360519	CITY OF BRAINERD	PLANTZ, JASON P & PLANTZ, BRIAN C	2202 SPRUCE DR	BRAINERD, MN 56401	0.10
41360520	CITY OF BRAINERD	STALL, PHYLLIS & STALL, DANIEL HOWARD	2208 SPRUCE DR	BRAINERD, MN 56401	0.11
41360521	CITY OF BRAINERD	MCCULLEY, RODNEY W &	2116 SPRUCE DR	BRAINERD, MN 56401	0.18
41360522	CITY OF BRAINERD	SKONE, LESLIE A REV TRUST	2112 SPRUCE DR	BRAINERD, MN 56401	0.33
41360523	CITY OF BRAINERD	TEASER, KIERAN	2216 SPRUCE DR	BRAINERD, MN 56401	0.17
41360525	CITY OF BRAINERD	GARRY, STACY A	2210 SPRUCE DR	BRAINERD, MN 56401	0.19
41360526	CITY OF BRAINERD	TEASER, KIERAN	2216 SPRUCE DR	BRAINERD, MN 56401	0.11
41360527	CITY OF BRAINERD	KRALL, MARCIE	2214 SPRUCE DR	BRAINERD, MN 56401	0.10
41360528	CITY OF BRAINERD	JENSEN, ROY W & BEVERLY K	2212 SPRUCE DRIVE	BRAINERD, MN 56401	0.13
41360529	CITY OF BRAINERD	BROWN, CYNTHIA	2238 SPRUCE DR	BRAINERD, MN 56401	0.10
41360530	CITY OF BRAINERD	ASHER, CARRIE J	2236 SPRUCE DR	BRAINERD, MN 56401	0.14
41360531	CITY OF BRAINERD	WIMER, MATTHEW D &	2240 SPRUCE DR	BRAINERD, MN 56401	0.09
41360532	CITY OF BRAINERD	BROWN, CYNTHIA	2238 SPRUCE DR	BRAINERD, MN 56401	0.01
41360533	CITY OF BRAINERD	DUPAY, JOSHUA	2234 SPRUCE DR	BRAINERD, MN 56401	0.15
41360534	CITY OF BRAINERD	WIMER, MATTHEW D &	2240 SPRUCE DR	BRAINERD, MN 56401	0.07
41360535	CITY OF BRAINERD	BACKSTROM, JEROLD H & MARGEE L	2232 SPRUCE DR	BRAINERD, MN 56401	0.23
41360536	CITY OF BRAINERD	FREEMAN, ARLENE	2230 SPRUCE DR	BRAINERD, MN 56401	0.11
41360537	CITY OF BRAINERD	SIMONS, SUSAN	2228 SPRUCE DR	BRAINERD, MN 56401	0.11
41360538	CITY OF BRAINERD	ALMER, VIRGINIA LEE	2226 SPRUCE DR	BRAINERD, MN 56401	0.25
41360539	CITY OF BRAINERD	ERICKSON, ROGER M & ADELLE R	2224 SPRUCE DR	BRAINERD, MN 56401	0.22
41360540	CITY OF BRAINERD	SIMPSON, MICHAEL & SARAH	1151 COUNTY ROAD 436	DUBLIN, TX 76446	0.11
41360541	CITY OF BRAINERD	KRAUTKREMER, LEE & GERALDINE	2220 SPRUCE DR	BRAINERD, MN 56401	0.11
41360542	CITY OF BRAINERD	KEWITSCH, SHIRLEY	2218 SPRUCE DR	BRAINERD, MN 56401	0.24
41360543	CITY OF BRAINERD	ANTHONY, HEATHER L	2246 SPRUCE DR	BRAINERD, MN 56401	0.10
41360544	CITY OF BRAINERD	SCRIMSHAW, STACIE ANN	2248 SPRUCE DR	BRAINERD, MN 56401	0.09
41360545	CITY OF BRAINERD	VOELLER, GLADYS B & CAROL J MILLER	2244 SPRUCE DR	BRAINERD, MN 56401	0.10
41360546	CITY OF BRAINERD	BRUTSCHER, DAVID P & SARAJANE	24052 235TH AVE	PIERZ, MN 56364	0.14
41360547	CITY OF BRAINERD	H BROTHERS LLP	13648 150TH ST	WADENA, MN 56482	2.00
41360548	CITY OF BRAINERD	WISE, LEE FRANK & CHERYL JEAN	418 FAIRFIELD LN	BRAINERD, MN 56401	0.22
41360549	CITY OF BRAINERD	MORRIS, ROBERT E & DONNA L	416 FAIRFIELD LN	BRAINERD, MN 56401	0.12
41360550	CITY OF BRAINERD	ATWELL, LILY E	414 FAIRFIELD LN	BRAINERD, MN 56401	0.12
41360551	CITY OF BRAINERD	REYNOLDS, DEBRA L	412 FAIRFIELD LN	BRAINERD, MN 56401	0.23
41360552	CITY OF BRAINERD	BOCK, JAY & JULIE	406 FAIRFIELD LN	BRAINERD, MN 56401	0.19
41360553	CITY OF BRAINERD	JOHNSON, LEONA M	404 FAIRFIELD LANE	BRAINERD, MN 56401	0.12
41360554	CITY OF BRAINERD	DIEMER, SANDRA A	402 FAIRFIELD LN	BRAINERD, MN 56401	0.10
41360555	CITY OF BRAINERD	LIBBY, HELEN C FAMILY RE TRST (THE)	5360 OLD VIKING BLVD NW	ANOKA, MN 55303	0.10
41360556	CITY OF BRAINERD	OAK CREST MANOR II	P O BOX 340	WALKER, MN 56484	0.83
41360557	CITY OF BRAINERD	FAIRFIELD GREEN, VILLAGE HOMES HOME	414 FAIRFIELD LN	BRAINERD, MN 56401	0.22
41360558	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.09
41360559	CITY OF BRAINERD	MATTSON, EDWARD W	109 2ND AVE NE	BRAINERD, MN 56401	0.72
41360560	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	16.26
41360561	CITY OF BRAINERD	ZONTELLI, LUKE R & SMUDE, ELLIE N	1623 EMMA ST	BRAINERD, MN 56401	0.17
41360562	CITY OF BRAINERD	BORCHERT, WILMA	1617 EMMA STR	BRAINERD, MN 56401	0.17
41360563	CITY OF BRAINERD	KUHN, DALE P & DEBRA L	10154 DEPOT ST	BRAINERD, MN 56401	0.17
41360564	CITY OF BRAINERD	LAFOND, BRODY P	1609 EMMA ST	BRAINERD, MN 56401	0.17
41360565	CITY OF BRAINERD	PLISCOTT, KELLY-JO	1605 EMMA ST	BRAINERD, MN 56401	0.17
41360566	CITY OF BRAINERD	DIRCKX, RYAN	1601 EMMA ST	BRAINERD, MN 56401	0.17
41360567	CITY OF BRAINERD	MYERS, JOHN W & ROBIN K	1624 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.15
41360568	CITY OF BRAINERD	WILT FAMILY PROPERTIES LLC	5389 PIONEER TRL	BRAINERD, MN 56401	0.12
41360569	CITY OF BRAINERD	PENNSYLVANIA AVENUE LLC	11171 TOWN HALL ST	BRAINERD, MN 56401	0.18
41360570	CITY OF BRAINERD	TAYLOR, KEVIN J & CROWLEY, ROSE M	1610 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.15
41360571	CITY OF BRAINERD	WEBER, JAMES H & DONNA	1604 PENNSYLVANIA	BRAINERD, MN 56401	0.15
41360572	CITY OF BRAINERD	ZOLLER, SYDNEY A	1602 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.15
41360573	CITY OF BRAINERD	CLJ TRUST, LOWELL S JOHNSON & COLLEEN LEBLANC	4441 20TH ST	FORT RIPLEY, MN 56449	0.15
41360574	CITY OF BRAINERD	BEACH, ASPEN & VERONICA WYNN	1519 EMMA ST	BRAINERD, MN 56401	0.15
41360575	CITY OF BRAINERD	BEACH, ASPEN & VERONICA WYNN	1519 EMMA ST	BRAINERD, MN 56401	0.09
41360576	CITY OF BRAINERD	FITCH, GARY D & GAIL	1510 PENNSYLVANIA	BRAINERD, MN 56401	0.05
41360577	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.23
41360578	CITY OF BRAINERD	WINTERS, HEATHER M	1524 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.15
41360579	CITY OF BRAINERD	BECK, ALLYSON D &	1518 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.23
41360580	CITY OF BRAINERD	FITCH, GARY D & GAIL	1510 PENNSYLVANIA	BRAINERD, MN 56401	0.23
41360581	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.13
41360582	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	4.16
41360583	CITY OF BRAINERD	CROW WING COUNTY LAND SERVICES	322 LAUREL ST STE 15	BRAINERD, MN 56401	0.05

PIN	CITY/ TOWNSHIP	OWNER NAME	OWNER ADDRESS	CITY-STATE-ZIP	Acres
41360584	CITY OF BRAINERD	CROW WING COUNTY LAND SERVICES	322 LAUREL ST STE 15	BRAINERD, MN 56401	0.11
41360585	CITY OF BRAINERD	SHANKS, SINDY M &	1424 MARY STREET	BRAINERD, MN 56401	0.20
41360586	CITY OF BRAINERD	JOHNSON, KEITH M	1420 MARY ST	BRAINERD, MN 56401	0.20
41360587	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.60
41360588	CITY OF BRAINERD	OHMAN, CYNTHIA M	1523 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.15
41360589	CITY OF BRAINERD	WEIK, ASHLEY J	1519 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.15
41360590	CITY OF BRAINERD	KUKOWSKI, RAYMOND T & PATRICIA D	35082 SILVER SANDS RD	PEQUOT LAKES, MN 56472	0.15
41360591	CITY OF BRAINERD	FRANZ, DEREK	1509 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.15
41360592	CITY OF BRAINERD	CARY, CHRISTOPHER	1503 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.40
41360593	CITY OF BRAINERD	HOWELL, STACI & ELI	1524 MARY ST	BRAINERD, MN 56401	0.30
41360594	CITY OF BRAINERD	BRIGHT, BARBARA L	1516 MARY ST	BRAINERD, MN 56401	0.15
41360595	CITY OF BRAINERD	SWIFT, SHARON J	1512 MARY ST	BRAINERD, MN 56401	0.15
41360596	CITY OF BRAINERD	J & M PROPERTY HOLDINGS 3 LLC	11429 SNAKE TRL SW	MOTLEY, MN 56466	0.15
41360597	CITY OF BRAINERD	LINDSEY, RYAN D & MICHELLE L	1504 MARY ST	BRAINERD, MN 56401	0.25
41360598	CITY OF BRAINERD	JONES, JERAMIE W & LUKSAMEE	1617 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.30
41360599	CITY OF BRAINERD	LOEFFELBEIN, JEFFREY D & JABS, BRIANNA	1613 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.15
41360600	CITY OF BRAINERD	KINNEY, SCOT & VICKY	8660 FERDMONT RD	LAKESHORE, MN 56468	0.15
41360601	CITY OF BRAINERD	NAUHEIMER, ALICIA	1607 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.15
41360602	CITY OF BRAINERD	KLINE, RILEY & JAYDA EMILEE	1601 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.15
41360603	CITY OF BRAINERD	PRITSCHET, DAVID J & ANNE T	1624 MARY ST	BRAINERD, MN 56401	0.15
41360604	CITY OF BRAINERD	PRITSCHET, DAVID J & ANNE T	1624 MARY ST	BRAINERD, MN 56401	0.15
41360605	CITY OF BRAINERD	KUPERUS, GLENN G & BRENDA R	1616 MARY ST	BRAINERD, MN 56401	0.15
41360606	CITY OF BRAINERD	MCCORMICK, CURTIS A	1608 MARY ST	BRAINERD, MN 56401	0.23
41360607	CITY OF BRAINERD	SHATTUCK, PAUL RICHARD	1602 MARY ST	BRAINERD, MN 56401	0.23
41360608	CITY OF BRAINERD	JUSTIN, KEITH D	1621 MARY ST	BRAINERD, MN 56401	0.30
41360609	CITY OF BRAINERD	THOMAS, DONALD A & JOAN	1613 MARY STR	BRAINERD, MN 56401	0.15
41360610	CITY OF BRAINERD	CLAUSSEN, BENJAMIN & HADDIE	1611 MARY ST	BRAINERD, MN 56401	0.15
41360611	CITY OF BRAINERD	KARNOWSKI, ERIN B	1605 MARY ST	BRAINERD, MN 56401	0.34
41360612	CITY OF BRAINERD	STEININGER, MURPHY	1523 MARY ST	BRAINERD, MN 56401	0.30
41360613	CITY OF BRAINERD	CLARK, JEFFREY B	1517 MARY ST	BRAINERD, MN 56401	0.15
41360614	CITY OF BRAINERD	CLARK, JEFFREY B	1517 MARY ST	BRAINERD, MN 56401	0.03
41360615	CITY OF BRAINERD	CROW WING COUNTY LAND SERVICES	322 LAUREL ST STE 15	BRAINERD, MN 56401	0.35
41360616	CITY OF BRAINERD	ROBERTS, DEVIN M & KELSIE M	1423 MARY ST	BAXTER, MN 56425	0.30
41360617	CITY OF BRAINERD	SCULL, TYLER	1419 MARY ST	BRAINERD, MN 56401	0.20
41360618	CITY OF BRAINERD	SHELITO, SCOTT & ALYSSA	1415 MARY ST	BRAINERD, MN 56401	0.20
41360619	CITY OF BRAINERD	COOPER, JAMES D & JOAN M	1411 MARY ST	BRAINERD, MN 56401	0.18
41360620	CITY OF BRAINERD	BYE CABLES INC	PO BOX 565	BRAINERD, MN 56411	0.34
41360621	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56411	0.69
41360622	CITY OF BRAINERD	HUMBLE, JILL & ALLEN LEE	2215 SPRUCE DR	BRAINERD, MN 56411	0.18
41360623	CITY OF BRAINERD	MURDOCK, BENTON D & GAIL M	2217 SPRUCE DR	BRAINERD, MN 56411	0.17
41360624	CITY OF BRAINERD	NYSTROM, ARTHUR W & LOIS J	2119 SPRUCE DR	BRAINERD, MN 56411	0.17
41360625	CITY OF BRAINERD	CAMPBELL, LARRY J & CAROLYN R	2121 SPRUCE DR	BRAINERD, MN 56411	0.17
41360626	CITY OF BRAINERD	SOREM, ALFRED A & LAURIE M REVOC TRUST	2209 SPRUCE DR	BRAINERD, MN 56411	0.17
41360627	CITY OF BRAINERD	JOHNSON, DUANE R & TERESA C	2211 SPRUCE DR	BRAINERD, MN 56411	0.17
41360628	CITY OF BRAINERD	BLOOM, PAUL	2117 SPRUCE DR	BRAINERD, MN 56411	0.17
41360629	CITY OF BRAINERD	ZAK, JOSEPH C & KATHLEEN A REST FAM TRST	12806 THOMPSON RD	BRAINERD, MN 56411	0.18
41360630	CITY OF BRAINERD	GREGERSEN, PETER A & GLORIA L	2111 SPRUCE DR	BRAINERD, MN 56411	0.17
41360631	CITY OF BRAINERD	BRAINERD LAKES INTEGRATED HEALTH	2024 SOUTH 6TH ST	BRAINERD, MN 56410	1.47
41360632	CITY OF BRAINERD	BRAINERD LAKES INTEGRATED HEALTH	2024 SOUTH 6TH ST	BRAINERD, MN 56409	2.14
41360633	CITY OF BRAINERD	BRAINERD LAKES INTEGRATED HEALTH	2024 SOUTH 6TH ST	BRAINERD, MN 56407	0.67
41360634	CITY OF BRAINERD	BRAINERD LAKES INTEGRATED HEALTH	2024 SOUTH 6TH ST	BRAINERD, MN 56406	1.07
41360635	CITY OF BRAINERD	2020 PROPERTIES	2020 S 6TH ST	BRAINERD, MN 56405	1.06
41360636	CITY OF BRAINERD	BRAINERD LAKES INTEGRATED HEALTH	2024 SOUTH 6TH ST	BRAINERD, MN 56404	1.85
41360637	CITY OF BRAINERD	AMERICAN NATIONAL BANK OF MN	1920 S 6TH ST	BRAINERD, MN 56403	1.77
41360638	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56402	0.34
41360639	CITY OF BRAINERD	MESSERSCHMIDT, MATTHEW & KAITLYN M	1912 S 6TH ST	BRAINERD, MN 56401	0.31
41360640	CITY OF BRAINERD	STATE OF MINNESOTA DOT	7694 INDUSTRIAL PARK ROAD	BAXTER, MN 56425-8096	0.35
41360641	CITY OF BRAINERD	STATE OF MINNESOTA DOT	7694 INDUSTRIAL PARK RD	BAXTER, MN 56425-8096	0.29
41360642	CITY OF BRAINERD	EDGEWOOD HOMES INC	P O BOX 492	BRAINERD, MN 56401	0.29
41360643	CITY OF BRAINERD	PALMER, ROBERT D & KAREN M	1919 BIRCHDRIDGE DR	BRAINERD, MN 56401	0.29
41360644	CITY OF BRAINERD	KRAUTKREMER, SCOTT M	208 BIRCHDRIDGE DR	BRAINERD, MN 56401	0.47
41360645	CITY OF BRAINERD	JOSH'S PLACE HOMES LLC	855 VILLAGE CENTER DR # 304	NORTH OAKS, MN 55127-2608	0.54
41360646	CITY OF BRAINERD	OAK CREST MANOR II	C/O D W JONES MGMT INC, PO BOX 340	WALKER, MN 56484	1.11
41360647	CITY OF BRAINERD	OAK CREST MANOR	C/O DW JONES MANAGEMENT, PO BOX 340	WALKER, MN 56484	1.12
41360648	CITY OF BRAINERD	OAK CREST MANOR	C/O DW JONES MANAGEMENT, PO BOX 340	WALKER, MN 56484	1.12
41360649	CITY OF BRAINERD	HAMILTON, BENJAMIN W	1731 GRAYDON AVE	BRAINERD MN 56401	0.19
41360650	CITY OF BRAINERD	GRAY, AMY J	1725 GRAYDON AVE	BRAINERD, MN 56401	0.24
41360651	CITY OF BRAINERD	FITCH, TYLER P	1721 GRAYDON AVE	BRAINERD, MN 56401	0.27
41360652	CITY OF BRAINERD	ERICKSON, JARED E & BRIANNA L	1717 GRAYDON AVE	BRAINERD, MN 56401	0.27
41360653	CITY OF BRAINERD	KOTYK, STEVEN M & CAROLYN H	1713 GRAYDON AVE	BRAINERD, MN 56401	0.27
41360654	CITY OF BRAINERD	MOHS, JORDAN P	1714 S 6TH ST	BRAINERD, MN 56401	0.27
41360655	CITY OF BRAINERD	MITCHELL, RHONDA	1720 6TH ST S	BRAINERD, MN 56401	0.27
41360656	CITY OF BRAINERD	HYATT FAMILY REV LIVING TRUST (THE)	1726 S 6TH ST	BRAINERD, MN 56401	0.27
41360657	CITY OF BRAINERD	PUERINGER, DAVID F PUERINGER INVEST	616 1/2 FRONT ST	BRAINERD, MN 56401	0.27
41360658	CITY OF BRAINERD	HYLAND, MATTHEW J & STEPHANIE J	1734 6TH ST S	BRAINERD, MN 56401	0.28
41360659	CITY OF BRAINERD	ALMQUIST, JANET	1531 6TH ST	BRAINERD, MN 56401	0.26
41360660	CITY OF BRAINERD	QUINN, STEPHEN P & EDIE M	1704 S 7TH ST	BRAINERD, MN 56401	0.24
41360661	CITY OF BRAINERD	TOFT, JON W & JUDITH M FAMILY TRUST	1710 7TH ST S	BRAINERD, MN 56401	0.24

PIN	CITY/ TOWNSHIP	OWNER NAME	OWNER ADDRESS	CITY-STATE-ZIP	Acres
41360662	CITY OF BRAINERD	BJORK, RICHARD A & KATHRYN A	1714 S 7TH ST	BRAINERD, MN 56401	0.24
41360663	CITY OF BRAINERD	KORTE, LINDSEY ELIZABETH	1772 7TH ST S	BRAINERD, MN 56401	0.24
41360664	CITY OF BRAINERD	SCHILLER, DAVID J	4035 VICTORIA ST N	SHOREVIEW, MN 55126	0.24
41360665	CITY OF BRAINERD	SCHREIBER REVOCABLE TRUST	1734 SOUTH 7TH ST	BRAINERD, MN 56401	0.24
41360666	CITY OF BRAINERD	MURPHY, KATHLEEN R	1740 S 7TH ST	BRAINERD, MN 56401	0.27
41360667	CITY OF BRAINERD	WASHINGTON, CHARLETTE G	1741 6TH ST S	BRAINERD, MN 56401	0.28
41360668	CITY OF BRAINERD	KUNDE, ALLISON E	1733 S 6TH ST	BRAINERD, MN 56401	0.26
41360669	CITY OF BRAINERD	SCHNELL, MICHAEL & STEPHANIE	1729 6TH ST S	BRAINERD, MN 56401	0.26
41360670	CITY OF BRAINERD	BARKER-PETERSEN, BARETTA T & MELISSA	1721 S 6TH ST	BRAINERD, MN 56401	0.26
41360671	CITY OF BRAINERD	REOPELLE, CHRISTOPHER & JUANITA	18277 RIDDLE RD NE	BEMIDJI, MN 56601	0.26
41360672	CITY OF BRAINERD	ANDERSON, ERIC L & THOMPSON, ELEANOR	1709 S 6TH ST	BRAINERD, MN 56401	0.26
41360673	CITY OF BRAINERD	WHIPPLE, ANTHONY R & MINDY L	606 RONALD ST	BRAINERD, MN 56401	0.26
41360674	CITY OF BRAINERD	CHRISTENSEN, BRADLEY A & DIANE L	10807 W WHITE MOUNTAIN RD	SUN CITY, AZ 85351	0.24
41360675	CITY OF BRAINERD	TRAXLER, DAVID C & LADY LOU C	1612 7TH ST S	BRAINERD, MN 56401	0.24
41360676	CITY OF BRAINERD	HAMILTON, KYLE & STRAW, CHELSEA	1618 SOUTH 7TH ST	BRAINERD, MN 56401	0.24
41360677	CITY OF BRAINERD	SCANLON, BARBARA J	1624 S SEVENTH ST	BRAINERD, MN 56401	0.24
41360678	CITY OF BRAINERD	CARLSON, JAMES W	1628 7TH ST S	BRAINERD, MN 56401	0.24
41360679	CITY OF BRAINERD	STUMPF, KEVIN & MARILYN	1636 S 7TH ST	BRAINERD, MN 56401	0.24
41360680	CITY OF BRAINERD	MARTIN, JEAN MARIE	1642 SOUTH 7TH ST	BRAINERD, MN 56401	0.24
41360681	CITY OF BRAINERD	SEVERSON, LINDA & LARRY	1648 7TH ST S	BRAINERD, MN 56401	0.24
41360682	CITY OF BRAINERD	LANE, GARY A & LINDA M	1654 S 7TH ST	BRAINERD, MN 56401	0.24
41360683	CITY OF BRAINERD	BRECKENRIDGE, GAIL J TRUST	605 RONALD ST	BRAINERD, MN 56401	0.24
41360684	CITY OF BRAINERD	BOTTONE, SANDRA C	1649 S 6TH ST	BRAINERD, MN 56401	0.24
41360685	CITY OF BRAINERD	SMOLKE, STEVEN J & WENDY	1643 S 6TH ST	BRAINERD, MN 56401	0.24
41360686	CITY OF BRAINERD	JUBIE, LOIS A	1635 S 6TH	BRAINERD, MN 56401	0.24
41360687	CITY OF BRAINERD	STUMPF, JACOB	1636 SOUTH 7TH ST	BRAINERD, MN 56401	0.24
41360688	CITY OF BRAINERD	HALONEN, TRISHA H & DALE L MENK	1625 6TH ST S	BRAINERD, MN 56401	0.24
41360689	CITY OF BRAINERD	LIEBEG, KRISTEN RAE	1615 6TH ST S	BRAINERD, MN 56401	0.24
41360690	CITY OF BRAINERD	FRANCIS, MARIE E	P O BOX 1142	BRAINERD, MN 56401	0.48
41360691	CITY OF BRAINERD	BROKAW, LLOYD LADD & MARK HOLLIS FORD	506 CEDAR ST	BRAINERD, MN 56401	0.83
41360692	CITY OF BRAINERD	BURBACH, MICHAEL & JESSICA	424 CEDAR ST	BRAINERD, MN 56401	0.36
41360693	CITY OF BRAINERD	MORGAN, MICHAEL L & LISA	418 CEDAR ST	BRAINERD, MN 56401	0.24
41360694	CITY OF BRAINERD	FAAS, ABIGAIL A	412 CEDAR ST	BRAINERD, MN 56401	0.24
41360695	CITY OF BRAINERD	FREDERICK, BRITTANY J	406 CEDAR ST	BRAINERD, MN 56401	0.22
41360696	CITY OF BRAINERD	ANTOLAK, SCOTT A	330 CEDAR ST	BRAINERD, MN 56401	0.28
41360697	CITY OF BRAINERD	LARSON, JASON D & JESSICA LOFRANO-LARSON	324 CEDAR ST	BRAINERD, MN 56401	0.20
41360698	CITY OF BRAINERD	CULLEN, EDWARD J & ROSELLA J	318 CEDAR ST	BRAINERD, MN 56401	0.28
41360699	CITY OF BRAINERD	BEHR, JEFFERY W & LILIA	321 CEDAR ST	BRAINERD, MN 56401	0.33
41360700	CITY OF BRAINERD	REYNOLDS, DANIEL & GOLDIE	403 CEDAR ST	BRAINERD, MN 56401	0.34
41360701	CITY OF BRAINERD	WICKHAM, DIANNE J & JEFF B	409 CEDAR ST	BRAINERD, MN 56401	0.17
41360702	CITY OF BRAINERD	MARCUSSEN, DENNIS & ERICA	415 CEDAR ST	BRAINERD, MN 56401	0.16
41360703	CITY OF BRAINERD	QUERY, JAMES R REVOCABLE TRUST	708 4TH ST S	PRINCETON, MN 55371	0.32
41360704	CITY OF BRAINERD	JOHANSEN, DANIEL	503 CEDAR ST	BRAINERD, MN 56401	0.16
41360705	CITY OF BRAINERD	MERTENS, JUSTIN G	509 CEDAR ST	BRAINERD, MN 56401	0.16
41360706	CITY OF BRAINERD	GOGOLIN, RUTH M	9422 HEARTHSIDE DR	TOWER, MN 55790	0.26
41360708	CITY OF BRAINERD	BRAINERD HOSPITALITY LLC	337 OAK GROVE ST	MINNEAPOLIS, MN 55403	1.05
41360709	CITY OF BRAINERD	MILBECK, BRADLEY O & KATHLEEN J	811 WRIGHT ST	BRAINERD, MN 56401	0.68
41360710	CITY OF BRAINERD	HENKE, DONALD E & GAIL L	807 WRIGHT ST	BRAINERD, MN 56401	0.30
41360711	CITY OF BRAINERD	SALVATION ARMY	2445 PRIOR AVE	ROSEVILLE, MN 55113-2714	0.29
41360712	CITY OF BRAINERD	REED, MITCHELL G & SARA B	1823 S 8TH ST	BRAINERD, MN 56410	0.41
41360713	CITY OF BRAINERD	WARRICK, SHIRLEY M	1815 8TH ST S	BRAINERD, MN 56410	0.29
41360714	CITY OF BRAINERD	SCOTT, JASON & ASHLEY	806 PAUL COURT	BRAINERD, MN 56410	0.27
41360715	CITY OF BRAINERD	TERRY, KARA JO	810 PAUL CT	BRAINERD, MN 56410	0.30
41360716	CITY OF BRAINERD	FRANZWA, EUGENE V & PATRICIA TRUST	814 PAUL CIRCLE	BRAINERD, MN 56410	0.35
41360717	CITY OF BRAINERD	BARTOSH, RICHARD A & BEATE	813 PAUL CIR	BRAINERD, MN 56410	0.46
41360718	CITY OF BRAINERD	JOHNSON, CAROLYN J	809 PAUL CIR	BRAINERD, MN 56410	0.30
41360719	CITY OF BRAINERD	OWEN, TIMOTHY D &	805 PAUL CT	BRAINERD, MN 56410	0.27
41360720	CITY OF BRAINERD	BOUTA, JERRY & LAURIE	1803 8TH ST S	BRAINERD, MN 56410	0.29
41360722	CITY OF BRAINERD	JOHNSON, STEPHEN & JANICE	1905 GRAYDON AVE	BRAINERD, MN 56410	0.32
41360723	CITY OF BRAINERD	BRENDEFUR, RANCE &	1909 GRAYDON AVE	BRAINERD, MN 56410	0.32
41360724	CITY OF BRAINERD	DENNY, LEWIS E IV & DAWN MARIE	1913 GRAYDON AVE	BRAINERD, MN 56410	0.32
41360725	CITY OF BRAINERD	OWEN, WILLIAM & PATRICIA	1917 GRAYDON AVE	BRAINERD, MN 56410	0.32
41360726	CITY OF BRAINERD	HEGSTROM, CARLY J	1921 GRAYDON AVE	BRAINERD, MN 56410	0.32
41360727	CITY OF BRAINERD	BRADLEY, HERMAN A JR & DIANE	1925 GRAYDON AVE	BRAINERD, MN 56410	0.32
41360728	CITY OF BRAINERD	HIGH, BARBARA A	1933 GRAYDON AVE	BRAINERD, MN 56410	0.32
41360729	CITY OF BRAINERD	HIGH, BARBARA A	1933 GRAYDON AVE	BRAINERD, MN 56410	0.30
41360730	CITY OF BRAINERD	HIGH, BARBARA A	1933 GRAYDON AVE	BRAINERD, MN 56410	0.30
41360731	CITY OF BRAINERD	FABIAN, MICHAEL & TERI	1941 GRAYDON AVE	BRAINERD, MN 56410	0.38
41360732	CITY OF BRAINERD	CONNELL, TRAVIS JOHN	1942 GRAYDON AVE	BRAINERD, MN 56410	0.34
41360733	CITY OF BRAINERD	MEINKE, LOREN B	1938 GRAYDON AVE	BRAINERD, MN 56410	0.32
41360734	CITY OF BRAINERD	SCHMITT, PHILIP A	1934 GRAYDON AVE	BRAINERD, MN 56410	0.38
41360735	CITY OF BRAINERD	KADLEC, KARISA	1930 GRAYDON AVE	BRAINERD, MN 56410	0.34
41360736	CITY OF BRAINERD	BURNETT, JOAN H	1926 GRAYDON AVE	BRAINERD, MN 56410	0.38
41360737	CITY OF BRAINERD	MARK, JAMES D	1922 GRAYDON AVE	BRAINERD, MN 56410	0.38
41360738	CITY OF BRAINERD	AMUNDSON, SAMUEL P	1918 GRAYDON AVE	BRAINERD, MN 56410	0.34
41360739	CITY OF BRAINERD	LARSON, CAMERON	1914 GRAYDON AVE	BRAINERD, MN 56410	0.34
41360740	CITY OF BRAINERD	JOHNSTON, PATRICIA A	1910 GRAYDON AVE	BRAINERD, MN 56410	1.38
41360741	CITY OF BRAINERD	ERICKSON, TAD & JACLYN	1906 GRAYDON AVE	BRAINERD, MN 56410	0.69

PIN	CITY/ TOWNSHIP	OWNER NAME	OWNER ADDRESS	CITY-STATE-ZIP	Acres
41360742	CITY OF BRAINERD	SAWYER, BLOSSOM	1902 GRAYDON AVE	BRAINERD, MN 56410	0.40
41360743	CITY OF BRAINERD	PINDEGAYOSH, DALE MANN	1711 GRAYDON AVE	BRAINERD, MN 56401	0.27
41360744	CITY OF BRAINERD	HARRIS, TROY R & JILL T	1705 GRAYDON AVE	BRAINERD, MN 56401	0.27
41360745	CITY OF BRAINERD	HARRIS, TROY R & JILL T	1705 GRAYDON AVE	BRAINERD, MN 56401	0.27
41360746	CITY OF BRAINERD	LINGENFELTER, JAY KENNETH & PATRICIA	501 LINDEN LN	BRAINERD, MN 56401	0.22
41360747	CITY OF BRAINERD	JEZIORSKI, STEPHANIE	505 LINDEN LANE	BRAINERD, MN 56401	0.20
41360748	CITY OF BRAINERD	OWEN, BRANDON D	509 LINDEN LN	BRAINERD, MN 56401	0.20
41360749	CITY OF BRAINERD	NESHEIM, FRANK & LUCY	1702 6TH ST S	BRAINERD, MN 56401	0.22
41360750	CITY OF BRAINERD	THOMS, STEVEN	1704 6TH ST S	BRAINERD, MN 56401	0.27
41360751	CITY OF BRAINERD	KARPINSKI, ARVIN J	1708 6TH ST S	BRAINERD, MN 56401	0.27
41360752	CITY OF BRAINERD	WALSH, VANCE EDWARD	1712 SIXTH ST S	BRAINERD, MN 56401	0.27
41360753	CITY OF BRAINERD	CANNON, HALEY AMBER &	1707 LINDEN LN	BRAINERD, MN 56401	0.36
41360754	CITY OF BRAINERD	SAM, RHONDA	1711 LINDEN LN	BRAINERD, MN 56401	0.24
41360755	CITY OF BRAINERD	FRAZIER, KIRK & JACQUELINE	10425 DES MOINES MEMORIAL DR S	SEATTLE, WA 98168	0.38
41360756	CITY OF BRAINERD	FEDERICI, JENNIFER	1727 LINDEN LANE	BRAINERD, MN 56401	0.18
41360757	CITY OF BRAINERD	FEDERICI, JENNIFER	1727 LINDEN LANE	BRAINERD, MN 56401	0.53
41360758	CITY OF BRAINERD	NOVICKY, JESSE P	1734 GRAYDON AVE	BRAINERD, MN 56401	0.26
41360759	CITY OF BRAINERD	MATTEN, DOLLY R	1730 GRAYDON AVE	BRAINERD, MN 56401	0.39
41360760	CITY OF BRAINERD	MATTEN, DOLLY	1730 GRAYDON AVE	BRAINERD, MN 56401	0.42
41360761	CITY OF BRAINERD	MILES, TANNER J & GUIN, HANNAH M	1714 GRAYDON AVE	BRAINERD, MN 56401	0.27
41360762	CITY OF BRAINERD	SCHEVING, BROCK L	1710 GRAYDON AVE	BRAINERD, MN 56401	0.27
41360763	CITY OF BRAINERD	PITT, DENNIS L & COLLEEN K	1706 GRAYDON AVE	BRAINERD, MN 56401	0.27
41360764	CITY OF BRAINERD	DERHEIMER, JOSHUA T & TRIS A	1702 GRAYDON AVE	BRAINERD, MN 56401	0.37
41360765	CITY OF BRAINERD	MANN, ANDREW W & RACHEL E	1718 LINDEN LN	BRAINERD, MN 56401	0.28
41360766	CITY OF BRAINERD	HAWKINSON, LISA & KYLE T	1714 LINDEN LN	BRAINERD, MN 56401	0.32
41360767	CITY OF BRAINERD	SOLIEN, BENJAMIN D	1710 LINDEN LN	BRAINERD, MN 56401	0.49
41360768	CITY OF BRAINERD	BEASLEY, LINDA L TRUST	1706 LINDEN LANE	BRAINERD, MN 56401	0.71
41360769	CITY OF BRAINERD	O'DAY, MICHAEL C & ALEXANDRA D	1702 LINDEN LANE	BRAINERD, MN 56401	2.30
41360770	CITY OF BRAINERD	DEHN, JESSIE AND GERRIN	1624 GRAYDON AVE	BRAINERD, MN 56401	0.34
41360771	CITY OF BRAINERD	SCHWARTZ, DWIGHT D & MARGARET	1622 GRAYDON AVE	BRAINERD, MN 56401	0.38
41360772	CITY OF BRAINERD	ARENS, JOSEPH P	1620 GRAYDON AVE	BRAINERD, MN 56401	0.43
41360773	CITY OF BRAINERD	ANDERSON, NICHOLAS	1614 GRAYDON AVE	BRAINERD, MN 56401	0.49
41360774	CITY OF BRAINERD	KOTULA, THOMAS J & BETTE TRTEES KOT	1610 GRAYDON AVE	BRAINERD, MN 56401	0.37
41360775	CITY OF BRAINERD	SCHMITZ, PETER A	1606 GRAYDON AVE	BRAINERD, MN 56401	0.26
41360776	CITY OF BRAINERD	CALOS, MATTHEW P	1602 GRAYDON AVE	BRAINERD, MN 56401	0.40
41360777	CITY OF BRAINERD	WILSON, IAN M & JENNIFER L	1603 GRAYDON AVE	BRAINERD, MN 56401	0.37
41360778	CITY OF BRAINERD	HALBACH, MARYA LISA	15004 LYNDALE LN	BAXTER, MN 56425	0.28
41360779	CITY OF BRAINERD	ALLEN, MISTY	1611 GRAYDON AVE	BRAINERD, MN 56401	0.28
41360780	CITY OF BRAINERD	MOON, WANDA L	1615 GRAYDON AVE	BRAINERD, MN 56401	0.28
41360781	CITY OF BRAINERD	ASKE, JEANNE M & KARL R	1619 GRAYDON AVE	BRAINERD, MN 56401	0.31
41360782	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	1.26
41360783	CITY OF BRAINERD	MANN, ANDREW W & RACHEL E	1718 LINDEN LN	BRAINERD, MN 56401	0.49
41360784	CITY OF BRAINERD	TORFIN, JEFFREY & GWENDA	1621 S 7TH ST	BRAINERD, MN 56401	1.10
41360785	CITY OF BRAINERD	CROW WING COUNTY LAND SERVICES	322 LAUREL ST STE 15	BRAINERD, MN 56401	0.09
41360786	CITY OF BRAINERD	MINNEGASCO INC ACCOUNTS PAYABLE	PO BOX 1475	HOUSTON, TX 77251-1475	0.03
41360787	CITY OF BRAINERD	DESPOT, ROBERT L REV TRUST	1302 POISSANT RD	FORT RIPLEY, MN 56449	0.29
41360788	CITY OF BRAINERD	DYRENDAHL, MICHELLE AMANDA	810 BROOK ST	BRAINERD, MN 56401	0.22
41360789	CITY OF BRAINERD	HOFFMAN, MASHONA	804 BROOK ST	BRAINERD, MN 56401	0.22
41360790	CITY OF BRAINERD	TORFIN, JEFFREY & GWENDA	1621 S 7TH ST	BRAINERD, MN 56401	0.22
41360791	CITY OF BRAINERD	DESPOT, ROBERT L REV TRUST	1302 POISSANT RD	FORT RIPLEY, MN 56449	0.27
41360792	CITY OF BRAINERD	KAIKKONEN, DARRELL & ROBIN	920 BROOK ST	BRAINERD, MN 56401	0.25
41360793	CITY OF BRAINERD	WITTSTRUCK, DAVID J & MARIA A BISEK	916 BROOK ST	BRAINERD, MN 56401	0.34
41360794	CITY OF BRAINERD	CHRISTLE, THOMAS A & KAREN A	1609 S TENTH ST	BRAINERD, MN 56401	0.17
41360795	CITY OF BRAINERD	NELSON, JAMES W & KARIN A	1324 KRAMER LAKE RD SW	PILLAGER, MN 56473	0.25
41360796	CITY OF BRAINERD	SMUDE, LAWRENCE V & BARBARA J	2677 COUNTY ROAD 113	BRAINERD, MN 56409	0.29
41360797	CITY OF BRAINERD	PRINDLE, NATALIE	1515 10TH ST S	BRAINERD, MN 56408	0.04
41360798	CITY OF BRAINERD	PRINDLE, NATALIE	1515 10TH ST S	BRAINERD, MN 56407	0.17
41360799	CITY OF BRAINERD	STUDER, JOSEPH A & CHERYL E	1511 10TH ST S	BRAINERD, MN 56406	0.19
41360800	CITY OF BRAINERD	TURCOTTE, BRANDON C & KATIE A	1503 10TH ST S	BRAINERD, MN 56405	0.31
41360801	CITY OF BRAINERD	HUMMEL, ROBERT GEORGE & LYNDA G	1520 S 10TH STREET	BRAINERD, MN 56404	0.25
41360802	CITY OF BRAINERD	HUMMEL, ROBERT GEORGE & LYNDA G	1520 S 10TH STREET	BRAINERD, MN 56403	0.23
41360803	CITY OF BRAINERD	HUMMEL, ROBERT GEORGE & LYNDA G	1520 S 10TH STREET	BRAINERD, MN 56402	0.07
41360804	CITY OF BRAINERD	KOWALKE, THOMAS P & JESSICA L	1512 10TH STREET S	BRAINERD, MN 56401	0.21
41360805	CITY OF BRAINERD	TABOR WEBER, ERICA L & CRAIGORY J	1508 10TH ST S	BRAINERD, MN 56401	0.23
41360806	CITY OF BRAINERD	MATCH, JAMES R & BEVERLY	5809 CLEARWATER RD	BAXTER, MN 56425	0.20
41360807	CITY OF BRAINERD	LAESTADIAN, CONGREGATION OF BRAINER	1501 S 8TH ST	BRAINERD, MN 56401	0.53
41360808	CITY OF BRAINERD	LAESTADIAN, CONGREGATION OF BRAINER	1501 S 8TH ST	BRAINERD, MN 56401	0.83
41360809	CITY OF BRAINERD	PAULSON, PHILLIP E JR & KATHLEEN	815 BROOK ST	BRAINERD, MN 56401	0.26
41360810	CITY OF BRAINERD	821 BROOK STREET LLC	29308 CROW CIR	BREEZY POINT, MN 56472	0.26
41360811	CITY OF BRAINERD	HOLMES, JAYME	1523 8TH ST S	BRAINERD, MN 56401	0.17
41360812	CITY OF BRAINERD	ANTUS, MICHAEL	811 BROOK ST	BRAINERD, MN 56401	0.34
41360813	CITY OF BRAINERD	LAESTADIAN, CONGREGATION OF BRAINER	1501 S 8TH ST	BRAINERD, MN 56401	0.65
41360814	CITY OF BRAINERD	JOHNSON, JAMES L & JOAN V	10501 GILBERT SHORES DR	BRAINERD, MN 56401	0.17
41360815	CITY OF BRAINERD	BETCHER, PATRICK W	13569 N SYLVAN DAM RD	PILLAGER, MN 56473	0.17
41360816	CITY OF BRAINERD	VILLWOCK, SCOTT & KRISTI	5213 GULL LAKE DAM RD	BRAINERD, MN 56401	0.17
41360817	CITY OF BRAINERD	EVANS, GREG & MELODY	1514 8TH ST S	BRAINERD, MN 56401	0.26
41360818	CITY OF BRAINERD	EUE, JENNIFER M	1524 8TH ST S	BRAINERD, MN 56401	0.40
41360819	CITY OF BRAINERD	RINGSTROM, DAVID C & ANGELA M	20334 LANCELOT LN	BRAINERD, MN 56401	0.48

PIN	CITY/ TOWNSHIP	OWNER NAME	OWNER ADDRESS	CITY-STATE-ZIP	Acres
41360820	CITY OF BRAINERD	WATSON, FAITH	1513 SOUTH 7TH ST	BRAINERD, MN 56401	0.16
41360821	CITY OF BRAINERD	JOHNSON, GUY D	1509 S 7TH ST	BRAINERD, MN 56401	0.16
41360822	CITY OF BRAINERD	GOODE, KEVIN R	1505 S 7TH ST	BRAINERD, MN 56401	0.21
41360823	CITY OF BRAINERD	BERNS, JOSHUA D & KRISTAL M	1501 S 7TH ST	BRAINERD, MN 56401	0.17
41360824	CITY OF BRAINERD	SCHAITBERGER, STEPHEN H TRUST AGR	1402 8TH ST S	BRAINERD, MN 56401	0.26
41360825	CITY OF BRAINERD	KAMPEN, KOREY G & SHELLI L	1410 S 8TH ST	BRAINERD, MN 56401	0.34
41360826	CITY OF BRAINERD	BEMENT, HARRY & ARLISS	11279 ASH AVE NE	BRAINERD, MN 56401	0.22
41360827	CITY OF BRAINERD	LEWIS, KALEEN R	1424 S 8TH ST	BRAINERD, MN 56401	0.21
41360828	CITY OF BRAINERD	HANSON, BRAD & SUSAN	1423 S 7TH ST	BRAINERD, MN 56401	0.17
41360829	CITY OF BRAINERD	IMDIEKE, ABRAHAM & KELSIE	1417 7TH ST S	BRAINERD, MN 56401	0.26
41360830	CITY OF BRAINERD	METZLER, PATRICK S	1411 7TH ST S	BRAINERD, MN 56401	0.26
41360831	CITY OF BRAINERD	WYMAN, DANIEL L & KAREN J	1407 S 7TH ST	BRAINERD, MN 56401	0.35
41360832	CITY OF BRAINERD	CLOSE, ALEXIS MARIE & DUSTIN	816 LAWN ST	BRAINERD, MN 56401	0.65
41360833	CITY OF BRAINERD	LAESTADIAN, CONGREGATION OF BRAINER	1501 S 8TH ST	BRAINERD, MN 56401	1.48
41360834	CITY OF BRAINERD	BEMENT, HARRY & ARLISS	11279 ASH AVE NE	BRAINERD, MN 56401	0.33
41360835	CITY OF BRAINERD	BUCHITE, CODY D	1403 S 8TH ST	BRAINERD, MN 56401	0.19
41360836	CITY OF BRAINERD	LAESTADIAN, CONGREGATION OF BRAINER	1501 S 8TH ST	BRAINERD, MN 56401	0.64
41360837	CITY OF BRAINERD	CLOSE, ALEXIS MARIE & DUSTIN	816 LAWN ST	BRAINERD, MN 56401	0.59
41360838	CITY OF BRAINERD	LAKES AREA HABITAT FOR HUMANITY INC	1110 WRIGHT ST	BRAINERD, MN 56401	0.63
41360839	CITY OF BRAINERD	BAYLISS, MISTY L	1423 10TH ST S	BRAINERD, MN 56401	0.25
41360840	CITY OF BRAINERD	SCHLEPPENBACH, WAYNE L	1413 10TH ST S	BRAINERD, MN 56401	0.41
41360841	CITY OF BRAINERD	WAYTASHEK, THOEDORE & MARLENE TRUST	1407 10TH ST S	BRAINERD, MN 56401	0.17
41360842	CITY OF BRAINERD	WEBER, PAUL G	4431 NEWTON AVE N	MINNEAPOLIS, MN 55412	0.17
41360843	CITY OF BRAINERD	ST ANDREW'S CHURCH	1108 WILLOW ST	BRAINERD, MN 56401	0.99
41360844	CITY OF BRAINERD	CROW WING COUNTY LAND SERVICES	322 LAUREL ST STE 15	BRAINERD, MN 56401	0.17
41360845	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.56
41360846	CITY OF BRAINERD	SHAW, CHASTIN &	910 WILLOW ST	BRAINERD, MN 56401	0.17
41360847	CITY OF BRAINERD	AUSTIN, KRISDELE &	912 WILLOW ST	BRAINERD, MN 56401	0.26
41360848	CITY OF BRAINERD	SLICE, GLENN R	916 WILLOW ST	BRAINERD, MN 56401	0.20
41360849	CITY OF BRAINERD	WENNBERG, DON W MD	824 WILLOW	BRAINERD, MN 56401	0.77
41360850	CITY OF BRAINERD	ENBERG, ZACHARY J & BRANDI	823 LAWN ST	BRAINERD, MN 56401	0.26
41360851	CITY OF BRAINERD	CARLSON, MARGARET	1323 8TH ST S	BRAINERD, MN 56401	0.09
41360852	CITY OF BRAINERD	BRAINERD LAKES PREMIER DEVELOPMENTS LLC	7153 FORTHUN RD STE 120	BAXTER, MN 56425	0.17
41360853	CITY OF BRAINERD	BIGLER, BILLY J & Alysia M	1313 S 8TH ST	BRAINERD, MN 56401	0.34
41360854	CITY OF BRAINERD	BOSTROM, DAVID & TAMI	6195 EDMONTON RD	BAXTER, MN 56425	0.26
41360855	CITY OF BRAINERD	WENNBERG, DON W MD	824 WILLOW	BRAINERD, MN 56401	0.17
41360856	CITY OF BRAINERD	DOUST, JOSEPH D	1302 8TH ST S	BRAINERD, MN 56401	0.17
41360857	CITY OF BRAINERD	MAESTAS, ENJOLI	1306 8TH ST S	BRAINERD, MN 56401	0.17
41360858	CITY OF BRAINERD	DUDLEY, MELYNDA MAE	1310 8TH ST S	BRAINERD, MN 56401	0.17
41360859	CITY OF BRAINERD	BRAINERD LAKES PREMIER DEV LLC	7153 FORTHUN RD STE 120	BAXTER, MN 56425	0.17
41360860	CITY OF BRAINERD	BANKS, TRAVIS E & TRACY L	15359 SHELLISA LN	BAXTER, MN 56425	0.17
41360861	CITY OF BRAINERD	MACHO, DARREN	1324 8TH ST S	BRAINERD, MN 56401	0.17
41360862	CITY OF BRAINERD	ZILKA, TAMI DANIELLE	1321 7TH ST S	BRAINERD, MN 56401	0.17
41360863	CITY OF BRAINERD	FREIDAY, DAVID W & KELLEY	1317 S 7TH STREET	BRAINERD, MN 56401	0.17
41360864	CITY OF BRAINERD	BARTOSH, CHRISTOPHER	1313 7TH ST S	BRAINERD, MN 56401	0.17
41360865	CITY OF BRAINERD	REICHENBACH, VINCENT J & JENNIFER M	1309 7TH ST S	BRAINERD, MN 56401	0.17
41360866	CITY OF BRAINERD	DAY, BRIAN T	13385 MAPLEWOOD DR	BAXTER, MN 56425	0.17
41360867	CITY OF BRAINERD	SCHARRER, TIMOTHY	1301 7TH ST S	BRAINERD, MN 56401	0.17
41360868	CITY OF BRAINERD	BRAINERD HOSPITALITY LLC	337 OAK GROVE ST	MINNEAPOLIS, MN 55403	2.15
41360869	CITY OF BRAINERD	BRAINERD SOUTH HOUSING GROUP INC	324 EAST RIVER RD	BRAINERD, MN 56401	2.35
41360870	CITY OF BRAINERD	EVANGELICAL LUTHERAN GOOD SAMARITAN	804 WRIGHT ST	BRAINERD, MN 56401	1.33
41360871	CITY OF BRAINERD	RENNEKE, DEAN	6151 PARIS RD	BAXTER, MN 56425	0.59
41360872	CITY OF BRAINERD	POTTS PROPERTIES LLC	23875 N 91ST ST	SCOTTSDALE, AZ 85255	0.64
41360873	CITY OF BRAINERD	ST JOSEPH'S MEDICAL CENTER	523 N 3RD STR	BRAINERD, MN 56401	0.64
41360874	CITY OF BRAINERD	RIVER OAKS PROPERTIES LLC	1905 WEST GULL RIVER RD SW	PILLAGER, MN 56473	0.64
41360875	CITY OF BRAINERD	EVANGELICAL LUTHERAN GOOD SAMARITAN	804 WRIGHT ST	BRAINERD, MN 56401	0.64
41360876	CITY OF BRAINERD	PRODUCTIVE ALTERNATIVES INC	1205 TOWER RD N	FERGUS FALLS, MN 56537	0.64
41360877	CITY OF BRAINERD	PRODUCTIVE ALTERNATIVES INC	1205 TOWER RD N	FERGUS FALLS, MN 56537	0.64
41360878	CITY OF BRAINERD	PRODUCTIVE ALTERNATIVES INC	1205 TOWER RD N	FERGUS FALLS, MN 56537	0.64
41360879	CITY OF BRAINERD	S SQUARED CAPITAL LLC	261 SCHOOL AVE #240	EXCELSIOR, MN 55331	1.54
41360880	CITY OF BRAINERD	EVANGELICAL LUTHERAN GOOD SAMARITAN	804 WRIGHT ST	BRAINERD, MN 56401	0.45
41360881	CITY OF BRAINERD	EVANGELICAL LUTHERAN GOOD SAMARITAN	804 WRIGHT ST	BRAINERD, MN 56401	0.56
41360882					1.50
41360883	CITY OF BRAINERD	POHLMAN, WILLARD A & LORETTA	1023 BROOK ST	BRAINERD, MN 56401	0.28
41360884	CITY OF BRAINERD	LORIMOR, ALAN C	1019 BROOK ST	BRAINERD, MN 56401	0.28
41360885	CITY OF BRAINERD	KAPING, GARRETT & SHANNON M	1015 BROOK ST	BRAINERD, MN 56401	0.32
41360886	CITY OF BRAINERD	BETCHER, PAT	13569 SYLVAN DAM RD	PILLAGER, MN 56473	0.34
41360887	CITY OF BRAINERD	EVANGELICAL LUTHERAN GOOD SAMARITAN	804 WRIGHT ST	BRAINERD, MN 56401	4.98
41360888	CITY OF BRAINERD	FITZPATRICK, JOHN G & ARLENE	415 BLUFF	BRAINERD, MN 56401	0.99
41360889	CITY OF BRAINERD	HOLTEN, JENNIFER	1618 SE 13TH ST	BRAINERD, MN 56401	0.36
41360890	CITY OF BRAINERD	WARD, JOHN E & SALLY	11442 FORESTVIEW DR	BAXTER, MN 56425	0.45
41360891	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.20
41360892	CITY OF BRAINERD	CUTKAY, JOE W & TABITHA L	1516 13TH ST SE	BRAINERD, MN 56401	0.55
41360896	CITY OF BRAINERD	JOHN DAN LUKE LLC	4376 MISSION RD	NISSWA, MN 56428	1.43
41360897	CITY OF BRAINERD	BELFIORI, ANNETTE M	1512 S 13TH ST	BRAINERD, MN 56401	0.50
41360899	CITY OF BRAINERD	CROW WING COUNTY LAND SERVICES	322 LAUREL ST STE 15	BRAINERD, MN 56401	0.15
41360901	CITY OF BRAINERD	LINDSTAM, STEVEN & SUSAN TRUST AGR	37646 MOEN BEACH TRL	CROSSLAKE, MN 56442	0.54
41360902	CITY OF BRAINERD	BAKER, WILLIAM T & JACQUELIN M	1806 SE 10TH STREET	BRAINERD, MN 56401	0.64

PIN	CITY/ TOWNSHIP	OWNER NAME	OWNER ADDRESS	CITY-STATE-ZIP	Acres
41360903	CITY OF BRAINERD	KITTLESAN, TERRENCE W	1802 S 10TH ST	BRAINERD, MN 56401	0.64
41360904	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.50
41360905	CITY OF BRAINERD	CASTLE, THOMAS & YULLY M	1804 S 8TH ST	BRAINERD, MN 56418	0.32
41360906	CITY OF BRAINERD	KUMMET, DEBBIE J	1820 S 8TH ST	BRAINERD, MN 56418	0.16
41360907	CITY OF BRAINERD	KUMMET, DEBBIE J	1820 S 8TH ST	BRAINERD, MN 56418	0.16
41360908	CITY OF BRAINERD	KUMMET, DEBBIE J	1820 S 8TH ST	BRAINERD, MN 56418	0.32
41360909	CITY OF BRAINERD	GIRLING, MICHAEL & CASSANDRA	1828 S 8TH ST	BRAINERD, MN 56418	0.32
41360910	CITY OF BRAINERD	GRAFF, JON C	1836 S 8TH STREET	BRAINERD, MN 56418	0.32
41360911	CITY OF BRAINERD	RAJALA, TORVIN & PATSY	1835 7TH ST S	BRAINERD, MN 56418	0.32
41360912	CITY OF BRAINERD	MODGLIN, KEITH	1827 S 5TH ST	BRAINERD, MN 56418	0.32
41360913	CITY OF BRAINERD	COTTEN, LORI R	1819 7TH ST S	BRAINERD, MN 56418	0.32
41360914	CITY OF BRAINERD	DOUCETTE, ERIC & BETHANY	1811 7TH ST S	BRAINERD, MN 56418	0.32
41360915	CITY OF BRAINERD	QUAST, MICHAEL ALAN	1803 7TH ST S	BRAINERD, MN 56418	0.32
41360916	CITY OF BRAINERD	MANKOWSKI, ERIK G	1836 7TH ST S	BRAINERD, MN 56418	0.32
41360917	CITY OF BRAINERD	CRANDALL, ROBERT L & DIANA J	1828 S 7TH ST	BRAINERD, MN 56418	0.32
41360918	CITY OF BRAINERD	MILLER, PAMELA L & JACK A	1820 S 7TH ST	BRAINERD, MN 56418	0.32
41360919	CITY OF BRAINERD	OGDEN, KATHY M	1812 7TH ST S	BRAINERD, MN 56418	0.32
41360920	CITY OF BRAINERD	POMERLEAU PROPERTIES LLC	1002 WRIGHT ST	BRAINERD, MN 56417	0.33
41360921	CITY OF BRAINERD	WILDS, SHELBY DENAE &	130 BIRCHRIDGE DR	BRAINERD, MN 56416	0.49
41360922	CITY OF BRAINERD	RICE, JEREMIAH & KASSIDY	126 BIRCHRIDGE DR	BRAINERD, MN 56415	0.38
41360923	CITY OF BRAINERD	SPIEGEL, SETH M & JENNIFER A	137 BIRCHRIDGE DR	BRAINERD, MN 56414	0.36
41360924	CITY OF BRAINERD	DOYLE, JEREMY E & NICOLE C	147 BIRCHRIDGE DR	BRAINERD, MN 56413	0.26
41360925	CITY OF BRAINERD	JOHNSON, SANDRA	153 BIRCHRIDGE DR	BRAINERD, MN 56412	0.38
41360926	CITY OF BRAINERD	BLONIGEN, PAULINE	157 BIRCHRIDGE DR	BRAINERD, MN 56411	0.53
41360927	CITY OF BRAINERD	MILLER, ROBERT E JR REV TRUST(1/2)	175 BIRCHRIDGE DR	BRAINERD, MN 56410	0.41
41360928	CITY OF BRAINERD	MARTIN, DENNIS J & JEANNE	1860 GRAYDON AVE	BRAINERD, MN 56409	0.19
41360929	CITY OF BRAINERD	THESING, MELINDA R	1854 GRAYDON AVE	BRAINERD, MN 56408	0.20
41360930	CITY OF BRAINERD	O'REILLY, MATTHEW DAVID	1848 GRAYDON AVE	BRAINERD, MN 56407	0.19
41360931	CITY OF BRAINERD	MELBY, MARK E & LEIGH A	1840 GRAYDON AVE	BRAINERD, MN 56406	0.20
41360932	CITY OF BRAINERD	LOVING, NEKIA D	1834 GRAYDON AVE	BRAINERD, MN 56405	0.20
41360933	CITY OF BRAINERD	VONALLEN, LUCINDA ALISON	1830 GRAYDON AVE	BRAINERD, MN 56404	0.21
41360934	CITY OF BRAINERD	BENTLER, BRADLEY ALAN & RACHEL DAWN	1824 GRAYDON AVE	BRAINERD, MN 56403	0.22
41360935	CITY OF BRAINERD	FOXX, NICHOLAS	1818 GRAYDON AVE	BRAINERD, MN 56402	0.22
41360936	CITY OF BRAINERD	GARBERICH, ROB & LISA	1808 GRAYDON AVE	BRAINERD, MN 56401	0.39
41360937	CITY OF BRAINERD	PYRAMID GROUP LLC	10620 WEST RIVER RD	BROOKLYN PARK, MN 55443	0.33
41360938	CITY OF BRAINERD	SHERMAN, ROBERT B	150 BIRCHRIDGE DR	BRAINERD, MN 56401	0.61
41360939	CITY OF BRAINERD	DRAKE, CHERYL A	164 BIRCHRIDGE DR	BRAINERD, MN 56401	0.61
41360940	CITY OF BRAINERD	WEBSTER, MARKO J & ERICA N	174 BIRCHRIDGE DR	BRAINERD, MN 56401	0.53
41360941	CITY OF BRAINERD	FINEDAY, ANITA P	182 BIRCHRIDGE DR	BRAINERD, MN 56401	0.50
41360942	CITY OF BRAINERD	FOSTER, ELIZABETH A TRSTUAD 8/10/07	1880 GRAYDON AVE	BRAINERD, MN 56401	0.31
41360943	CITY OF BRAINERD	IMGRUND, GAIL	1876 GRAYDON AVE	BRAINERD, MN 56401	0.27
41360944	CITY OF BRAINERD	KNUTSON, BRIAN K & KATALINA M	1887 GRAYDON AVE	BRAINERD, MN 56401	0.35
41360945	CITY OF BRAINERD	AFFINITY PLUS FEDERAL CREDIT UNION	175 W LAFAYETTE RD	ST PAUL, MN 55107	0.34
41360946	CITY OF BRAINERD	BOWMAN, PETER H & KRISTI A	1883 GRAYDON AVE	BRAINERD, MN 56401	0.33
41360947	CITY OF BRAINERD	GONSER, KIT A & DARLA J	204 BIRCHRIDGE DR	BRAINERD, MN 56401	0.33
41360948	CITY OF BRAINERD	WEEKS, NICHOLAS L	1838 6TH ST S	BRAINERD, MN 56401	0.30
41360949	CITY OF BRAINERD	ROBERTSON, LARS B & KARA K	1834 6TH ST S	BRAINERD, MN 56401	0.17
41360950	CITY OF BRAINERD	JERDE, SARA	1830 SOUTH 6TH ST	BRAINERD, MN 56401	0.17
41360951	CITY OF BRAINERD	TUOMI, ANNE MARIE	1826 S 6TH ST	BRAINERD, MN 56401	0.17
41360952	CITY OF BRAINERD	BENSON, KATHERINE J	1822 S 6TH ST	BRAINERD, MN 56401	0.17
41360953	CITY OF BRAINERD	CRUIKSHANK, BOBBI K & LUKAS W METTLER	1818 6TH ST S	BRAINERD, MN 56401	0.17
41360954	CITY OF BRAINERD	LUTTERMAN, DENNIS R & DARLENE	1814 6TH ST S	BRAINERD, MN 56401	0.17
41360955	CITY OF BRAINERD	CARLSON, ROBERT A	13806 161ST ST	WADENA, MN 56482	0.17
41360956	CITY OF BRAINERD	ECKSTROM, DAWN	1802 6TH ST S	BRAINERD, MN 56401	0.18
41360957	CITY OF BRAINERD	BIGHAM, DANIEL R & PATRICIA ANN	8047 INGELSIDE AVE	COTTAGE GROVE, MN 55016	0.14
41360958	CITY OF BRAINERD	SMITH, BETHANY	115 BIRCHRIDGE DR	BRAINERD, MN 56401	0.18
41360959	CITY OF BRAINERD	CLOSE, MEKENNA	1809 GRAYDON AVE	BRAINERD, MN 56401	0.17
41360960	CITY OF BRAINERD	HOPPE, WADE A & JULIE A	1813 GRAYDON AVE	BRAINERD, MN 56401	0.17
41360961	CITY OF BRAINERD	CHAPUT, TRAVIS	1817 GRAYDON AVE	BRAINERD, MN 56401	0.17
41360962	CITY OF BRAINERD	STALL, LOGAN	1821 GRAYDON AVE	BRAINERD, MN 56401	0.17
41360963	CITY OF BRAINERD	MACARTHUR, VIRGINIA J	1829 GRAYDON AVE	BRAINERD, MN 56401	0.33
41360964	CITY OF BRAINERD	ROSTE, CRYSTAL J	1833 GRAYDON AVE	BRAINERD, MN 56401	0.21
41360965	CITY OF BRAINERD	LYSCIO, MICHAEL F & ALEXIS R HUMMELL	1837 GRAYDON AVE	BRAINERD, MN 56401	0.24
41360966	CITY OF BRAINERD	IRVIN, KENNETH & MELISSA	1841 GRAYDON AVE	BRAINERD, MN 56401	0.30
41360967	CITY OF BRAINERD	REYES, BRENDA	1845 GRAYDON AVE	BRAINERD, MN 56401	0.25
41360968	CITY OF BRAINERD	NEUMANN, CARRIE LAGER	1849 GRAYDON AVE	BRAINERD, MN 56401	0.21
41360969	CITY OF BRAINERD	DALLAND, LAURA L	1853 GRAYDON AVE	BRAINERD, MN 56401	0.18
41360970	CITY OF BRAINERD	STOCK, REBECCA D	1857 GRAYDON AVE	BRAINERD, MN 56401	0.17
41360971	CITY OF BRAINERD	LINSKENS, DAWN M & HOGAN, JAMIE B	3650 VINCENT AVE N	MINNEAPOLIS, MN 55412	0.21
41360972	CITY OF BRAINERD	SAILER, BENJAMIN & MACKENZIE	116 BIRCHRIDGE DR	BRAINERD, MN 56401	0.25
41360973	CITY OF BRAINERD	QUALLEY, DARREL W & JOYCE B	P O BOX 236	FULTON, TX 78358	0.20
41360974	CITY OF BRAINERD	COLE, RICKE R & DEBRA	1748 S 6TH ST	BRAINERD, MN 56401	0.24
41360975	CITY OF BRAINERD	SHERMAN, ROBERT B	150 BIRCHRIDGE DR	BRAINERD, MN 56401	1.10
41360976	CITY OF BRAINERD	TWO DOGS PROPERTY MANAGEMENT LLC	9662 WISE RD	BRAINERD, MN 56401	1.54
41360977	CITY OF BRAINERD	TORFIN, JEFFREY & GWENDA	1621 S 7TH ST	BRAINERD, MN 56401	1.44
41360978	CITY OF BRAINERD	TORFIN, JEFFREY & GWENDA	1621 S 7TH ST	BRAINERD, MN 56401	0.56
41360979	CITY OF BRAINERD	TORFIN, JEFFREY & GWENDA	1621 S 7TH ST	BRAINERD, MN 56401	1.16
41360980					0.10

PIN	CITY/ TOWNSHIP	OWNER NAME	OWNER ADDRESS	CITY-STATE-ZIP	Acres
41360981	CITY OF BRAINERD	MOEN, SHERRY L	1711 10TH ST S	BRAINERD, MN 56405	0.29
41360982	CITY OF BRAINERD	MOEN, SHERRY L	1711 10TH ST S	BRAINERD, MN 56404	0.10
41360983	CITY OF BRAINERD	HAMILTON, MICHAEL AND THERESA	1627 SOUTH 10TH ST	BRAINERD, MN 56403	0.10
41360984	CITY OF BRAINERD	HAMILTON, MICHAEL AND THERESA	1627 SOUTH 10TH ST	BRAINERD, MN 56402	0.29
41360985	CITY OF BRAINERD	MAIWALD, MELISSA M	24400 GREEN SHORES DR	BRAINERD, MN 56401	0.29
41360986	CITY OF BRAINERD	BAHR, JOSHUA R	1617 S 10TH ST	BRAINERD, MN 56401	0.25
41360987	CITY OF BRAINERD	PHILLIPS, DAVID N JR & LARISSA L	1615 SOUTH 10TH ST	BRAINERD, MN 56401	0.25
41360988	CITY OF BRAINERD	BEMENT, HARRY & ARLISS	11279 ASH AVE NE	BRAINERD, MN 56401	0.42
41360989	CITY OF BRAINERD	LEONARD, KEITH B & GLORIA R	1716 10TH ST S	BRAINERD, MN 56401	0.55
41360990	CITY OF BRAINERD	SIMENSTAD, VINCE & DENISE	1708 10TH ST S	BRAINERD, MN 56401	0.52
41360991	CITY OF BRAINERD	LEONARD, DAVID D & WENDY J	1704 S 10TH ST	BRAINERD, MN 56401	0.65
41360992	CITY OF BRAINERD	NORTHBURG, GORDON L & NEDRA	1620 S 10TH ST	BRAINERD, MN 56401	0.31
41360993	CITY OF BRAINERD	LOSSOW, IRMA	1616 S 10TH ST	BRAINERD, MN 56401	0.30
41360994	CITY OF BRAINERD	LOSSOW, RANDY H & MARY A	1614 S 10TH ST	BRAINERD, MN 56401	0.28
41360995	CITY OF BRAINERD	CHRISTLE, THOMAS A & KAREN A	1609 S TENTH ST	BRAINERD, MN 56401	0.06
41360996	CITY OF BRAINERD	BROWN, JEAN M & MARJORIE WOOD	3060 NORTHSORE DR	BRAINERD, MN 56401	2.37
41360997	CITY OF BRAINERD	BX PROPERTIES, LIMITED LIABILITY PA	3060 NORTHSORE DR	WAYZATA, MN 55391	3.23
41360998	CITY OF BRAINERD	BX PROPERTIES, LIMITED LIABILITY PA	3060 NORTHSORE DR	WAYZATA, MN 55391	1.87
41360999	CITY OF BRAINERD	DICK FAMILY REAL ESTATE LLC	PO BOX 457	SAUK RAPIDS, MN 56379	3.10
41361000	CITY OF BRAINERD	DH HOLDINGS LLC	915 BLAIR CIR	BRAINERD, MN 56401	2.33
41361001	CITY OF BRAINERD	EVANGELICAL LUTHERAN GOOD SAMARITAN	804 WRIGHT ST	BRAINERD, MN 56401	2.37
41361002	CITY OF BRAINERD	OPTIC PROPERTIES LLC	P O BOX 763	BRAINERD, MN 56401	1.71
41361003	CITY OF BRAINERD	OPTIC PROPERTIES LLC	P O BOX 763	BRAINERD, MN 56401	2.28
41361004	CITY OF BRAINERD	D5 INVESTMENT LLC	3360 CHELSEA RD W	MONTICELLO, MN 55362	2.66
41361005	CITY OF BRAINERD	D5 INVESTMENT LLC	3360 CHELSEA RD W	MONTICELLO, MN 55362	3.48
41361006	CITY OF BRAINERD	VITALE 2017 MINNESOTA EXEMPT TRUST	PO BOX 666	BRAINERD, MN 56401	2.97
41361007	CITY OF BRAINERD	STATE OF MINNESOTA DEPARTMENT OF	600 CEDAR ST	SAINT PAUL, MN 55101	2.29
41361008	CITY OF BRAINERD	STATE OF MINNESOTA DEPARTMENT OF	600 CEDAR ST	SAINT PAUL, MN 55101	6.32
41361009	CITY OF BRAINERD	U S LINK	PO BOX 2629	ADDISON, TX 75001	4.40
41361010	CITY OF BRAINERD	HENCO PROPERTY LEASING LLC	417 19TH ST NW	WILLMAR, MN 56201	3.17
41361011	CITY OF BRAINERD	POJAY PROPERTIES LLC	22739 COUNTY ROAD 4	NISSWA, MN 56468	3.95
41361012	CITY OF BRAINERD	NEW EARTH TECHNOLOGIES LLC	7756 COLLEGE RD	BAXTER, MN 56425	4.04
41361013	CITY OF BRAINERD	DLP INVESTMENTS LLC	3995 ROOSEVELT RD	ST CLOUD, MN 56301	3.32
41361014	CITY OF BRAINERD	HEARTLAND PROPERTIES OF BLAINE LLC	6885 139TH LANE NW STE 100	RAMSEY, MN 55303	2.71
41361015	CITY OF BRAINERD	HEARTLAND PROPERTIES OF BLAINE LLC	6885 139TH LANE NW STE 100	RAMSEY, MN 55303	1.03
41361016	CITY OF BRAINERD	MARIGOLD FOODS INC	1270 ENERGY LN	ST PAUL, MN 55113-0003	1.03
41361017	CITY OF BRAINERD	ESAR CORPORATION	1205 MADISON ST	BRAINERD, MN 56401	1.11
41361018	CITY OF BRAINERD	ESAR CORPORATION	9303 MEADOW BROOK LN	BRAINERD, MN 56401	0.55
41361019	CITY OF BRAINERD	HEARTLAND PROPERTIES OF BLAINE LLC	6885 139TH LANE NW STE 100	RAMSEY, MN 55303	0.55
41361020	CITY OF BRAINERD	AW HOLDINGS LLC	1119 MADISON ST	BRAINERD, MN 56401	2.48
41361021	CITY OF BRAINERD	GREENFOREST ENVIRONMENTAL SOLUTIONS CO	15861 OLD STONEBRIDGE TRL	BRAINERD, MN 56401	3.95
41361022	CITY OF BRAINERD	BT PROPERTY LLC	55 GLENLAKE PKWY NE	ATLANTA, GA 30328	1.58
41361023	CITY OF BRAINERD	POMERLEAU PROPERTIES LLC	1002 WRIGHT ST	BRAINERD, MN 56401	1.29
41361024	CITY OF BRAINERD	FELSKO PROPERTIES LLC	1021 INDUSTRIAL PARK RD	BRAINERD, MN 56401	7.87
41361025	CITY OF BRAINERD	SONS & DAUGHTERS PARTNERSHIP LLC	1111 INDUSTRIAL PARK RD	BRAINERD, MN 56401	2.81
41361026	CITY OF BRAINERD	THOMPSON PROPERTIES OF BRAINERD LLC	23493 HAVEN RD	LITTLE FALLS, MN 56345	2.81
41361027	CITY OF BRAINERD	BOTTLING GROUP INC	P O BOX 660634	DALLAS, TX 75266-0634	5.43
41361028	CITY OF BRAINERD	BEST OIL LLC	PO BOX Q	TRIMONT, MN 56176	2.54
41361029	CITY OF BRAINERD	LUND PROPERTIES LLC	1676 MISSISSIPPI RIVER BLVD S	SAINT PAUL MN 55116	1.61
41361030	CITY OF BRAINERD	CONSOLIDATED TELEPHONE CO	1102 MADISON ST	BRAINERD, MN 56401	5.62
41361031	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	3.14
41361032	CITY OF BRAINERD	SUNDQUIST, STEVEN P & JUDITH C	P O BOX 978	BRAINERD, MN 56401	3.45
41361033	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	2.11
41361034	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	4.29
41361035	CITY OF BRAINERD	SCHILLING, TROY & DEBORAH SMITH	711 TODD ST	BRAINERD, MN 56401	0.36
41361036	CITY OF BRAINERD	WELDON, CHASE &	719 TODD ST	BRAINERD, MN 56401	0.55
41361037	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.47
41361038	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	1.72
41361039	CITY OF BRAINERD	VERCHOTA, ALLIE M	1639 S 7TH ST	BRAINERD, MN 56401	0.26
41361040	CITY OF BRAINERD	ASH PROPERTIES INC	722 S 6TH ST	BRAINERD, MN 56401	0.26
41361041	CITY OF BRAINERD	BRAINERD HOUSING & REDEVELOPMENT AUTHORI	324 E RIVER RD	BRAINERD, MN 56401	0.26
41361042	CITY OF BRAINERD	REYNOLDS, BROCK & KATI	707 TODD ST	BRAINERD, MN 56401	0.26
41361043	CITY OF BRAINERD	WYMAN, KRISTIN & JAMES	315 CEDAR ST	BRAINERD, MN 56401	0.17
41361044	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.18
41361045	CITY OF BRAINERD	BEASLEY, LINDA L TRUST	1706 LINDEN LANE	BRAINERD, MN 56401	0.70
41361047	CITY OF BRAINERD	KRAEMER, MARCELLENE J	1302 PARK ST	BRAINERD, MN 56401	0.32
41361048	CITY OF BRAINERD	TRINITY LUTHERAN, CHURCH	1420 S 6TH ST	BRAINERD, MN 56401	12.87
41361049	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.33
41361050	CITY OF BRAINERD	LOSCHKO, SARAH E	1418 S 7TH ST	BRAINERD, MN 56401	0.26
41361052	CITY OF BRAINERD	VREELAND, JOSEPH L & JULIE	1507 S 6TH ST	BRAINERD, MN 56401	1.48
41361053	CITY OF BRAINERD	FEIERABEND, AUDREY C	1433 S 6TH ST	BRAINERD, MN 56401	0.37
41361054	CITY OF BRAINERD	AULIE, MARCUS C	1429 6TH ST S	BRAINERD, MN 56401	0.30
41361055	CITY OF BRAINERD	MUEHLENHARDT, MARY E	1419 6TH ST S	BRAINERD, MN 56401	0.28
41361056	CITY OF BRAINERD	LUHRS, JON A TRUST (UND 1/2 INT)	1524 SEVENTH ST S	BRAINERD, MN 56401	0.50
41361057	CITY OF BRAINERD	WILSON, KAYLEEN	1510 S 7TH ST	BRAINERD, MN 56401	0.17
41361058	CITY OF BRAINERD	HANSEN, BARBARA J	1506 S 7TH ST	BRAINERD, MN 56401	0.17
41361059	CITY OF BRAINERD	LOSCHKO, JAMES F & JUDITH	1428 S 7TH	BRAINERD, MN 56401	0.28
41361060	CITY OF BRAINERD	DOUCETTE, BRIAN M	1422 7TH ST S	BRAINERD, MN 56401	0.23

PIN	CITY/ TOWNSHIP	OWNER NAME	OWNER ADDRESS	CITY-STATE-ZIP	Acres
41361061	CITY OF BRAINERD	PATRICK, DEVIN & SIERRA	1415 6TH ST S	BRAINERD, MN 56401	0.28
41361062	CITY OF BRAINERD	LONG, MICHELE A	1411 6TH ST S	BRAINERD, MN 56401	0.30
41361063	CITY OF BRAINERD	GORDON, KARI L	1414 S 7TH ST	BRAINERD, MN 56401	0.23
41361064	CITY OF BRAINERD	GILDERMAN, ISAIAH H	1404 7TH ST S	BRAINERD, MN 56401	0.20
41361065	CITY OF BRAINERD	REDAHL, JOYCE A	1400 S 7TH ST	BRAINERD, MN 56401	0.20
41361066	CITY OF BRAINERD	YEZEK, CHYLER & LECLAIRE, SAMANTHA	1312 7TH ST S	BRAINERD, MN 56401	0.26
41361067	CITY OF BRAINERD	SELISKER, CHAD	1324 S 7TH ST	BRAINERD, MN 56401	0.30
41361068	CITY OF BRAINERD	STATURE PROPERTIES BRD LLC	PO BOX 1152	BRAINERD, MN 56401	0.20
41361069	CITY OF BRAINERD	BEMENT, HARRY & ARLISS	11279 ASH AVE NE	BRAINERD, MN 56401	0.10
41361070	CITY OF BRAINERD	ERICKSON, KIMBERLY	5064 GULL LAKE DAM RD	BRAINERD, MN 56401	0.16
41361071	CITY OF BRAINERD	DEJAEGHERE, NICOLE	616 WILLOW ST	BRAINERD, MN 56401	0.21
41361072	CITY OF BRAINERD	DOSHAN, BRENT	622 WILLOW ST	BRAINERD, MN 56401	0.14
41361074	CITY OF BRAINERD	BRAINERD HOSPITALITY LLC	337 OAK GROVE ST	MINNEAPOLIS, MN 55403	0.63
41361075	CITY OF BRAINERD	BRAINERD HOSPITALITY LLC	337 OAK GROVE ST	MINNEAPOLIS, MN 55403	4.31
41361076	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	18.82
41361077	CITY OF BRAINERD	IND SCHOOL DIST, # 181	804 OAK ST	BRAINERD, MN 56401	20.37
41361078	CITY OF BRAINERD	MADISON, JULIE M REVOCABLE TRUST	1927 WOODCREST RD	BRAINERD, MN 56401	7.52
41361079	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	7.78
41361080	CITY OF BRAINERD	ROBERTS SAND & GRAVEL	1701 EMMA ST	BRAINERD, MN 56401	8.22
41361081	CITY OF BRAINERD	ROBERTS SAND & GRAVEL	1701 EMMA ST	BRAINERD, MN 56401	27.01
41361082	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.88
41361083	CITY OF BRAINERD	ROBERTS REVOCABLE TRUST	1702 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.37
41361084	CITY OF BRAINERD	BACON, JOSIAH &	1702 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.44
41361085	CITY OF BRAINERD	PETERSON, KNUTE J & MELANIE L	1701 PENNSYLVANIA AVE	BRAINERD, MN 56401	1.25
41361086	CITY OF BRAINERD	ENNS, DOUGLAS W & JEMIMA	310 HATTIE ST	BRAINERD, MN 56401	0.55
41361088	CITY OF BRAINERD	A L S PROPERTIES, STONEYBROOK SOUTH	SCHRADER BUILDING STE 201	5501 LAKELAND AVE N	31.85
41361089	CITY OF BRAINERD	D & G PROPERTIES, LLC	1711 SE 13TH ST	BRAINERD, MN 56401	3.13
41361090	CITY OF BRAINERD	THELEN HEATING &, ROOFING INC	1717 13TH STR SE	BRAINERD, MN 56401	0.05
41361091	CITY OF BRAINERD	DRIVER, DELORES F	1631 7TH ST S	BRAINERD, MN 56401	0.26
41361092	CITY OF BRAINERD	ZOELLNER, CRYSTAL &	1625 7TH ST S	BRAINERD, MN 56401	1.07
41361093	CITY OF BRAINERD	O'REILLY, DEVIN	1623 7TH ST S	BRAINERD, MN 56401	0.24
41361094	CITY OF BRAINERD	DESPOT, ROBERT L REV TRUST	1302 POISSANT RD	FORT RIPLEY, MN 56449	0.60
41361095	CITY OF BRAINERD	AT & T COMMUNICATIONS OF THE MIDWEST	1010 PINE ST, 9E-L-01	SAINT LOUIS, MO 63101	4.38
41361096	CITY OF BRAINERD	AMERICAN TOWER MANAGEMENT INC	P O BOX 723597	ATLANTA, GA 31139	0.03
41361097	CITY OF BRAINERD	LEONARD, LARRY L & IRENE	1807 S 10TH ST	BRAINERD, MN 56401	3.24
41361098	CITY OF BRAINERD	ROBERTS, KATHLEEN K	1011 SUMMIT ST	BRAINERD, MN 56401	0.98
41361099	CITY OF BRAINERD	POWERS, MICHAEL & ANN	2877 CHIPPEWA SHORES RD	BRAINERD, MN 56401	2.13
41361100	CITY OF BRAINERD	HELMIN, KYLER L & VICTORIA A	1107 BROOK ST	BRAINERD, MN 56401	1.46
41361101	CITY OF BRAINERD	HANSON, PETER J	1101 BROOK ST	BRAINERD, MN 56401	0.43
41361102	CITY OF BRAINERD	ZEIGLER, STACY R	1117 BROOK ST	BRAINERD, MN 56401	0.47
41361103	CITY OF BRAINERD	BARTYLLA, SCOTT A & MONA L	1121 BROOK ST	BRAINERD, MN 56401	0.24
41361104	CITY OF BRAINERD	HEGRE, CINDY L & JON D	1120 BROOK ST	BRAINERD, MN 56401	0.99
41361105	CITY OF BRAINERD	DOUCETTE, HARVEY D & ROBERTA	1201 BROOK STREET	BRAINERD, MN 56401	0.96
41361106	CITY OF BRAINERD	MATHISON, DUANE CURTIS	1206 BROOK ST	BRAINERD, MN 56401	1.02
41361107	CITY OF BRAINERD	SCHLEPPENBACH, WAYNE L	1413 10TH ST S	BRAINERD, MN 56401	1.04
41361108	CITY OF BRAINERD	YOUNG, BRANDON & GABRICK, ASHLEY	1420 13TH ST SE	BRAINERD, MN 56401	5.83
41361109	CITY OF BRAINERD	ST ANDREW'S CHURCH	1108 WILLOW ST	BRAINERD, MN 56401	9.82
41361110	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	22.41
41361111	CITY OF BRAINERD	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	7.35
41361116	CITY OF BRAINERD	ALDRIDGE PROPERTIES LLC	22400 IVERSON RD	IRONTON, MN 56455	1.47
41361117	CITY OF BRAINERD	GOLDEN OAK PROPERTIES LLC	8328 50TH AVE	BRAINERD, MN 56401	0.29
41361118	CITY OF BRAINERD	SOLIEN, BENJAMIN D	1710 LINDEN LN	BRAINERD, MN 56401	0.45
56010536					44.95
75060513	LONG LAKE TOWNSHIP	CROW WING COOP POWER & LIGHT	P O BOX 507	BRAINERD, MN 56401	0.11
75060515	LONG LAKE TOWNSHIP	CROW WING COOP POWER & LIGHT	P O BOX 507	BRAINERD, MN 56401	1.03
75060516	LONG LAKE TOWNSHIP	THIESSE, ALVINA M REVOCABLE TRUST	9340 COUNTY ROAD 45	BRAINERD, MN 56401	23.83
81310500	OAK LAWN TOWNSHIP	THOMPSON PROPERTIES OF BRAINERD LLC	23493 HAVEN RD	LITTLE FALLS, MN 56345	0.67
81310501	OAK LAWN TOWNSHIP	THELEN HEATING &, ROOFING INC	1717 13TH STR SE	BRAINERD, MN 56401	1.59
81310509	OAK LAWN TOWNSHIP	CROW WING COUNTY FAIR GROUNDS	PO BOX 169	BRAINERD, MN 56409	40.42
81310510	OAK LAWN TOWNSHIP	CROW WING COUNTY FAIR GROUNDS	PO BOX 169	BRAINERD, MN 56409	37.83
81310511	OAK LAWN TOWNSHIP	PT HOLDINGS LLC	1748 13TH ST SE	BRAINERD, MN 56409	7.23
81310512	OAK LAWN TOWNSHIP	CROW WING COUNTY FAIR GROUNDS	PO BOX 169	BRAINERD, MN 56409	26.77
81310513	OAK LAWN TOWNSHIP	CROW WING COUNTY FAIR GROUNDS	PO BOX 169	BRAINERD, MN 56408	19.96
81310514	OAK LAWN TOWNSHIP	THELEN - HAGLIN LLC	1717 13TH ST SE	BRAINERD, MN 56407	0.53
81310515	OAK LAWN TOWNSHIP	TREICHLER, JOHN W & ANN MARIE	8404 COUNTY ROAD 23	BRAINERD, MN 56406	0.28
81310516	OAK LAWN TOWNSHIP	D & G PROPERTIES, LLC	1711 SE 13TH ST	BRAINERD, MN 56405	0.91
81310517	OAK LAWN TOWNSHIP	SUPER C FARM LLC	18127 MILL RD	BRAINERD, MN 56404	0.57
81310518	OAK LAWN TOWNSHIP	THELEN HEATING &, ROOFING INC	1717 13TH STR SE	BRAINERD, MN 56403	0.55
81310519	OAK LAWN TOWNSHIP	THELEN HEATING &, ROOFING INC	1717 13TH STR SE	BRAINERD, MN 56402	0.29
81310520	OAK LAWN TOWNSHIP	THELEN HEATING &, ROOFING INC	1717 13TH STR SE	BRAINERD, MN 56401	2.97
81310521	OAK LAWN TOWNSHIP	IMGRUND, RONALD J & GWEN M	10126 GLACIER RD	BRAINERD, MN 56401	2.05
81310522	OAK LAWN TOWNSHIP	D & G PROPERTIES, LLC	1711 SE 13TH ST	BRAINERD, MN 56401	3.21
81310523	OAK LAWN TOWNSHIP	NORTHSTAR RENTAL PROPERTIES LLC	10131 INDUSTRIAL RD	BRAINERD, MN 56409	1.62
81310524	OAK LAWN TOWNSHIP	D & G PROPERTIES, LLC	1711 SE 13TH ST	BRAINERD, MN 56401	12.27
81310525	OAK LAWN TOWNSHIP	D & G PROPERTIES, LLC	1711 SE 13TH ST	BRAINERD, MN 56401	10.81
81310530	OAK LAWN TOWNSHIP	PT HOLDINGS LLC	1748 13TH ST SE	BRAINERD, MN 56409	5.19
81310531	OAK LAWN TOWNSHIP	WALSH, BRIAN E & JULIE	10131 INDUSTRIAL RD	BRAINERD, MN 56409	1.49
4136P000	CITY OF BRAINERD	UNDIVIDED INTEREST			1.12

PIN	CITY/ TOWNSHIP	OWNER NAME	OWNER ADDRESS	CITY-STATE-ZIP	Acres
				BRAINERD, MN 56401	0.42
	Blue Jay Court				0.53
	BLUE JAY TERRACE				0.77
	CSAH 45				0.20
	GREENWOOD ST				2.02
	HILLCREST DR				1.10
	Not on tax rolls				0.37
	R/W EASEMENT				0.39
	SOUTHVIEW CT				0.53
	WHIPPOORWILL LN				0.75
	WOODRIDGE LN				0.69
	R/W				1119.42
	R/W				118.46
	<New parcel>				106.48
	BUFFALO HILLS LN				2.70
	FRONTAGE RD				3.26
	GAP				27.53
	OVERLAP				9.69
	R/W				2247.16
	Unknown				6.12

PCSI	PROPERTY ID	DWSMA VULNERABILITY	GWCA or SWCA	WELL OR PERMIT ID	PCSI TYPE	PERMIT ACTIVITY	STATUS CODE	PCS CODE	PERMIT/WELL NAME	LOCATION ADDRESS	LOCATION CITY	LOCATION ZIP	OWNER NAME	OWNER ADDRESS	OWNER CITY STATE ZIP	PARCEL ACREAGE
1	41360513	High Vulnerability	BOTH	00090886	MPCA - Hazardous Waste	Hazardous Waste	I	HWG	ROBERTS SAND & GRAVEL INC	1700 EMMA ST	BRAINERD	56401	ROBERTS, KEITH W & JAN D	1700 EMMA ST	BRAINERD, MN 56401	1.45
2	41360513	High Vulnerability	BOTH	TS0011516	MPCA - Tanks	Underground Storage Tanks	A	UST	ROBERTS SAND & GRAVEL INC	1700 EMMA ST	BRAINERD	56401	ROBERTS, KEITH W & JAN D	1700 EMMA ST	BRAINERD, MN 56401	1.45
3	41360560	High Vulnerability	BOTH	232347	Public Water Supply Well	Water Supply Well	A	WEL	BRAINERD #3	CITY ADMINISTRATOR-CITY HALL	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	16.26
4	41360560	High Vulnerability	BOTH	232348	Public Water Supply Well	Water Supply Well	A	WEL	BRAINERD #4	CITY ADMINISTRATOR-CITY HALL	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	16.26
5	41361082	High Vulnerability	BOTH	232349	Public Water Supply Well	Water Supply Well	A	WEL	BRAINERD #5	CITY ADMINISTRATOR-CITY HALL	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.88
6	41360560	High Vulnerability	BOTH	232350	Public Water Supply Well	Water Supply Well	A	WEL	BRAINERD #6	CITY ADMINISTRATOR-CITY HALL	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	16.26
7	41350655	High Vulnerability	BOTH	232352	Public Water Supply Well	Water Supply Well	A	WEL	BRAINERD #7	CITY ADMINISTRATOR-CITY HALL	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	65.81
8	41360508	High Vulnerability	BOTH	403973	Public Water Supply Well	Water Supply Well	A	WEL	BRAINERD #8	CITY ADMINISTRATOR-CITY HALL	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	5.33
9	41360560	High Vulnerability	BOTH	MNG820014	MPCA - Water Quality	Water Quality	A	WWDS	BRAINERD WTP		BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	16.26
10	41360560	High Vulnerability	BOTH	409976	Located Well	Test Well	A	WEL	BRAINERD TEST WELL 1		BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	16.26
11	41360592	High Vulnerability	BOTH	COM00257	MPCA - Solid Waste	Solid Waste	A	SWMS	KEITH ANDERSON	1503 PENNSYLVANIA AVE	BRAINERD	56401	CARY, CHRISTOPHER	1503 PENNSYLVANIA AVE	BRAINERD, MN 56401	0.40
12	41360586	High Vulnerability	BOTH	COM00258	MPCA - Solid Waste	Solid Waste	A	SWMS	KEITH JOHNSON	1420 MARY ST	BRAINERD	56401	JOHNSON, KEITH M	1420 MARY ST	BRAINERD, MN 56401	0.20
13	41360586	High Vulnerability	BOTH	COM00259	MPCA - Solid Waste	Solid Waste	A	SWMS	PEGG VOSS	1420 MARY ST	BRAINERD	56401	JOHNSON, KEITH M	1420 MARY ST	BRAINERD, MN 56401	0.20
14	41360596	High Vulnerability	BOTH	COM00103	MPCA - Solid Waste	Solid Waste	A	SWMS	DAVID CAIRD	1508 MARY ST	BRAINERD	56401	J & M PROPERTY HOLDINGS 3 LLC	11429 SNAKE TRL SW	MOTLEY, MN 56466	0.15
15	41361048	High Vulnerability	BOTH	LS0016206	MPCA - Tanks	Underground Storage Tanks	I	UST	TRINITY LUTHERAN CHURCH	1420 6TH ST S	BRAINERD	56401	TRINITY LUTHERAN, CHURCH	1420 S 6TH ST	BRAINERD, MN 56401	12.87
16	41361048	High Vulnerability	BOTH	TS0124046	MPCA - Tanks	Underground Storage Tanks	I	UST	TRINITY LUTHERAN CHURCH	1420 6TH ST S	BRAINERD	56401	TRINITY LUTHERAN, CHURCH	1420 S 6TH ST	BRAINERD, MN 56401	12.87
17	41350510	High Vulnerability	SWCA		City Stormwater	Stormwater	A	SWB	CITY OF BRAINERD	501 LAUREL ST	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.64
18	41350511	High Vulnerability	SWCA		City Stormwater	Stormwater	A	SWB	CITY OF BRAINERD	501 LAUREL ST	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.46
19	41360512	High Vulnerability	GWCA	LS0005441	MPCA - Tanks	Underground Storage Tanks	I	UST	MR DONUT	1301 6TH ST S	BRAINERD	56401	LAZY H PROPERTIES LLC	501 EAST BROADWAY	LITTLE FALLS, MN 56345	0.47
20	41360512	High Vulnerability	GWCA	TS0005901	MPCA - Tanks	Underground Storage Tanks	I	UST	MR DONUT	1301 6TH ST S	BRAINERD	56401	LAZY H PROPERTIES LLC	501 EAST BROADWAY	LITTLE FALLS, MN 56345	0.47
21	41361066	High Vulnerability	GWCA	TS0005879	MPCA - Tanks	Underground Storage Tanks	R	UST	BONKERS - TOM THUMB	1325 S 6TH ST	BRAINERD	56401	YEZEK, CHYLER & LECLAIRE, SAMANTHA	1312 7TH ST S	BRAINERD, MN 56401	0.26
22	41360854	Moderate Vulnerability	GWCA	198030	Located Well	Well	A	WEL	WENNBERG, DON	1307 8TH ST S	BRAINERD	56401	BOSTROM, DAVID & TAMI	6195 EDMONTON RD	BAXTER MN 56425	0.26
23	41360849	Moderate Vulnerability	GWCA	198029	Located Well	Well	A	WEL	WENNBERG, DON	824 WILLOW ST	BRAINERD	56401	WENNBERG, DON W MD	824 WILLOW	BRAINERD, MN 56401	0.77
24	41361109	Moderate Vulnerability	GWCA	TS0017629	MPCA - Tanks	Underground Storage Tanks	R	UST	SAINT ANDREW'S CATHOLIC CHURCH	1108 WILLOW ST	BRAINERD	56401	ST ANDREW'S CHURCH	1108 WILLOW ST	BRAINERD, MN 56401	9.82
25	41360789	Moderate Vulnerability	GWCA	TS0012100	MPCA - Tanks	Underground Storage Tanks	R	UST	LAND O LAKES INC - BRAINERD	804 BROOK ST	BRAINERD	56401	HOFFMAN, MASHONA	804 BROOK ST	BRAINERD, MN 56401	0.22
26	41360979	Moderate Vulnerability	BOTH	TS0012916	MPCA - Tanks	Underground Storage Tanks	R	UST	INDEPENDENT PETROLEUM	1621 7TH ST S	BRAINERD	56401	TORFIN, JEFFREY & GWENDA	1621 S 7TH ST	BRAINERD, MN 56401	1.16
27	41361038	Moderate Vulnerability	GWCA	TS0005826	MPCA - Tanks	Underground Storage Tanks	R	UST	AT&T RADIO TOWER	723 TODD ST	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	1.72
28	41361034	Moderate Vulnerability	GWCA	198050	Unlocated Well	Well	U	WEL	CITY OF BRAINERD	1713 7TH ST S	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	4.29
29	41361034	Moderate Vulnerability	GWCA	437131	Unlocated Well	Well	U	WEL	CITY OF BRAINERD	1713 7TH ST S	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	4.29
30	41361034	Moderate Vulnerability	GWCA	409971	Unlocated Well	Test Well	U	WEL	BRAINERD TEST WELL 6	1713 7TH ST S	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	4.29
31	41361034	Moderate Vulnerability	GWCA	409973	Unlocated Well	Test Well	U	WEL	BRAINERD TEST WELL 4	1713 7TH ST S	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	4.29
32	41361034	Moderate Vulnerability	GWCA	409974	Unlocated Well	Test Well	U	WEL	BRAINERD TEST WELL 3	1713 7TH ST S	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	4.29
33	41361034	Moderate Vulnerability	GWCA	409975	Unlocated Well	Test Well	U	WEL	BRAINERD TEST WELL 2	1713 7TH ST S	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	4.29
34	41361034	Moderate Vulnerability	GWCA	273400	Unlocated Well	Well	U	WEL	CITY OF BRAINERD	1713 7TH ST S	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	4.29
35	41360638	High Vulnerability	BOTH		City Stormwater	Stormwater	A	SWB	CITY OF BRAINERD	1916 6TH ST S	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	0.34
36	41360636	High Vulnerability	BOTH	MNS000347464	MPCA - Hazardous Waste	Hazardous Waste	A	HWG	ESSENTIA HEALTH NORTHERN ORTHOPEDICS	2014 S 6TH ST	BRAINERD	56401	BRAINERD LAKES INTEGRATED HEALTH	2014 S 6TH ST	BRAINERD, MN 56401	1.50
37	41360634	High Vulnerability	BOTH	MNS000122424	MPCA - Hazardous Waste	Hazardous Waste	A	HWG	ESSENTIA HEALTH SAINT JOSEPH'S BRAINERD CLINIC	2024 S 6TH ST	BRAINERD	56401	BRAINERD LAKES INTEGRATED HEALTH	2024 S 6TH ST	BRAINERD, MN 56401	1.07
38	41361076	High Vulnerability	SWCA	725262	Unlocated Well	Well	U	WEL	CITY OF BRAINERD	101 BUFFALO HILLS LN E	BRAINERD	56401	CITY OF BRAINERD	501 LAUREL ST	BRAINERD, MN 56401	18.82
39	41010615	High Vulnerability	SWCA	ENF179	MPCA - Hazardous Waste	Hazardous Waste	I	PCS	PETERSON TOWING & REPAIR	400 BUFFALO HILLS LN E	BRAINERD	56401	DK INVESTMENTS LLC	1107 6TH ST S	BRAINERD, MN 56401	0.99
40	41010606	High Vulnerability	SWCA	MNS000322152	MPCA - Hazardous Waste	Hazardous Waste	A	HWG	GUARDIAN PHARMACY - GOOD SAMARITAN SENIOR LIVING APARTMENTS	308 BUFFALO HILLS LN	BRAINERD	56401	ABRAHAMSON, FAYE A	308 BUFFALO HILLS LN W	BRAINERD, MN 56401	1.03
41	41010608	High Vulnerability	SWCA	150754	Located Well	Well	A	WEL	ASSEMBLY OF GOD CHURCH	2424 BUSINESS 371	BRAINERD	56401	MINNESOTA TEEN CHALLENGE INC	1619 PORTLAND AVE S	MINNEAPOLIS, MN 55404	9.37
42	41361088	Moderate Vulnerability	GWCA	LS0000939	MPCA - Investigation and Cleanup	Investigation and Cleanup	C	PCS-HWIC	KATHY GROSS	128 KELLY RAE RD	BRAINERD	56401	A L S PROPERTIES, STONEYBROOK SOUTH	5501 LAKELAND AVE N	CRYSTAL, MN 55429	31.85
43	41361003	Moderate Vulnerability	GWCA	TS0126193	MPCA - Tanks	Aboveground Storage Tanks	A	AST	C & L DISTRIBUTING	924 WRIGHT ST	BRAINERD	56401	OPTIC PROPERTIES LLC	P O BOX 763	BRAINERD, MN 56401	2.28
44	41361011	Moderate Vulnerability	GWCA	TS0005895	MPCA - Tanks	Underground Storage Tanks	R	UST	CHAS LEVY COMPANY	1006 WRIGHT ST	BRAINERD	56401	POJAY PROPERTIES LLC	22739 COUNTY ROAD 4	NISSWA, MN 56468	3.95
45	41361002	Moderate Vulnerability	GWCA	726797	Unlocated Well	Well	U	WEL	OPTIC PROPERTIES LLC	P O BOX 763	BRAINERD	56401	OPTIC PROPERTIES LLC	P O BOX 763	BRAINERD, MN 56401	1.71
46	41361002	Moderate Vulnerability	GWCA	726798	Unlocated Well	Well	U	WEL	OPTIC PROPERTIES LLC	P O BOX 763	BRAINERD	56401	OPTIC PROPERTIES LLC	P O BOX 763	BRAINERD, MN 56401	1.71
47	41361002	Moderate Vulnerability	GWCA	726796	Unlocated Well	Well	U	WEL	OPTIC PROPERTIES LLC	P O BOX 763	BRAINERD	56401	OPTIC PROPERTIES LLC	P O BOX 763	BRAINERD, MN 56401	1.71
48	41361022	Moderate Vulnerability	GWCA	LS0004473	MPCA - Investigation and Cleanup	Investigation and Cleanup	C	PCS-HWIC	UNITED PARCEL SERVICE	1009 MADISON ST	BRAINERD	56401	BT PROPERTY LLC	55 GLENLAKE PKWY NE	ATLANTA, GA 30328	1.58
49	41361022	Moderate Vulnerability	GWCA	LS0021567	MPCA - Investigation and Cleanup	Investigation and Cleanup	C	PCS-HWIC	UNITED PARCEL SERVICE	1009 MADISON ST	BRAINERD	56401	BT PROPERTY LLC	55 GLENLAKE PKWY NE	ATLANTA, GA 30328	1.58
50	41361022	Moderate Vulnerability	GWCA	TS0005845	MPCA - Tanks	Underground Storage Tanks	R	UST	UNITED PARCEL SERVICE	1009 MADISON ST	BRAINERD	56401	BT PROPERTY LLC	55 GLENLAKE PKWY NE	ATLANTA, GA 30328	1.58
51	41360997	Moderate Vulnerability	GWCA	TS0005861	MPCA - Tanks	Underground Storage Tanks	R	UST	NORTH STAR PLATING	2110 S 10TH ST	BRAINERD	56401	BX PROPERTIES, LIMITED LIABILITY PA	3060 NORTHSHORE DR	WAYZATA, MN 55391	3.23
52	41360547	Moderate Vulnerability	GWCA	TS0019614	MPCA - Tanks	Underground Storage Tanks	A	UST	SAVE FOOS	701 INDUSTRIAL PARK RD SW	BRAINERD	56401	H BROTHERS LLP, C/O JEFFREY HARRISON	13648 150TH ST	WADENA, MN 56482	2.00
53	41010609	Moderate Vulnerability	GWCA	437476	Located Well	Well	A	WEL	L & M STEEL	702 INDUSTRIAL PARK RD SW	BRAINERD	56401	THOMPSON, ROXANNE D	12701 NORTH PELICAN LN	MERRIFIELD, MN 56465	8.51
54	41010617	Moderate Vulnerability	GWCA	835149	Unlocated Well	Well	U	WEL	CROW WING RECYCLING INC	714 INDUSTRIAL PARK RD	BRAINERD	56401	VANWYNGEEREN PROPERTIES BRAINERD LLC	17134 JOHNSON RD	BRAINERD, MN 56401	17.30
55	41010617	Moderate Vulnerability	GWCA	RCRA01187	MPCA - Investigation and Cleanup	Investigation and Cleanup	A	PCS-HWIC	VANWYNGEEREN PROPERTIES BRAINERD LLC	714 INDUSTRIAL PARK RD	BRAINERD	56401	VANWYNGEEREN PROPERTIES BRAINERD LLC	17134 JOHNSON RD	BRAINERD, MN 56401	17.30
56	41010617	Moderate Vulnerability	GWCA	779293	Unlocated Well	Well	U	WEL	CROW WING RECYCLING	714 INDUSTRIAL PARK RD	BRAINERD	56401	VANWYNGEEREN PROPERTIES BRAINERD LLC	17134 JOHNSON RD	BRAINERD, MN 56401	17.30
57	81310524	Moderate Vulnerability	GWCA	259294	Located Well	Well	A	WEL	SHIPMAN AUTO PARTS, INC.	1711 SE 13TH ST	BRAINERD	56401	D & G PROPERTIES, LLC	1711 SE 13TH ST	BRAINERD, MN 56401	12.27
58	81310501	Moderate Vulnerability	GWCA	259322	Located Well	Well	A	WEL	THELEN HEATING AND ROOFI	1717 SE 13TH ST	BRAINERD	56401	THELEN HEATING &, ROOFING INC	1717 13TH STR SE	BRAINERD, MN 56401	1.59
59	41361088	Moderate Vulnerability	GWCA	774835	Unlocated Well	Well	U	WEL	TIMOTHY COPLEY	13TH ST S	BRAINERD	56401	A L S PROPERTIES, STONEYBROOK SOUTH	5501 LAKELAND AVE N	CRYSTAL, MN 55429	31.85
60	41361009	Moderate Vulnerability	GWCA	TS0013924	MPCA - Tanks	Underground Storage Tanks	R	UST	BRAINERD TACC	1203 WRIGHT ST	BRAINERD	56401	U S LINK	PO BOX 2629	ADDISON, TX 75001	4.40
61	41361009	Moderate Vulnerability	GWCA	TS0124491	MPCA - Tanks	Underground Storage Tanks	R	UST	TDS TELECOM TOWER	1203 WRIGHT ST	BRAINERD	56401	U S LINK	PO BOX 2629	ADDISON, TX 75001	4.40
62	41361020	Moderate Vulnerability	GWCA	TS0005810	MPCA - Tanks	Underground Storage Tanks	A	UST	GREENFOREST WASTE SERVICES LLC	1119 MADISON ST	BRAINERD	56401	AW HOLDINGS LLC	1119 MADISON ST	BRAINERD, MN 56401	2.48
63	81310524	Moderate Vulnerability	GWCA	105940	Unlocated Well	Well	U	WEL	JOHNSON, T E	1711 SE 13TH ST	BRAINERD	56401	D & G PROPERTIES, LLC	1711 SE 13TH ST	BRAINERD, MN 56401	12.27
64	81310520	Moderate Vulnerability	GWCA	472893	Unlocated Well	Well	U	WEL	THELEN - HAGLIN LLC	1717 13TH ST SE	BRAINERD	56401	THELEN HEATING &, ROOFING INC	1717 13TH STR SE	BRAINERD, MN 56401	2.97
65	81310517	Moderate Vulnerability	GWCA		Unlocated Well	Well	U	WEL	SUPER - HAGLIN LLC	1737 SE 13TH ST	BRAINERD	56401	SUPER C FARM LLC	18127 MILL RD	BRAINERD, MN 56401	0.57
66	81310514	Moderate Vulnerability	GWCA		Unlocated Well	Well	U	WEL	THELEN - HAGLIN LLC	1739 SE 13TH ST	BRAINERD	56401	THELEN - HAGLIN LLC	1717 13TH ST SE	BRAINERD, MN 56401	0.53
67	81310511	Moderate Vulnerability	GWCA	TS0021266	MPCA - Tanks	Underground Storage Tanks	R	UST	TCBX INC	1748 SE 13TH ST	BRAINERD	56401	PT HOLDINGS LLC, ATTN: PATRICK O'BRIEN	1748 13TH ST SE	BRAINERD, MN 56401	7.23
68	81310515	Moderate Vulnerability	GWCA		Unlocated Well	Well	U	WEL	TREICHLER, JOHN W & ANN MARIE	10052 GLACIER RD	BRAINERD	56401	TREICHLER, JOHN W & ANN MARIE	8404 COUNTY ROAD 23	BRAINERD, MN 56401	0.28
69	81310511	Moderate Vulnerability	GWCA	TS0020934	MPCA - Tanks	Underground Storage Tanks	A	UST	TCBS INC	1748 SE 13TH ST	BRAINERD	56401	PT HOLDINGS LLC, ATTN: PATRICK O'BRIEN	1748 13TH ST SE	BRAINERD, MN 56401	7.23
70	81310516	Moderate Vulnerability	GWCA		Unlocated Well	Well	U	WEL	D & G PROPERTIES, LLC	10074 GLACIER RD	BRAINERD	56401	D & G PROPERTIES, LLC	1711 SE 13TH ST	BRAINERD, MN 56401	0.91
71	81310511	Moderate Vulnerability	GWCA	259296	Located Well	Well	A									

PCSI	PROPERTY ID	DWSMA VULNERABILITY	GWCA or SWCA	WELL OR PERMIT ID	PCSI TYPE	PERMIT ACTIVITY	STATUS CODE	PCS CODE	PERMIT/WELL NAME	LOCATION ADDRESS	LOCATION CITY	LOCATION ZIP	OWNER NAME	OWNER ADDRESS	OWNER CITY STATE ZIP	PARCEL ACREAGE
79	41361029	Moderate Vulnerability	GWCA	BF0000808	MPCA - Investigation and Cleanup	Investigation and Cleanup	A	PCS-BMS	ROAD EQUIPMENT	2006 13TH ST SE	BRAINERD	56401	LUND PROPERTIES LLC	1676 MISSISSIPPI RIVER BLVD S	SAINT PAUL, MN 55116	1.61
80	81310510	Moderate Vulnerability	GWCA	TS0005823	MPCA - Tanks	Underground Storage Tanks	R	UST	PEPSI COLA	CROW WING COUNTY FAIR GROUNDS	BRAINERD	56401	CROW WING COUNTY FAIR GROUNDS	PO BOX 169	BRAINERD, MN 56401	37.83
81	41361028	Moderate Vulnerability	GWCA	TS0123148	MPCA - Tanks	Underground Storage Tanks	A	UST	TRIANGLE OIL BULK PLANT	1202 MADISON ST	BRAINERD	56401	BEST OIL LLC	PO BOX Q	TRIMONT, MN 56176	2.54
82	41361028	Moderate Vulnerability	GWCA	PB3278	MPCA - Investigation and Cleanup	Investigation and Cleanup	C	PCS-BMS	IMAGE ROTOMOLDING ENTERPRISES	1100 INDUSTRIAL PARK RD SW	BRAINERD	56401	BEST OIL LLC	PO BOX Q	TRIMONT, MN 56176	2.54
83	41361026	Moderate Vulnerability	GWCA	LS0013645	MPCA - Investigation and Cleanup	Investigation and Cleanup	A	PCS	BRAINERD CENEX BULK PLANT	1123 INDUSTRIAL PARK RD SW	BRAINERD	56401	THOMPSON PROPERTIES OF BRAINERD LLC	23493 HAVEN RD	LITTLE FALLS, MN 56345	2.81
84	81310512	Moderate Vulnerability	GWCA	857277	Unlocated Well	Well	U	WEL	CROW WING COUNTY FAIR GROUNDS	CROW WING COUNTY FAIR GROUNDS	BRAINERD	56401	CROW WING COUNTY FAIR GROUNDS	PO BOX 169	BRAINERD, MN 56401	26.77
85	81310510	Moderate Vulnerability	GWCA	825239	Located Well	Well	A	WEL	HYTEC CONSTRUCTION	CROW WING COUNTY FAIR GROUNDS	BRAINERD	56401	CROW WING COUNTY FAIR GROUNDS	PO BOX 169	BRAINERD, MN 56401	37.83
86	41010556	Moderate Vulnerability	GWCA	TS0119042	MPCA - Tanks	Underground Storage Tanks	R	UST	THIESSE INDUSTRIAL PARK	11869 COUNTY ROAD 45	BRAINERD	56401	BTD GROUP LLC	11869 COUNTY RD 45	BRAINERD, MN 56401	3.50

INNER WELLHEAD MANAGEMENT ZONE (IWMZ) - POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1180002	COMMUNITY
NAME	Brainerd	
ADDRESS	Brainerd Water Superintendent, c/o Charlie Gammon, 8027 Highland Scenic Road, Baxter, MN 564257896	

FACILITY (WELL) INFORMATION

NAME	Well #3	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE? ☐ YES (Please attach a copy) ☐ NO ☐ UNDETERMINED
SAMPLE POINT ID	S01	
UNIQUE WELL NO.	232347	
COUNTY	Crow Wing	

PWS ID / SAMPLE POINT ID	1180002 S01	UNIQUE WELL NO.	232347
---------------------------------	----------------	------------------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well'	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non- community				

Agricultural Related

*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well ² (Class V well - illegal ³)	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		

SSTS Related

AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well) ²	50/300/150 ⁴	50/300/150 ⁴	100/600/300 ⁴	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		

PWS ID / SAMPLE POINT ID	1180002 S01	UNIQUE WELL NO.	232347
--------------------------	-------------	-----------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well'	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal) ²	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal) ²	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		Y	125	Y
SWI	Storm water drainage well ² (Class V well - illegal ³)	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		Y	172	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		Y	170	N
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		

PWS ID / SAMPLE POINT ID	1180002 S01	UNIQUE WELL NO.	232347
--------------------------	-------------	-----------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well ¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
IWD	Industrial waste disposal well (Class V well) ²	illegal ³	illegal ³		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50 ⁵	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	Y	185	N

Additional Sources (If there is more than one source listed above, please indicate here).

Potential Contamination Sources and Codes Based on Previous Versions of this Form

	none found within 200' of this well.						
--	--------------------------------------	--	--	--	--	--	--

* New potential contaminant source.

¹ A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

² These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

³ These sources are classified as illegal by Minnesota Rules, Chapter 4725.

⁴ Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

⁵ A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / SAMPLE POINT ID	1180002 S01	UNIQUE WELL NO.	232347
SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.		

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?	X		
Is the system monitoring existing nonconforming sources of contamination?			X

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Meyer, Aaron	DATE	10 - 18 - 2023
------------------	--------------	-------------	----------------

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Best management practices should be employed for outdoor chemical use, to prevent stormwater from moving chemical contaminants to surface waters or where wells could be impacted.		
Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.		

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

**INNER WELLHEAD MANAGEMENT ZONE (IWMZ) -
POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT**

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1180002	COMMUNITY
NAME	Brainerd	
ADDRESS	Brainerd Water Superintendent, c/o Charlie Gammon, 8027 Highland Scenic Road, Baxter, MN 564257896	

FACILITY (WELL) INFORMATION

NAME	Well #4	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?
SAMPLE POINT ID	S02	☐ YES (Please attach a copy)
UNIQUE WELL NO.	232348	☐ NO ☐ UNDETERMINED
COUNTY	Crow Wing	

PWS ID / SAMPLE POINT ID	1180002 S02	UNIQUE WELL NO.	232348
---------------------------------	-------------	------------------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)			LOCATION	
		Minimum Distances		Sensitive Well'	Within 200 Ft. Y / N / U	Dist. from Well
		Community	Non- community			

Agricultural Related

*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well ² (Class V well - illegal ³)	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		

SSTS Related

AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well) ²	50/300/150 ⁴	50/300/150 ⁴	100/600/300 ⁴	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		

PWS ID / SAMPLE POINT ID	1180002 S02	UNIQUE WELL NO.	232348
--------------------------	-------------	-----------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well'	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal) ²	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal) ²	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well ² (Class V well - illegal ³)	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		Y	172	
WEL	Operating well	record dist.	record dist.		Y	186	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		Y	164	N**
GP1	Gravel pocket or French drain for clear water drainage only	20	20		Y	90	N
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		

PWS ID / SAMPLE POINT ID	1180002 S02	UNIQUE WELL NO.	232348
--------------------------	-------------	-----------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)²	illegal³	illegal³		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50⁵	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	Y	149	N**

Additional Sources (If there is more than one source listed above, please indicate here).

Potential Contamination Sources and Codes Based on Previous Versions of this Form

	none found within 200' of this well.						
--	--------------------------------------	--	--	--	--	--	--

* New potential contaminant source.

** This number is the estimated distance that this potential source is from this well even though it was identified during an inventory for an adjacent well.

¹ A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

² These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

³ These sources are classified as illegal by Minnesota Rules, Chapter 4725.

⁴ Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

⁵ A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / SAMPLE POINT ID	1180002 S02	UNIQUE WELL NO.	232348
--------------------------	-------------	-----------------	--------

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.
-------------------	--

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?	X		
Is the system monitoring existing nonconforming sources of contamination?			X

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Wettlaufer, Mark (SWP)	DATE	10 - 18 - 2023
-----------	------------------------	------	----------------

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.		

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

**INNER WELLHEAD MANAGEMENT ZONE (IWMZ) -
POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT**

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1180002	COMMUNITY
NAME	Brainerd	
ADDRESS	Brainerd Water Superintendent, c/o Charlie Gammon, 8027 Highland Scenic Road, Baxter, MN 564257896	

FACILITY (WELL) INFORMATION

NAME	Well #5	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?
SAMPLE POINT ID	S03	☐ YES (Please attach a copy)
UNIQUE WELL NO.	232349	☐ NO ☐ UNDETERMINED
COUNTY	Crow Wing	

PWS ID / SAMPLE POINT ID	1180002 S03	UNIQUE WELL NO.	232349
---------------------------------	-------------	------------------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well'	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non- community				

Agricultural Related

*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well ² (Class V well - illegal ³)	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		

SSTS Related

AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well) ²	50/300/150 ⁴	50/300/150 ⁴	100/600/300 ⁴	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		

PWS ID / SAMPLE POINT ID	1180002 S03	UNIQUE WELL NO.	232349
--------------------------	-------------	-----------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well'	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal) ²	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal) ²	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well ² (Class V well - illegal ³)	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		Y	154	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		Y	164	N**
GP1	Gravel pocket or French drain for clear water drainage only	20	20		Y	102	N
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		

PWS ID / SAMPLE POINT ID	1180002 S03	UNIQUE WELL NO.	232349
--------------------------	-------------	-----------------	--------

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.
-------------------	--

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?	X		
Is the system monitoring existing nonconforming sources of contamination?			X

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Wettlaufer, Mark (SWP)	DATE	10 - 18 - 2023
-----------	------------------------	------	----------------

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.		

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

**INNER WELLHEAD MANAGEMENT ZONE (IWMZ) -
POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT**

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1180002	COMMUNITY
NAME	Brainerd	
ADDRESS	Brainerd Water Superintendent, c/o Charlie Gammon, 8027 Highland Scenic Road, Baxter, MN 564257896	

FACILITY (WELL) INFORMATION

NAME	Well #6	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?
SAMPLE POINT ID	S04	☐ YES (Please attach a copy)
UNIQUE WELL NO.	232350	☐ NO ☐ UNDETERMINED
COUNTY	Crow Wing	

PWS ID / SAMPLE POINT ID	1180002 S04	UNIQUE WELL NO.	232350
---------------------------------	-------------	------------------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well'	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non- community				

Agricultural Related

*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well ² (Class V well - illegal ³)	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		

SSTS Related

AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well) ²	50/300/150 ⁴	50/300/150 ⁴	100/600/300 ⁴	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		

PWS ID / SAMPLE POINT ID	1180002 S04	UNIQUE WELL NO.	232350
--------------------------	-------------	-----------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well'	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal) ²	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal) ²	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well ² (Class V well - illegal ³)	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		Y	154	
WEL	Operating well	record dist.	record dist.		Y	186	
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		Y	179	N**
GP1	Gravel pocket or French drain for clear water drainage only	20	20		Y	100	N
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		

PWS ID / SAMPLE POINT ID	1180002 S04	UNIQUE WELL NO.	232350
--------------------------	-------------	-----------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		
IWD	Industrial waste disposal well (Class V well)²	illegal³	illegal³		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50⁵	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	N		

Additional Sources (If there is more than one source listed above, please indicate here).

Potential Contamination Sources and Codes Based on Previous Versions of this Form

	none found within 200' of this well.						
--	--------------------------------------	--	--	--	--	--	--

* New potential contaminant source.

** This number is the estimated distance that this potential source is from this well even though it was identified during an inventory for an adjacent well.

¹ A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

² These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

³ These sources are classified as illegal by Minnesota Rules, Chapter 4725.

⁴ Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

⁵ A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / SAMPLE POINT ID	1180002 S04	UNIQUE WELL NO.	232350
--------------------------	-------------	-----------------	--------

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.
-------------------	--

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?	X		
Is the system monitoring existing nonconforming sources of contamination?			X

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Wettlaufer, Mark (SWP)	DATE	10 - 18 - 2023
-----------	------------------------	------	----------------

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.		

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

**INNER WELLHEAD MANAGEMENT ZONE (IWMZ) -
POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT**

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1180002	COMMUNITY
NAME	Brainerd	
ADDRESS	Brainerd Water Superintendent, c/o Charlie Gammon, 8027 Highland Scenic Road, Baxter, MN 564257896	

FACILITY (WELL) INFORMATION

NAME	Well #7	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE? ☐ YES (Please attach a copy) ☐ NO ☐ UNDETERMINED
SAMPLE POINT ID	S05	
UNIQUE WELL NO.	232352	
COUNTY	Crow Wing	

PWS ID / SAMPLE POINT ID	1180002 S05	UNIQUE WELL NO.	232352
---------------------------------	-------------	------------------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well'	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non- community				

Agricultural Related

*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well ² (Class V well - illegal ³)	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		

SSTS Related

AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well) ²	50/300/150 ⁴	50/300/150 ⁴	100/600/300 ⁴	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		

PWS ID / SAMPLE POINT ID	1180002 S05	UNIQUE WELL NO.	232352
--------------------------	-------------	-----------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well'	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal) ²	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal) ²	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well ² (Class V well - illegal ³)	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		Y	65	N
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		

PWS ID / SAMPLE POINT ID	1180002 S05	UNIQUE WELL NO.	232352
--------------------------	-------------	-----------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well¹	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
IWD	Industrial waste disposal well (Class V well)²	illegal³	illegal³		N		
IWS	Interceptor, including a flammable waste or sediment	50	50		N		
OH1	Ordinary high water level of a stream, river, pond, lake, reservoir, or drainage ditch (holds water six months or more)	50	35		N		
*PP1	Petroleum buried piping	50	50		N		
*PP2	Petroleum or crude oil pipeline to a refinery or distribution center	100	100		N		
PT1	Petroleum tank or container, 1100 gal. or more, without safeguards	150	150		N		
PT2	Petroleum tank or container, 1100 gal. or more, with safeguards	100	100		N		
PT3	Petroleum tank or container, buried, between 56 and 1100 gal.	50	50		N		
PT4	Petroleum tank or container, not buried, between 56 and 1100 gal.	50⁵	20		N		
PU1	Pit or unfilled space more than four feet in depth	20	20		N		
PC1	Pollutant or contaminant that may drain into the soil	50	50	100	N		
SP1	Swimming pool, in-ground	20	20		N		
*VH1	Vertical heat exchanger, horizontal piping conforming to rule	50	10		N		
*VH2	Vertical heat exchanger (vertical) piping, conforming to rule	50	35		N		
*WR1	Wastewater rapid infiltration basin, municipal or industrial	300	300	600	N		
*WA1	Wastewater spray irrigation area, municipal or industrial	150	150	300	N		
*WS1	Wastewater stabilization pond, industrial	150	150	300	N		
*WS2	Wastewater stabilization pond, municipal, 500 or more gal./acre/day of leakage	300	300	600	N		
*WS3	Wastewater stabilization pond, municipal, less than 500 gal./acre/day of leakage	150	150	300	N		
*WT1	Wastewater treatment unit tanks, vessels and components (Package plant)	100	100		N		
*WT2	Water treatment backwash disposal area	50	50	100	Y	75	N

Additional Sources (If there is more than one source listed above, please indicate here).

Potential Contamination Sources and Codes Based on Previous Versions of this Form

	none found within 200' of this well.						
--	--------------------------------------	--	--	--	--	--	--

* New potential contaminant source.

¹ A sensitive well has less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10' in thickness.

² These sources, known as Class V underground injection wells, are regulated by the federal U.S. Environmental Protection Agency.

³ These sources are classified as illegal by Minnesota Rules, Chapter 4725.

⁴ Isolation distance is determined by average flow per day or if a facility handles infectious or pathological wastes.

⁵ A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container, unless the tank or container is used for emergency pumping and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

This form is based on the new isolation distances in Minnesota Rules, Chapter 4725, related to wells and borings adopted August 4, 2008, and Minnesota Rules, Chapter 4720, related to wellhead protection.

PWS ID / SAMPLE POINT ID	1180002 S05	UNIQUE WELL NO.	232352
---------------------------------	-------------	------------------------	--------

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.
--------------------------	---

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?	X		
Is the system monitoring existing nonconforming sources of contamination?			X

Reminder Question: Were the wellhead protection measure(s) implemented?	
--	--

INSPECTOR	Meyer, Aaron	DATE	10 - 18 - 2023
------------------	--------------	-------------	----------------

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED
Floor drains, such as in pumphouses, that discharge to a gravel pocket or seepage pit should have a "No Dumping" sign posted.		

COMMENTS

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

**INNER WELLHEAD MANAGEMENT ZONE (IWMZ) -
POTENTIAL CONTAMINANT SOURCE INVENTORY (PCSI) REPORT**

PUBLIC WATER SYSTEM INFORMATION

PWS ID	1180002	COMMUNITY
NAME	Brainerd	
ADDRESS	Brainerd Water Superintendent, c/o Charlie Gammon, 8027 Highland Scenic Road, Baxter, MN 564257896	

FACILITY (WELL) INFORMATION

NAME	Well #8	IS THERE A WELL LOG OR ADDITIONAL CONSTRUCTION INFORMATION AVAILABLE?
SAMPLE POINT ID	S06	☐ YES (Please attach a copy)
UNIQUE WELL NO.	403973	☐ NO ☐ UNDETERMINED
COUNTY	Crow Wing	

PWS ID / SAMPLE POINT ID	1180002 S06	UNIQUE WELL NO.	403973
---------------------------------	-------------	------------------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well'	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non- community				

Agricultural Related

*AC1	Agricultural chemical buried piping	50	50		N		
*AC2	Agricultural chemical multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gal. or 100 lbs. dry weight	50	50		N		
ACP	Agricultural chemical tank or container with 25 gal. or more or 100 lbs. or more dry weight, or equipment filling or cleaning area without safeguards	150	150		N		
ACS	Agricultural chemical storage or equipment filling or cleaning area with safeguards	100	100		N		
ACR	Agricultural chemical storage or equipment filling or cleaning area with safeguards and roofed	50	50		N		
ADW	Agricultural drainage well ² (Class V well - illegal ³)	50	50		N		
AAT	Anhydrous ammonia tank (stationary tank)	50	50		N		
AB1	Animal building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit (stockyard)	50	20	100/40	N		
AB2	Animal building or poultry building, including a horse riding area, more than 1.0 animal unit	50	50	100	N		
ABS	Animal burial area, more than 1.0 animal unit	50	50		N		
FWP	Animal feeding or watering area within a pasture, more than 1.0 animal unit	50	50	100	N		
AF1	Animal feedlot, unroofed, 300 or more animal units (stockyard)	100	100	200	N		
AF2	Animal feedlot, more than 1.0, but less than 300 animal units (stockyard)	50	50	100	N		
AMA	Animal manure application	use discretion	use discretion		N		
REN	Animal rendering plant	50	50		N		
MS1	Manure (liquid) storage basin or lagoon, unpermitted or noncertified	300	300	600	N		
MS2	Manure (liquid) storage basin or lagoon, approved earthen liner	150	150	300	N		
MS3	Manure (liquid) storage basin or lagoon, approved concrete or composite liner	100	100	200	N		
MS4	Manure (solid) storage area, not covered with a roof	100	100	200	N		
OSC	Open storage for crops	use discretion	use discretion		N		

SSTS Related

AA1	Absorption area of a soil dispersal system, average flow greater than 10,000 gal./day	300	300	600	N		
AA2	Absorption area of a soil dispersal system serving a facility handling infectious or pathological wastes, average flow 10,000 gal./day or less	150	150	300	N		
AA3	Absorption area of a soil dispersal system, average flow 10,000 gal./day or less	50	50	100	N		
AA4	Absorption area of a soil dispersal system serving multiple family residences or a non-residential facility and has the capacity to serve 20 or more persons per day (Class V well) ²	50/300/150 ⁴	50/300/150 ⁴	100/600/300 ⁴	N		
CSP	Cesspool	75	75	150	N		
AGG	Dry well, leaching pit, seepage pit	75	75	150	N		
*FD1	Floor drain, grate, or trough connected to a buried sewer	50	50		N		
*FD2	Floor drain, grate, or trough if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences	50	20		N		

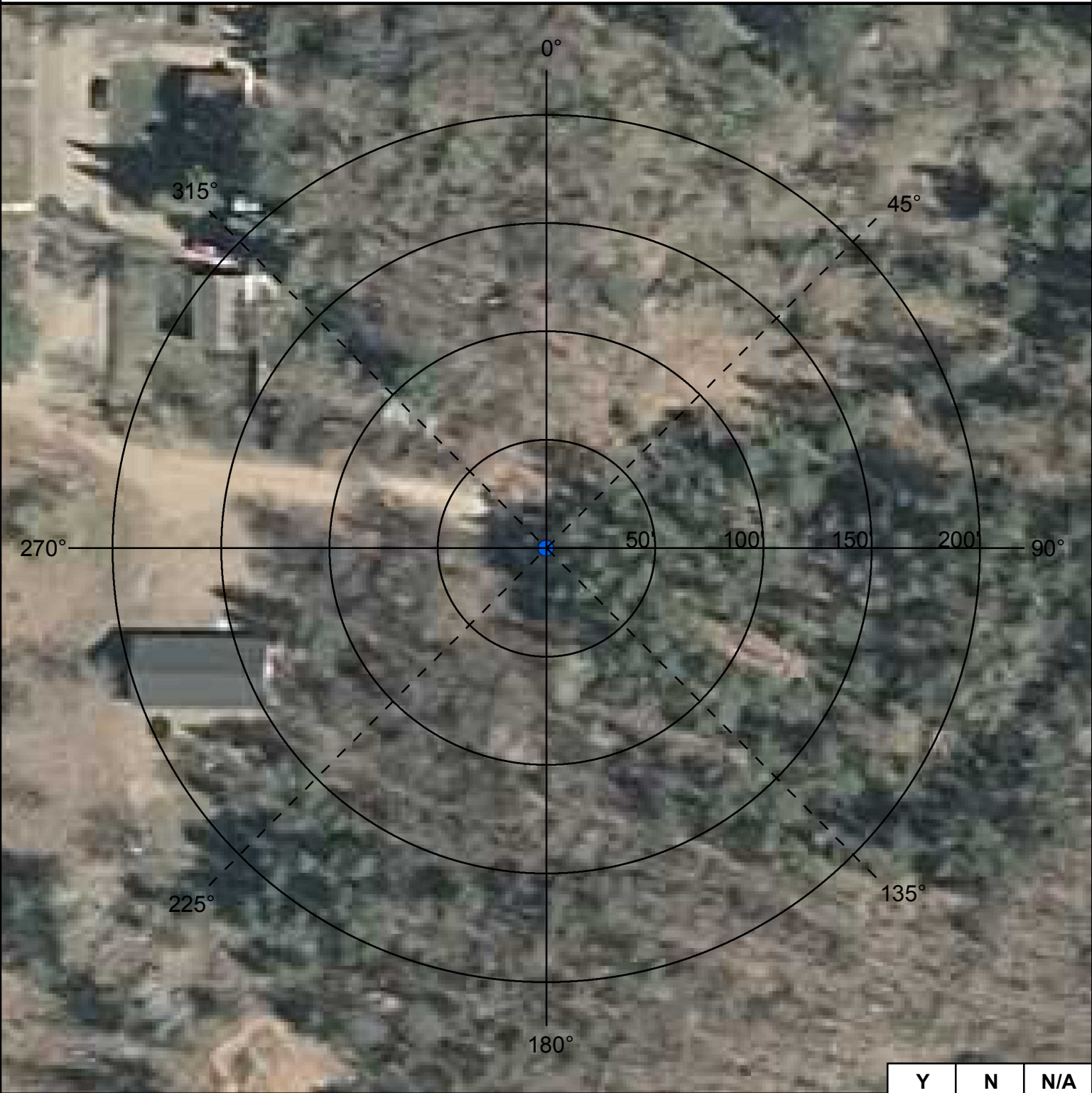
PWS ID / SAMPLE POINT ID	1180002 S06	UNIQUE WELL NO.	403973
--------------------------	-------------	-----------------	--------

PCSI CODE	ACTUAL OR POTENTIAL CONTAMINATION SOURCE	ISOLATION DISTANCES (FEET)				LOCATION	
		Minimum Distances		Sensitive Well'	Within 200 Ft. Y / N / U	Dist. from Well	Est. (?)
		Community	Non-community				
*GW1	Gray-water dispersal area	50	50	100	N		
LC1	Large capacity cesspools (Class V well - illegal) ²	75	75	150	N		
MVW	Motor vehicle waste disposal (Class V well - illegal) ²	illegal	illegal		N		
PR1	Privy, nonportable	50	50	100	N		
PR2	Portable (privy) or toilet	50	20		N		
*SF1	Watertight sand filter; peat filter; or constructed wetland	50	50		N		
SET	Septic tank	50	50		N		
HTK	Sewage holding tank, watertight	50	50		N		
SS1	Sewage sump capacity 100 gal. or more	50	50		N		
SS2	Sewage sump capacity less than 100 gal., tested, conforming to rule	50	20		N		
*ST1	Sewage treatment device, watertight	50	50		N		
SB1	Sewer, buried, approved materials, tested, serving one building, or two or less single-family residences	50	20		N		
SB2	Sewer, buried, collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials	50	50		N		
*WB1	Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection	50	50		N		
*WB2	Water treatment backwash holding basin, reclaim basin, or surge tank with a backflow protected sewer connection	20	20		N		
Land Application							
SPT	Land spreading area for sewage, septage, or sludge	50	50	100	N		
Solid Waste Related							
COS	Commercial compost site	50	50		N		
CD1	Construction or demolition debris disposal area	50	50	100	N		
*HW1	Household solid waste disposal area, single residence	50	50	100	N		
LF1	Landfill, permitted demolition debris, dump, or mixed municipal solid waste from multiple persons	300	300	600	N		
SVY	Scrap yard	50	50		N		
SWT	Solid waste transfer station	50	50		N		
Storm Water Related							
SD1	Storm water drain pipe, 8 inches or greater in diameter	50	20		N		
SWI	Storm water drainage well ² (Class V well - illegal ³)	50	50		N		
SM1	Storm water pond greater than 5000 gal.	50	35		N		
Wells and Borings							
*EB1	Elevator boring, not conforming to rule	50	50		N		
*EB2	Elevator boring, conforming to rule	20	20		N		
MON	Monitoring well	record dist.	record dist.		N		
WEL	Operating well	record dist.	record dist.		N		
UUW	Unused, unsealed well or boring	50	50		N		
General							
*CR1	Cistern or reservoir, buried, nonpressurized water supply	20	20		N		
PLM	Contaminant plume	50	50		N		
*CW1	Cooling water pond, industrial	50	50	100	N		
DC1	Deicing chemicals, bulk road	50	50	100	N		
*ET1	Electrical transformer storage area, oil-filled	50	50		N		
GRV	Grave or mausoleum	50	50		N		
GP1	Gravel pocket or French drain for clear water drainage only	20	20		N		
*HS1	Hazardous substance buried piping	50	50		N		
HS2	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight, without safeguards	150	150		N		
HS3	Hazardous substance tank or container, above ground or underground, 56 gal. or more, or 100 lbs. or more dry weight with safeguards	100	100		N		
HS4	Hazardous substance multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gal. or 100 lbs., but aggregate volume exceeding	50	50		N		
HWF	Highest water or flood level	50	N/A		N		
*HG1	Horizontal ground source closed loop heat exchanger buried piping	50	50		N		
*HG2	Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid	50	10		N		

PWS ID / SAMPLE POINT ID	1180002 S06	UNIQUE WELL NO.	403973
--------------------------	-------------	-----------------	--------

SETBACK DISTANCES	All potential contaminant sources must be noted on sketch.
-------------------	--

Record the distance and approximate compass bearing of each potential contaminant source from the well, and identify the source using the "Source Code". Unlabeled points on the map are unsealed wells.



	Y	N	N/A
Were the isolation distances maintained for the new sources of contamination?			X
Is the system monitoring existing nonconforming sources of contamination?			X

Reminder Question: Were the wellhead protection measure(s) implemented?

INSPECTOR	Meyer, Aaron	DATE	10 - 18 - 2023
-----------	--------------	------	----------------

PWS ID / SAMPLE POINT ID	1180002 S06	UNIQUE WELL NO.	403973
--------------------------	-------------	-----------------	--------

RECOMMENDED WELLHEAD PROTECTION (WHP) MEASURES	WHP MEASURE IMPLEMENTED? Y or N	DATE VERIFIED

COMMENTS
A wooded ravine East, North & South surrounds the well.Should re-verify with PWS no contaminants exist SW , W of well on the 200' periphery of the IWMZ area.

For further information, please contact:

Minnesota Department of Health
Drinking Water Protection Section
Source Water Protection Unit
P.O. Box 64975
St. Paul, Minnesota 55164-0975

Section Receptionist: 651-201-4700
Division TDD: 651-201-5797 or MN Relay Service @ 1-800-627-3529 and ask for 651-201-5000

Brainerd Public Utilities Local Water Supply Plan 2017

Formerly called Water Emergency & Water Conservation Plan



Cover photo by Molly Shodeen



For more information on this Water Supply Plan Template, please contact the DNR Division of Ecological and Water Resources at (651) 259-5034 or (651) 259-5100.

Copyright 2015 State of Minnesota, Department of Natural Resources

This information is available in an alternative format upon request.

Equal opportunity to participate in and benefit from programs of the Minnesota Department of Natural Resources is available to all individuals regardless of race, color, creed, religion, national origin, sex, marital status, public assistance status, age, sexual orientation, disability or activity on behalf of a local human rights commission. Discrimination inquiries should be sent to Minnesota DNR, 500 Lafayette Road, St. Paul, MN 55155-4049; or the Equal Opportunity Office, Department of the Interior, Washington, DC 20240.

Table of contents

INTRODUCTION TO WATER SUPPLY PLANS (WSP)	6
Who needs to complete a Water Supply Plan	6
Groundwater Management Areas (GWMA)	6
Benefits of completing a WSP	6
WSP Approval Process	7
PART 1. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION	9
A. Analysis of Water Demand.....	9
B. Treatment and Storage Capacity	11
Treatment and storage capacity versus demand.....	12
C. Water Sources.....	13
Limits on Emergency Interconnections.....	13
D. Future Demand Projections – <i>Key Metropolitan Council Benchmark</i>	14
Water Use Trends.....	14
Projection Method	15
E. Resource Sustainability	15
Monitoring – <i>Key DNR Benchmark</i>	15
Potential Water Supply Issues & Natural Resource Impacts – <i>Key DNR & Metropolitan Council Benchmark</i>	16
Wellhead Protection (WHP) and Surface Water Protection (SWP) Plans	19
F. Capital Improvement Plan (CIP).....	20
Adequacy of Water Supply System	20
Proposed Future Water Sources	21
Water Source Alternatives - <i>Key Metropolitan Council Benchmark</i>	21
Part 2. Emergency Preparedness Procedures	23
A. Federal Emergency Response Plan	23
B. Operational Contingency Plan	23
C. Emergency Response Procedures.....	23
Emergency Telephone List	24

Current Water Sources and Service Area	24
Procedure for Augmenting Water Supplies	24
Allocation and Demand Reduction Procedures	25
Notification Procedures	27
Enforcement	28
PART 3. WATER CONSERVATION PLAN	29
Progress since 2006	29
A. Triggers for Allocation and Demand Reduction Actions	31
B. Conservation Objectives and Strategies – <i>Key benchmark for DNR</i>	34
Objective 1: Reduce Unaccounted (Non-Revenue) Water loss to Less than 10%	34
Objective 2: Achieve Less than 75 Residential Gallons per Capita Demand (GPCD)	36
Objective 3: Achieve at least a 1.5% per year water reduction for Institutional, Industrial, Commercial, and Agricultural GPCD over the next 10 years or a 15% reduction in ten years	37
Objective 4: Achieve a Decreasing Trend in Total Per Capita Demand	38
Objective 5: Reduce Peak Day Demand so that the Ratio of Average Maximum day to the Average Day is less than 2.6	38
Objective 6: Implement a Conservation Water Rate Structure and/or a Uniform Rate Structure with a Water Conservation Program	39
Objective 7: Additional strategies to Reduce Water Use and Support Wellhead Protection Planning	41
Objective 8: Tracking Success: How will you track or measure success through the next ten years?	41
A. Regulation	42
B. Retrofitting Programs	43
Retrofitting Programs	43
C. Education and Information Programs	44
Proposed Education Programs	44
Part 4. ITEMS FOR METROPOLITAN AREA COMMUNITIES	48

A. Water Demand Projections through 2040	48
B. Potential Water Supply Issues	48
C. Proposed Alternative Approaches to Meet Extended Water Demand Projections	48
D. Value-Added Water Supply Planning Efforts (Optional)	49
Source Water Protection Strategies	49
Technical assistance.....	49
GLOSSARY	50
Acronyms and Initialisms	52
APPENDICES TO BE SUBMITTED BY THE WATER SUPPLIER	54
Appendix 1: Well records and maintenance summaries – see Part 1C	54
Appendix 2: Water level monitoring plan – see Part 1E	54
Appendix 3: Water level graphs for each water supply well - see Part 1E	54
Appendix 4: Capital Improvement Plan - see Part 1E	54
Appendix 5: Emergency Telephone List – see Part 2C.....	54
Appendix 6: Cooperative Agreements for Emergency Services – see Part 2C.....	54
Appendix 7: Municipal Critical Water Deficiency Ordinance – see Part 2C.....	54
Appendix 8: Graph showing annual per capita water demand for each customer category during the last ten-years – see Part 3 Objective 4.....	54
Appendix 9: Water Rate Structure – see Part 3 Objective 6.....	54
Appendix 10: Adopted or proposed regulations to reduce demand or improve water efficiency – see Part 3 Objective 7.....	54
Appendix 11: Implementation Checklist – summary of all the actions that a community is doing, or proposes to do, including estimated implementation dates – see www.mndnr.gov/watersupplyplans	54

DEPARTMENT OF NATURAL RESOURCES – DIVISION OF ECOLOGICAL AND WATER RESOURCES AND METROPOLITAN COUNCIL

INTRODUCTION TO WATER SUPPLY PLANS (WSP)

Who needs to complete a Water Supply Plan

Public water suppliers serving more than 1,000 people, large private water suppliers in designated Groundwater Management Areas, and all water suppliers in the Twin Cities metropolitan area are required to prepare and submit a water supply plan.

The goal of the WSP is to help water suppliers: 1) implement long term water sustainability and conservation measures; and 2) develop critical emergency preparedness measures. Your community needs to know what measures will be implemented in case of a water crisis. A lot of emergencies can be avoided or mitigated if long term sustainability measures are implemented.

Groundwater Management Areas (GWMA)

The DNR has designated three areas of the state as Groundwater Management Areas (GWMAs) to focus groundwater management efforts in specific geographies where there is an added risk of overuse or water quality degradation. A plan directing the DNR's actions within each GWMA has been prepared. Although there are no specific additional requirements with respect to the water supply planning for communities within designated GWMAs, communities should be aware of the issues and actions planned if they are within the boundary of one of the GWMAs. The three GWMAs are the North and East Metro GWMA (Twin Cities Metro), the Bonanza Valley GWMA and the Straight River GWMA (near Park Rapids). Additional information and maps are included in the DNR webpage at

<http://www.dnr.state.mn.us/gwmp/areas.html>

Benefits of completing a WSP

Completing a WSP using this template, fulfills a water supplier's statutory obligations under M.S. [M.S.103G.291](#) to complete a water supply plan. For water suppliers in the metropolitan area, the WSP will help local governmental units to fulfill their requirements under M.S. 473.859 to complete a local comprehensive plan. Additional benefits of completing WSP template:

- The standardized format allows for quicker and easier review and approval.
- Help water suppliers prepare for droughts and water emergencies.
- Create eligibility for funding requests to the Minnesota Department of Health (MDH) for the Drinking Water Revolving Fund.
- Allow water suppliers to submit requests for new wells or expanded capacity of existing wells.
- Simplify the development of county comprehensive water plans and watershed plans.
- Fulfill the contingency plan provisions required in the MDH wellhead protection and surface water protection plans.

- Fulfill the demand reduction requirements of Minnesota Statutes, section 103G.291 subd 3 and 4.
- Upon implementation, contribute to maintaining aquifer levels, reducing potential well interference and water use conflicts, and reducing the need to drill new wells or expand system capacity.
- Enable DNR to compile and analyze water use and conservation data to help guide decisions.
- Conserve Minnesota's water resources

If your community needs assistance completing the Water Supply Plan, assistance is available from your area hydrologist or groundwater specialist, the MN Rural Waters Association circuit rider program, or in the metropolitan area from Metropolitan Council staff. Many private consultants are also available.

WSP Approval Process

10 Basic Steps for completing a 10-Year Water Supply Plan

1. Download the DNR/Metropolitan Council Water Supply Plan Template
www.mndnr.gov/watersupplyplans
2. Save the document with a file name with this naming convention:
WSP_cityname_permitnumber_date.doc.
3. The template is a form that should be completed electronically.
4. Compile the required water use data (Part 1) and emergency procedures information (Part 2)
5. The Water Conservation section (Part 3) may need discussion with the water department, council, or planning commission, if your community does not already have an active water conservation program.
6. Communities in the seven-county Twin Cities metropolitan area should complete all the information discussed in Part 4. The Metropolitan Council has additional guidance information on their webpage <http://www.metrocouncil.org/Handbook/Plan-Elements/Water-Resources/Water-Supply.aspx>. All out-state water suppliers do *not* need to complete the content addressed in Part 4.
7. Use the Plan instructions and Checklist document to insure all data is complete and attachments are included. This will allow for a quicker approval process. www.mndnr.gov/watersupplyplans
8. Plans should be submitted electronically – no paper documents are required.
<https://webapps11.dnr.state.mn.us/mpars/public/authentication/login>
9. DNR hydrologist will review plans (in cooperation with Metropolitan Council in Metro area) and approve the plan or make recommendations.
10. Once approved, communities should complete a Certification of Adoption form, and send a copy to the DNR.

Complete Table 1 with information about the public water supply system covered by this WSP.

Table 1. General information regarding this WSP

Requested Information	Description
DNR Water Appropriation Permit Number(s)	1977-3523
Ownership	☒ Public or ☐ Private
Metropolitan Council Area	☐ Yes or ☒ No Crow Wing County
Street Address	8027 Highland Scenic Rd
City, State, Zip	Brainerd, MN 56401
Contact Person Name	Scott Magnuson
Title	Superintendent
Phone Number	218-825-3213
MDH Supplier Classification	Municipal

PART 1. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION

The first step in any water supply analysis is to assess the current status of demand and availability. Information summarized in Part 1 can be used to develop Emergency Preparedness Procedures (Part 2) and the Water Conservation Plan (Part 3). This data is also needed to track progress for water efficiency measures.

A. Analysis of Water Demand

Complete Table 2 showing the past 10 years of water demand data.

- Some of this information may be in your Wellhead Protection Plan.
- If you do not have this information, do your best, call your engineer for assistance or if necessary leave blank.

If your customer categories are different than the ones listed in Table 2, please describe the differences below:

--

Table 2. Historic water demand (see definitions in the glossary after Part 4 of this template)

Year	Pop. Served	Total Connections	Residential Water Delivered (MG)	C/I/I Water Delivered (MG)	Water used for Non-essential	Wholesale Deliveries (MG)	Total Water Delivered (MG)	Total Water Pumped (MG)	Water Supplier Services	Percent Unmetered/Unaccounted	Average Daily Demand (MGD)	Max. Daily Demand (MGD)	Date of Max. Demand	Residential Per Capita Demand (GPCD)	Total per capita Demand (GPCD)
2005	13798	4617	194	298	n/a	100	592	685	n/a	13.7	1.62			39	116
2006	13849	4679	217	332	n/a	177	726	818	n/a	11.2	1.99			43	127
2007	13849	4664	206	329	n/a	143	678	751	n/a	9.7	1.86			41	120
2008	13775	4613	188	276	n/a	21.3	485	540	n/a	10.2	1.32			37	107
2009	13770	4609	184	266	n/a	41	491	569	n/a	14.7	1.34			36	113
2010	13590	4626	177	275	n/a	22.3	474	514	n/a	8.8	1.29			35	103
2011	13533	4621	170	265	n/a	24.9	460	500	n/a	8	1.26			34	101
2012	13526	4642	173	266	n/a	31.8	471	497	n/a	7.3	1.29	2.4	7-2	35	100
2013	13487	4651	170	263	n/a	29.7	463	507	n/a	8.9	1.26	2.5	8-7	34	103
2014	13371	4629	180	239	n/a	31.1	450	500	n/a	9	1.23	2.3	8-13	36	102
2015	13371	4650	164	248	n/a	37.1	449	506	n/a	11.3	1.23	2.4	7-22	33	104
Avg. 2010-2015	13480	4635	172	259	n/a	29.5	461	504	n/a	8.8	1.26	2.4		34.5	102

MG – Million Gallons **MGD** – Million Gallons per Day **GPCD** – Gallons per Capita per Day

See Glossary for definitions

Complete Table 3 by listing the top 10 water users by volume, from largest to smallest. For each user, include information about the category of use (residential, commercial, industrial, institutional, or wholesale), the amount of water used in gallons per year, the percent of total water delivered, and the status of water conservation measures.

Table 3. Large volume users

Customer	Use Category (Residential, Industrial, Commercial, Institutional, Wholesale)	Amount Used (Gallons per Year)	Percent of Total Annual Water Delivered	Implementing Water Conservation Measures? (Yes/No/Unknown)
1 ST JOSEPHS HOSP.	COMMERCIAL	13,892,000	3.2	UNKNOWN
2 COUNTY BLDG	COMMERCIAL	6,111,000	1.4	LOW FLOW FIXT
3 HIGH SCHOOL	COMMERCIAL	4,096,000	.97	UNKNOWN
4 KEYSTONE	COMMERCIAL	4,076,367	.97	UNKNOWN
5 BRD. H.R.A.	COMMERCIAL	4,008,000	.97	UNKNOWN
6 ST JOSEPHS BMC	COMMERCIAL	3,349,000	.7	UNKNOWN
7 EDGEWOOD SR.	COMMERCIAL	2,595,000	.6	LOW FLOW FIXT
8 BRD. MANOR	COMMERCIAL	2,566,000	.6	LOW FLOW FIXT
9 BAHA	COMMERCIAL	2,554,000	.6	NO
10 MISS. TERRACE	COMMERCIAL	2,499,750	.6	LOW FLOW FIXT

B. Treatment and Storage Capacity

Complete Table 4 with a description of where water is treated, the year treatment facilities were constructed, water treatment capacity, the treatment methods (i.e. chemical addition, reverse osmosis, coagulation, sedimentation, etc.) and treatment types used (i.e. fluoridation, softening, chlorination, Fe/MN removal, coagulation, etc.). Also describe the annual amount and method of disposal of treatment residuals. Add rows to the table as needed.

Table 4. Water treatment capacity and treatment processes

Treatment Site ID (Plant Name or Well ID)	Year Constructed	Treatment Capacity (GPD)	Treatment Method	Treatment Type	Annual Amount of Residuals	Disposal Process for Residuals	Do You Reclaim Filter Backwash Water?
central	1931	1.5 MGD	Catalization	Fe/Mn removal		Settling pond	No
Addition	1946	1.5 MGD	Same	Same		Same	No
Addition	1965	4.3 MGD	Same	Same		Same	No
Total	NA	7.3 MGD	NA	NA		NA	

Complete Table 5 with information about storage structures. Describe the type (i.e. elevated, ground, etc.), the storage capacity of each type of structure, the year each structure was constructed, and the primary material for each structure. Add rows to the table as needed.

Table 5. Storage capacity, as of the end of the last calendar year

Structure Name	Type of Storage Structure	Year Constructed	Primary Material	Storage Capacity (Gallons)
1 DT & East	Elevated storage	1959 & 1958	Steel	1 MG & .6 MG
2 Water Plant	Ground storage	1973	Steel	1 MG
3 Water Plant	Ground storage	1935	Concrete	.8 MG
Total	NA	NA	NA	

Treatment and storage capacity versus demand

It is recommended that total storage equal or exceed the average daily demand.

Discuss the difference between current storage and treatment capacity versus the water supplier's projected average water demand over the next 10 years (see Table 7 for projected water demand):

Currently, our storage and treatment capacity far exceed the needs of demand now and looking 10 years into the future. We are though looking at new raw water storage at the plant to eliminate the old concrete storage, the lead paint steel storage, and the backwash system and storage tank. Probably a 2019 project.

C. Water Sources

Complete Table 6 by listing all types of water sources that supply water to the system, including groundwater, surface water, interconnections with other water suppliers, or others. Provide the name of each source (aquifer name, river or lake name, name of interconnecting water supplier) and the Minnesota unique well number or intake ID, as appropriate. Report the year the source was installed or established and the current capacity. Provide information about the depth of all wells. Describe the status of the source (active, inactive, emergency only, retail/wholesale interconnection) and if the source facilities have a dedicated emergency power source. Add rows to the table as needed for each installation.

Include copies of well records and maintenance summary for each well that has occurred since your last approved plan in **Appendix 1**.

Table 6. Water sources and status

Resource Type (Groundwater, Surface water, Interconnection)	Resource Name	MN Unique Well # or Intake ID	Year Installed	Capacity (Gallons per Minute)	Well Depth (Feet)	Status of Normal and Emergency Operations (active, inactive, emergency only, retail/wholesale interconnection))	Does this Source have a Dedicated Emergency Power Source? (Yes or No)
Groundwater	Well 3	232347	1938	1000	121	Active	Yes
Groundwater	Well 4	232348	1944	900	120	Active	Yes
Groundwater	Well 5	232349	1947	1000	150	Active	Yes
Groundwater	Well 6	232350	1947	1200	145	Active	Yes
Groundwater	Well 7	232352	1955	2300	150	Active	Yes
Groundwater	Well 8	403973	1983	1100	187	Active	Yes
Resource Type (Groundwater, Surface water, Interconnection)	Resource Name	MN Unique Well # or Intake ID	Year Installed	Capacity (Gallons per Minute)	Well Depth (Feet)	Status of Normal and Emergency Operations (active, inactive, emergency only, retail/wholesale interconnection))	Does this Source have a Dedicated Emergency Power Source? (Yes or No)
Interconnection w/ city of Baxter	Jackson Street	N/A			N/A	Emergency only	N/A
Interconnection w/ city of Baxter	Ind. Park Rd. & Highland Sc. Rd.	N/A			N/A	Emergency only	N/A

Limits on Emergency Interconnections

Discuss any limitations on the use of the water sources (e.g. not to be operated simultaneously, limitations due to blending, aquifer recovery issues etc.) and the use of interconnections, including capacity limits or timing constraints (i.e. only 200 gallons per minute are available from the City of Prior Lake, and it is estimated to take 6 hours to establish the emergency connection). If there are no limitations, list none.

Approx. 1 MGD from the city of Baxter to the city of Brainerd is available in emergency situations. Connection can be accomplished in less than one hour.

D. Future Demand Projections – Key Metropolitan Council Benchmark

Water Use Trends

Use the data in Table 2 to describe trends in 1) population served; 2) total per capita water demand; 3) average daily demand; 4) maximum daily demand. Then explain the causes for upward or downward trends. For example, over the ten years has the average daily demand trended up or down? Why is this occurring?

Looking at the data in table two, and information from the state demographer, the population is slowly trending down. We are starting to see a couple houses built each year, first time since 2008, but there are still a large number of empty homes in Brainerd. Currently, 51% of homes in Brainerd are rental, and a large number of homes in Brainerd have an elderly couple in them, explaining the low per capita numbers and daily demand numbers. Also, due to rental properties, and Brainerd not having a “green grass” ordinance, not a lot of water is used to irrigate lawns.

Use the water use trend information discussed above to complete Table 7 with projected annual demand for the next ten years. Communities in the seven-county Twin Cities metropolitan area must also include projections for 2030 and 2040 as part of their local comprehensive planning.

Projected demand should be consistent with trends evident in the historical data in Table 2, as discussed above. Projected demand should also reflect state demographer population projections and/or other planning projections.

Table 7. Projected annual water demand

Year	Projected Total Population	Projected Population Served	Projected Total Per Capita Water Demand (GPCD)	Projected Average Daily Demand (MGD)	Projected Maximum Daily Demand (MGD)
2016	13,500	13,500	100	1.17	2.40
2017	13,500	13,500	100	1.15	2.38
2018	13,500	13,500	100	1.13	2.36
2019	13,500	13,500	100	1.11	2.34
2020	13,500	13,500	100	1.09	2.32
2021	13,500	13,500	100	1.07	2.30
2022	13,500	13,500	100	1.05	2.28
2023	13,500	13,500	100	1.03	2.26
2024	13,500	13,500	100	1.01	2.24
2025	13,500	13,500	100	1.00	2.22

GPCD – Gallons per Capita per Day

MGD – Million Gallons per Day

Projection Method

Describe the method used to project water demand, including assumptions for population and business growth and how water conservation and efficiency programs affect projected water demand:

Using both state demographer info, which showed Brainerd growing slightly in the next ten years, and Brainerd City planner information, showing Brainerd shrinking in size, is assumed a growth rate of zero for the next ten years. With information from table seven (7) showing reduced numbers in all categories, I continued that trend, although at a slightly lesser rate, for water use. Brainerd city does not have a lot of room for large scale companies to come in drastically change our water trends.

E. Resource Sustainability

Monitoring – Key DNR Benchmark

Complete Table 8 by inserting information about source water quality and quantity monitoring efforts. List should include all production wells, observation wells, and source water intakes or reservoirs. Add rows to the table as needed. Find information on groundwater level monitoring program at:

http://www.dnr.state.mn.us/waters/groundwater_section/obwell/index.html

Table 8. Information about source water quality and quantity monitoring

MN Unique Well # or Surface Water ID	Type of monitoring point	Monitoring program	Frequency of monitoring	Monitoring Method
Well # 232347 Well # 232348 Well # 232349 Well # 232350 Well # 232352 Well # 403973	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☐ routine MDH sampling ☒ routine water utility sampling ☐ other	☐ continuous ☐ hourly ☐ daily ☒ weekly ☐ quarterly ☐ annually	☐ SCADA ☐ grab sampling ☐ steel tape ☒ sounder
	☐ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☐ routine MDH sampling ☐ routine water utility sampling ☐ other	☐ continuous ☐ hourly ☐ daily ☐ monthly ☐ quarterly ☐ annually	☐ SCADA ☐ grab sampling ☐ steel tape ☐ stream gauge
	☐ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☐ routine MDH sampling ☐ routine water utility sampling ☐ other	☐ continuous ☐ hourly ☐ daily ☐ monthly ☐ quarterly ☐ annually	☐ SCADA ☐ grab sampling ☐ steel tape ☐ stream gauge
	☐ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☐ routine MDH sampling ☐ routine water utility sampling ☐ other	☐ continuous ☐ hourly ☐ daily ☐ monthly ☐ quarterly ☐ annually	☐ SCADA ☐ grab sampling ☐ steel tape ☐ stream gauge

Water Level Data

A water level monitoring plan that includes monitoring locations and a schedule for water level readings must be submitted as **Appendix 2**. If one does not already exist, it needs to be prepared and submitted with the WSP. Ideally, all production and observation wells are monitored at least monthly.

Complete Table 9 to summarize water level data for each well being monitored. Provide the name of the aquifer and a brief description of how much water levels vary over the season (the difference between the highest and lowest water levels measured during the year) and the long-term trends for each well. If water levels are not measured and recorded on a routine basis, then provide the static water level when each well was constructed and the most recent water level measured during the same season the well was constructed. Also include all water level data taken during any well and pump maintenance. Add rows to the table as needed.

Provide water level data graphs for each well in **Appendix 3** for the life of the well, or for as many years as water levels have been measured. See DNR website for Date Time Water Level

http://www.dnr.state.mn.us/waters/groundwater_section/obwell/waterleveldata.html

Table 9. Water level data

Unique Well Number or Well ID	Aquifer Name	Seasonal Variation (Feet)	Long-term Trend in water level data	Water level measured during well/pumping maintenance
232347	QWTA	2.9	☐ Falling ☒ Stable ☐ Rising	7-27-14
232348	QWTA	2.7	☐ Falling ☒ Stable ☐ Rising	4-26-14
232349	QWTA	5.2	☐ Falling ☒ Stable ☐ Rising	9-15-14
232350	QWTA	2.9	☐ Falling ☒ Stable ☐ Rising	8-19-14
232352	QWTA	2.9	☐ Falling ☒ Stable ☐ Rising	10-27-14
403973	QWTA	1.8	☐ Falling ☒ Stable ☐ Rising	3-31-09

Potential Water Supply Issues & Natural Resource Impacts – Key DNR & Metropolitan Council Benchmark

Complete Table 10 by listing the types of natural resources that are or could be impacted by permitted water withdrawals. If known, provide the name of specific resources that may be impacted. Identify

what the greatest risks to the resource are and how the risks are being assessed. Identify any resource protection thresholds – formal or informal – that have been established to identify when actions should be taken to mitigate impacts. Provide information about the potential mitigation actions that may be taken, if a resource protection threshold is crossed. Add additional rows to the table as needed. See glossary at the end of the template for definitions.

Some of this baseline data should have been in your earlier water supply plans or county comprehensive water plans. When filling out this table, think of what are the water supply risks, identify the resources, determine the threshold and then determine what your community will do to mitigate the impacts.

Your DNR area hydrologist is available to assist with this table.

For communities in the seven-county Twin Cities metropolitan area, the *Master Water Supply Plan Appendix 1 (Water Supply Profiles)*, provides information about potential water supply issues and natural resource impacts for your community.

Table 10. Natural resource impacts

Resource Type	Resource Name	Risk	Risk Assessed Through	Describe Resource Protection Threshold *	Mitigation Measure or Management Plan	Describe How Changes to Thresholds are Monitored
☐ River or stream		☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ____		☐ Revise permit ☐ Change groundwater pumping ☐ Increase conservation ☐ Other	
☐ Calcareous fen		☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ____		☐ Revise permit ☐ Change groundwater pumping ☐ Increase conservation ☐ Other	

Resource Type	Resource Name	Risk	Risk Assessed Through	Describe Resource Protection Threshold *	Mitigation Measure or Management Plan	Describe How Changes to Thresholds are Monitored
		☐ Other: _____				
☐ Lake		☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ____		☐ Revise permit ☐ Change groundwater pumping ☐ Increase conservation ☐ Other	
☐ Wetland		☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ____		☐ Revise permit ☐ Change groundwater pumping ☐ Increase conservation ☐ Other	
☐ Trout stream		☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ____		☐ Revise permit ☐ Change groundwater pumping ☐ Increase conservation ☐ Other	
☒ Aquifer		☒ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded	☐ GIS analysis ☒ Modeling ☒ Mapping	n/a	☐ Revise permit ☐ Change groundwater pumping	Bi-weekly monitoring of aquifer

Resource Type	Resource Name	Risk	Risk Assessed Through	Describe Resource Protection Threshold *	Mitigation Measure or Management Plan	Describe How Changes to Thresholds are Monitored
		☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☒ Monitoring ☒ Aquifer testing ☐ Other: ____		☐ Increase conservation ☐ Other	
☐ Endangered, threatened, or special concern species habitat, other natural resource impacts		☐ Flow/water level decline ☐ Degrading water quality trends and/or MCLs exceeded ☐ Impacts on endangered, threatened, or special concern species habitat or other natural resource impacts ☐ Other: _____	☐ GIS analysis ☐ Modeling ☐ Mapping ☐ Monitoring ☐ Aquifer testing ☐ Other: ____		☐ Revise permit ☐ Change groundwater pumping ☐ Increase conservation ☐ Other	

* Examples of thresholds: a lower limit on acceptable flow in a river or stream; water quality outside of an accepted range; a lower limit on acceptable aquifer level decline at one or more monitoring wells; withdrawals that exceed some percent of the total amount available from a source; or a lower limit on acceptable changes to a protected habitat.

Wellhead Protection (WHP) and Surface Water Protection (SWP) Plans

Complete Table 11 to provide status information about WHP and SWP plans.

The emergency procedures in this plan are intended to comply with the contingency plan provisions required in the Minnesota Department of Health's (MDH) Wellhead Protection (WHP) Plan and Surface Water Protection (SWP) Plan.

Table 11. Status of Wellhead Protection and Surface Water Protection Plans

Plan Type	Status	Date Adopted	Date for Update
WHP	☐ In Process ☒ Completed ☐ Not Applicable	April 2012	April 2022
SWP	☐ In Process ☐ Completed ☒ Not Applicable		

F. Capital Improvement Plan (CIP)

Please note that any wells that received approval under a ten-year permit, but that were not built, are now expired and must submit a water appropriations permit.

Adequacy of Water Supply System

Complete Table 12 with information about the adequacy of wells and/or intakes, storage facilities, treatment facilities, and distribution systems to sustain current and projected demands. List planned capital improvements for any system components, in chronological order. Communities in the seven-county Twin Cities metropolitan area should also include information about plans through 2040.

The assessment can be the general status by category; it is not necessary to identify every single well, storage facility, treatment facility, lift station, and mile of pipe.

Please attach your latest Capital Improvement Plan as **Appendix 4**.

Table 12. Adequacy of Water Supply System

System Component	Planned action	Anticipated Construction Year	Notes
Wells/Intakes	☒ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition		
Water Storage Facilities	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	2019	New 2MG raw water storage tank to replace existing 1.8MG tanks
Water Treatment Facilities	☒ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition		
Distribution Systems (pipes, valves, etc.)	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	2018	1 mile of 8"-16" water main replacement on B371, part of main line from water plant to elevated tower

System Component	Planned action	Anticipated Construction Year	Notes
Pressure Zones	☐ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition		
Other: additional elevated tower	☐ No action planned - adequate ☐ Repair/replacement ☒ Expansion/addition	2020	.6 MG tower in south pressure zone

Proposed Future Water Sources

Complete Table 13 to identify new water source installation planned over the next ten years. Add rows to the table as needed.

Table 13. Proposed future installations/sources

Source	Installation Location (approximate)	Resource Name	Proposed Pumping Capacity (gpm)	Planned Installation Year	Planned Partnerships
Groundwater	n/a				
Surface Water	n/a				
Interconnection to another supplier	n/a				

Water Source Alternatives - Key Metropolitan Council Benchmark

Do you anticipate the need for alternative water sources in the next 10 years? Yes ☐ No ☒

For metro communities, will you need alternative water sources by the year 2040? Yes ☐ No ☐

If you answered yes for either question, then complete table 14. If no, insert NA.

Complete Table 14 by checking the box next to alternative approaches that your community is considering, including approximate locations (if known), the estimated amount of future demand that could be met through the approach, the estimated timeframe to implement the approach, potential partnerships, and the major benefits and challenges of the approach. Add rows to the table as needed.

For communities in the seven-county Twin Cities metropolitan area, these alternatives should include approaches the community is considering to meet projected 2040 water demand.

Table 14. Alternative water sources

Alternative Source Considered	Source and/or Installation Location (approximate)	Estimated Amount of Future Demand (%)	Timeframe to Implement (YYYY)	Potential Partners	Benefits	Challenges
☐ Groundwater	n/a					
☐ Surface Water	n/a					
☐ Reclaimed stormwater	n/a					
☐ Reclaimed wastewater	n/a					
☐ Interconnection to another supplier	n/a					

Part 2. Emergency Preparedness Procedures

The emergency preparedness procedures outlined in this plan are intended to comply with the contingency plan provisions required by MDH in the WHP and SWP. Water emergencies can occur as a result of vandalism, sabotage, accidental contamination, mechanical problems, power failings, drought, flooding, and other natural disasters. The purpose of emergency planning is to develop emergency response procedures and to identify actions needed to improve emergency preparedness. In the case of a municipality, these procedures should be in support of, and part of, an all-hazard emergency operations plan. Municipalities that already have written procedures dealing with water emergencies should review the following information and update existing procedures to address these water supply protection measures.

A. Federal Emergency Response Plan

Section 1433(b) of the Safe Drinking Water Act, (Public Law 107-188, Title IV- Drinking Water Security and Safety) requires community water suppliers serving over 3,300 people to prepare an Emergency Response Plan.

Do you have a federal emergency response plan? Yes ☒ No ☐

If yes, what was the date it was certified? June 24, 2004

Complete Table 15 by inserting the noted information regarding your completed Federal Emergency Response Plan.

Table 15. Emergency Preparedness Plan contact information

Emergency Response Plan Role	Contact Person	Contact Phone Number	Contact Email
Emergency Response Lead	Scott Magnuson	218-825-3213	smagnuson@bpu.org
Alternate Emergency Response Lead	Sam Arnzen	218-825-3280	central@bpu.org

B. Operational Contingency Plan

All utilities should have a written operational contingency plan that describes measures to be taken for water supply mainline breaks and other common system failures as well as routine maintenance.

Do you have a written operational contingency plan? Yes ☐ No ☒

At a minimum, a water supplier should prepare and maintain an emergency contact list of contractors and suppliers.

C. Emergency Response Procedures

Water suppliers must meet the requirements of MN Rules 4720.5280 . Accordingly, the Minnesota Department of Natural Resources (DNR) requires public water suppliers serving more than 1,000 people to submit Emergency and Conservation Plans. Water emergency and conservation plans that have been approved by the DNR, under provisions of Minnesota Statute 186 and Minnesota Rules, part 6115.0770, will be considered equivalent to an approved WHP contingency plan.

Emergency Telephone List

Prepare and attach a list of emergency contacts, including the MN Duty Officer (1-800-422-0798), as **Appendix 5**. A template is available at www.mndnr.gov/watersupplyplans

The list should include key utility and community personnel, contacts in adjacent water suppliers, and appropriate local, state and federal emergency contacts. Please be sure to verify and update the contacts on the emergency telephone list and date it. Thereafter, update on a regular basis (once a year is recommended). In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the Emergency Manager for that community. Responsibilities and services for each contact should be defined.

Current Water Sources and Service Area

Quick access to concise and detailed information on water sources, water treatment, and the distribution system may be needed in an emergency. System operation and maintenance records should be maintained in secured central and back-up locations so that the records are accessible for emergency purposes. A detailed map of the system showing the treatment plants, water sources, storage facilities, supply lines, interconnections, and other information that would be useful in an emergency should also be readily available. It is critical that public water supplier representatives and emergency response personnel communicate about the response procedures and be able to easily obtain this kind of information both in electronic and hard copy formats (in case of a power outage).

Do records and maps exist? Yes ☒ No ☐

Can staff access records and maps from a central secured location in the event of an emergency?

Yes ☒ No ☐

Does the appropriate staff know where the materials are located?

Yes ☒ No ☐

Procedure for Augmenting Water Supplies

Complete Tables 16 – 17 by listing all available sources of water that can be used to augment or replace existing sources in an emergency. Add rows to the tables as needed.

In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community. Municipalities are encouraged to execute cooperative agreements for potential emergency water services and copies should be included in **Appendix 6**. Outstate Communities may consider using nearby high capacity wells (industry, golf course) as emergency water sources.

WSP should include information on any physical or chemical problems that may limit interconnections to other sources of water. Approvals from the MDH are required for interconnections or the reuse of water.

Table 16. Interconnections with other water supply systems to supply water in an emergency

Other Water Supply System Owner	Capacity (GPM & MGD)	Note Any Limitations On Use	List of services, equipment, supplies available to respond
CITY OF BAXTER	1 MGD		TWO POINTS OF INTERCONNECT

GPM – Gallons per minute MGD – million gallons per day

Table 17. Utilizing surface water as an alternative source

Surface Water Source Name	Capacity (GPM)	Capacity (MGD)	Treatment Needs	Note Any Limitations On Use
N/A				

If not covered above, describe additional emergency measures for providing water (obtaining bottled water, or steps to obtain National Guard services, etc.)

Culligan Water, National Guard, in Brainerd, with potable water units.
--

Allocation and Demand Reduction Procedures

Complete Table 18 by adding information about how decisions will be made to allocate water and reduce demand during an emergency. Provide information for each customer category, including its priority ranking, average day demand, and demand reduction potential for each customer category. Modify the customer categories as needed, and add additional lines if necessary.

Water use categories should be prioritized in a way that is consistent with Minnesota Statutes 103G.261 (#1 is highest priority) as follows:

1. Water use for human needs such as cooking, cleaning, drinking, washing and waste disposal; use for on-farm livestock watering; and use for power production that meets contingency requirements.
2. Water use involving consumption of less than 10,000 gallons per day (usually from private wells or surface water intakes)
3. Water use for agricultural irrigation and processing of agricultural products involving consumption of more than 10,000 gallons per day (usually from private high-capacity wells or surface water intakes)
4. Water use for power production above the use provided for in the contingency plan.
5. All other water use involving consumption of more than 10,000 gallons per day.
6. Nonessential uses – car washes, golf courses, etc.

Water used for human needs at hospitals, nursing homes and similar types of facilities should be designated as a high priority to be maintained in an emergency. Lower priority uses will need to address water used for human needs at other types of facilities such as hotels, office buildings, and manufacturing plants. The volume of water and other types of water uses at these facilities must be carefully considered. After reviewing the data, common sense should dictate local allocation priorities to protect domestic requirements over certain types of economic needs. Water use for lawn sprinkling, vehicle washing, golf courses, and recreation are legislatively considered non-essential.

Table 18. Water use priorities

Customer Category	Allocation Priority	Average Daily Demand (GPD)	Short-Term Emergency Demand Reduction Potential (GPD)
Residential	1	465,060	150,000
Institutional	1	123,000	25,000
Commercial	2	703,000	150,000
Industrial	3	83,900	83,900
Irrigation	3	N/A	
Wholesale	N/A	N/A	
Non-Essential	6		
TOTAL	NA	1,374,960	408,900

GPD – Gallons per Day

Tip: Calculating Emergency Demand Reduction Potential

The emergency demand reduction potential for all uses will typically equal the difference between maximum use (summer demand) and base use (winter demand). In extreme emergency situations, lower priority water uses must be restricted or eliminated to protect priority domestic water requirements. Emergency demand reduction potential should be based on average day demands for customer categories within each priority class. Use the tables in Part 3 on water conservation to help you determine strategies.

Complete Table 19 by selecting the triggers and actions during water supply disruption conditions.

Table 19. Emergency demand reduction conditions, triggers and actions (Select all that may apply and describe)

Emergency Triggers	Short-term Actions	Long-term Actions
☒ Contamination ☒ Loss of production ☒ Infrastructure failure ☒ Executive order by Governor ☐ Other: _____	☒ Supply augmentation through interconnection ☒ Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Water allocation through _____ ☒ Meet with large water users to discuss their contingency plan.	☒ Supply augmentation through interconnection ☒ Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Water allocation through _____ ☒ Meet with large water users to discuss their contingency plan.

Notification Procedures

Complete Table 20 by selecting trigger for informing customers regarding conservation requests, water use restrictions, and suspensions; notification frequencies; and partners that may assist in the notification process. Add rows to the table as needed.

Table 20. Plan to inform customers regarding conservation requests, water use restrictions, and suspensions

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
☒ Short-term demand reduction declared (< 1 year)	☒ Website ☒ Email list serve ☒ Social media (e.g. Twitter, Facebook) ☐ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☒ Meeting with large water users (> 10% of total city use) ☐ Other: _____	☐ Daily ☒ Weekly ☐ Monthly ☐ Annually	Local newspaper (website) Local radio station County Emergency Manager
☒ Long-term Ongoing demand reduction declared	☒ Website ☐ Email list serve ☒ Social media (e.g. Twitter, Facebook) ☒ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☒ Meeting with large water users (> 10% of total city use) ☐ Other: _____	☐ Daily ☐ Weekly ☒ Monthly ☐ Annually	
☒ Governor's critical water deficiency declared	☒ Website ☒ Email list serve ☒ Social media (e.g. Twitter, Facebook) ☒ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☒ Meeting with large water users (> 10% of total city use) ☐ Other: _____	☒ Daily ☐ Weekly ☐ Monthly ☐ Annually	

Enforcement

Prior to a water emergency, municipal water suppliers must adopt regulations that restrict water use and outline the enforcement response plan. The enforcement response plan must outline how conditions will be monitored to know when enforcement actions are triggered, what enforcement tools will be used, who will be responsible for enforcement, and what timelines for corrective actions will be expected.

Affected operations, communications, and enforcement staff must then be trained to rapidly implement those provisions during emergency conditions.

Important Note:

Disregard of critical water deficiency orders, even though total appropriation remains less than permitted, is adequate grounds for immediate modification of a public water supply authority's water use permit (2013 MN Statutes 103G.291)

Does the city have a critical water deficiency restriction/official control in place that includes provisions to restrict water use and enforce the restrictions? (This restriction may be an ordinance, rule, regulation, policy under a council directive, or other official control) Yes ☐ No ☒

If yes, attach the official control document to this WSP as **Appendix 7**.

If no, the municipality must adopt such an official control within 6 months of submitting this WSP and submit it to the DNR as an amendment to this WSP.

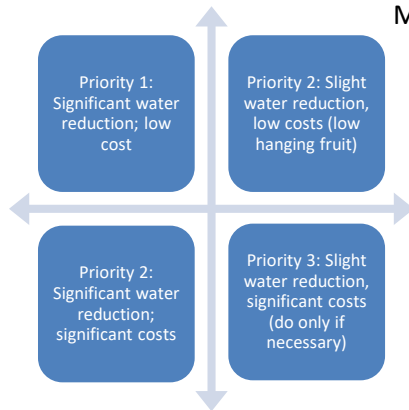
Irrespective of whether a critical water deficiency control is in place, does the public water supply utility, city manager, mayor, or emergency manager have standing authority to implement water restrictions? Yes ☒ No ☐

If yes, cite the regulatory authority reference: BPU water restriction ordinance.

If no, who has authority to implement water use restrictions in an emergency?

--

PART 3. WATER CONSERVATION PLAN



Minnesotans have historically benefited from the state's abundant water supplies, reducing the need for conservation. There are however, limits to the available supplies of water and increasing threats to the quality of our drinking water. Causes of water supply limitation may include: population increases, economic trends, uneven statewide availability of groundwater, climatic changes, and degraded water quality. Examples of threats to drinking water quality include: the presence of contaminant plumes from past land use activities, exceedances of water quality standards from natural and human sources, contaminants of emerging concern, and increasing pollutant trends from nonpoint sources.

There are many incentives for conserving water; conservation:

- reduces the potential for pumping-induced transfer of contaminants into the deeper aquifers, which can add treatment costs
- reduces the need for capital projects to expand system capacity
- reduces the likelihood of water use conflicts, like well interference, aquatic habitat loss, and declining lake levels
- conserves energy, because less energy is needed to extract, treat and distribute water (and less energy production also conserves water since water is used to produce energy)
- maintains water supplies that can then be available during times of drought

It is therefore imperative that water suppliers implement water conservation plans. The first step in water conservation is identifying opportunities for behavioral or engineering changes that could be made to reduce water use by conducting a thorough analysis of:

- Water use by customer
- Extraction, treatment, distribution and irrigation system efficiencies
- Industrial processing system efficiencies
- Regulatory and barriers to conservation
- Cultural barriers to conservation
- Water reuse opportunities

Once accurate data is compiled, water suppliers can set achievable goals for reducing water use. A successful water conservation plan follows a logical sequence of events. The plan should address both conservation on the supply side (leak detection and repairs, metering), as well as on the demand side (reductions in usage). Implementation should be conducted in phases, starting with the most obvious and lowest-cost options. In some cases one of the early steps will be reviewing regulatory constraints to water conservation, such as lawn irrigation requirements. Outside funding and grants may be available for implementation of projects. Engage water system operators and maintenance staff and customers in brainstorming opportunities to reduce water use. Ask the question: "How can I help save water?"

Progress since 2006

Is this your community's first Water Supply Plan? Yes ☐ No ☒

If yes, describe conservation practices that you are already implementing, such as: pricing, system improvements, education, regulation, appliance retrofitting, enforcement, etc.

n/a

If no, complete Table 21 to summarize conservation actions taken since the adoption of the 2006 water supply plan.

Table 21. Implementation of previous ten-year Conservation Plan

2006 Plan Commitments	Action Taken?
Change water rates structure to provide conservation pricing	☐ Yes ☒ No
Water supply system improvements (e.g. leak repairs, valve replacements, etc.)	☒ Yes ☐ No
Educational efforts	☒ Yes ☐ No
New water conservation ordinances	☒ Yes ☐ No
Rebate or retrofitting Program (e.g. for toilet, faucets, appliances, showerheads, dish washers, washing machines, irrigation systems, rain barrels, water softeners, etc.)	☒ Yes ☐ No
Enforcement	☐ Yes ☒ No
Describe other	☐ Yes ☒ No

What are the results you have seen from the actions in Table 21 and how were results measured?

Looking at data, hard to tell. For sure we have a decline in usage, part due to our work and part due to other factors (age, rental property)

A. Triggers for Allocation and Demand Reduction Actions

Complete table 22 by checking each trigger below, as appropriate, and the actions to be taken at various levels or stages of severity. Add in additional rows to the table as needed.

Table 22. Short and long-term demand reduction conditions, triggers and actions

Objective	Triggers	Actions
Protect surface water flows	☐ Low stream flow conditions ☐ Reports of declining wetland and lake levels ☐ Other: _____	☐ Increase promotion of conservation measures ☐ Other: _____
Short-term demand reduction (less than 1 year)	☒ Extremely high seasonal water demand (more than double winter demand) ☒ Loss of treatment capacity ☐ Lack of water in storage ☐ State drought plan ☐ Well interference ☐ Other: _____	☒ Adopt (if not already) and enforce the critical water deficiency ordinance to restrict or prohibit lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☒ Supply augmentation through interconnection ☐ Water allocation through _____ ☐ Meet with large water users to discuss user's contingency plan.
Long-term demand reduction (>1 year)	☒ Per capita demand increasing ☐ Total demand increase (higher population or more industry) Water level in well(s) below elevation of _____ ☐ Other: _____	☐ Develop a critical water deficiency ordinance that is or can be quickly adopted to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Enact a water waste ordinance that targets overwatering (causing water to flow off the landscape into streets, parking lots, or similar), watering impervious surfaces (streets, driveways or other hardscape areas), and negligence of known leaks, breaks, or malfunctions. ☒ Meet with large water users to discuss user's contingency plan. ☐ Enhanced monitoring and reporting: audits, meters, billing, etc.
Governor's "Critical Water Deficiency Order" declared	☐ Governor declares critical water deficiency order	☐ Policy 2017-21 is activated. Policy is listed below

POLICY NO. 2017-21

A POLICY regulating nonessential water usage upon critical water deficiency as authorized by Minn. Stat. § 103G.291, subd. 1 and 2.

Sec. 1-1. Purpose.

This Policy establishes water conservation restrictions; and the plan will be in effect at any time the governor declares by executive order a critical water deficiency, pursuant to Minnesota Statutes section 103G.291.

Sec. 1-2. Application.

- (a) This Policy applies to all customers of public water suppliers who own or control water use on any premises.
- (b) No person shall make, cause, use, or permit the use of water received from a public water supply for residential, commercial, industrial, governmental, or any other purpose in any manner contrary to any provision in this Policy.
- (c) Mandatory emergency conservation measures shall be implemented based upon the declaration of a critical water emergency by the governor.

Sec. 1-3. Declaration of critical water deficiency.

Upon the declaration of a critical water deficiency by the governor, Brainerd Public Utilities (BPU) shall immediately notify all water users via social media tools, including but not limited to radio, facebook, and website of the emergency declaration. BPU shall provide notification to the public as quickly as possible or through established water supply plans emergency response plans or procedures.

Sec. 1-4. Mandatory emergency water conservation measures.

Upon declaration of a water emergency and notification to the public, the following mandatory restrictions upon nonessential water use shall be enforced:

- (1) Outdoor irrigation of yards, gardens, golf courses, parklands, and other non-agricultural land, except for those areas irrigated with reclaimed water, is prohibited.
- (2) Washing or spraying of sidewalks, driveways, parking areas, tennis courts, patios, or other paved areas with water from any pressurized source, including garden hoses, except to alleviate immediate health or safety hazards, is prohibited.
- (3) The outdoor use of any water-based play apparatus connected to a pressurized source is prohibited.
- (4) Restaurants and other food service establishments are prohibited from serving water to their customers, unless water is specifically requested by the customer.
- (5) Operation of outdoor misting systems used to cool public areas is prohibited.
- (6) The filling of swimming pools, fountains, spas, or other exterior water features is prohibited.
- (7) The washing of automobiles, trucks, trailers, and other types of mobile equipment is prohibited, except at facilities equipped with wash water recirculation systems, and for vehicles requiring frequent washing to protect public health, safety, and welfare.

Sec. 1-5. Variances.

BPU management is authorized to grant variances to this Policy where strict application of its provisions would result in serious hardship to a customer. A variance may be granted only for reasons involving health or safety. An applicant may appeal the denial of a variance within five (5) days of the decision by submitting a written appeal to BPU management. The BPU commission shall hear the appeal at the next commission meeting. The decision of the commission is final.

Sec. 1-6. Violation.

(a) Violations shall be determined and cited by the BPU management. A violator may appeal the citation within five (5) days of its issuance by submitting a written appeal to the commission. The BPU Commission shall hear the appeal at the next Commission meeting. The decision of the Commission is final. Violators may be granted an administrative waiver if evidence is provided that equipment failure was the cause of the violation. A letter from a qualified vendor or equipment invoice will be required to show proof of equipment failure.

(b) Upon discovery of a first violation, the violator shall be issued, either personally or by mail, a warning letter that sets forth the violation and which shall describe the remedy and fines for future violations.

(c) Upon subsequent violations at the same location, the violator shall be issued, either personally or by mail, a citation that sets forth the violation and shall describe the remedy. Fines shall be added to the monthly water bill of the owner or current occupant of the premises where the violation occurred. The imposition of the fine shall in no way limit the right of the City to pursue other legal remedies.

Sec. 1-7. Enforcement.

BPU management or his/her designee is authorized to designate city employees or law enforcement personnel to enforce the provisions of this Policy.

Sec. 1-8 Severability.

If any provision of this Policy or the application of any provision to a particular situation is held to be invalid by a court of competent jurisdiction, the remaining portions of the Policy and the application of the Policy to any other situation shall not be invalidated.

Sec. 1-9 Effective date.

This Policy becomes effective on January 24, 2017

Passed by the BPU Commissionl of Brainerd January 24, 2017.

Attested:


BPU Commission Secretary

Approved:


BPU Commission President

B. Conservation Objectives and Strategies – *Key benchmark for DNR*

This section establishes water conservation objectives and strategies for eight major areas of water use.

Objective 1: Reduce Unaccounted (Non-Revenue) Water loss to Less than 10%

The Minnesota Rural Waters Association, the Metropolitan Council and the Department of Natural Resources recommend that all water uses be metered. Metering can help identify high use locations and times, along with leaks within buildings that have multiple meters.

It is difficult to quantify specific unmetered water use such as that associated with firefighting and system flushing or system leaks. Typically, water suppliers subtract metered water use from total water pumped to calculate unaccounted or non-revenue water loss.

Is your five-year average (2005-2014) unaccounted Water Use in Table 2 higher than 10%?

Yes ☐ No ☒

What is your leak detection monitoring schedule? (e.g. monitor 1/3rd of the city lines per year)

Leak detect entire system every other year

Water Audits - are intended to identify, quantify and verify water and revenue losses. The volume of unaccounted-for water should be evaluated each billing cycle. The American Water Works Association (AWWA) recommends that ten percent or less of pumped water is unaccounted-for water. Water audit procedures are available from the AWWA and MN Rural Water Association www.mrwa.com. Drinking Water Revolving Loan Funds are available for purchase of new meters when new plants are built.

What is the date of your most recent water audit? _____

Frequency of water audits: ☐ yearly ☐ other (specify frequency) _____

Leak detection and survey: ☐ every year ☒ every other year ☐ periodic as needed

Year last leak detection survey completed: 2015

If Table 2 shows annual water losses over 10% or an increasing trend over time, describe what actions will be taken to reach the <10% loss objective and within what timeframe

We are in the process of changing out meters in our wells, three done, three to do in 2017. Also working on replacing old galvanized services in town with copper. Looking at redo of water plant with storage with more efficient back wash system.

Metering -AWWA recommends that every water supplier install meters to account for all water taken into its system, along with all water distributed from its system at each customer's point of service. An effective metering program relies upon periodic performance testing, repair, maintenance or replacement of all meters. AWWA also recommends that water suppliers conduct regular water audits to ensure accountability. Some cities install separate meters for interior and exterior water use, but some research suggests that this may not result in water conservation.

Complete Table 23 by adding the requested information regarding the number, types, testing and maintenance of customer meters.

Table 23. Information about customer meters

Customer Category	Number of Customers	Number of Metered Connections	Number of Automated Meter Readers	Meter testing intervals (years)	Average age/meter replacement schedule (years)
Residential		3968	3968		All meters are
Irrigation meters	88	119	119		New within the
Institutional					Last 10 years
Commercial		761	761		
Industrial					
Public facilities	2	24	24		
Other					
TOTALS		4872	4872	NA	NA

For unmetered systems, describe any plans to install meters or replace current meters with advanced technology meters. Provide an estimate of the cost to implement the plan and the projected water savings from implementing the plan.

n/a

Table 24. Water source meters

	Number of Meters	Meter testing schedule (years)	Number of Automated Meter Readers	Average age/meter replacement schedule (years)
Water source (wells/intakes)	6	2	0	3 new in 2015 3 new will be installed in 2017
Treatment plant	2	2	0	12 / 2020

Objective 2: Achieve Less than 75 Residential Gallons per Capita Demand (GPCD)

The 2002 average residential per capita demand in the Twin Cities Metropolitan area was 75 gallons per capita per day.

Is your average 2010-2015 residential per capita water demand in Table 2 more than 75? Yes ☐ No ☒

What was your 2010 – 2015 five-year average residential per capita water demand? 34.5 g/person/day

Describe the water use trend over that timeframe:

Water usage per residential capita had been steady in the upper 30's to low 40's, now is slowly dropping to the low 30's

Complete Table 25 by checking which strategies you will use to continue reducing residential per capita demand and project a likely timeframe for completing each checked strategy (Select all that apply and add rows for additional strategies):

Table 25. Strategies and timeframe to reduce residential per capita demand

Strategy to reduce residential per capita demand	Timeframe for completing work
☐ Revise city ordinances/codes to encourage or require water efficient landscaping.	
☐ Revise city ordinance/codes to permit water reuse options, especially for non-potable purposes like irrigation, groundwater recharge, and industrial use. Check with plumbing authority to see if internal buildings reuse is permitted	
☐ Revise ordinances to limit irrigation. Describe the restricted irrigation plan:	

Strategy to reduce residential per capita demand	Timeframe for completing work
☐ Revise outdoor irrigation installations codes to require high efficiency systems (e.g. those with soil moisture sensors or programmable watering areas) in new installations or system replacements.	
☒ Make water system infrastructure improvements	Ongoing, replacing service lines
☐ Offer free or reduced cost water use audits) for residential customers.	
☐ Implement a notification system to inform customers when water availability conditions change.	
☐ Provide rebates or incentives for installing water efficient appliances and/or fixtures indoors (e.g., low flow toilets, high efficiency dish washers and washing machines, showerhead and faucet aerators, water softeners, etc.)	
☐ Provide rebates or incentives to reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	
☐ Identify supplemental Water Resources	
☒ Conduct audience-appropriate water conservation education and outreach.	Ongoing, senior centers
☐ Describe other plans	

Objective 3: Achieve at least a 1.5% per year water reduction for Institutional, Industrial, Commercial, and Agricultural GPCD over the next 10 years or a 15% reduction in ten years.

Complete Table 26 by checking which strategies you will used to continue reducing non-residential customer use demand and project a likely timeframe for completing each checked strategy (add rows for additional strategies).

Where possible, substitute recycled water used in one process for reuse in another. (For example, spent rinse water can often be reused in a cooling tower.) Keep in mind the true cost of water is the amount on the water bill PLUS the expenses to heat, cool, treat, pump, and dispose of/discharge the water. Don't just calculate the initial investment. Many conservation retrofits that appear to be prohibitively expensive are actually very cost-effective when amortized over the life of the equipment. Often reducing water use also saves electrical and other utility costs. Note: as of 2015, water reuse, and is not allowed by the state plumbing code, M.R. 4715 (a variance is needed). However several state agencies are addressing this issue.

Table 26. Strategies and timeframe to reduce institutional, commercial industrial, and agricultural and non-revenue use demand

Strategy to reduce total business, industry, agricultural demand	Timeframe for completing work
☐ Conduct a facility water use audit for both indoor and outdoor use, including system components	
☒ Install enhanced meters capable of automated readings to detect spikes in consumption	Done
☐ Compare facility water use to related industry benchmarks, if available (e.g., meat processing, dairy, fruit and vegetable, beverage, textiles, paper/pulp, metals, technology, petroleum refining etc.)	

Strategy to reduce total business, industry, agricultural demand	Timeframe for completing work
☐ Install water conservation fixtures and appliances or change processes to conserve water	
☒ Repair leaking system components (e.g., pipes, valves)	ongoing
☐ Investigate the reuse of reclaimed water (e.g., stormwater, wastewater effluent, process wastewater, etc.)	
☒ Reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	Rain gardens in new construction areas, new Royal Tire has astro turf for "grass"
☐ Train employees how to conserve water	
☐ Implement a notification system to inform non-residential customers when water availability conditions change.	
☐ Rainwater catchment systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, industrial processes, water features, vehicle washing facilities, cooling tower makeup, and similar uses shall be approved by the commissioner. Proposed plumbing code 4714.1702.1 http://www.dli.mn.gov/PDF/docket/4714rule.pdf	
☐ Describe other plans:	

Objective 4: Achieve a Decreasing Trend in Total Per Capita Demand

Include as **Appendix 8** one graph showing total per capita water demand for each customer category (i.e., residential, institutional, commercial, industrial) from 2005-2014 and add the calculated/estimated linear trend for the next 10 years.

Describe the trend for each customer category; explain the reason(s) for the trends, and where trends are increasing.

As shown in Table 7, and discussed above, I show zero movement in the next ten years for total per capita water demand. Therefore, I did not add the graph showing a straight line.

Objective 5: Reduce Peak Day Demand so that the Ratio of Average Maximum day to the Average Day is less than 2.6

Is the ratio of average 2005-2014 maximum day demand to average 2005-2014 average day demand reported in Table 2 more than 2.6? Yes ☐ No ☒

Calculate a ten year average (2005 – 2014) of the ratio of maximum day demand to average day demand: 1.9

The position of the DNR has been that a peak day/average day ratio that is above 2.6 for in summer indicates that the water being used for irrigation by the residents in a community is too large and that efforts should be made to reduce the peak day use by the community.

It should be noted that by reducing the peak day use, communities can also reduce the amount of infrastructure that is required to meet the peak day use. This infrastructure includes new wells, new water towers which can be costly items.

Objective 6: Implement a Conservation Water Rate Structure and/or a Uniform Rate Structure with a Water Conservation Program

Water Conservation Program

Municipal water suppliers serving over 1,000 people are required to adopt demand reduction measures that include a conservation rate structure, or a uniform rate structure with a conservation program that achieves demand reduction. These measures must achieve demand reduction in ways that reduce water demand, water losses, peak water demands, and nonessential water uses. These measures must be approved before a community may request well construction approval from the Department of Health or before requesting an increase in water appropriations permit volume (*Minnesota Statutes*, section 103G.291, subd. 3 and 4). Rates should be adjusted on a regular basis to ensure that revenue of the system is adequate under reduced demand scenarios. If a municipal water supplier intends to use a Uniform Rate Structure, a community-wide Water Conservation Program that will achieve demand reduction must be provided.

Current Water Rates

Include a copy of the actual rate structure in **Appendix 9** or list current water rates including base/service fees and volume charges below.

Volume included in base rate or service charge: 1000 gallons or ____ cubic feet ____ other

Frequency of billing: ☒ Monthly ☐ Bimonthly ☐ Quarterly ☐ Other: _____

Water Rate Evaluation Frequency: ☒ every year ☐ every ____ years ☐ no schedule

Date of last rate change: February 1, 2016

Table 27. Rate structures for each customer category (Select all that apply and add additional rows as needed)

Customer Category	Conservation Billing Strategies in Use *	Conservation Neutral Billing Strategies in Use **	Non-Conserving Billing Strategies in Use ***
Residential	☒ Monthly billing ☐ Increasing block rates (volume tiered rates) ☐ Seasonal rates ☐ Time of use rates ☒ Water bills reported in gallons ☐ Individualized goal rates ☐ Excess use rates ☐ Drought surcharge ☐ Use water bill to provide comparisons	☒ Uniform ☐ Odd/even day watering	☐ Service charge based on water volume ☐ Declining block ☐ Flat ☐ Other (describe)

Customer Category	Conservation Billing Strategies in Use *	Conservation Neutral Billing Strategies in Use **	Non-Conserving Billing Strategies in Use ***
	☒ Service charge not based on water volume ☐ Other (describe)		
Commercial/ Industrial/ Institutional	☒ Monthly billing ☐ Increasing block rates (volume tiered rates) ☐ Seasonal rates ☐ Time of use rates ☒ Water bills reported in gallons ☐ Individualized goal rates ☐ Excess use rates ☐ Drought surcharge ☐ Use water bill to provide comparisons ☐ Service charge not based on water volume ☐ Other (describe)	☒ Uniform	☐ Service charge based on water volume ☐ Declining block ☐ Flat ☐ Other (describe)
☐ Other			

*** Rate Structures components that may promote water conservation:**

- **Monthly billing:** is encouraged to help people see their water usage so they can consider changing behavior.
- **Increasing block rates (also known as a tiered residential rate structure):** Typically, these have at least three tiers: should have at least three tiers.
 - The first tier is for the winter average water use.
 - The second tier is the year-round average use, which is lower than typical summer use. This rate should be set to cover the full cost of service.
 - The third tier should be above the average annual use and should be priced high enough to encourage conservation, as should any higher tiers. For this to be effective, the difference in block rates should be significant.
- **Seasonal rate:** higher rates in summer to reduce peak demands
- **Time of Use rates:** lower rates for off peak water use
- **Bill water use in gallons:** this allows customers to compare their use to average rates
- **Individualized goal rates:** typically used for industry, business or other large water users to promote water conservation if they keep within agreed upon goals. **Excess Use rates:** if water use goes above an agreed upon amount this higher rate is charged
- **Drought surcharge:** an extra fee is charged for guaranteed water use during drought
- **Use water bill to provide comparisons:** simple graphics comparing individual use over time or compare individual use to others.
- **Service charge or base fee that does not include a water volume** – a base charge or fee to cover universal city expenses that are not customer dependent and/or to provide minimal water at a lower rate (e.g., an amount less than the average residential per capita demand for the water supplier for the last 5 years)
- **Emergency rates** -A community may have a separate conservation rate that only goes into effect when the community or governor declares a drought emergency. These higher rates can help to protect the city budgets during times of significantly less water usage.

****Conservation Neutral****

- **Uniform rate:** rate per unit used is the same regardless of the volume used
- **Odd/even day watering** –This approach reduces peak demand on a daily basis for system operation, but it does not reduce overall water use.

***** Non-Conserving *****

- **Service charge or base fee with water volume:** an amount of water larger than the average residential per capita demand for the water supplier for the last 5 years
- **Declining block rate:** the rate per unit used decreases as water use increases.
- **Flat rate:** one fee regardless of how much water is used (usually unmetered).

Provide justification for any conservation neutral or non-conserving rate structures. If intending to adopt a conservation rate structure, include the timeframe to do so:

Over the past ten years plus, our water usage has steadily dropped, to where it is now at 35 gpcd. We cannot justify spending the dollars on a conservation rate that would only pertain to a few households, and MAYBE save minimal water. We did, however, in 2008 change from a declining block rate that had lower rates the more water you used, to a flat rate per 1000 gallons used.

Objective 7: Additional strategies to Reduce Water Use and Support Wellhead Protection Planning

Development and redevelopment projects can provide additional water conservation opportunities, such as the actions listed below. If a Uniform Rate Structure is in place, the water supplier must provide a Water Conservation Program that includes at least two of the actions listed below. Check those actions that you intent to implement within the next 10 years.

Table 28. Additional strategies to Reduce Water Use & Support Wellhead Protection

☒	Participate in the GreenStep Cities Program, including implementation of at least one of the 20 “Best Practices” for water
☐	Prepare a master plan for smart growth (compact urban growth that avoids sprawl)
☐	Prepare a comprehensive open space plan (areas for parks, green spaces, natural areas)
☒	Adopt a water use restriction ordinance (lawn irrigation, car washing, pools, etc.)
☐	Adopt an outdoor lawn irrigation ordinance
☒	Adopt a private well ordinance (private wells in a city must comply with water restrictions)
☒	Implement a stormwater management program
☐	Adopt non-zoning wetlands ordinance (can further protect wetlands beyond state/federal laws-for vernal pools, buffer areas, restrictions on filling or alterations)
☐	Adopt a water offset program (primarily for new development or expansion)
☐	Implement a water conservation outreach program
☐	Hire a water conservation coordinator (part-time)
☐	Implement a rebate program for water efficient appliances, fixtures, or outdoor water management
☐	Other

Objective 8: Tracking Success: How will you track or measure success through the next ten years?

Not sure

Tip: The process to monitor demand reduction and/or a rate structure includes:

- a) The DNR Hydrologist will call or visit the community the first 1-3 years after the water supply plan is completed.
- b) They will discuss what activities the community is doing to conserve water and if they feel their actions are successful. The Water Supply Plan, Part 3 tables and responses will guide the discussion. For example, they will discuss efforts to reduce unaccounted for water loss if that is a problem, or go through Tables 33, 34 and 35 to discuss new initiatives.
- c) The city representative and the hydrologist will discuss total per capita water use, residential per capita water use, and business/industry use. They will note trends.
- d) They will also discuss options for improvement and/or collect case studies of success stories to share with other communities. One option may be to change the rate structure, but there are many other paths to successful water conservation.
- e) If appropriate, they will cooperatively develop a simple work plan for the next few years, targeting a couple areas where the city might focus efforts.

A. Regulation

Complete Table 29 by selecting which regulations are used to reduce demand and improve water efficiencies. Add additional rows as needed.

Copies of adopted regulations or proposed restrictions or should be included in **Appendix 10** (a list with hyperlinks is acceptable).

Table 29. Regulations for short-term reductions in demand and long-term improvements in water efficiencies

Regulations Utilized	When is it applied (in effect)?
☐ Rainfall sensors required on landscape irrigation systems	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☐ Water efficient plumbing fixtures required	☐ New development ☐ Replacement ☐ Rebate Programs
☐ Critical/Emergency Water Deficiency ordinance	☐ Only during declared Emergencies
☐ Watering restriction requirements (time of day, allowable days, etc.)	☐ Odd/even ☐ 2 days/week ☐ Only during declared Emergencies
☐ Water waste prohibited (for example, having a fine for irrigators spraying on the street)	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☐ Limitations on turf areas (requiring lots to have 10% - 25% of the space in natural areas)	☐ New development ☐ Shoreland/zoning ☐ Other
☒ Soil preparation requirements (after construction, requiring topsoil to be applied to promote good root growth)	☒ New Development ☒ Construction Projects ☐ Other
☐ Tree ratios (requiring a certain number of trees per square foot of	☐ New development

Regulations Utilized	When is it applied (in effect)?
lawn)	☐ Shoreland/zoning ☐ Other
☒ Permit to fill swimming pool and/or requiring pools to be covered (to prevent evaporation)	☒ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☐ Ordinances that permit stormwater irrigation, reuse of water, or other alternative water use (Note: be sure to check current plumbing codes for updates)	☐ Describe

B. Retrofitting Programs

Education and incentive programs aimed at replacing inefficient plumbing fixtures and appliances can help reduce per capita water use, as well as energy costs. It is recommended that municipal water suppliers develop a long-term plan to retrofit public buildings with water efficient plumbing fixtures and appliances. Some water suppliers have developed partnerships with organizations having similar conservation goals, such as electric or gas suppliers, to develop cooperative rebate and retrofit programs.

A study by the AWWA Research Foundation (Residential End Uses of Water, 1999) found that the average indoor water use for a non-conserving home is 69.3 gallons per capita per day (gpcd). The average indoor water use in a conserving home is 45.2 gpcd and most of the decrease in water use is related to water efficient plumbing fixtures and appliances that can reduce water, sewer and energy costs. In Minnesota, certain electric and gas providers are required (Minnesota Statute 216B.241) to fund programs that will conserve energy resources and some utilities have distributed water efficient showerheads to customers to help reduce energy demands required to supply hot water.

Retrofitting Programs

Complete Table 30 by checking which water uses are targeted, the outreach methods used, the measures used to identify success, and any participating partners.

Table 30. Retrofitting programs (Select all that apply)

Water Use Targets	Outreach Methods	Partners
☐ Low flush toilets, ☒ Toilet leak tablets, ☒ Low flow showerheads, ☒ Faucet aerators;	☒ Education about ☒ Free distribution of ☐ Rebate for ☐ Other	☐ Gas company ☐ Electric company ☐ Watershed organization
☐ Water conserving washing machines, ☐ Dish washers, ☐ Water softeners;	☐ Education about ☐ Free distribution of ☐ Rebate for ☐ Other	☐ Gas company ☐ Electric company ☐ Watershed organization
☐ Rain gardens, ☐ Rain barrels, ☐ Native/drought tolerant landscaping, etc.	☐ Education about ☐ Free distribution of ☐ Rebate for ☐ Other	☐ Gas company ☐ Electric company ☐ Watershed organization

Briefly discuss measures of success from the above table (e.g. number of items distributed, dollar value of rebates, gallons of water conserved, etc.):

Leak tablets are in baskets, for free, at the front service counter and back repair counter. Low flow heads and aerators are given out for free at annual open house, along with brochures
--

C. Education and Information Programs

Customer education should take place in three different circumstances. First, customers should be provided information on how to conserve water and improve water use efficiencies. Second, information should be provided at appropriate times to address peak demands. Third, emergency notices and educational materials about how to reduce water use should be available for quick distribution during an emergency.

Proposed Education Programs

Complete Table 31 by selecting which methods are used to provide water conservation and information, including the frequency of program components. Select all that apply and add additional lines as needed.

Table 31. Current and Proposed Education Programs

Education Methods	General summary of topics	#/Year	Frequency
Billing inserts or tips printed on the actual bill	W.H.P., drip calculator		☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Consumer Confidence Reports	State of the water	1	☐ Ongoing ☒ Seasonal ☐ Only during declared emergencies
Press releases to traditional local news outlets (e.g., newspapers, radio and TV)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Social media distribution (e.g., emails, Facebook, Twitter)	General conservation stuff		☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Paid advertisements (e.g., billboards, print media, TV, radio, web sites, etc.)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Presentations to community groups	General water info, water conservation info, projects		☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Staff training			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Facility tours			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Displays and exhibits	Annual open house, brochures and give aways	1 week/year	☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Marketing rebate programs (e.g., indoor fixtures & appliances and outdoor practices)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community news letters			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Direct mailings (water audit/retrofit kits,			☐ Ongoing

Education Methods	General summary of topics	#/Year	Frequency
showerheads, brochures)			☐ Seasonal ☐ Only during declared emergencies
Information kiosk at utility and public buildings	Always info on display in front office, covering various topics for all three departments of utility		☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Public service announcements			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Cable TV Programs			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Demonstration projects (landscaping or plumbing)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
K-12 education programs (Project Wet, Drinking Water Institute, presentations)	Fourth grade students		☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community events (children's water festivals, environmental fairs)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community education classes			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Water week promotions			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Website (include address:) www.bpu.org	Revolving info on water issues		☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Targeted efforts (large volume users, users with large increases)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Notices of ordinances			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies

Education Methods	General summary of topics	#/Year	Frequency
Emergency conservation notices			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Other:			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies

Briefly discuss what future education and information activities your community is considering in the future:

Spend more time educating school children, who in turn do a good job of “teaching” their parents the importance of water conservation. More info on web site and social media, about conservation and WHP.



Part 4. ITEMS FOR METROPOLITAN AREA COMMUNITIES

Minnesota Statute 473.859 requires WSPs to be completed for all local units of government in the seven-county Metropolitan Area as part of the local comprehensive planning process.

Much of the information in Parts 1-3 addresses water demand for the next 10 years. However, additional information is needed to address water demand through 2040, which will make the WSP consistent with the Metropolitan Land Use Planning Act, upon which the local comprehensive plans are based.

This Part 4 provides guidance to complete the WSP in a way that addresses plans for water supply through 2040.

A. Water Demand Projections through 2040

Complete Table 7 in Part 1D by filling in information about long-term water demand projections through 2040. Total Community Population projections should be consistent with the community's system statement, which can be found on the Metropolitan Council's website and which was sent to the community in September 2015.

Projected Average Day, Maximum Day, and Annual Water Demands may either be calculated using the method outlined in *Appendix 2* of the *2015 Master Water Supply Plan* or by a method developed by the individual water supplier.

B. Potential Water Supply Issues

Complete Table 10 in Part 1E by providing information about the potential water supply issues in your community, including those that might occur due to 2040 projected water use.

The *Master Water Supply Plan* provides information about potential issues for your community in *Appendix 1 (Water Supply Profiles)*. This resource may be useful in completing Table 10.

You may document results of local work done to evaluate impact of planned uses by attaching a feasibility assessment or providing a citation and link to where the plan is available electronically.

C. Proposed Alternative Approaches to Meet Extended Water Demand Projections

Complete Table 12 in Part 1F with information about potential water supply infrastructure impacts (such as replacements, expansions or additions to wells/intakes, water storage and treatment capacity, distribution systems, and emergency interconnections) of extended plans for development and redevelopment, in 10-year increments through 2040. It may be useful to refer to information in the community's local Land Use Plan, if available.

Complete Table 14 in Part 1F by checking each approach your community is considering to meet future demand. For each approach your community is considering, provide information about the amount of

future water demand to be met using that approach, the timeframe to implement the approach, potential partners, and current understanding of the key benefits and challenges of the approach.

As challenges are being discussed, consider the need for: evaluation of geologic conditions (mapping, aquifer tests, modeling), identification of areas where domestic wells could be impacted, measurement and analysis of water levels & pumping rates, triggers & associated actions to protect water levels, etc.

D. Value-Added Water Supply Planning Efforts (Optional)

The following information is not required to be completed as part of the local water supply plan, but completing this can help strengthen source water protection throughout the region and help Metropolitan Council and partners in the region to better support local efforts.

Source Water Protection Strategies

Does a Drinking Water Supply Management Area for a neighboring public water supplier overlap your community? Yes ☐ No ☐

If you answered no, skip this section. If you answered yes, please complete Table 32 with information about new water demand or land use planning-related local controls that are being considered to provide additional protection in this area.

Table 32. Local controls and schedule to protect Drinking Water Supply Management Areas

Local Control	Schedule to Implement	Potential Partners
☐ None at this time		
☐ Comprehensive planning that guides development in vulnerable drinking water supply management areas		
☐ Zoning overlay		
☐ Other:		

Technical assistance

From your community's perspective, what are the most important topics for the Metropolitan Council to address, guided by the region's Metropolitan Area Water Supply Advisory Committee and Technical Advisory Committee, as part of its ongoing water supply planning role?

- ☐ Coordination of state, regional and local water supply planning roles
- ☐ Regional water use goals
- ☐ Water use reporting standards
- ☐ Regional and sub-regional partnership opportunities
- ☐ Identifying and prioritizing data gaps and input for regional and sub-regional analyses
- ☐ Others: _____

GLOSSARY

Agricultural/Irrigation Water Use - Water used for crop and non-crop irrigation, livestock watering, chemigation, golf course irrigation, landscape and athletic field irrigation.

Average Daily Demand - The total water pumped during the year divided by 365 days.

Calcareous Fen - Calcareous fens are rare and distinctive wetlands dependent on a constant supply of cold groundwater. Because they are dependent on groundwater and are one of the rarest natural communities in the United States, they are a protected resource in MN. Approximately 200 have been located in Minnesota. They may not be filled, drained or otherwise degraded.

Commercial/Institutional Water Use - Water used by motels, hotels, restaurants, office buildings, commercial facilities and institutions (both civilian and military). Consider maintaining separate institutional water use records for emergency planning and allocation purposes. Water used by multi-family dwellings, apartment buildings, senior housing complexes, and mobile home parks should be reported as Residential Water Use.

Commercial/Institutional/Industrial (C/I/I) Water Sold - The sum of water delivered for commercial/institutional or industrial purposes.

Conservation Rate Structure - A rate structure that encourages conservation and may include increasing block rates, seasonal rates, time of use rates, individualized goal rates, or excess use rates. If a conservation rate is applied to multifamily dwellings, the rate structure must consider each residential unit as an individual user. A community may have a separate conservation rate that only goes into effect when the community or governor declares a drought emergency. These higher rates can help to protect the city budgets during times of significantly less water usage.

Date of Maximum Daily Demand - The date of the maximum (highest) water demand. Typically this is a day in July or August.

Declining Rate Structure - Under a declining block rate structure, a consumer pays less per additional unit of water as usage increases. This rate structure does not promote water conservation.

Distribution System - Water distribution systems consist of an interconnected series of pipes, valves, storage facilities (water tanks, water towers, reservoirs), water purification facilities, pumping stations, flushing hydrants, and components that convey drinking water and meeting fire protection needs for cities, homes, schools, hospitals, businesses, industries and other facilities.

Flat Rate Structure - Flat fee rates do not vary by customer characteristics or water usage. This rate structure does not promote water conservation.

Industrial Water Use - Water used for thermonuclear power (electric utility generation) and other industrial use such as steel, chemical and allied products, paper and allied products, mining, and petroleum refining.

Low Flow Fixtures/Appliances - Plumbing fixtures and appliances that significantly reduce the amount of water released per use are labeled “low flow”. These fixtures and appliances use just enough water to be effective, saving excess, clean drinking water that usually goes down the drain.

Maximum Daily Demand - The maximum (highest) amount of water used in one day.

Metered Residential Connections - The number of residential connections to the water system that have meters. For multifamily dwellings, report each residential unit as an individual user.

Percent Unmetered/Unaccounted For - Unaccounted for water use is the volume of water withdrawn from all sources minus the volume of water delivered. This value represents water “lost” by miscalculated water use due to inaccurate meters, water lost through leaks, or water that is used but unmetered or otherwise undocumented. Water used for public services such as hydrant flushing, ice skating rinks, and public swimming pools should be reported under the category “Water Supplier Services”.

Population Served - The number of people who are served by the community’s public water supply system. This includes the number of people in the community who are connected to the public water supply system, as well as people in neighboring communities who use water supplied by the community’s public water supply system. It should not include residents in the community who have private wells or get their water from neighboring water supply.

Residential Connections - The total number of residential connections to the water system. For multifamily dwellings, report each residential unit as an individual user.

Residential Per Capita Demand - The total residential water delivered during the year divided by the population served divided by 365 days.

Residential Water Use - Water used for normal household purposes such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens. Should include all water delivered to single family private residences, multi-family dwellings, apartment buildings, senior housing complexes, mobile home parks, etc.

Smart Meter - Smart meters can be used by municipalities or by individual homeowners. Smart metering generally indicates the presence of one or more of the following:

- Smart irrigation water meters are controllers that look at factors such as weather, soil, slope, etc. and adjust watering time up or down based on data. Smart controllers in a typical summer will reduce water use by 30%-50%. Just changing the spray nozzle to new efficient models can reduce water use by 40%.
- Smart Meters on customer premises that measure consumption during specific time periods and communicate it to the utility, often on a daily basis.
- A communication channel that permits the utility, at a minimum, to obtain meter reads on demand, to ascertain whether water has recently been flowing through the meter and onto the

premises, and to issue commands to the meter to perform specific tasks such as disconnecting or restricting water flow.

Total Connections - The number of connections to the public water supply system.

Total Per Capita Demand - The total amount of water withdrawn from all water supply sources during the year divided by the population served divided by 365 days.

Total Water Pumped - The cumulative amount of water withdrawn from all water supply sources during the year.

Total Water Delivered - The sum of residential, commercial, industrial, institutional, water supplier services, wholesale and other water delivered.

Ultimate (Full Build-Out) - Time period representing the community's estimated total amount and location of potential development, or when the community is fully built out at the final planned density.

Unaccounted (Non-revenue) Loss - See definitions for "percent unmetered/unaccounted for loss".

Uniform Rate Structure - A uniform rate structure charges the same price-per-unit for water usage beyond the fixed customer charge, which covers some fixed costs. The rate sends a price signal to the customer because the water bill will vary by usage. Uniform rates by class charge the same price-per-unit for all customers within a customer class (e.g. residential or non-residential). This price structure is generally considered less effective in encouraging water conservation.

Water Supplier Services - Water used for public services such as hydrant flushing, ice skating rinks, public swimming pools, city park irrigation, back-flushing at water treatment facilities, and/or other uses.

Water Used for Nonessential Purposes - Water used for lawn irrigation, golf course and park irrigation, car washes, ornamental fountains, and other non-essential uses.

Wholesale Deliveries - The amount of water delivered in bulk to other public water suppliers.

Acronyms and Initialisms

AWWA – American Water Works Association

C/I/I – Commercial/Institutional/Industrial

CIP – Capital Improvement Plan

GIS – Geographic Information System

GPCD – Gallons per capita per day

GWMA – Groundwater Management Area – North and East Metro, Straight River, Bonanza,

MDH – Minnesota Department of Health

MGD – Million gallons per day

MG – Million gallons

MGL – Maximum Contaminant Level

MnTAP – Minnesota Technical Assistance Program (University of Minnesota)

MPARS – MN/DNR Permitting and Reporting System (new electronic permitting system)

MRWA – Minnesota Rural Waters Association

SWP – Source Water Protection

WHP – Wellhead Protection

APPENDICES TO BE SUBMITTED BY THE WATER SUPPLIER

Appendix 1: Well records and maintenance summaries – see Part 1C

Appendix 2: Water level monitoring plan – see Part 1E

Appendix 3: Water level graphs for each water supply well - see Part 1E

Appendix 4: Capital Improvement Plan - see Part 1E

Appendix 5: Emergency Telephone List – see Part 2C

Appendix 6: Cooperative Agreements for Emergency Services – see Part 2C

Appendix 7: Municipal Critical Water Deficiency Ordinance – see Part 2C

Appendix 8: Graph showing annual per capita water demand for each customer category during the last ten-years – see Part 3 Objective 4

Appendix 9: Water Rate Structure – see Part 3 Objective 6

Appendix 10: Adopted or proposed regulations to reduce demand or improve water efficiency – see Part 3 Objective 7

Appendix 11: Implementation Checklist – summary of all the actions that a community is doing, or proposes to do, including estimated implementation dates – see www.mndnr.gov/watersupplyplans

Appendix 1

Well Maintenance Summary

Well 3- June, 2014- Electric voltage conversion, new motor and variable speed drive, pump rehabilitation, and cleaning of casing and screen.

Well 4- May, 2014- Electric voltage conversion, new motor and variable speed drive, pump rehabilitation, and cleaning of casing and screen.

Well 5- August, 2014- Electric voltage conversion, new motor and variable speed drive, pump rehabilitation, and cleaning of casing and screen.

Well 6- July, 2014- Electric voltage conversion, new motor and variable speed drive, pump rehabilitation, and cleaning of casing and screen. June, 2015- Warranty replacement of electric motor.

Well 7- September, 2014- Electric voltage conversion, new motor and variable speed drive, pump rehabilitation, and cleaning of casing and screen.

Well 8- February/March, 2009- Well and Motor rehabilitation, new variable speed drive for the motor.

Well No. 525

Latitude: 33° 15' N Longitude: 111° 45' W

HYDROGEOLOGIC CARD

SAVE AS ON MASTER CARD 1:2 Section: 1:2

B Drainage Basin: 2:8-F Subbasin: 1:6

Top of depression, stream channel, dunes, flat, hilltop, sink, swamp.
 well site: (D) (C) (E) (F) (H) (K) (L)
 (G) (P) (S) (T) (U) (V)
 offshore, pediment, hillside, terrace, undulating, valley flat

MAJOR
 Aquifer: Q-G Aquifer, formation, group 1:6

Lithology: 4:R Origin: Q Aquifer Thickness: 107 ft

1:0-7 Length of well open to: 73-125 ft Depth to top of: 5:2 ft

MINOR
 Aquifer: 1:0-7 Aquifer, formation, group 1:6

Lithology: 1:0-7 Origin: Q Aquifer Thickness: 107 ft

1:0-7 Length of well open to: 73-125 ft Depth to top of: 5:2 ft

Intervals Screened: 73-125

Depth to consolidated rock: 73-125 ft Source of data: 1:6

Depth to basement: 73-125 ft Source of data: 1:6

Surficial material: 73-125 ft Infiltration characteristics: 1:6

Coefficient Trans: 73-125 gpd/ft² Coefficient Storage: 73-125

Perm: 73-125 gpd/ft² Spec cap: 73-125 gpd/ft² Number of geologic cards: 1:6

	Depth	Thickness
Sand, fine, red	60	60
Sand, cse., grey	65	5
Sand, cse., grey w/pebbles	80	15
Gravel	115	35
Sand, cse., grey w/pebbles	122	7
Sand, cse. to med, grey	125	3

U.S. GOVERNMENT PRINTING OFFICE: 1973-730-617/395 3-1

Well No. 2537

Latitude-Longitude N
E
S
W

HYDROGEOLOGIC CARD

NAME AS ON MASTER CARD PHILADELPHIA 112 Section: 112

B Drainage Basin: 25-F Subbasin: 112

Top of well site: (D) depression, stream channel, dunes, flat, hilltop, sink, swamp.
 (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V)
 offshore, pediment, hillside, terrace, undulating, valley flat 112

MAJOR AQUIFER: Q1G aquifer, formation, group 112

Lithology: R Origin: Q Aquifer Thickness: 111 ft

112 Length of well open to: 73-123 ft 5:0 Depth to top of: 12 ft 112

MINOR AQUIFER: Q1G aquifer, formation, group 112

Lithology: R Origin: Q Aquifer Thickness: 111 ft

112 Length of well open to: 73-123 ft 5:0 Depth to top of: 12 ft 112

Intervals Screened: 73-123

Depth to consolidated rock: 60 ft Source of data: 112

Depth to basement: 70 ft Source of data: 112

Surficial material: 112 Infiltration characteristics: 112

Coefficient of permeability: 50.5 Coefficient of storage: 112

Permeability: 50.5 Specific capacity: 112 Number of geologic cards: 112

	Depth	Thickness
Sand, red	60	60
Sand, coarse, grey	70	10
Gravel	122	52
Sand, fine, grey	123	1

U.S. GOVERNMENT PRINTING OFFICE: 1975-730-617/395 3-1

Well No. 4231 - 1 - 1

WELL SCHEDULE

U. S. DEPT. OF THE INTERIOR

GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

WELL

#5

#5

MASTER CARD

Source: Brooklyn

County: Brooklyn

City: Brooklyn

State: NY

Latitude: 40 45 00 N

Longitude: 73 55 00 W

Section: 1

Block: 1

Lot: 1

Owner: MCCARTHY WELL CO.

Address: CITY BRAINERD

Ownership: County, Fed Gov't, State, Corp of Co., Private, State Agency, Water Dist

Use of water: (A) Air cond, Bottling, Comm, De-water, Power, Fire, Dom, Irr, Ind, P, S, Rec, (G) Stock, Instit, Un-used, Re-charge, Desal-P S, Desal-other, Other

Use of well: (A) Anode, Drain, Seismic, Heat Res, Obs, Oil-gas, Re-charge, Test, Un-used, Withdraw, Waste, Destroyed

Is a duplicate: Well data 1 Yes W/L meas. 1 Field aquifer char. 1

Well data: 1

Qual. water data: 1

Freq. sampling: 1 Pumpage inventory 1 period 1

Aperture cards: 1

Low data: 1

WELL-DESCRIPTION CARD

SAME AS ON MASTER CARD

Depth well: 145 ft

Depth cased: 105 ft

Casing type: 105

Accuracy: 1

Finish: (C) porous gravel w. gravel w. horiz. open part., schen. ad. pt., shored, open

Method: (A) air, bucket, cent. jet, multiple, multiple, G, (P) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

Drilled: 1225 9:47 Pump intake setting 1 ft

Driller: McCarthy Well Co.

Use: (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

Power: (type) diesel (elec) gas, gasoline, hand, gas, wind, H.P. 100

Trans. of meter no. 1

Descript. MP 1 ft below LSD, Alt. MP 1

Alt. LSD: 160 Accuracy: 1

Water level: 1160 Accuracy: 1

Yield: 2400 gpm

Method: 1

Flow rate: 65 ft

Accuracy: 1

Water data: 1 Sulfate 1 Chloride 1 Hard. 1

Sp. conduct: 1 x 10³ temp. 1

Date: May 1965

#232350

FORM 9-1642
(1-68)

Well No. 45.31.35. and

WELL SCHEDULE

U. S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

MASTER CARD

Loc. No. Yessah State City records Date 11/20/75 Brainerd 15'

County Minn. Township 2-7 Range 1-8

Latitude 46° 12' 03.9" N Longitude 93° 41' 21.3" W Section 1

Latitude 2-45 Longitude 31-35 NE NE 4th

Local name 0.45 N. 31 W. 35 A. A. D. Other number 6

Local use MCCARTHY WELL CO. Owner or name City of Brainerd

Owner or name CITY, BRAINERD Address Brainerd, Minn.

Ownership: (C) County, Fed Gov't, (N) Corp or Co, Private, State Agency, Water Dist (M)

Use of water: (A) Air cond., (B) Bottling, (C) Comm. Dewater., (D) Power, (E) Fire, (F) Dom. Irr., (G) Ind., (H) Rec., (I) Stock, (J) Unused, (K) Recharge, (L) Desal-P S., (M) Desal-other, (N) Other (P)

Use of well: (A) Anode, (B) Drain, (C) Seismic, (D) Heat Res., (E) Gas, (F) Oil-gas, (G) Recharge, (H) Test, (I) Unused, (J) Withdraw, (K) Waste, (L) Destroyed (W)

DATA AVAILABLE: Well data 7 Pres. W. meas. 7 Field aquifer char. 7

Mod. lab. data: 7

Qual. water data: 7

Freq. sampling: 7 Pumpage inventory: 7 period: 7

Spec. rec. cards: 7

Log data: Drill log

WELL-DESCRIPTION CARD

SAVE AS ON MASTER CARD Depth well: 156 ft. 115.6 Meas. 6

Depth cased: 107 ft. 110.7 Casing size: Step Diam. 16" In. 16

Finish: (C) port.-s. gravel w. (D) (H) (P) (S) (T) (U) (V) (W) (X) (Y) (Z)

Material: (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

Date drilled: 1947 9:47 Pump intake setting: 7 ft. 7

Driller: McCarthy Well Co., St. Paul, Minn.

Site: (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

Power: (A) diesel, (B) elec., (C) gas, (D) gasoline, (E) hand, (F) wind, (G) H.P. 100 (V) Trans. or meter no. 7

Descript. MP 1160 ft. below LSD, Alt. MP Brainerd 15'

Alt. LSD 11.5 ft. above MP; ft. below LSD 11.2 Accuracy: 7

Dis. 52.6 ft. 5.3 Yield: 2500 gpm. 2:50.0 Method 7

Drawdown: 94 ft. 4 Sulfate 2.3 Chloride 5.4 Hard. 230

Water data: 94 4 Sulfate 2.3 Chloride 5.4 Hard. 230

Sp. Conduct. 94 4 Temp. 14.5 Date sampled 6:7

Lab. color, etc. Mn. 12, NO₂ 44, Diss. Sol. 150, F. 17, pH 7.7

Sulfate 0.05 Alk (25) 200

WELL
#6

Well No. _____

Latitude-Longitude _____

HYDROGEOLOGIC CARD

NAME AS ON MASTER CARD _____

Province _____

Section _____

Drainage Basin _____

Subbasin _____

Topo of well site: (D) depression, stream channel, dunes, flat, hilltop, sink, swamp.
(E) (F) (G) (H) (I) (J) (K) (L)
(M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) offshore, pediment, hillside, terrace, undulating, valley flat

MAJOR AQUIFER: _____

system _____ series _____ aquifer, formation, group _____

Lithology: _____

Origin: _____

Thickness: _____ ft

Length of well open to: _____ ft

Depth to top of: _____ ft

MINOR AQUIFER: _____

system _____ series _____ aquifer, formation, group _____

Lithology: _____

Origin: _____

Thickness: _____ ft

Length of well open to: _____ ft

Depth to top of: _____ ft

Intervals Screened: _____

Depth to consolidated rock: _____ ft

Source of data: _____

Depth to basement: _____ ft

Source of data: _____

Surficial material: _____

Infiltration characteristics: _____

Coefficient Trans: _____

Coefficient Storage: _____

Perm: _____

Spd/ft: _____

Spec cap: _____

Spd/ft: _____

Number of geologic cards: _____

Depth Thickness

Sand, red	47	47
Sand, fine, grey	79	32
Sand, gravel, grey	104	25
gravel	144	40
Sand, fine, grey	156	12

Well No. _____

U.S. GOVERNMENT PRINTING OFFICE: 1973-730-617:395 3-

MINNESOTA CONSERVATION DEPARTMENT
DIVISION OF WATERS

RECEIVED
SEP 16 1959

WELL LOG STATEMENT

File No. **WELL #7**

Well No. **#7**

MAIL REPORT PROMPTLY TO DIRECTOR, DIVISION OF WATERS, STATE OFFICE BLDG., ST. PAUL 1, MINN.

Location of Well City of Brainerd

County Crow Wing County City or Town Brainerd

Describe Further by Lot, Block, Nearest Highway, Street and Number

Locate Well on Plat of Section

Sec. 45
Twp. 30
Range 30

Well #7
Drilled for: City of Brainerd

Driller McCarthy Well Company

Address Brainerd, Minnesota

Address 670 Eustis St., St. Paul, Minn.

REPORT OF FINAL PUMPING TEST

Date of Completion August 26, 1955

Date of Test 8/23/55

Site upland
Upland, Valley, Hillside, Etc.

Duration of Test 1 Hrs. Min.

Type of Well drilled
Dug, Driven, Bored, Drilled

Rate of Pumping 2300 GPM

Drill Rig Used rotary
Solid Tool, Jet, Rotary

Static Water Level 17'6" Ft.

Diameter: Top 48" Bottom 32"

Water Level While Pumping 48 Ft.

Depth of Well 150'

Drawdown 31'6" Ft.

Ground Elevation unknown
Sea Level Datum or Give Distance Above
or Below U. S. Highway, Lake, Etc.

Time Required for Recovery

Expected Average Yield Gal. per day

Height of Casing Above Ground 2 1/2'

If Other Tests were Made, Give Details on Another Sheet.

Quality of Water hard
(Hard or Soft, Fresh or Salty, Etc.)

Were Measurements Made of Effect on Other Nearby Wells During Test? Give Details.

Temperature of Water unknown

Was Laboratory Analysis Made? unknown

For What Purpose Will Water Be Used? City water supply

Is Well Pumped? yes Pump Capacity GPM

Was Well Sealed on Completion? yes

Does Well Overflow Without Pumping? no
Yes or No

Natural Flow GPM

What Pressure, or Head, at Ground Level? none

Principal Aquifer Penetrated sand and gravel

(Fill Out Both Sides of Form)

107

Well No. _____

Scale: 1 inch = 1 mile

HYDROGEOLOGIC CARD

NAME AS ON MASTER CARD: _____ Physiographic Province: _____ Section: 12

Drainage Basin: B Subbasin: 2.8.F

Top of well site: (D) depression, stream channel, dunes, flat, hilltop, sink, swamp, (E) offshore, pediment, hillside, terrace, undulating, valley flat

MAJOR AQUIFER: system _____ series D.G. aquifer, formation, group 1:6

Lithology: _____ Origin: Q Aquifer Thickness: 140 ft

Length of well open to: 88-157 ft Depth to top of: 17 ft

MINOR AQUIFER: system _____ series _____ aquifer, formation, group _____

Lithology: _____ Origin: _____ Aquifer Thickness: _____ ft

Length of well open to: _____ ft Depth to top of: _____ ft

Intervals Screened: 88-157

Depth to consolidated rock: _____ ft Source of data: _____

Depth to basement: _____ ft Source of data: _____

Surficial material: _____ Infiltration characteristics: _____

Coefficient Trans: _____ spm/ft² Coefficient Storage: _____

Coefficient Perm: _____ spm/ft²; Spec cap: 51 gpm/ft; Number of geologic cards: _____

	Depth	Thickness
Sand, red	21	21
Sand, cse, stones, grey	42	21
Sand, m-f., grey	56	14
Sand, grl., cse.	81	25
Sand, m-f., grey	86	5
Sand, grl. grey	146	60
Sand, m-f., grey	157	11

Well No. _____

WATER WELL RECORD					(for Water Sampler)																																				
County Name <u>Crow Wing</u>					403973																																				
City of Brainerd Brainerd, MN					WELL # 8																																				
Well # 8					187 ground level																																				
DATE OF COMPLETION <u>9/13/84</u>					DATE OF COMPLETION <u>9/13/84</u>																																				
USE ☐ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Agricultural ☐ Commercial ☐ Test Well ☐ Air Conditioning ☐ Other					SCREEN Make <u>Johnson</u> Size <u>16</u> Type <u>Stainless steel</u> Dia. <u>16</u> Slot/Gauge <u>70 slot</u> Length <u>45</u> Set between <u>144</u> ft. and <u>129</u> ft. Fig T wash bottom																																				
FORMATION LOG					STATIC WATER LEVEL <u>771</u> ft. ☐ Below ☐ Above Date Measured <u>9-11-84</u>																																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>FORMATION LOG</th> <th>COLOR</th> <th>HARDNESS OF STRATIFICATION</th> <th>FROM</th> <th>TO</th> </tr> </thead> <tbody> <tr> <td>sand</td> <td>brown</td> <td>very soft</td> <td>0</td> <td>30</td> </tr> <tr> <td>sand fine & coarse</td> <td>brown</td> <td>soft</td> <td>30</td> <td>35</td> </tr> <tr> <td>sand fine & med.</td> <td>brown</td> <td>soft</td> <td>35</td> <td>61</td> </tr> <tr> <td>sand & gravel</td> <td>brown</td> <td>soft</td> <td>61</td> <td>75</td> </tr> <tr> <td>sand med. coarse</td> <td>brown</td> <td>soft</td> <td>75</td> <td>191</td> </tr> <tr> <td>shale & clay</td> <td>brown</td> <td>soft</td> <td>191</td> <td>195</td> </tr> </tbody> </table>					FORMATION LOG	COLOR	HARDNESS OF STRATIFICATION	FROM	TO	sand	brown	very soft	0	30	sand fine & coarse	brown	soft	30	35	sand fine & med.	brown	soft	35	61	sand & gravel	brown	soft	61	75	sand med. coarse	brown	soft	75	191	shale & clay	brown	soft	191	195	PUMPING LEVEL (From same surface) <u>128' 11 1/2"</u> <u>31</u> hrs. pumping <u>1500 to 1920</u> g.p.m. ft. after _____ hrs. pumping _____ g.p.m.	
FORMATION LOG	COLOR	HARDNESS OF STRATIFICATION	FROM	TO																																					
sand	brown	very soft	0	30																																					
sand fine & coarse	brown	soft	30	35																																					
sand fine & med.	brown	soft	35	61																																					
sand & gravel	brown	soft	61	75																																					
sand med. coarse	brown	soft	75	191																																					
shale & clay	brown	soft	191	195																																					
LOCATED BY 1 - ☐ Address Verification 2 - ☐ Name on Mailbox 3 - ☐ Lot-Block 4 - ☐ Plat Book 5 - ☐ Info. From Owner 6 - ☐ Info. From Neighbor 7 - ☐ Other ☐ Can't Locate State Why					WELL HEAD COMPLETION ☐ Pressure adapter manufacturer _____ model _____ ☐ Basement offset ☒ At least 12" above grade																																				
REMARKS, ELEVATION, SOURCE OF DATA, etc. RECEIVED MAR 25 1985 Minn. Dept. of Health GWSC					WELL GROUTED ☒ Yes ☐ No Grout material <u>0</u> W. <u>142'</u> D. <u>7.72</u>																																				
MINN. GEOLOGICAL SURVEY COPY					WATER WELL CONTRACTOR'S CERTIFICATION This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Ben Ervin Well Company <u>65252</u> Address <u>Olivia, MN 56277</u> Signed <u>Ben Ervin</u> Date <u>9-18-84</u> David Ervin Date <u>9-18-84</u> (Name of Driller)																																				

Appendix 2

Brainerd Public Utilities

Well performance and level monitoring plan

The purpose of this plan is to set a routine monitoring schedule and delineate general procedures for assessing the performance and general health of the City of Brainerd's municipal water production wells.

Schedule: Our intent is to perform well monitoring tests once weekly, preferably on Mondays, depending on workload variances.

Procedure:

1. Start static tests after all wells have been inactive for a minimum of 60 minutes.
2. Use sounder cable to determine Static Level in feet.
3. Record non-pumping pressure.
4. Start well (or multiple wells depending on capacity of the filtration plant) and run for approximately 30 minutes.
5. Record pumping pressure.
6. Use sounder cable to determine Pumping Level in feet.
7. Determine flow rate (in gallons per minute) through the meter.
8. Record data in the well performance log and perform calculations to determine specific capacity. Ex: $1000 \text{ gpm} / 25 \text{ ft dd} = 40 \text{ gpm/ft}$

Appendix 3

1E. Water Level Data

1E-1 Table 9- Water Level Records

SL= Static Level PL= Pumping Level DD= Draw Down Spec Cap= Specific Capacity

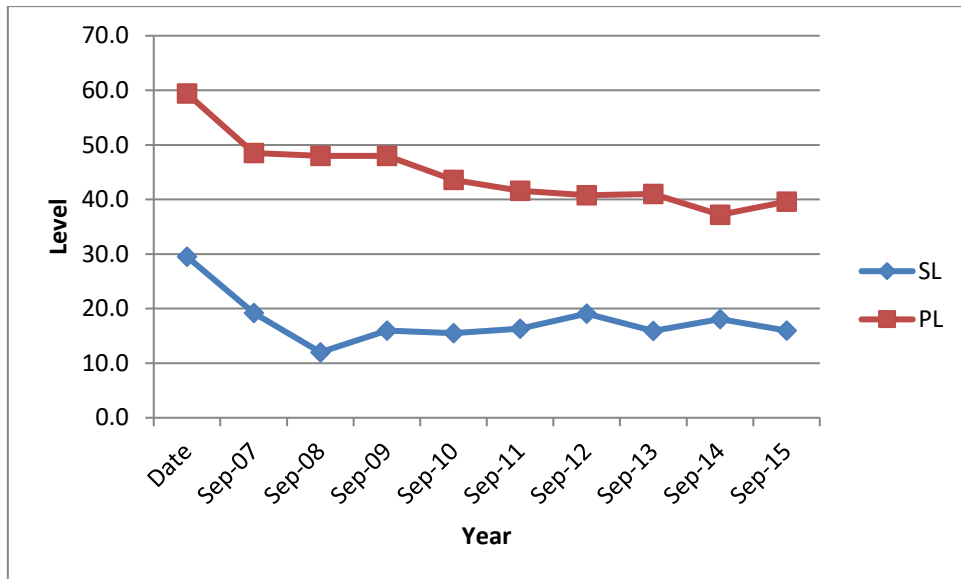
Date	Well 3				Well 4				Well 5			
	SL	PL	DD	Spec Cap	SL	PL	DD	Spec Cap	SL	PL	DD	Spec Cap
Sep-07	29.5		59.4	29.9	26.4	28.8	58.5	31.5	13.4			
Sep-08	19.2		48.5	29.3	26.3	18.0	53.5	35.5	11.7			
Sep-09	12.0		48.0	36.0	25.3	17.0	50.0	33.0	11.4			
Sep-10	16.0		48.0	32.0	27.2	16.0	46.5	30.5	11.3			
Sep-11	15.5		43.6	28.1	28.8	13.4	42.1	28.7	11.2			
Sep-12	16.3		41.6	25.3	27.9	15.0	40.0	25.0	11.0			
Sep-13	19.1		40.8	21.7	30.1	19.2	38.0	18.8	12.4			
Sep-14	15.9		41.0	25.1	49.8	15.0	59.0	44.0	23.5	25.0	45.0	20.0
Sep-15	18.1		37.2	19.1	51.4	17.1	60.0	42.9		24.0	42.0	18.0
Sep-16	16.0		39.6	23.6	37.9	14.9	57.1	42.2		20.0	72.0	52.0
Date	Well 6				Well 7				Well 8			
	SL	PL	DD	Spec Cap	SL	PL	DD	Spec Cap	SL	PL	DD	Spec Cap
Sep-07	28.1		53.6	25.5	20.3	28.0	56.2	28.2	84.8	91.3	128.8	37.5
Sep-08	17.6		41.0	23.4	23.2	21.0	49.0	28.0	82.4	80.0	119.0	39.0
Sep-09	17.2		39.8	22.6	21.8	20.7	47.8	27.1	82.6		Out of service	
Sep-10	15.9		35.7	19.8	23.1	17.1	45.8	28.7	79.4	75.6	114.0	38.4
Sep-11	15.4		33.8	18.4	21.5	18.8	47.7	28.9		75.8	106.5	30.7
Sep-12	17.0		35.8	18.8	19.4	17.0	44.0	27.0		76.0	107.0	31.0
Sep-13	18.1		35.2	17.1	21.4	15.0	42.2	27.2		77.8	107.4	29.6
Sep-14	15.0		35.3	20.3	53.7	15.2	41.1	25.9		75.5	105.8	30.3
Sep-15	15.9		38.5	22.6	47.4	18.5	38.8	20.3	102.5	75.2	107.3	32.1
Sep-16	15.7		39.1	23.4	52.3	16.5	35.8	19.3	105.7	75.3	105.1	29.8

1E. Water Level Data

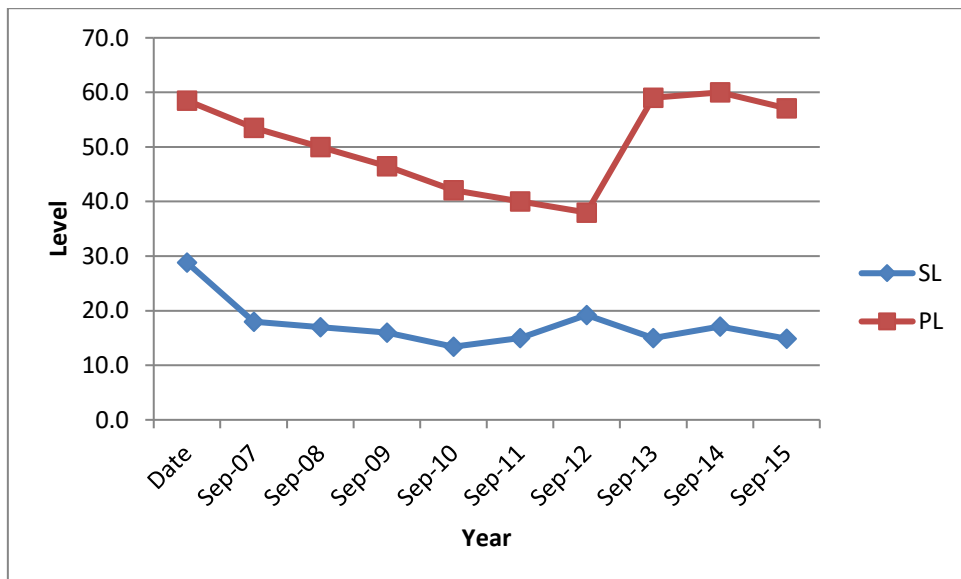
1E-2 Water Level Graphs

(Gap in graphs 3,4,5,6,7,8 = no data available)

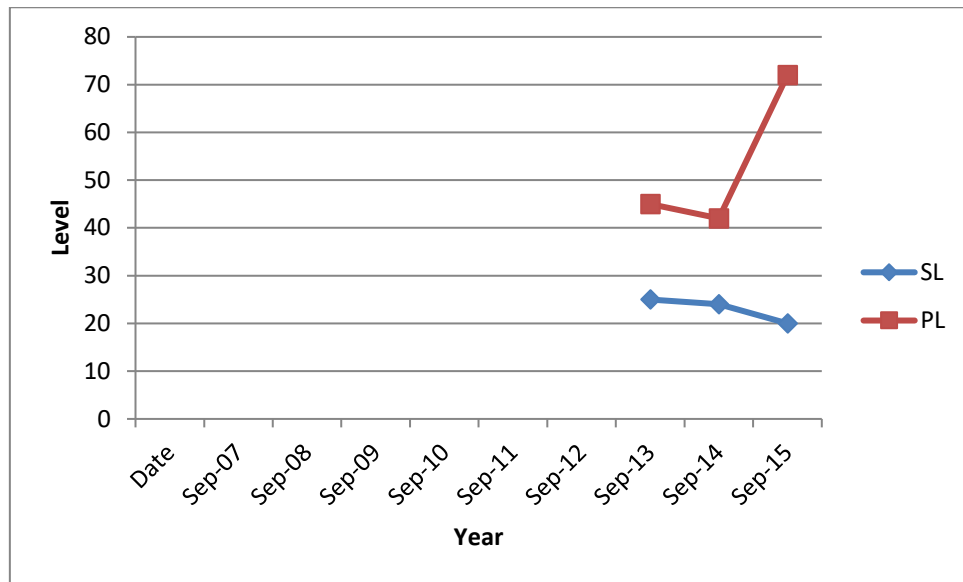
Static and Pumping Levels-Well 3



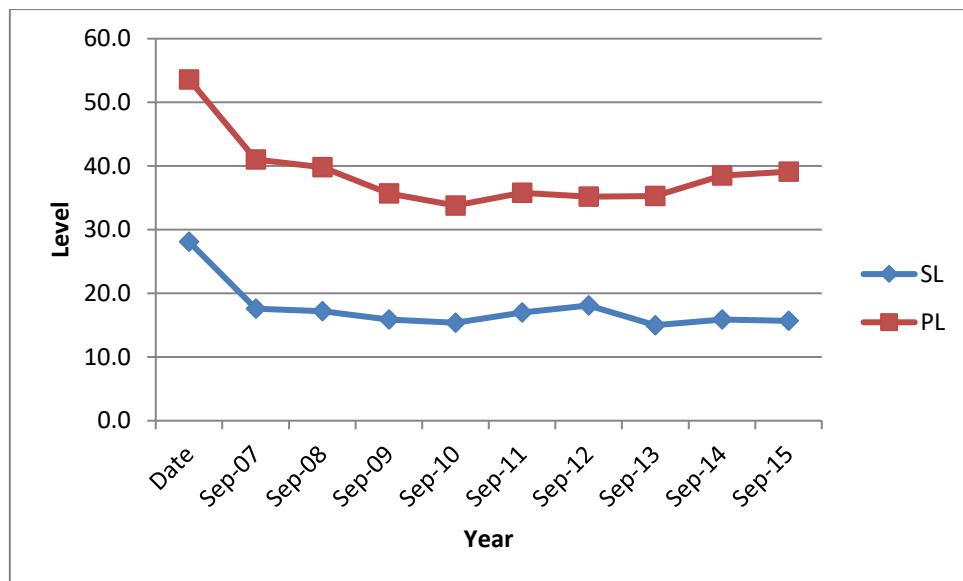
Static and Pumping Levels- Well 4



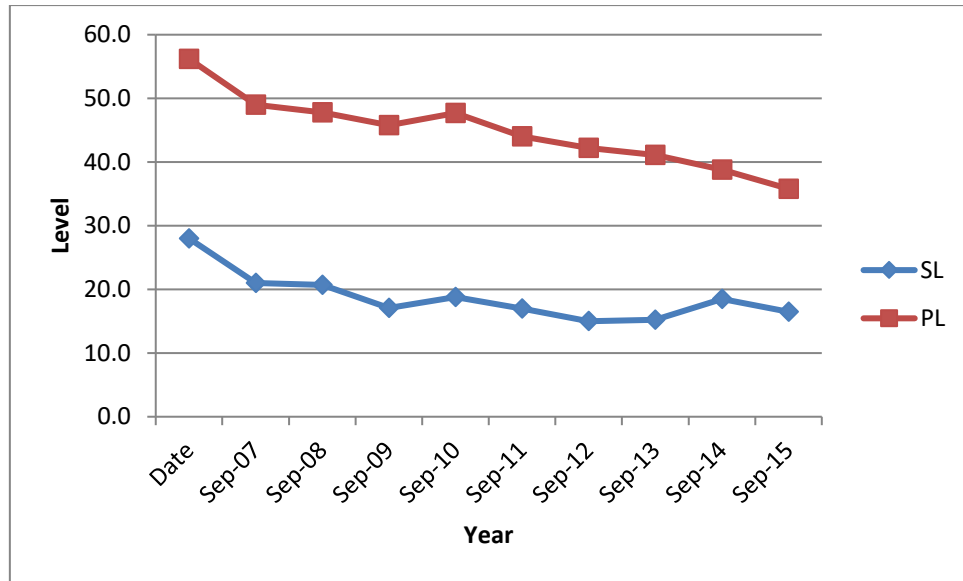
Static and Pumping Levels-Well 5



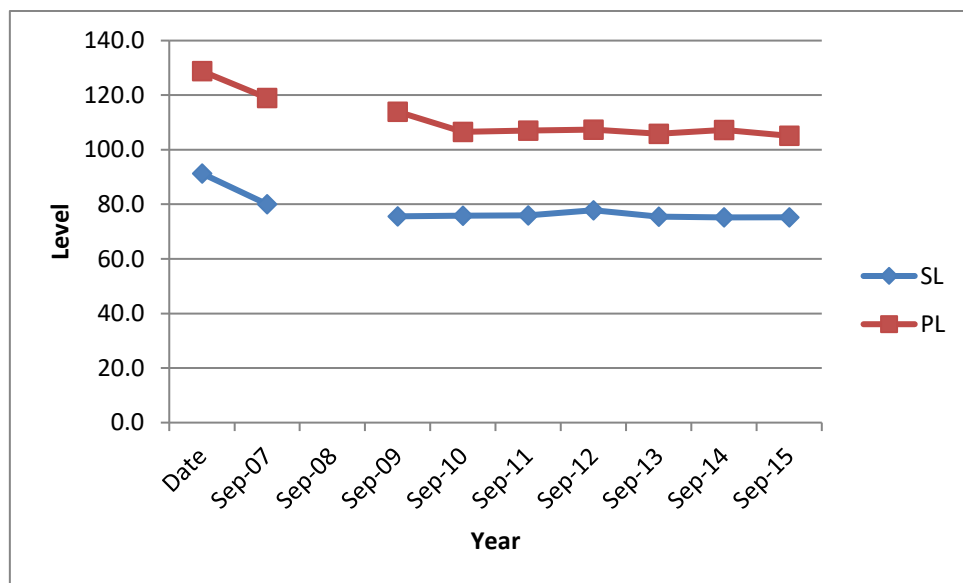
Static and Pumping Levels-Well 6



Static and Pumping Levels- Well 7



Static and Pumping Levels- Well 8



Appendix 4

WATER DEPARTMENT CAPITAL IMPROVEMENT BUDGET FOR THE YEARS 2017 THROUGH 2021							
Project No.	Project Description	2017	2018	2019	2020	2021	Total
PRODUCTION SYSTEM IMPROVEMENTS							
01	Flow Meters For Wells	15,000					15,000
02	Check Valves For Wells		20,000				20,000
03	Electrical Conversion Central Station						-
04	SCADA System Well Conversion	40,000					40,000
05	Energy Improvements						-
WATER RESERVOIR/TANKS							
01	Reclamation/Backwash Tank						-
02	2 Million Gallon Ground Reservoir						-
03	South System Water Tower						-
04	Rehabilitate Existing Towers and Reservoirs						-
05	Land Acquisition - Towers/Reservoirs						-
FILTRATION/TREATMENT FACILITY IMPROVEMENTS							
01	Filter Bed Improvements	40,000	40,000	40,000	40,000	40,000	200,000
02	Valves/Actuators/Level Indicators	20,000	20,000	20,000	20,000	20,000	100,000
03	Control System for South Water Plant		150,000	150,000			300,000
04	Chlorination Equipment		50,000				50,000
05	Chemical Clean	6,000	6,000	6,000	6,000	6,000	30,000
06	Central Garage	60,000					60,000
DISTRIBUTION							
01	Gates/Valves/Hydrants	50,000	50,000	50,000	50,000	50,000	250,000
02	Watermain Projects	10,000	1,000,000	50,000	50,000	50,000	1,160,000
	City Projects						
WATER SERVICE IMPROVEMENTS							
01	Water Service Line Improvements	25,000	15,000	15,000	15,000	15,000	85,000
02	Commercial Water Meter Improvements	20,000	10,000	10,000	10,000	10,000	60,000
SPECIAL EQUIPMENT							
01	Laboratory Equipment/Scales/Containment	5,000	5,000	5,000	5,000	5,000	25,000
TRUCKS AND VEHICLES							
01	Service Truck #2					75,000	75,000
02	Service Truck #1		75,000				75,000
03	Fork Lift (20%)	16,000					16,000
SAFETY EQUIPMENT							
01	Barricades/Warning Equipment/Fall Equip.	5,000	5,000	5,000	5,000	5,000	25,000
02	Arrow Trailer (1/2)	3,000					3,000
03	Trench Box	11,000					11,000
OTHER IMPROVEMENTS							
01	Instrumental & Control System	5,000	5,000	5,000	5,000	5,000	25,000
02	Security System Water Treatment Plant						-
TOTAL BEFORE CONTINGENCIES							
		331,000	1,451,000	356,000	206,000	281,000	2,625,000
CONTINGENCIES							
		17,000	73,000	18,000	10,000	14,000	132,000
GRAND TOTAL							
		348,000	1,524,000	374,000	216,000	295,000	2,757,000

Appendix 5

Emergency Telephone List

Emergency Response Team	Name	Work Telephone	Alternate Telephone
Emergency Response Lead	Scott Magnuson	218-825-3213	651-343-2673
Alternate Emergency Response Lead	Sam Arnzen	218-820-1399	218-270-0773
Water Operator	Jeff Innes	218-825-3228	218-330-6765
Alternate Water Operator	Jason Engholm	825-3228	218-820-2775
Public Communications	Julie Batters	218-825-3203	218-839-1734
State and Local Emergency Response Contacts	Name	Work Telephone	Alternate Telephone
State Incident Duty Officer	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
County Emergency Director	John Bowen	218-537-0288	911
National Guard	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
Mayor/Board Chair	Ed Menk	218-829-7266	218-330-8166
Fire Chief	Tim Holmes	218-839-8063	218-828-2312
Sheriff	Todd Dahl	218-4749	911
Police Chief	Corky McQuiston	218-829-2805	911
Ambulance	Kevin Lee	218-829-8767	218-820-0773
Hospital	Curtis-St Joseph Essentia	218-828-7315	---
Doctor or Medical Facility	Greg-Essentia	218-892-0310	---
State and Local Agencies	Name	Work Telephone	Alternate Telephone
MDH District Engineer	Dave Shultz	320-255-4216	320-808-5016
MDH	Drinking Water Protection	651-201-4700	
State Testing Laboratory	Minnesota Duty Officer	800/422-0798 Out State	651-649-5451 Metro
MPCA	Local Office	218-828-2594	800-657-3862
DNR Area Hydrologist	Gayle / Mark Bacigalupi	612-998-5112	
County Water Planner	Soil & water Conservation	218-828-6197	

Utilities	Name	Work Telephone	Alternate Telephone
Electric Company	Brainerd Public Utilities	218-829-2193	218-829-8726
Gas Company	Centerpoint/Excel	1-800-603-6000	800-722-9326
Telephone Company	Keith Harmeling	763-425-3767	612-559-9288
Gopher State One Call	Utility Locations	800-252-1166	651-454-0002
Highway Department	CWC Highway Dept	218-824-1110	
Mutual Aid Agreements	Name	Work Telephone	Alternate Telephone
Neighboring Water System	City of Baxter	454-5100	
Emergency Water Connection	City of Baxter	454-5100	
Materials	HD Supply Waterworks	1-800-492-6909	763-428-7473
Technical/Contracted Services/Supplies	Name	Work Telephone	Alternate Telephone
MRWA Technical Services	MN Rural Water Association	800-367-6792	
Well Driller/Repair	Thein Well Co/Alan Anderson	320-796-2111	320-894-1535
Pump Repair	WW Goetsch Com	218-829-6890	Scott Austin 612-802-6706
Electrician	Brainerd Public Utilities	218-829-2193	218-829-8726
Plumber	Tim Thompson	218-839-2935	
Backhoe	Brainerd Public Utilities	218-829-2193	218-829-8726
Chemical Feed	Sam Arnzen	218-820-1399	218-270-0773
Meter Repair	Jeff Innes	218-825-3228	218-330-6765
Generator	Trent Hawkinson	218-330-8913	218-522-0606
Valves	Brainerd Public Utilities	218-829-2193	218-829-8726
Pipe & Fittings	National Waterworks	952-937-9666	
Water Storage	Brainerd Public Utilities	218-829-2193	218-829-8726
Laboratory	Brainerd Public Utilities	218-829-2193	218-829-8726
Engineering firm	SEH-Jeff Lodin	218-855-1700	

Communications	Name	Work Telephone	Alternate Telephone
News Paper	Brainerd Dispatch	218-829-4705	Pete Mohs 218-855-5855
Radio Station	Hubbard Radio	218-828-1244	218-839-6879/218-820-1771
School Superintendent	Laine D. Larson	218-454-6900	
Property & Casualty Insurance	W.E. Insurance Craig Miller	218-829-4721	
Critical Water Users	Name	Work Telephone	Alternate Telephone
Hospital Critical Use:	Curtis-St Joseph Essentia	218-828-7315	
Nursing Home Critical Use:	Bethany Good Samaritan	218-829-1407	218-825-2500??

Appendix 6

Cooperative Agreement for Emergency Services

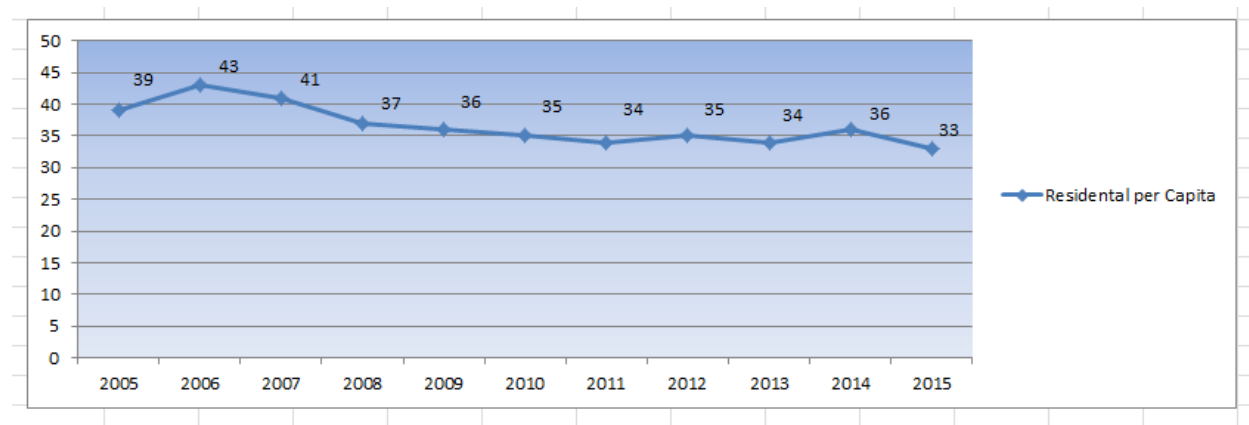
We currently do not have an official Agreement with our neighbor city Baxter for water in emergencies. We have an agreement for Brainerd to sell water to Baxter, but has not been used for a few years (Baxter built a new water plant) I am working on an official agreement.

Appendix 7

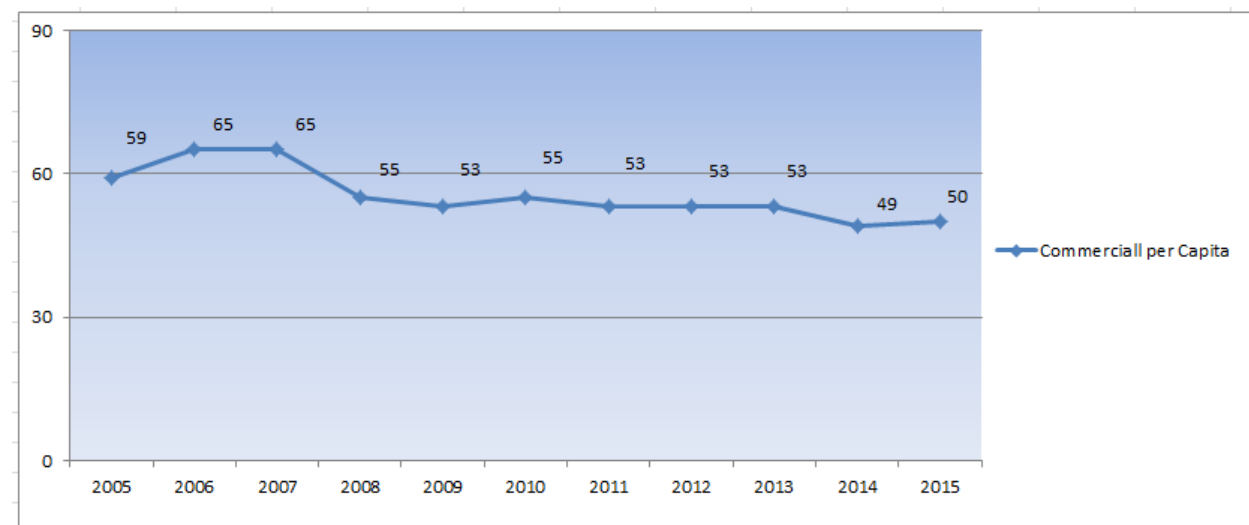
Municipal Critical Water Deficiency Ordinance

We currently do not have this ordinance, I am working on this also, and will submit to DNR within six months.

Appendix 8A



Appendix 8B



Appendix 9

WATER AND WASTEWATER RATES

Water Rates

The following water rates are **effective February 1, 2016**. Commercial water customers will be subject to Minnesota sales tax.

Each water customer will be charged a monthly service charge, according to the size of their water meter.

The monthly service charge is billed even if there is no water consumption, unless the water is shut off by BPU.

<u>METER SIZE</u>	<u>MONTHLY RATE</u>	<u>INCLUDING MDH CHARGE</u>
5/8 inch & 3/4 inch	\$ 15.20	\$ 15.73
1 inch	40.25	40.78
1 1/2 inch	58.00	58.53
2 inch	105.00	105.53
3 inch	173.00	173.53
4 inch	263.00	263.53
6 inch	443.00	443.53
8 inch	833.00	833.53
Hydrants (Per Hydrant)	6.15	

In addition to the monthly water service charge, each customer is billed a commodity charge of \$2.50 per 1,000 gallons of water used.

If a customer lives outside the city limits, the customer is charged 200% for both the service and commodity charge.

Safe Drinking Water Fee

A \$0.53 water service connection fee is included in each monthly service charge. The drinking water service connection fee was established in 1993 to help fund program activities related to compliance with the federal Safe Drinking Water Act.

Wastewater Treatment Rates

Effective February 1, 2016, each wastewater customer will be charged a monthly service charge based on the size of the customer's water meter.

<u>METER SIZE</u>	<u>MONTHLY CHARGE</u>
5/8 inch & 3/4 inch	\$ 11.40
1 inch	12.35
1 1/2 inch	13.30
2 inch	14.25
3 inch	16.20
4 inch	18.65
6 inch	21.60
8 inch	22.55

In addition to the monthly service charge, each customer is billed a commodity charge of \$2.65 per 1,000 gallons of water used.

If a customer lives outside the city limits, the customer is charged 200% for both the service and commodity charge

Wastewater Debt Service Rates

Effective February 1, 2016, each wastewater customer is charged the following monthly debt service charge based on the size of their water meter. This charge is to fund a portion of the upgrade and expansion of the wastewater treatment facility.

<u>METER SIZE</u>	<u>DEBT SERVICE</u>
5/8 inch & 3/4 inch	\$ 9.00
1 inch	11.70
1 1/2 inch	16.20
2 inch	19.80
3 inch	27.90
4 inch	35.10
6 inch	49.50
8 inch	63.00

If a customer lives outside the city limits, the customer is charged 200% of the above wastewater rates.

Wastewater Collection Rates

Effective January 1, 2016, each wastewater customer is charged \$1.50 per every 1,000 gallons of water that is used. This charge has been added as a line item to the BPU utility bill, on behalf of the City of Brainerd, to cover the maintenance costs of the City's wastewater collection system.

If a customer lives outside the city limits, the customer is charged 200% for both the service and commodity charge.

Summer Sprinkling Rates

Residential Customers

Residential customers are given a sprinkling credit on their wastewater treatment and collection rate for the billing months of June through September. The customer's wastewater charges will be based on the customer's average water consumption during the billing months of December through February.

No residential customer will be allowed to install a separate water meter for a sprinkling system.

Commercial Customers

Commercial customers must purchase a separate water meter for irrigation purposes. The customer is then charged for the water usage on this meter for the months of May through September. No wastewater charges are billed for this meter.

Backflow Preventers

Both residential and commercial underground sprinkling systems shall have a backflow preventer installed in the main service connection to the sprinkling system that is in accordance with the MN Plumbing Code requirement.

Appendix 10

3B-7. Regulation and Enforcement

RESOLUTION ESTABLISHING LAWN WATERING RESTRICTIONS

WHEREAS, the Brainerd Public Utilities municipal water supply system may reach critical levels due to summer peak usage; and

WHEREAS, a possibility of water shortage is made more critical by hot and dry weather conditions; and

WHEREAS, lack of adequate water pressure could cause serious fire protection problems; and

WHEREAS, it has been determined that a watering ban must be implemented in order to assure the safety and well being of the residents of the City of Brainerd.

NOW, THEREFORE, BE IT RESOLVED, that the Utilities Commission of the City of Brainerd, hereby establishes restrictions for all residential, commercial and industrial users of the Utilities' water system;

1. The Superintendent of Brainerd Public Utilities shall be given the authority to implement emergency restrictions to restrict water use during emergency periods. The Superintendent of Brainerd Public Utilities shall notify municipal system users of a watering ban by publishing notice in the Brainerd Daily Dispatch and on KAWB Lakeland TV.
2. Residents with an odd house number shall water lawns or wash cars when necessary only on odd-numbered calendar days, and those with even-numbered addresses shall water lawns or wash cars only on even-numbered days. Lawns shall not be watered between the hours of 10:00 am and 6:00 pm.
3. An exception may be granted for recently established lawns. Those lawns may be watered daily for up to one month after installation, but only during the hours listed above.
4. In extreme emergency cases, the Superintendent of Brainerd Public Utilities shall have the authority to issue a total watering ban until such time that the emergency situation ceases to exist.
5. The penalty for violating the Utilities' watering ban shall be a warning for the first day of violation, a \$25.00 per day fine for the second violation, and a \$50.00 per day fine for the third violation.

Adopted by the Public Utilities Commission of the City of Brainerd, this date June 24, 2008.

ATTEST: _____

Ordinances and policies are enforced thru inspection and public education.

Water Supply Plan Checklist

All sections of the plan must be completed in order for the plan to be approved. The following checklist can be used to make sure all elements of the plan have been completed.

Part 1. Water Supply System Description and Evaluation

☐	Table 1. DNR Water Appropriation Permit Number & Utility Contact Information
☐	Table 2. Historic Water Demand (Part 1, A)
☐	Table 1. Large volume users (Part 1, A)
☐	Table 2. Water treatment capacity and treatment processes (Part 1, B)
☐	Table 3. Storage capacity, as of the end of the last calendar year (Part 1, B)) & discussion of current and future storage capacity needs
☐	Table 4. Water sources & status (Part 1, C) & discussion of limitations
☐	Table 5. Projected annual water demand (Part 1, D) & discussion of water use trends & projection method
☐	Table 6. Source water quality monitoring (Part 1, E)
☐	Table 9. Water level data (Part 1, E)
☐	Table 10. Natural resource impacts (Part 1, E)
☐	Table 11. Status of Wellhead Protection and Source Water Protection Plans (Part 1, E)
☐	Table 12. Adequacy of Water Supply System (Part 1, F)
☐	Table 13. Proposed future installations/sources (Part 1, F)
☐	Table 14. Alternative water sources (Part 1, F)
☐	Appendix 1: Well records and maintenance summaries
☐	Appendix 2: Water level monitoring plan
☐	Appendix 3: Water level graphs for each water supply well
☐	Appendix 4: Capital Improvement Plan

Part 2. Emergency Planning and Response Procedures

☐	Table 15. Emergency response plan contact information (Part 2, A) & Y/N questions
☐	Table 16. Interconnections with other water supply systems to supply water in an emergency (Part 2, C) & Y/N questions
☐	Table 17. Utilizing Surface Water as an Alternative Source (Part 2, C) & discussion of additional emergency water provisions
☐	Table 18. Water use priorities (Part 2, C)
☐	Table 19. Emergency demand reduction conditions, triggers and actions (Part 2, C)
☐	Table 20. Plan to Inform Customers Regarding Conservation Requests, Water Use Restrictions, and Suspensions (Part 2, C) & discussion of restriction authority
☐	Appendix 5: Emergency Telephone List
☐	Appendix 6: Cooperative Agreements for Emergency Services
☐	Appendix 7: Municipal Critical Water Deficiency Ordinance

Part 3. Water Conservation Plan

☐	Table 21. Implementation of previous ten-year Conservation Plan (Part 3, A) & discussion of progress and results
☐	Table 22. Short and long-term demand reduction conditions, triggers & actions (Part 3, A)
☐	Y/N & discussion of leak detection monitoring, water audits & water loss (Part 3, B)
☐	Table 23. Customer Meters (Part 3, B)
☐	Table 24. Water Source Meters (Part 3, B)
☐	Y/N & discussion of water use trends in residential GPCD (Part 3, B)
☐	Table 25. Strategies and timeframe to reduce residential per capita demand (Part 3, B)
☐	Table 26. Strategies and timeframe to reduce institutional, commercial, industrial, and agricultural and non-revenue use demand (Part 3, B)
☐	Describe trends in customer use categories (Part 3, B)
☐	Calculate ratio of maximum day demand to average day demand (Part 3, B)
☐	Table 27. Rate structures for each customer category (add additional rows as needed)
☐	Table 28. Additional strategies to Reduce Water Use & Support Wellhead Protection (Part 3, B)
☐	Discuss how you will track success (Part 3, B)
☐	Table 29. Regulations for short-term reductions in demand and long-term improvements in water efficiencies (Part 3, B)
☐	Table 30. Retrofitting programs (Part 3, B)
☐	Table 31. Current and Proposed Education Programs (Part 3, C) and discussion of future education plans
☐	Appendix 8: Graph showing annual per capita water demand for each customer category during the last ten-years
☐	Appendix 9: Water Rate Structure
☐	Appendix 10: Adopted or proposed regulations to reduce demand/improve water efficiency
☐	Appendix 11: Implementation Checklist

Part 4. Items Metropolitan Area Water Suppliers

☐	Table 32. Alternative Approaches (Part IV, D)
☐	Complete Technical Assistance question

Plan Submittal and Adoption

- ☒ Follow MPARS submission guidelines on page 1 of this document (preferred) or
 Mail to: DNR Ecological & Water Resources
 Water Permit Programs Supervisor
 500 Lafayette Road
 St. Paul, MN 55155-4032 Or e-mail to <http://www.dnr.state.mn.us/mpars/index.html>
- ☐ *(Metro communities with less than 1,000 people only)*
 Follow MPARS submission guidelines on page 1 of this document (preferred) or
 Mail to: Metropolitan Council
 Reviews Coordinator
 390 N Robert St
 St. Paul, MN 55101 Or e-mail to ReviewsCoordinator@metc.state.mn.us

January 30, 2017

City of Brainerd
Scott Magnuson
8027 Highland Scenic Rd, PO Box 373
Brainerd, MN 56401

Dear Mr. Magnuson:

RE: WATER EMERGENCY AND CONSERVATION PLAN APPROVAL, CITY OF BRAINERD, CROW WING COUNTY

Our office has completed the review of your 2016 Water Supply Plan for public water supply authorized under DNR Permit 1977-3523.

I am pleased to advise you that in accordance with Minnesota Statutes, Section 103G.291, Subdivision 3, and on behalf of the Commissioner of Natural Resources, I hereby approve your plan. The Department requires receipt of a completed copy of the attached "Certification of Adoption" form once the plan has been adopted. Please return the form to my office as soon as the City Council officially adopts the plan.

An optional administrative amendment for additional water supply and wells authorized under Permit 1977-3523 was not requested during the Water Supply Plan approval process. As such, all terms and conditions of your existing permit shall remain in effect.

Thank you for efforts in planning for the future of the City of Brainerd water supply and for conserving the water resources of the State of Minnesota. If you have any questions or need additional assistance with your water appropriation permit, please contact me, at 218-302-3249 or greg.root@state.mn.us, in our Duluth area office.

Sincerely,



Greg Root
Regional Water Appropriations Hydrologist

Cc: Mike Peloquin, Regional Hydrologist
Crow Wing County SWCD
Steve Colvin, Deputy Director
Carmelita Nelson, Water Conservation Consultant



**CERTIFICATION OF ADOPTION
WATER EMERGENCY AND CONSERVATION PLAN**

City or Water System Name:

Name of Person Authorized to Sign
Certification on Behalf of the System:

Title:

Address:

Telephone:

Fax:

E-mail:

I certify that the Water Emergency and Conservation Plan approved by the Department of Natural Resources has been adopted by the city council or utility board that has authority over water supply services.

Signed:

Date:

Fax (218/327-4263) or mail this certification to:

**DNR Ecological & Water Resources
525 Lake Ave South Suite 415
Duluth, MN 55802**

Or email to:

**greg.root@state.mn.us or
heidi.lindgren@state.mn.us**

Controls and Programs

City of Brainerd

Type of Control / Program	Program Description
City Code Chapter 4 – Building, Housing & Construction Regulations	Provides an opportunity to require performance standards to offset potential risk posed by a land use.
City Code Chapter 5 – Planning & Land Use	Includes planning, environmental review, zoning, and other regulations for land use within the city limits.
City Code Chapter 7 – Public Utilities	Sets requirements for the city sewer, water, and storm sewer utilities, and stormwater management.
City Code: https://www.ci.brainerd.mn.us/153/City-Code	

Local Agency Controls and Programs

Government Unit	Name of Control / Program	Program Description
Crow Wing County Zoning Department	Zoning Ordinance	Sets minimum standards for zoning and land use, including permitting design and construction of SSTs.
Crow Wing County Zoning Department	Planning and Zoning	Crow Wing County administers the land use in the County, outside of city limits.
Crow Wing County Zoning Department	Solid Waste Management	Crow Wing County oversees all solid waste management activities of the county, including the recycling program, licensure of private waste haulers, transportation and processing.
Crow Wing Soil and Water Conservation District (SWCD)	Well Sealing – State Cost Share Program Stormwater Projects Funding	This program is primarily intended for rural and agricultural properties. These funds can be used for well sealing.

State and Federal Agency Controls and Programs

Government Unit	Name of Control / Program	Program Description
Board of Soil and Water Resources (BWSR)	County Water Planning	Encourages counties to include WHP in water planning and provides grants for WHP-related projects.
BWSR	One Watershed One Plan (1W1P)	Provides oversight and funding opportunities to improve surface water quality assessments and implementation projects.
Environmental Protection Agency (EPA)	Underground Injection Control (SDWA) / Class 5 Wells Program	The U.S. EPA administers the Class 5 wells program. Automatic closure of Class 5 automotive waste disposal wells in WHPAs. Inventory of all Class 5 wells. Memorandum of agreement (MOA) with MDH re: Class 5 wells.
EPA	Environmental Review of Federally Funded Projects	Assess the water quality impacts of federally funded projects in WHPAs.
EPA	National Source Water Collaborative	Identify partners for supporting WHP planning and implementation.
Farm Service Agency (FSA)	Conservation Reserve Program (CRP)	Automatic sign-up of lands within 2,000 feet of a well that is within an approved WHPA.
FSA and State of Minnesota	Conservation Reserve Enhance Program (CREP)	Automatic sign-up and increased state funding for WHPAs that are located in priority geographic areas.
Minnesota Department of Agriculture (MDA)	Nutrient Management Relating to Agriculture Practices	WHPAs are priority areas for MDA staff involvement. Interagency agreements to develop tools for local wellhead teams.
Minnesota Department of Health (MDH)	State Well Code / Well Construction and Sealing (MR 4725)	MDH has authority over the construction of new wells and sealing of wells. MDH staff in the Well Management Program offers technical assistance for enforcing well construction, maintaining setback distances for certain contamination sources, and well sealing. Requires minimal construction methods and sealing of unused wells.
Minnesota Department of Labor and Industry	Minnesota Plumbing Code	Design standards for plumbing.

Government Unit	Name of Control / Program	Program Description
Minnesota Department of Natural Resources (MNDNR)	Water Appropriation Permitting (MR Chapter 6115)	DNR can require that anyone requesting an increase in existing permitted appropriations or to pump groundwater must address concerns of the impacts to drinking water if these concerns are included in a WHP plan.
MNDNR	Water Conservation Plans (MR 186)	DNR approved water conservation plan = WHP contingency plan (MR 4720)
Minnesota Department of Public Safety / Office of Pipeline Safety	Pipeline Spill Response	Recognizes DWSMA vulnerability as part of clean-up efforts.
Minnesota Department of Transportation (MNDOT)	Environmental Review of Highway Construction Projects	Recognize water quality and quantity impacts of highway projects.
Minnesota Environmental Quality Board (EQB)	Environmental Review (MR 4410)	Recognizes the vulnerability of DWSMAs in reviewing environmental documents.
Minnesota Pollution Control Agency (MPCA)	Feedlot Rules (MR 7020)	Establishes minimum state-wide standards for feedlot regulations. Setback distances and management criteria. MDH participation with training events.
MPCA	Leaking Underground Storage Tank Program (MR 7037)	MPCA administers the leaking underground storage tank program. Addresses DWSMA vulnerability when determining scope of cleanup and Petro Fund use.
MPCA	Subsurface Sewage Treatment Systems (SSTS) (MR 7080)	Regulates setback distances and plan review.
MPCA	Stormwater Management (Clean Water Act)	Design standards and setback distances.
MPCA	Clean Water Act Section 319	Provides funding to support SWP efforts through a competitive process.
U.S. Department of Agriculture (USDA)	Farm Storage Tank Program	USDA administers the farm storage tank program.

Glossary Of Terms

Data Element. A specific type of information required by the Minnesota Department of Health to prepare a wellhead protection plan.

Drinking Water Supply Management Area (DWSMA). The area, delineated using identifiable landmarks, reflects the scientifically calculated wellhead protection area boundaries as closely as possible (Minnesota Rules, part 4720.5100, subpart 13).

Drinking Water Supply Management Area Vulnerability. An assessment of the likelihood that the aquifer within the DWSMA is subject to impact from land and water uses within the wellhead protection area. It is based upon criteria that are specified under Minnesota Rules, part 4720.5210, subpart 3.

Emergency Response Area (ERA). The part of the wellhead protection area that is defined by a one-year time of travel within the aquifer that is used by the public water supply well (Minnesota Rules, part 4720.5250, subpart 3). It is used to set priorities for managing potential contamination sources within the DWSMA.

Inner Wellhead Management Zone (IWMZ). The land that is within 200 feet of a public water supply well (Minnesota Rules, part 4720.5100, subpart 19). The public water supplier must manage the IWMZ to help protect it from sources of pathogen or chemical contamination that may cause an acute health effect.

Wellhead Protection (WHP). A method of preventing well contamination by effectively managing potential contamination sources in all or a portion of the well's recharge area.

Wellhead Protection Area (WHPA). The surface and subsurface area surrounding a well or well field that supplies a public water system, through which contaminants are likely to move toward and reach the well or well field (Minnesota Statutes, section 103I.005, subdivision 24).

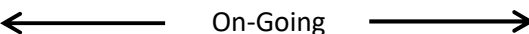
Well Vulnerability. An assessment of the likelihood that a well is at risk of human-caused contamination, either due to its construction or indicated by criteria that are specified under Minnesota Rules, part 4720.5550, subpart 2.

A. DATA COLLECTION, MONITORING AND ASSESSMENT

Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<u>WHP Measure #A1</u> <i>Groundwater Quality / Quantity Monitoring</i> Notify the MDH Hydrologist during year 6 for monitoring of the standard assessment package, which should include the primary wells and wetlands. BPU will collect samples to submit to MDH to pay for monitoring and analysis costs.	1, 5	M	Staff Time	Brainerd MDH Hydro						X				
<u>WHP Measure #A2</u> Coordinate with MDH on locating and verifying any known new wells, especially east of the Mississippi River, and within one mile of the city's public water supply wells. Well details should include well owner, depth, use, and MDH well record.	1, 5	L	Staff Time	Brainerd MDH		X		X		X		X		X
<u>WHP Measure #A3</u> Coordinate with MDH and MNDNR to identify new high-capacity wells that are proposed for construction within one mile of the DWSMA. Request MDH and MNDNR provide an objective well evaluation identifying potential impacts.	1, 5	M	Staff Time	Brainerd MDH MNDNR Well Owners			X				X			
<u>WHP Measure #A4</u> <i>Class V Wells</i> Inventory locations of potential Class V wells via direct communication with the business or landowner. Provide a Fact Sheet and reporting requirements on Class V Wells and impacts on groundwater quality. Notify MDH of any Class V wells identified within the DWSMA. Information available at: https://www.epa.gov/uic/federal-requirements-class-v-wells .	1, 5	M	Staff Time	Brainerd EPA Landowners MDH										

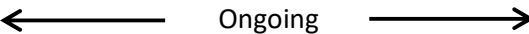
Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<u>WHP Measure #A5</u> <i>Aquifer Testing</i> The city may prepare to replace one or more of the existing wells due to infrastructure age. Work cooperatively with MDH for future well-siting, sampling, and analysis. To prepare for this, the city may consider water quality sampling of existing wells, construction of test wells, and well capacity testing to determine potential yield and suitability as a public water supply well.	1, 5	H	TBD	Brainerd MDH Hydro	← As Needed →									
<u>WHP Measure #A6</u> Coordinate with MDH, MNDNR, and/or MPCA to identify any surface-to-ground water connectivity between the public water supply wells and the adjacent wetland areas and/or other adjacent surface waters, including stormwater runoff. Apply for grant funding to perform water quality or infrastructure improvement projects as corrective measures.	1, 5	M	Staff Time	Brainerd MDH MNDNR MPCA			X				X			
<u>WHP Measure #A7</u> Investigate the integrity and construction of the older public water supply wells to make sure they are not serving as potential contaminant pathways. This could include scoping, televising, and other assessment methods.	1, 5	H	TBD	Brainerd MDH	← As Needed →									

B. POTENTIAL CONTAMINANT SOURCE MANAGEMENT

Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<u>WHP Measure #B1</u> <i>Potential Contaminant Source Inventory</i> Update the PCSI, as needed, with a complete update during year six. Review status of existing potential contaminants and add any new ones identified within the DWSMA.	2, 6	M	Staff Time	Brainerd MDA MDH MRWA						X				
<u>WHP Measure #B2</u> <i>Unlocated-Unsealed Wells</i> Seal unlocated-unsealed or abandoned wells. Promote local abandonment and sealing of these wells within the DWSMA. The city may assist in finding funding sources for the homeowners. Wells in the Emergency Response Area are the priority.	2	M	TBD	Brainerd Crow Wing County MDH Well Owners										
<u>WHP Measure #B3</u> <i>Old Municipal Well Report</i> Review the OMWR and work with MDH to identify, locate, and seal any wells identified in this report.	2, 5	M	TBD	Brainerd MDH			X	X						
<u>WHP Measure #B4</u> <i>Inner Well Management Zone</i> Review and update the IWMZ survey and monitor setbacks for all public water supply (PWS) wells every 5 years. Perform any necessary corrective measures.	2, 5	M	Staff Time	Brainerd MDH				X					X	
<u>WHP Measure #B5</u> <i>Emergency Response Plan</i> Continue coordination between the city and local and county emergency responders to review the DWSMA Emergency Response Area as a high priority for response efforts. Identify training opportunities and equipment needs to improve response time and effectiveness.	3, 5	H	Staff Time	Brainerd Brainerd Fire Dept City of Baxter Crow Wing County		X					X			

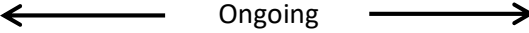
Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame										
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	
<u>WHP Measure #B6</u> <i>Hazardous Materials</i> Conduct a survey to identify the current status of storage tanks, leak sites, and other MPCA-regulated permit locations within the moderate and high vulnerability areas of the DWSMA. Tanks within the ERA are the priority. Request MPCA assistance to help conduct this survey and apply for funds to facilitate corrective actions.	2	H	Staff Time / Special Studies (if needed)	Brainerd MDH MPCA				X						X	
<u>WHP Measure #B7</u> <i>Transportation Corridors</i> Coordinate with MnDOT, MDH, and contractors to address impacts of construction along transportation corridors within the moderate and high vulnerability areas of the DWSMA (GWCA and SWCA) to minimize chances of future contamination.	2, 5	H	Staff Time	Brainerd MnDOT MDH	 As Needed										
<u>WHP Measure #B8</u> <i>City Infrastructure</i> Continue to evaluate water, sanitary and stormwater systems to identify components that have a potential to contaminate the water system. Make recommendations to the City Council as part of the Capital Improvement Plan to repair or replace failing infrastructure. The parts of the system within the ERA are the priority.	2	L	Staff Time	Brainerd WHP Team			X			X				X	
<u>WHP Measure #B9</u> Evaluate and identify PFAS/PFOS and other potential contaminants of concern (lead, copper, etc.) that may enter the water supply system and how to mitigate these concerns.	2, 5	M	TBD	Brainerd MDH MPCA	 As Needed										

C. ADMINISTRATIVE CONTROLS AND GUIDELINES

Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<u>WHP Measure #C1</u> <i>Municipal Policy</i> Incorporate recognition of WHP and DWSMA in future updates of City Comprehensive Plan, Economic Development Plan, City Zoning and Ordinances, and other administrative controls. This may include a city well ordinance.	3	M	Staff Time	Brainerd MDH MRWA		X				X				X
<u>WHP Measure #C2</u> <i>Conservation Guidelines</i> Explore opportunities to promote water conservation measures and codify these in updated plans, policies, and education/outreach materials and programs.	3, 4	M	TBD	Brainerd WHP Team		X			X			X		
<u>WHP Measure #C3</u> <i>City Codes and Permits</i> Review and enforce applicable City Code and permits for public utilities and Minnesota Plumbing Code 4715.1920 banning cross connections, preventing contamination of city water via private wells. This may reduce the likelihood that pumping of other wells will impact contaminant movement to the city wells.	3	H	Staff Time	Brainerd										
<u>WHP Measure #C4</u> <i>Land Use, Zoning, and City Code</i> Identify and document any land use or zoning changes within the DWSMA (prioritize the ERA) that may affect the drinking water supply. Update land use, zoning, and city code as needed and address these changes in future comprehensive planning documents.	1, 2	M	Staff Time	Brainerd MDH WHP Team										

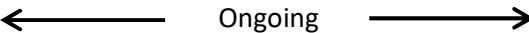
Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<u>WHP Measuer #C5</u> Work cooperatively with local, state, and federal agencies to provide long-term protection on vulnerable lands within the DWSMA.	2, 3	M	Staff Time	Brainerd BWSR Crow Wing County MDH MPCA MRWA	← As Needed →									
<u>WHP Measure #C6</u> <i>New Wells</i> Coordinate with city staff to identify new wells drilled within the city limits.	2, 3	H	Staff Time	Brainerd Crow Wing County MDH WHP Team	← Ongoing →									
<u>WHP Measure #C7</u> <i>Best Management Practices</i> Provide Best Management Practices (BMPs) information for all land-use operations within the DWSMA. The city will work with city departments, businesses and residents to improve awareness, reduce use of fertilizers/chemicals, and address other nonpoint source pollutants.	3, 4	L	TBD	Brainerd Crow Wing County SWCD MRWA WHP Team	← Ongoing →									
<u>WHP Measure #C8</u> <i>Emergency Response, Physical and Cyber Security</i> Evaluate and document the city's emergency response operations. Assess and improve physical and cyber security and backup power options for the city wells and water system.	2, 3, 6	H	Staff Time / TBD	Brainerd MDH MRWA WHP Team			X					X		

D. PUBLIC EDUCATION AND OUTREACH

Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<u>WHP Measure #D1</u> Develop and release periodic WHP educational materials to residents via newsletters, bill stuffers, and social media platforms. Provide public information explaining the WHPP and its purpose, especially to citizens served by the public water supply system.	2, 4	M	Staff Time	Brainerd Local Media MRWA		X			X			X		
<u>WHP Measure #D2</u> Coordinate with MPCA to provide educational materials directly to hazardous waste and solid waste permit holders. Direct landowners to household hazardous waste collection held by Crow Wing County Solid Waste Disposal Site.	2, 4	M	Staff Time	Brainerd Crow Wing County MPCA WHP Team			X		X		X		X	
<u>WHP Measure #D3</u> Maintain communication with Crow Wing County and adjoining townships to ensure that concerns regarding city water supply protection are addressed in local land-use decisions, including comprehensive land use plan, zoning ordinances, and other plan updates.	2, 3	H	Staff Time	Brainerd City of Baxter Crow Wing County Townships WHP Team										
<u>WHP Measure #D4</u> City staff will distribute MDH and/or MRWA brochures describing proper well maintenance and operation to private landowners within the DWSMA.	4	M	Staff Time	Brainerd MDH MRWA WHP Team		X			X			X		

Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<u>WHP Measure #D5</u> Provide information regarding effective road salt use to citizens, either by informational brochure, posting on the City website, or in the news or social media posts. Encourage less use of salt or a less damaging salt alternative. Provide MPCA Smart Salting training to the City's street maintenance staff.	2, 4	M	Staff Time / Marketing Costs	Brainerd Local Media MPCA MRWA	X			X			X			X
<u>WHP Measure #D6</u> Provide information about PFAS/PFOS and other potential contaminants as future treatment or mitigation efforts are identified.	2, 4, 5	M	Staff Time	Brainerd MDH MPCA		X			X			X		

E. WHP COORDINATION, REPORTING AND EVALUATION

Description	Objective	Priority	Cost	Responsible Party & Cooperators	Implementation Time Frame									
					2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
<u>WHP Measure #E1</u> <i>Water Use Management</i> Review and update the Emergency / Contingency Strategy Plan portion of the City's WHP plan every 2.5 years to ensure it reflects any changes in the water supply system.	3, 6	M	Staff Time	Brainerd WHP Team			X			X		X		X
<u>WHP Measure #E2</u> <i>WHP Coordination</i> Coordinate a meeting with the WHP team annually. Discuss funding needs and pursuit of SWP Grant funds to help implement activities identified in the WHP Plan.	5, 6	H	Staff Time	Brainerd MDH MRWA WHP Team	X	X	X	X	X	X	X	X	X	X
<u>WHP Measure #E3</u> <i>Implementation Tracking and Reporting Activities</i> Maintain a "WHP folder" that contains documentation of annual WHP activities and dates completed.	6	H	Staff Time	Brainerd WHP Team	X	X	X	X	X	X	X	X	X	X
<u>WHP Measure #E4</u> Develop a spreadsheet that monitors plan implementation activities and completion dates.	6	H	Staff Time	Brainerd WHP Team										
<u>WHP Measure #E5</u> <i>WHP Program Evaluation Plan Reporting</i> Complete an Evaluation Report every 2.5 years that evaluates the "progress of plan of action and the impact of any contaminant release on the aquifer supplying the public water supply well" MN WHP Rule 4720.5270.	6	H	Staff Time	Brainerd MDH MRWA			X			X		X		X
<u>WHP Measure #E6</u> Summarize WHP Plan implementation efforts in a report to MDH in the year 8.	5, 6	M	Staff Time	Brainerd MDH MRWA								X		



Protecting, Maintaining and Improving the Health of All Minnesotans

Old Municipal Well Report for Brainerd

PWSID: 1180002

MDH

April 2019



Minnesota Department of Health

Environmental Health in Minnesota

MDH Public Water Supply Sources Report

PWSID: [1180002](#)

PWS Name: **Brainerd**

PWS Type: **Community**

PWS Status: **Active**

Public Water Supply Sources: Information from MNDWIS and CWI (sorted by Sample Point ID)

Source Type Codes: **GW** = Ground water; **SW** = Surface water; **GUI** = Ground water under influence

Location Source: **MGS** = digitized by the MN Geological Survey; * indicates incomplete records

O* = duplicate in Old Municipal Well Data; **R*** = duplicate in MNDWIS PWS Sources Removed from Flow; **S*** = duplicate in MNDWIS PWS Sources in Flow;

MNDWIS PWS SOURCES IN FLOW														
Source Info							MNDWIS Data				CWI Data			
Sample Point ID	Name	Type	Availability	Status	Well No. (link to Well Log (s))	Location Info (link to Map)	Drill Year	Depth (in feet)	Case Depth (in feet)	Case Diam. (in inches)	Drill Date	Depth Completed (in feet)	Case Depth (in feet)	Case Diam. (in inches)
S01	Well #3	GW	Primary	Active	232347 O*	05/12/1999 (T. Johnson)	1939	125	73	16	00-00-1939	125	73	16
S02	Well #4	GW	Primary	Active	232348 O*	07/27/2010 (G. Haglund)	1944	123	73	16	00-00-1944	123	73	16
S03	Well #5	GW	Primary	Active	232349 O*	07/27/2010 (G. Haglund)	1947	145	105	16	00-00-1947	145	105	16
S04	Well #6	GW	Primary	Active	232350 O*	07/27/2010 (G. Haglund)	1947	156	107	16	00-00-1947	156	107	16
S05	Well #7	GW	Primary	Active	232352 O*	07/27/2010 (G. Haglund)	1955	157	88	20	08-26-1955	157	88	0
S06	Well #8	GW	Primary	Active	403973 O*	07/27/2010 (G. Haglund)	1984	187	144	16	09-13-1984	187	144	16

MNDWIS and CWI data value discrepancies in preceding tables are shown in **RED** (0 or null values excepted).

Old Municipal Wells

The following tables show information on wells whose existence (or previous existence) has not yet been confirmed.

OLD MUNICIPAL Well Data													
Well Search Reference	Name(s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
Well A	Mississippi River												
Well B			91			8	Before 1912						Well group No. 1
Well C			91			8	Before 1921						Well group No. 1
Well D			91			8	Before 1921						Well group No. 1
Well E			91			9	Before 1921						Well group No. 1
Well F			72			8	Before 1921						Well group No. 2

OLD MUNICIPAL Well Data													
Well Search Reference	Name(s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
Well G			72			8	Before 1921						Well group No. 2
Well H			72			8	Before 1921						Well group No. 2
Well I			105			5	Before 1921						Well group No. 2
Well J			94			5	Before 1921						Well group No. 1
Well K			94			5	Before 1921						Well group No. 1
Well L			94			8	Before 1921						Well group No. 1
Well M			94			8	Before 1921						Well group No. 1
Well N			94			8	Before 1921						Well group No. 1
Well O			94			8	Before 1921						Well group No. 1
Well P	Dug Well No. 1		28				Before 1928	Dug					
Well Q	Dug Well No. 2		22				Before 1928	Dug				North and east of the main pumping station	
Well R	Well No. 1		104			24	1939					400 ft south of the main pump station. Flood plane of Mississippi River in the SW part of the city. Woodland Park Addition.	
Well S	Well No. 2		120				1939					Flood plane of Mississippi River in the SW part of the city. Woodland Park Addition. West of the main pump station	Inside of an old dug well
Well T	Well No. 3	232347 S*	120			16	1938					Flood plane of Mississippi River in the SW part of the city. Woodland Park	Active

OLD MUNICIPAL Well Data													
Well Search Reference	Name(s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
												Addition. South side of the main pump station and about half way between it and Well No. 1	
Well U	Well No. 4	232348 S*	120		120	16	1944						Active
Well V	Well No. 5	232349 S*	150			16	1947						Active
Well W	Well No. 6	232350 S*	145			16	1947						Active
Well X	Well No. 7	232352 S*	150			20	1955					200 ft south of Well No. 5	Active
Databases Searched					Remarks								
County Well Index (1-mile radius); MDH DWP Microfiche; MDH 1988-2002 Muni Well Inventory (1Suite); Biennial Report of the MN State Dairy and Food Commissioner-1907; Minnesota Geological Survey City Well File Folders; MGS Bulletin (22, 27, 31, or 32); MDH DWP MNDWIS; MN Historical Soc.- Fire Underwriters Insp. Bureau (Fisher) historical map ; Sanborn Fire Insurance Maps; MDH WELLS													
Old Municipal Well Data Compiled By: Mara Boulanger Compiled Date: 4/19/2019 2:47:55 PM													

OLD MUNICIPAL Well Data - the following data are from RAW HYDRO spreadsheets, and need to be processed accordingly.													
Well Search Reference	Name (s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
1			91 feet			8 inch	1921	Drilled	1939			*at the pumping station	
2			91 feet			8 inch	1921	Drilled	1939			*at the pumping station	
3			91 feet			8 inch	1921	Drilled	1939			*at the pumping station	
4			91 feet			8 inch	1921	Drilled	1939			*at the pumping station	
5			1921: 70 feet 1930: 72 feet		0-58 feet	8 inch	1921	Drilled	1939			*at the pumping station	
6			1921: 70 feet 1930: 72 feet		0-58 feet	8 inch	1921	Drilled	1939			*at the pumping station	
7			1921: 70 feet 1930: 72 feet		0-58 feet	8 inch	1921	Drilled	1939			*at the pumping station	
8						5 inch	1921	Drilled	1939				

OLD MUNICIPAL Well Data - the following data are from RAW HYDRO spreadsheets, and need to be processed accordingly.													
Well Search Reference	Name (s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
			105 feet		0-69 feet							*at the pumping station	
9			94 feet		0-74 feet	5 inch	1921	Drilled	1939			*at the pumping station	
10			95 feet		0-74 feet	5 inch	1921	Drilled	1939			*at the pumping station	
11			96 feet		0-74 feet	8 inch	1921	Drilled	1939			*at the pumping station	
12			97 feet		0-74 feet	8 inch	1921	Drilled	1939			*at the pumping station	
13			98 feet		0-74 feet	8 inch	1921	Drilled	1939			*at the pumping station	
14			99 feet		0-74 feet	8 inch	1921	Drilled	1939			*at the pumping station	
15			28 feet			40 feet	1930	Dug	1939			*at the pumping station	
16	Open Well #2		1930: 22 feet 1939: 30 feet			40 feet	1930	Dug	1939			*Vacated portion of Woodland Park Addition *Southwest portion of the city on the Mississippi flood plains * North and East of the main pumping station	
17	Well No. 1		104 feet			24 inch	1939	Drilled	1939			*Vacated portion of Woodland Park Addition *Southwest portion of the city on the Mississippi flood plains *400 feet south of the main pumpstation	
18	Well No. 2		120 feet				1939	Drilled	1939			*Vacated portion of Woodland Park Addition *Southwest portion of the city on the Mississippi	

OLD MUNICIPAL Well Data - the following data are from RAW HYDRO spreadsheets, and need to be processed accordingly.													
Well Search Reference	Name (s)	Unique Well Number	Drilled Depth (ft.)	Completed Depth (ft.)	Depth Cased (ft.)	Casing Diameter (in.)	Year Constructed	Construction Type	Year Out of Service	Sealing Record?	Year Sealed	Location Info	Comments
												flood plains *Drilled inside of an old dug well	
19	Well No. 3 (STILL IN USE)	232347 S*											
20	Well No. 4 (STILL IN USE)	232348 S*											
21	Well No. 5 (STILL IN USE)	232349 S*											
22	Well No. 6 (STILL IN USE)	232350 S*											
23	Well No. 7 (STILL IN USE)	403973 S*											
Databases Searched					Remarks								
Old Municipal Well Data Compiled By: Jim Walsh Compiled Date: 6/27/2005													

Source: MN Dep't. of Health - 4/19/2019

Use of MDH Public Water Supply Sources Report

The report you have received shows three classes of Public Water Supply wells:

- In Use (actively used)
- Removed From Flow (for back-up or emergency use; may be disconnected from PWS)
- **Old Municipal Wells (unused wells with no documented location, unique ID number, and/or well sealing record)**

Old Municipal Wells are unsealed, abandoned wells. These wells pose a risk of contamination to existing wells and aquifers. According to State Well Code and under the terms of your Wellhead Protection Plan, your PWS may need to identify, locate, and properly seal Old Municipal Wells within your Drinking Water Supply Management Area, to current MDH standards. While historical records may indicate that some of these wells were "capped", "abandoned", or "sealed" in the past, unless it can be shown that the sealing was performed to current standards, they may need to be located, cleaned out, and sealed properly with a well sealing record issued.

The report lists database references that were searched to compile the report. Under "Remarks" are notes and questions to help you with this process. State grant funding is available to help fund sealing of these old public water supply wells.

If you have questions, please talk to your MDH Planner or Hydrologist to address your PWS's specific issues. This report is not intended to be the "last word" on the status of Old Municipal Wells and your input will be critical in successfully finding and sealing these potential sources of contamination.

Restart

Brainerd

3/29/17

to

~~12/27/85~~

7/27/83

MINNESOTA STATE BOARD OF HEALTH
Division of Sanitation
REPORT ON WATER SUPPLY AT BRAINERD
March 29, 1917

Well A The public water supply is obtained from the Mississippi River and disinfected with liquid chlorine before being distributed to the consumers. Data relating to the system are contained in the reports of previous investigations by this Division. The last investigation was made on June 3, 1916. In the report of that investigation, attention was called to the fact that a liquid chlorine control device had been installed to replace the previous treatment with calcium hypochlorite. Owing to a scant supply of liquid chlorine, however, the hypochlorite treatment was again being used at that time.

The present investigation was undertaken to check up the liquid chlorine treatment as now being applied. It was found that some trouble is experienced with the chlorine meter, owing to the collection of moisture around the float indicator. A rough estimate is being kept of the supply of chemical that is used. A drum of approximately 100 pounds of chlorine is said to be consumed every seven days. This amounts to about 14 pounds of chlorine being applied to an average daily water pumpage of approximately 1,900,000 gallons. This rate of chemical addition results in an amount equal to .98 P. P. M. (parts per million) of chlorine entering the supply at this time. In order that the operation of the disinfecting treatment may be maintained on a better basis, it is suggested that a set of scales be obtained for weighing the chlorine drum at 12 hour intervals during the day, and that record sheet be maintained in the pumping station

MINNESOTA STATE BOARD OF HEALTH
Division of Sanitation
REPORT ON WATER SUPPLY OF BRAINERD.
May 24, 1921.

This water supply is obtained from fourteen drilled wells.

These wells are independently located in three groups.

Well B & C & D & E One of these groups consists of four, eight inch wells which have been drilled to a depth of ninety-one feet. The soil formation is sand and gravel. A fifteen foot screen is used on each of these wells.

Well F & G & H Three of the four wells in another group are seventy-two feet in depth and cased with eight inch pipe. The screens on these wells are twelve feet in length. **Well I** The fourth well of this group is 105 feet in depth and is cased with five inch pipe and equipped with a thirty-six foot screen.

Well J & K The third group of wells consists of two, five inch casings and four, eight inch casings which have been drilled to a depth of ninety-four feet. These wells have been drilled from the bottom of a deep well which is itself twenty-eight feet in depth. Screens on these wells are twenty feet in length.

Complete plans of this water supply system are on file with the Division of Sanitation of the State Board of Health (File H-7)

At the time of this investigation one of the ejector pumps installed for the purpose of removing waste water from the pump pit at the group two wells, was not in operation on account of the burning out, a few days previous, of the motor. A new motor has since been installed.

MINNESOTA DEPARTMENT OF HEALTH
Division of Sanitation
REPORT ON THE WATER SUPPLY OF BRAINERD, MINNESOTA
July 31, 1928

This water supply is obtained from fourteen drilled wells in two groups Well B - O and Well P & O and two dug wells all located in the vicinity of the pumping station. The water is pumped to a low receiving concrete reservoir and from there to an elevated concrete tank from which it is distributed for public consumption. Data relative to this supply are contained in the reports of previous investigations made by this Division. This supply was last investigated on March 22, 1927. No changes have been made in the system which would affect the sanitary aspect of the supply, since that time. From a sanitary point of view, the supply is satisfactory.

Analytical Data: (See analytical sheet attached). Samples nos. 29535 to 29539, inclusive, represent water collected from the wells, pumping station, and various points on the distribution system. The bacteriological examination of these samples shows the water to be of good sanitary quality as evidenced by the very low bacterial counts and by the absence of organisms of the B. coli group in 50 c. c. amounts in all samples.

Conclusion.

The field survey showed conditions which were satisfactory from a sanitary point of view, and in the analytical results, indications of contamination were not found on this date. This water supply may be considered safe for public consumption with the usual reservations as stated on the attached sheet entitled "Information Relative to Cross Connections Between Safe and Unsafe, or Questionable Water Supplies".

J. E. Brownell
Sanitary Engineer

Approved: *W. H. Pittman*
Director

JG

MINNESOTA DEPARTMENT OF HEALTH
Division of Sanitation

Report On Water Supply Of Brainerd, Minn.
October 7th, 1929

This supply is obtained from fourteen drilled wells in two groups, and two dug wells all located in the vicinity of the pumping station. Water is pumped to a low receiving concrete reservoir and from there to an elevated concrete tank located in the business section of town, from which it is distributed for public consumption. Data relative to this supply are contained in reports of previous investigations made by this Division. This supply was last investigated on July 31, 1928. No changes have been made in the system which would affect the sanitary aspect since that time.

Analytical Data: (See attached sheet) Samples Nos. 31812, 31813 and 31814 represent water collected from the pump station and various points on the distribution system. The bacteriological examination of these samples showed the water to be of good sanitary quality as evidenced by the very low bacterial counts and the absence of organisms of the coli aerogenes group in 50 c.c. amounts.

Conclusion

The field survey showed conditions which were satisfactory from a sanitary point of view and in the analytical results indications of contamination were not found on this date. This water supply may be considered safe for public consumption with the usual reservations stated on the attached sheet entitled "Information Relative to Cross Connections Between Safe and Unsafe, or Questionable Water Supplies".

Approved: _____

Director

J. H. Rogers
Sanitary Engineer

EG

MINNESOTA DEPARTMENT OF HEALTH
Division of Sanitation

Report on Water Supply of Brainerd, Minn.
May 3rd, 1930

This water supply is obtained from two groups of fourteen drilled wells and two dug wells, all located in the vicinity of the pump station. The water is pumped to a low receiving concrete reservoir of 800,000 gallons capacity, and from there into the distribution system. The overflow accumulates in an elevated concrete tank of 300,000 gallons capacity. Data concerning the wells are contained in the following table:

	No.	Casing:	Diam.:	Depth:
Well B - E & J - O				
Well Group No. 1	4	8-inch		91 ft.
	2	5-inch		94 ft.
	4	2-inch		94 ft.
Well F - I				
Well Group No. 2	3	8-inch		72 ft.
	1	5-inch		105 ft. (closed)
Well P				
Dug Well No. 1			40 ft.	28 ft.
Well Q				
Dug Well No. 2			40 ft.	22 ft.

Well groups Nos. 1 and 2 are equipped with motor-driven vertical centrifugal pumps with pumping capacities of 275 and 121 gallons-per-minute, respectively. The dug wells are equipped with motor-driven vertical turbines, No. 1 having a pumping capacity of 1,377 gallons-per-minute, and No. 2 having a capacity of 780 gallons-per-minute. There are also two motor-driven centrifugal service pumps in the station, each of 1,000 gallons-per-minute capacity, and two motor-driven centrifugal fire pumps having capacities of 1,000 gallons-per-minute each.

The distribution system consists of about 30.5 miles of water mains which supply water to 2,130 service connections and 125 fire hydrants. The average daily consumption of water is 700,000 gallons; a maximum of 1,000,000 gallons is reached in the summer time.

MINNESOTA DEPARTMENT OF HEALTH
Division of Sanitation

Report on the Investigation of the Water Supply of
Brainerd, Minnesota
October 12, 1939

This water supply is obtained from four wells situated along the edge of the Mississippi Valley in the southwestern part of the city. Before being distributed for consumption, the water is treated for the removal of iron and manganese by aeration, contact with a catalytic bed, a coke bed and rapid sand filtration. The water from the plant discharges to a concrete reservoir. The water is pumped from this reservoir into the distribution system. The overflow from the distribution system collects in an elevated concrete tank.

Location of Source:

The wells are situated in the vacated portion of Woodland Park Addition. This addition is in the southwestern part of the city and wells are situated on a flood plain of the Mississippi River. A portion of this site has been flooded during high water level in the river. Filling operations are in progress to minimize the danger of flooding in the vicinity of the wells.

Wells, Pumps and Pumpstations:

Well R Well No. 1 is situated about 400 feet south of the main pumpstation. The well is 104 feet deep and is provided with a 24-inch iron casing. Water is drawn from the well by means of a deep-well pump of the turbine type which has a capacity of 1100 gallons per minute. The pumpstation floor is situated entirely above ground.

Well S Well No. 2 is a drilled well 120 feet deep and is inside of an old dug well. This well is situated just west of the main pumpstation. The dug well thus forms a pit around the drilled well. The dug well receives roof drainage from the pumphouse and the waste water from the pumpbase. There are two sewer lines which pass close to this well. One line which carries sanitary sewage from the toilet in the pumpstation is about three feet south of the old

dug well. The floor drainage from the main pumpstation is carried in a vitrified tile sewer just north of the dug well around the drilled well. Water is drawn from the drilled well by means of a deep-well pump of the turbine type which has a capacity of 1100 gallons per minute.

Well T Well No. 3 is situated south of the main pumpstation and about half-way between it and well No. 1. This well is 120 feet deep and is of the gravel packed type of construction. Water is drawn from this well by means of a deep-well pump of the turbine type which has a capacity of 1100 gallons per minute.

Well Q The fourth well is referred to as old open well No. 2 and is no longer used regularly, although it is considered as an emergency supply. This well is situated north and east of the main pumping station. This is a dug well about 30 feet deep and 40 feet in diameter. The well curbing and cover is constructed of reinforced concrete. Water is drawn from this well by means of a vertical centrifugal pump which has a capacity of 700 gallons per minute.

The main pumpstation houses the booster pumps which draw water from the low receiving reservoir and discharge it into the distribution system. There are four pumps of the horizontal centrifugal type and each has a capacity of 1000 gallons per minute. The pumpstation floor is situated above ground but the suction piping is laid in channels below the pumproom floor and they are therefore subject to flooding.

Treatment Plant:

Water from the various wells is discharged to a treatment plant which is designed to remove iron and manganese from the water. In the first unit of the treatment the water flows upward through a catalytic contact bed of pyrolusite ore. The effluent from the catalytic bed flows onto aerator pans. These pans or trays have numerous holes drilled through the bottom and water flows through.

MINNESOTA DEPARTMENT OF HEALTH
Division of Sanitation

Sanitation Rating of Brainerd Water Supply

Owner Municipal Date Aug. 31, 1944

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Bacteriological safety)	30	23		
Adequacy of treatment)				
Physical quality	2	2		
Chemical quality	4	3		
Biological quality	2	2		
Adequacy of quantity	2	2		
Sub-total	40			
Penalty deducted	0			
Total	40	32	40	
(B) Prime Moving Equipment				
Well or intake	8	7		
Pumps	7	7		
Piping arrangement	5	2		
Reservoirs	7	7		
Equipment housing	3	2		
Sub-total	30			
Penalty deducted	0			
Total	30	25	27	
(C) Distribution System				
Street mains	5	2		
Building services	2	2		
Plumbing	3	3		
Hydrants	1	1		
Storage	4	4		
Pressure	2	2		
Tap-water quality	3	3		
Sub-total	20			
Penalty deducted	0			
Total	20	17	18	
(D) Operation and Operators				
Control of plant	5	4		
Condition of plant	3	2		
Training and experience	2	1		
Sub-total	10			
Penalty deducted	0			
Total	10	7	9	
GRAND TOTAL AND RATING	100	63	94	

Grade A: Ratings from 90 and upward. Indicates a high degree of safety.

Grade B: Ratings from 80 to 90. Indicates a reasonable degree of protection

Grade C: Ratings from 70 to 80. Indicates that there are serious hazards in the supply that demand attention. Any grade below "C" portrays a dangerous condition of the supply from which serious consequences can develop. Emergency measures for immediate

protection of the supply are recommended under these circumstances and prompt action should be taken to provide a permanent remedy of the defects.

MINNESOTA DEPARTMENT OF HEALTH
Division of Sanitation

Report on Investigation of Water Supply
at Brainerd, Minnesota
August 28, 1945

The public water supply for this city is obtained from three drilled wells. The water from two wells is passed through a treatment plant which removes manganese by means of a catalytic contact bed and iron by means of aeration and filtration through sand. The treated water flows into a low level reservoir from which it is pumped to the distribution system while the overflow collects in an elevated concrete tank. Water from the third well generally by-passes the treatment plant.

Previous Investigation:

Data relative to this supply are contained in the reports of previous investigations made by this Division. The last investigation was undertaken August 31, 1944 at which time the sanitary aspect of the supply was considered unsatisfactory.

Well U In 1944 a new well was constructed to replace the old No. 4 well. This well is drilled to a depth of 120 feet and is cased with 16-inch iron pipe throughout its entire depth. A 48-foot screen is provided. The well is gravel packed and has an outer casing 24-inches in diameter. Water is drawn from the well by means of a vertical turbine pump having a rated capacity of 1,000 gallons per minute.

Summary of Sanitary Defects:

1. The suction piping in the main pumping station lies in channels below the pumproom floor which are subject to flooding.
2. The sanitary and waste-water sewers from the pumping station lie too close to well No. 2.
3. The fill west of the new well No. 4 permits marsh water to approach too close to the well.

MINNESOTA DEPARTMENT OF HEALTH
Division of Sanitation

Sanitation Rating of Brainerd Water Supply

Owner Municipality Date August 28, 1945

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Bacteriological safety)				
Adequacy of treatment)	30	21		
Physical quality	2	2		
Chemical quality	4	3		
Biological quality	2	2		
Adequacy of quantity	2	2		
Sub-total	40			
Penalty deducted	0			
Total	40	30	40	
(B) Prime Moving Equipment				
Well or intake	8	7		
Pumps	7	7		
Piping arrangement	5	2		
Reservoirs	7	7		
Equipment housing	3	2		
Sub-total	30			
Penalty deducted	0			
Total	30	25	27	
(C) Distribution System				
Street mains	5	2		
Building services	2	2		
Plumbing	3	3		
Hydrants	1	1		
Storage	4	4		
Pressure	2	2		
Tap-water quality	3	3		
Sub-total	20			
Penalty deducted	0			
Total	20	17	18	
(D) Operation and Operators				
Control of plant	5	4		
Condition of plant	3	2		
Training and experience	2	1		
Sub-total	10			
Penalty deducted	0			
Total	10	7	9	
GRAND TOTAL AND RATING	100	79	94	

Grade A: Ratings from 90 and upward. Indicates a high degree of safety.

Grade B: Ratings from 80 to 90. Indicates a reasonable degree of protection

Grade C: Ratings from 70 to 80. Indicates that there are serious hazards in the supply that demand attention. Any grade below "C" portrays a dangerous condition of the supply from which serious consequences can develop. Emergency measures for immediate protection of the supply are recommended under these circumstances and prompt action

MINNESOTA DEPARTMENT OF HEALTH
Division of Sanitation

Sanitation Rating of Municipal Water Supply

Owner Brainerd Date December 19, 1946

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Bacteriological safety)				
Adequacy of treatment)	30	20		
Physical quality	2	2		
Chemical quality	4	3		
Biological quality	2	2		
Adequacy of quantity	2	2		
Sub-total	40			
Hazard adjustment factor deducted	0			
Total	40	29		
(B) Prime Moving Equipment				
Well or intake	8	7		
Pumps	7	5		
Piping arrangement	5	4		
Reservoirs	7	5		
Equipment housing	3	2		
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	23		
(C) Distribution System				
Street mains	5	3		
Building services	2	2		
Plumbing	3	3		
Hydrants	1	1		
Storage	4	4		
Pressure	2	2		
Tap-water quality	3	3		
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	18		
(D) Operation and Operators				
Control of plant	5	4		
Condition of plant	3	2		
Training and experience	2	1		
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	6		
GRAND TOTAL AND RATING	100	76		

Grade A: Ratings from 90 and upward. Indicates a high degree of safety.

Grade B: Ratings from 80 to 90. Indicates a reasonable degree of protection

Grade C: Ratings from 70 to 80. Indicates that there are serious hazards in the supply that demand attention. Any grade below "C" portrays a dangerous condition of the supply from which serious consequences can develop. Emergency measures for immediate protection of the supply are recommended under these circumstances and prompt action

MINNESOTA DEPARTMENT OF HEALTH
Division of Water Supply and Plumbing

Sanitation Rating of Municipal Water Supply

Owner Brainerd Date November 25, 1947

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Bacteriological safety)				
Adequacy of treatment)	30	22	30	1a
Physical quality	2	2	2	
Chemical quality	4	3	4	Softening
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	31	40	
Hazard adjustment factor deducted	0	2	0	5
Total	40	29	40	
(B) Prime Moving Equipment				
Well or intake	8	7	8	3a
Pumps	7	6	7	2a, 3a
Piping arrangement	5	4	5	4
Reservoirs	7	7	7	
Equipment housing	3	2	3	1b, 2b
Sub-total	30	26	30	
Hazard adjustment factor deducted	0			
Total	30	26	30	
(C) Distribution System				
Street mains	5	3	4	6,7
Building services	2	1½	1½	
Plumbing	3	1½	2½	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap-water quality	3	3	3	
Sub-total	20	16	18	
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	5	4	4	
Condition of system	3	2	2	
Training and experience	2	1	1	
Sub-total	10	7	7	
Hazard adjustment factor deducted	0			
Total	10	7	7	
GRAND TOTAL AND RATING	100	78	95	

Grade A: Ratings from 90 and upward. Indicates a high degree of safety.

Grade B: Ratings from 80 to 90. Indicates a reasonable degree of protection.

Grade C: Ratings from 70 to 80. Indicates that there are serious hazards in the supply that

demand attention. Any grade below "C" portrays a dangerous condition of the supply

from which serious consequences can develop. Emergency measures for immediate

protection of the supply are recommended under these circumstances and prompt action

MINNESOTA DEPARTMENT OF HEALTH
Division of Municipal Water Supply

Report on Water Supply of
Brainerd, Minnesota
September 13, 1948

1. Ownership - Municipal
2. Date of Last Investigation - November 25, 1947
3. Changes Since Last Investigation -

a. A duplicate water treatment plant for the removal of iron and manganese has been completed but not as yet placed in service.

Well V & W Wells No. 5 and 6 have been installed. However, the pumps, connecting main, and housing have not been made to date.

4. Analytical Data -

Samples Nos. 93190, 93191, 93192, 93193, and 93194 represent water collected from well No. 2 and from various points on the distribution system. The bacteriological examination of these samples showed the water to be of good sanitary quality as evidenced by the fact that organisms of the coliform group were not found in 100 ml. portions of the samples examined.

The physical examination of sample No. 93223 showed a water with very low turbidity and very low color. The chemical examination showed a hard water with a trace of iron content. Manganese was not found.

5. Recommendations -

1. Well No. 2

a. The waste-water and sanitary sewers should be relocated at least forty feet from well No. 2 when constructed of extra heavy cast-iron pipe with tested water-tight joints. Sanitary wastes should not be discharged to the river without proper treatment. See paragraph 408-C of Section IV of the Manual of Water Supply Sanitation.

b. The door of the well house should be rehung to open outward to facilitate rapid drainage in case of accidental flooding of the pump-

MINNESOTA DEPARTMENT OF HEALTH
DIVISION OF WATER SUPPLY AND PLUMBING

Sanitation Rating of Municipal Water Supply

Owner Brainerd Date September 13, 1948

	Perfect Score	As Found	As Recommended	See Recommendation No. in Attached Report
(A) Source				
Sanitary Safety	30	22	30	1a, 1c
Adequacy of treatment				
Physical quality	2	2	2	
Chemical quality	4	3	4	Softening
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	31	40	
Hazard adjustment factor deducted	0	2	0	8
Total	40	29	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	6	7	2a, 3a
Piping arrangement	5	4	5	7
Reservoirs	7	5	7	5, 6
Equipment housing	3	1	3	1b, 2b, 4
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	24	30	
(C) Distribution System				
Street mains	5	3	4	9, 10
Building services	2	1½	1½	
Plumbing	3	1½	2½	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	5	4	4	
Condition of system	3	2	2	
Training and experience	2	1	1	
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	7	7	
GRAND TOTAL AND RATING	100	76	95	

Grade A: 90 and upward -- high degree of safety.

Grade B: 85 to 89 -- moderately high degree of safety.

Grade C: 80 to 84 -- moderately safe -- improvement needed.

Grade D: 70 to 79 -- low degree of safety -- improvement urgent.

MINNESOTA DEPARTMENT OF HEALTH
DIVISION OF WATER SUPPLY AND PLUMBING

Sanitation Rating of Municipal Water Supply

Owner Brainerd Date September 7, 1949

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety } Adequacy of treatment }	30	22	30	A1, A2
Physical quality	2	2	2	
Chemical quality	4	3	4	Softening
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	31	40	
Hazard adjustment factor deducted	0	2	0	H
Total	40	29	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	6	7	B
Piping arrangement	5	4	5	G
Reservoirs	7	5	7	E, F
Equipment housing	3	2	3	13, D
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	25	30	
(C) Distribution System				
Street mains	5	3	4	I, J
Building services	2	1½	1½	
Plumbing	3	1½	2½	K
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	5	5	5	
Condition of system	3	3	3	
Training and experience	2	1	1	
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	9	9	
GRAND TOTAL AND RATING	100	79	97	

Grade A: 90 and upward - high degree of safety.

Grade B: 85 to 89 - moderately high degree of safety.

Grade C: 80 to 84 - improvement needed.

Grade D: 70 to 79 - improvement urgent.

MINNESOTA DEPARTMENT OF HEALTH
DIVISION OF WATER SUPPLY AND PLUMBING

Sanitation Rating of Municipal Water Supply

Owner Brainerd

Date September 21, 1950

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety } Adequacy of treatment	30	25	30	additional fill & dyke work
Physical quality	2	2	2	
Chemical quality	4	3	4	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	34		
Hazard adjustment factor deducted	0	2	0	chlorination
Total	40	32	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	pipe channels reservoir overflow
Pumps	7	7	7	
Piping arrangement	5	4	5	
Reservoirs	7	5	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	29	30	
(C) Distribution System				
Street mains	5	3	4	
Building services	2	1½	1½	
Plumbing	3	1½	2½	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	5	5	5	
Condition of system	3	3	3	
Training and experience	2	1	1	
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	9	9	
GRAND TOTAL AND RATING	100	85	97	

Grade A: 90 and upward - high degree of safety.

Grade B: 85 to 89 - moderately high degree of safety.

Grade C: 80 to 84 - improvement needed.

Grade D: 70 to 79 - improvement urgent.

Grade E: 60 and lower - very dangerous condition, emergency measures recommended.

MINNESOTA DEPARTMENT OF HEALTH
DIVISION OF MUNICIPAL WATER SUPPLY

Sanitation Rating of Municipal Water Supply

Owner Brainerd Date November 1, 1951

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety	30	26	30	Additional fill & dyke work
Adequacy of treatment				
Physical quality				
Chemical quality				
Biological quality				
Adequacy of quantity				
Sub-total	40	35		
Hazard adjustment factor deducted	0	3	0	chlorinator
Total	40	32	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	pipe channels in pump station reservoir overflow
Pumps	7	7	7	
Piping arrangement	5	4	5	
Reservoirs	7	6	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	3	4	
Building services	2	1½	1½	
Plumbing	3	1½	2½	
Hydrants	1	4	4	
Storage	4	2	2	
Pressure	2	3	3	
Tap water quality	3			
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	5	5	5	
Condition of system	3	3	3	
Training and experience	2	1	1	
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	9	9	
GRAND TOTAL AND RATING	100	85	97	

Grade A: 90 and upward - high degree of safety.

Grade B: 85 to 89 - moderately high degree of safety.

Grade C: 70 to 84 - poor to dangerous condition.

Grade D: 60 and lower - very dangerous condition, emergency measures recommended.

MINNESOTA DEPARTMENT OF HEALTH

DIVISION OF MUNICIPAL WATER SUPPLY

Sanitation Rating of Municipal Water Supply

Owner Brainerd Date September 15, 1952

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety } Adequacy of treatment	30	28	30	di ke work
Physical quality	2	2	2	
Chemical quality	4	3	4	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	37		
Hazard adjustment factor deducted	0	3	0	chlorinator
Total	40			
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	4	5	Pipe channels in pump stat
Reservoirs	7	6	7	Reservoir overflow
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	3	4	e.
Building services	2	1½	1½	
Plumbing	3	1½	2½	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	3	3	3	
Condition of system	2	2	2	
Operator qualifications	5	4	4	
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	9	9	
GRAND TOTAL AND RATING	100	87	97	

Grade A: 90 and upward - high degree of safety.

Grade B: 85 to 89 - moderately high degree of safety.

Grade C: 70 to 84 - poor to dangerous condition.

Grade D: 60 and lower - very dangerous condition, emergency measures recommended.

MINNESOTA DEPARTMENT OF HEALTH

Section of Municipal Water Supply

Sanitation Safety Rating of Braintree Water Supply

Date June 16, 1953

	Perfect Score	As Found	As Recommended	See Recommendation No. in Attached Report
(A) Source				
Sanitary Safety	20	18	20	a. (dike work)
Adequacy of treatment				
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	4	softening
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	37	40	
Hazard adjustment factor deducted	0	3	0	b.
Total	40	34	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	4	5	pipe channels in pump stn.
Reservoirs	7	6	7	d.
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	3	4	e.
Building services	2	1 1/2	1 1/2	
Plumbing	3	1 1/2	1 1/2	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	2 1/2	3	bacteriological history
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	15 1/2	18	
(D) Operation and Operators				
Control of system	3	3	3	
Condition of system	2	2	2	
Operator qualifications	5	4	4	
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	9	9	
GRAND TOTAL AND RATING	100	86 1/2	97	

MINNESOTA DEPARTMENT OF HEALTH

Section of Municipal Water Supply

Sanitation Safety Rating of Brainerd Water Supply

Date June 16, 1953

	Perfect Score	As Found	As Recommended	See Recommendation No. in Attached Report
(A) Source				
Sanitary Safety } Adequacy of treatment }	20	18	20	a. (dike work)
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	4	softening
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	37	40	
Hazard adjustment factor deducted	0	3	0	b.
Total	40	34	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	4	5	pipe channels in pump stn.
Reservoirs	7	6	7	d.
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	3	4	e.
Building services	2	1	1	
Plumbing	3	1	1	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	2	3	Bacteriological history
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	15	18	
(D) Operation and Operators				
Control of system	3	3	3	
Condition of system	2	2	2	
Operator qualifications	5	4	4	
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	9	9	
GRAND TOTAL AND RATING	100	86	97	

MINNESOTA DEPARTMENT OF HEALTH
District VIII
Little Falls, Minnesota

Report of Investigation of Water Supply of
Brainerd, Minnesota
May 14, 1956

1. Date of Last Investigation - May 16, 1955
2. Rating at Last Investigation - 88
3. Changes since Last Investigation -

Well X

a. A new 20-inch diameter gravel-packed well 150 feet in depth has been drilled approximately 200 feet south of Well No. 5. A well screen 60 feet in length is provided. The static water level is reported to be 15 feet below the ground surface. Pumping equipment, connecting main and pump house have not been installed.

b. The new water main bridge crossing to West Brainerd is under construction.

c. A number of water main extensions have been installed. Details relative to location, construction, size and total length were not available at the time of this investigation. As far as could be determined, plans and specifications covering the extensions were not submitted for review in accordance with Regulation 200 of the State Board of Health.

4. Analytical Data (See attached sheet)

Samples Nos. 6006 through 6009 and 6011 through 6015 represent water collected from the wells and various points on the distribution system. The bacteriological examination of these samples showed the water to be of good sanitary quality as evidenced by the fact that coliform organisms were not found in the portions of the samples examined.

Sample No. 6010 represents water collected from a point on the distribution system. The bacteriological examination of this sample showed indications of contamination in the water as evidenced by the fact that organisms of the coliform group were found in the portions of the samples examined. There are indications of

MINNESOTA DEPARTMENT OF HEALTH

Section of Municipal Water Supply

Sanitation Safety Rating of Princeton Water Supply

Date May 14, 1956

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety	20	19	20	a, b.
Adequacy of treatment	10	10	10	
Bacteriological Quality	2	2	2	
Physical quality	4	3	4	softening
Chemical quality	2	2	2	
Biological quality	2	2	2	
Adequacy of quantity	40	38	40	
Sub-total	0	3	0	a.
Hazard adjustment factor deducted	40	35	40	
Total				
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	4	5	pipe channels in pump sta.
Reservoirs	7	6	7	c.
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	3	4	d.
Building services	2	1 1/2	1 1/2	
Plumbing	3	1 1/2	1 1/2	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	2	3	coliform-free samples
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	15	18	
(D) Operation and Operators				
Control of system	3	3	3	
Condition of system	2	2	2	
Operator qualifications	5	4	5	Operators' School
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	9	10	
GRAND TOTAL AND RATING	100	87	98	

90 and upward - high degree of safety. Watchful maintenance needed.

85 to 89 - moderately high degree of safety. Correction and maintenance program continued. Page 393 of 492

MINNESOTA DEPARTMENT OF HEALTH

Section of Municipal Water Supply

Sanitation Safety Rating of Trainor

Water Supply

Date Mar 22, 1957

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety	20	19	20	a, b.
Adequacy of treatment	10	10	10	
Bacteriological Quality	2	2	2	
Physical quality	4	3	4	softening
Chemical quality	2	2	2	
Biological quality	2	2	2	
Adequacy of quantity	40	38	40	
Sub-total	40	38	40	
Hazard adjustment factor deducted	0	3	0	a.
Total	40	35	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	4	5	pipe channels in pump sta.
Reservoirs	7	6	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	3	4	d.
Building services	2	1	1	
Plumbing	3	1	2	Plumbing Code
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	2	3	coliform-free samples
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	15	18	
(D) Operation and Operators				
Control of system	3	3	3	
Condition of system	2	2	2	
Operator qualifications	5	4	5	Operators' School
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	9	10	
GRAND TOTAL AND RATING	100	87	98	

MINNESOTA DEPARTMENT OF HEALTH

Section of Municipal Water Supply

Sanitation Safety Rating of Brainerd

Water Supply

Date May 14, 1958

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety	20	19	20	a, b.
Adequacy of treatment				
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	4	softening
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	38	40	
Hazard adjustment factor deducted	0	3	0	a.
Total	40	35	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	4	5	pipe channels in pump
Reservoirs	7	6	7	c. station
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	3	4	d.
Building services	2	1½	1½	
Plumbing	3	1½	2½	Plumbing Code
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	3	2	3	e.
Condition of system	2	2	2	
Operator qualifications	5	4	5	Operators' School
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	8	10	
GRAND TOTAL AND RATING	100	87	98	

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Brainard Water Supply

Date April 22, 1959

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety } Adequacy of treatment	20	19	20	1, 2.
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	4	softening.
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	38	40	
Hazard adjustment factor deducted	0	3	0	1.
Total	40	35	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	4	5	pipe channels in pump station.
Reservoirs	7	6	7	3.
Equipment housing	3	2	3	4.
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	27	30	
(C) Distribution System				
Street mains	5	3	4 $\frac{1}{2}$	5.
Building services	2	1 $\frac{1}{2}$	1 $\frac{1}{2}$	
Plumbing	3	1 $\frac{1}{2}$	2 $\frac{1}{2}$	Plumbing Code.
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	3	2	3	6.
Condition of system	2	2	2	
Operator qualifications	5	4	5	Operators' school
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	8	10	
GRAND TOTAL AND RATING	100	86	98	

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Peabody Municipal Water Supply

Date May 11, 1960

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety } Adequacy of treatment	20	19	20	1, 2.
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	4	softening.
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	38	40	
Hazard adjustment factor deducted	0	0	0	1.
Total	40	38	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	4	5	pipe channels in pump station.
Reservoirs	7	6	7	3.
Equipment housing	3	2	3	4.
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	27	30	
(C) Distribution System				
Street mains	5	3	4	5.
Building services	2	1	1	
Plumbing	3	1	2	Plumbing Code.
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	3	2	3	6.
Condition of system	2	2	2	
Operator qualifications	5	4	5	7.
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	8	10	
GRAND TOTAL AND RATING	100	86	98	

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Brainerd Municipal Water Supply

Date May 23, 1961

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety } Adequacy of treatment	20	19	20	1, 2.
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	4	Softening.
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	38	40	
Hazard adjustment factor deducted	0	3	0	1.
Total	40	35	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	4	5	pipe channels in pump station.
Reservoirs	7	6	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	3	4	4.
Building services	2	1½	1½	
Plumbing	3	1½	2½	5.
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	3	2	3	6.
Condition of system	2	2	2	
Operator qualifications	5	4	5	7.
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	8	10	
GRAND TOTAL AND RATING	100	87	98	

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Brainerd Municipal Water Supply

Date April 25, 1962

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety	20	19	20	1, 2.
Adequacy of treatment				
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	4	Softening.
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	38	40	
Hazard adjustment factor deducted	0	3	0	1.
Total	40	35	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	4	5	Pipe channels in pump station.
Reservoirs	7	6	7	3.
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	3	4	4.
Building services	2	1½	1½	
Plumbing	3	1½	2½	5.
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	3	2	3	6.
Condition of system	2	2	2	
Operator qualifications	5	4	5	7.
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	8	10	
GRAND TOTAL AND RATING	100	87	98	

90 and upward - high degree of safety. Watchful maintenance needed.

85 to 89 - moderately high degree of safety. Correction and maintenance program continued.

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of **Brainerd Municipal**

Water Supply

Date May 13, 1964

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety } Adequacy of treatment	20	19	20	1, 2.
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	4	Softening
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	38	40	
Hazard adjustment factor deducted	0	3	0	1.
Total	40	35	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	4	3	Pipe channels in pump station.
Reservoirs	7	6	7	3.
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	3	4	4.
Building services	2	1 $\frac{1}{2}$	1 $\frac{1}{2}$	
Plumbing	3	1 $\frac{1}{2}$	2 $\frac{1}{2}$	5.
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	3	3	3	
Condition of system	2	2	2	
Operator qualifications	5	4	5	6.
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	9	10	
GRAND TOTAL AND RATING	100	88	98	

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Brainerd Municipal Water Supply

Date May 4, 1966

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety } Adequacy of treatment }	20	19	20	1, 2.
Bacteriological Quality	10	10	10	
Physical quality	2	2	2	
Chemical quality	4	3	4	Softening
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	38	40	
Hazard adjustment factor deducted	0	3	0	1.
Total	40	35	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	
Pumps	7	7	7	
Piping arrangement	5	4	5	Pipe channels in pump station.
Reservoirs	7	7	7	
Equipment housing	3	2	3	3.
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	3	4	4.
Building services	2	1½	1½	
Plumbing	3	1½	2½	5.
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	3	3	3	
Condition of system	2	2	2	
Operator qualifications	5	4	5	6.
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	9	10	
GRAND TOTAL AND RATING	100	88	98	

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Brainerd Municipal Water Supply

Date May 16 & 18, 1967

	Perfect Score	As Found	As Recommended	See Recommendation No. in Attached Report
(A) Source				
Sanitary Safety	20	19	20	1, 2. Softening
Adequacy of treatment	10	10	10	
Bacteriological Quality	2	2	2	
Physical quality	4	3	4	
Chemical quality	2	2	2	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	38	40	
Hazard adjustment factor deducted	0	2	0	1.
Total	40	36	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	3. 4.
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	6	7	
Equipment housing	3	2	3	
Sub-total	30	28	30	
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	3	4	5. 6.
Building services	2	1½	1½	
Plumbing	3	1½	2½	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20	16	18	
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	3	2½	3	7. 8.
Condition of system	2	2	2	
Operator qualifications	5	4	5	
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	8½	10	
GRAND TOTAL AND RATING	100	88½	98	

90 and upward - high degree of safety. Watchful maintenance needed.

85 to 89 - moderately high degree of safety. Correction and maintenance program continued. Page 402 of 492

70 to 84 - near to dangerous condition. Prompt corrective action urgently needed.

generally along a line adjacent to the bluff east of the well field area.

Basic information available on the well sources is as follows:

	Well T	Well U	Well V	Well W	Well X
Well No.	3	4	5	6	7
Installed (date)	1938	1944	1947	1947	1955
Diameter (inches)	16	16	16	16	20
Depth (feet)	120	120	150	145	150
Screen Length (feet)	60	60	60	63	77
Pump Capacity (gpm)	1100	1200	1400	1400	2300
Static Water Level	15'	15'	15'	15'	15'

As far as could be determined the well casings project upward into the pumpbases at least one inch. The casing and discharge air relief vents are of a satisfactory design. Openings for draw-down gauge connections to the pumpbases are adequately protected.

The pumpbase floors are above grade and the pumpbase doors are installed to open outward. With the exception of Well No. 7 which has a 6-inch door sill, no door sills are installed. The pumpbase floor drains are reported to be of cast-iron construction with discharge to leaching pits located at least 30 feet from the wells.

Treatment

The wells discharge to the treatment plant through a common buried discharge pipe. A blow-off line is installed on the well discharge line and extends through the dike to the adjacent low-lying area. The blow-off pipe may be subject to occasional flooding of the low area during high water periods. The well discharge line normally is under continuous positive head from the pyrolumite contact basins during operation and by the backwash storage tank during the backwash cycle.

The raw water is subjected to iron-manganese removal at a facility

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of **Brainerd Municipal**

Water Supply

Date September 23, 1970

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety } 20	20	19	20	1, 2.
Adequacy of treatment }				
Bacteriological Quality 10	10	10	10	
Physical quality 2	2	2	2	
Chemical quality 4	4	3	4	Softening
Biological quality 2	2	2	2	
Adequacy of quantity 2	2	2	2	
Sub-total 40	40	38	40	
Hazard adjustment factor deducted 0	0	5	0	1, 3
Total 40	40	33	40	
(B) Prime Moving Equipment				
Well or intake 8	8	8	8	
Pumps 7	7	7	7	
Piping arrangement 5	5	5	5	
Reservoirs 7	7	6	7	4
Equipment housing 3	3	2	3	5
Sub-total 30	30			
Hazard adjustment factor deducted 0	0			
Total 30	30	28	30	
(C) Distribution System				
Street mains 5	5	3	4	6, 7
Building services 2	2	1 1/2	1 1/2	8
Plumbing 3	3	1 1/2	2 1/2	9
Hydrants 1	1	1	1	
Storage 4	4	4	4	
Pressure 2	2	2	2	
Tap water quality 3	3	3	3	
Sub-total 20	20			
Hazard adjustment factor deducted 0	0			
Total 20	20	16	18	
(D) Operation and Operators				
Control of system 3	3	3	3	10
Condition of system 2	2	2	2	
Operator qualifications 5	5	4	5	11, Certification
Sub-total 10	10			
Hazard adjustment factor deducted 0	0			
Total 10	10	9	10	
GRAND TOTAL AND RATING 100	100	86	98	

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of **Brainerd Municipal**

Water Supply

Date **September 22 - 23, 1971**

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety	20	19	20	1, 2.
Adequacy of treatment				
Bacteriological Quality	10	10	10	Softening
Physical quality	2	2	2	
Chemical quality	4	3	4	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	36	40	
Hazard adjustment factor deducted	0	5	0	1, 3.
Total	40	33	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	4
Pumps	7	7	7	
Piping arrangement	5	5	5	
Reservoirs	7	6	7	
Equipment housing	3	2	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	28	30	
(C) Distribution System				
Street mains	5	3	4	6, 7. 8 9
Building services	2	1½	1½	
Plumbing	3	1½	2½	
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	16	18	
(D) Operation and Operators				
Control of system	3	3	3	10
Condition of system	2	2	2	
Operator qualifications	5	4	5	11
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	9	10	
GRAND TOTAL AND RATING	100	86	98	

90 and upward - high degree of safety. Watchful maintenance needed.

85 to 89 - moderately high degree of safety. Correction and maintenance program continued.

REPORT ON INVESTIGATION OF PUBLIC WATER SUPPLY

Name of Water Supply				PWS ID Number	
Brainerd Municipal Water Supply				1180002	
Street				Telephone Numbers:	
P.O. Box 373				City: 218-829-2586 (Clerk)	
City		State	Zip Code	Operator: 218-828-1066 (Res.)	
Brainerd		MN	56401	Engineer: 218-828-1919 (Supt.)	
County		District		Other: 218-829-2193 (Util.)	

Water Superintendent Larry Paulson	Classification B	Plant Classification C	Owner Type
Other Operators	Classification	Plant Type Community	Plumbing Permits and Inspections Required ☒ Yes ☐ No
		Date of Previous Survey August 16, 1978	Date of Survey December 27, 1979 February 20, 1980

City Engineer	
---------------	--

SERVICE AREA CHARACTERISTICS:

☒ Municipal ☐ School or College ☐ Recreation Area
☐ Mobile Home Park ☐ Hotel/Motel ☐ Campground
☐ Company Town ☐ Resort ☐ Housing Development
☐ Institution ☐ Restaurant ☐ Other _____

Population Served 11,600	Service Connections 4100	Storage Capacity: (List Separately)
Design Capacity (gal/day)	Average Daily Production (gal/day) 2,600,000	Elev. tank 1,000,000 gal. " " 600,000 gal.
Emergency Capacity (gal/day)	Highest Daily Production (gal/day) 4,250,000	Low Reservoir 1,000,000 gal. 800,000 gal. Total: 3,400,000 gallons

[illegible]

Remarks:

**Under repair

***Out of service - this date

*After Ac, water flow through coke filters before Fl.

Surveyed by:

~~A. U. Starin~~

Approved by

Roman J. Koch

MINNESOTA DEPARTMENT OF HEALTH

Section of Water Supply and General Engineering

Sanitation Safety Rating of Brainerd Municipal

Water Supply

Date December 27, 1980

	Perfect Score	As Found	As Recommended	See Recommendation No. In Attached Report
(A) Source				
Sanitary Safety	20	19	20	1, 2, 3.
Adequacy of treatment				
Bacteriological Quality	10	10	10	Softening
Physical quality	2	2	2	
Chemical quality	4	3	4	
Biological quality	2	2	2	
Adequacy of quantity	2	2	2	
Sub-total	40	38	40	
Hazard adjustment factor deducted	0	5	0	1, 4.
Total	40	33	40	
(B) Prime Moving Equipment				
Well or intake	8	8	8	10.
Pumps	7	7	7	
Piping arrangement	5	4	5	
Reservoirs	7	7	7	
Equipment housing	3	3	3	
Sub-total	30			
Hazard adjustment factor deducted	0			
Total	30	29	30	
(C) Distribution System				
Street mains	5	4	4.5	5.
Building services	2	1.5	1.5	6.
Plumbing	3	1.5	2.5	7.
Hydrants	1	1	1	
Storage	4	4	4	
Pressure	2	2	2	
Tap water quality	3	3	3	
Sub-total	20			
Hazard adjustment factor deducted	0			
Total	20	17	18	
(D) Operation and Operators				
Control of system	3	2	3	8, 9, 10, 11.
Condition of system	2	2	2	
Operator qualifications	5	5	5	
Sub-total	10			
Hazard adjustment factor deducted	0			
Total	10	9	10	
GRAND TOTAL AND RATING	100	88	98	

90 and upward = high degree of safety. Watchful maintenance needed.

85 to 89 = moderately high degree of safety. Correction and maintenance program continued.

70 to 84 = high to dangerous condition. Prompt corrective action urgently needed.

ELEVENTH BIENNIAL REPORT

OF THE

Minnesota

★ State Dairy and Food Commissioner

TRANSMITTED TO THE LEGISLATURE

1907

1907
HARRISON & SMITH CO.,
MINNEAPOLIS

CHISAGO COUNTY.

Chisago City Co-operative Creamery.....	Chisago City	L. A. Anderson.....	Chisago City	J. A. Peterson.....	Chisago City
The Shafer Co-operative Creamery.....	Shafer	S. Swanson	Shafer, R. F. D.	C. E. Kendall.....	Shafer.
The Farmers Creamery Co.....	Shafer	F. A. Porter.....	Center City	O. Esker	Shafer.
Lindstrom Creamery Co.....	Lindstrom	L. J. Anderson.....	Lindstrom	F. A. Peterson.....	Lindstrom.
South Side Creamery	Wyoming	J. H. Sowers.....	Wyoming	J. H. Sowers.....	Wyoming.
Rush City Creamery Co.....	Rush City	A. W. Carlson.....	Rush City	A. W. Carlson.....	Rush City.
Almelund Co-operative Creamery Co.....	Shafer	John Almquist.....	Taylor's Falls	E. O. Bloomquist.....	Almelund.
Palmdale Co-operative Creamery Co.....	Taylor's Falls	L. J. Klinke.....	Palmdale	Otto Holf	Palmdale.
Kost Creamery Co.....	North Branch	P. Farsje	North Branch	Erhard Lindblad	Kost.
Stark Creamery Co.....	Harris	A. R. Hammergren.....	Stark	W. V. Almquist.....	Stark.
Rush Point Creamery.....	Grandy	A. P. Almquist.....	Rush City, R. R.	A. P. Almquist.....	Rush City, R. F. D.
Danewood	Danewood .....	.....	.....	.....	.....
Spring Lake Co-operative Creamery Co.....	North Branch .....	.....	.....	.....	.....

CLAY COUNTY.

Ulen Creamery	Ulen	Fred Kelly	Ulen .....	.....	.....
Barnesville Co-operative	Barnesville, R. 7.	N. Nelson	Barnesville .....	.....	.....
Farmers Co-operative Creamery.....	Hawley	N. J. Jerald	Hawley	M. C. Mattland.....	Hawley.

CLEARWATER COUNTY.

Meadows Co-operative Creamery.....	Beroun	P. J. Espeseth.....	Beroun	R. A. Nelson.....	Beroun.
------------------------------------	--------------	---------------------	--------------	-------------------	---------

COTTONWOOD COUNTY.

Bingham Lake Creamery.....	Bingham Lake	H. E. Hakes.....	Bingham Lake	C. J. Hakes.....	Bingham Lake.
Highwater Creamery Co.....	Lamberton	L. O. Iverson.....	Lamberton, R.R. 2.	A. T. Sunde.....	Lamberton, R.R. 2.
Windom Creamery Co.....	Windom	M. Perkins	Windom	S. Sorrenson	Windom.
Rose Creamery	Westbrook	S. Norun	Westbrook	John Grosser	Westbrook.
Delft Creamery	Westbrook	Berndt Klassen	Delft	Fred Rasmussen.....	Delft.
Westbrook Creamery Association.....	Westbrook	Jens C. Hanson	Westbrook	Nels Hanson .....	.....
Storden	Storden	W. R. Port.....	Storden	W. R. Port.....	Storden.

CROW WING COUNTY.

Rose Creamery Co.....	Brainerd	F. J. Wolpert.....	Brainerd, Route 1.	F. Kelley	Brainerd.
Carlson & Oberg	Deerwood .....	.....	.....	.....	.....
Brainerd Creamery	Brainerd	B. Armstrong	Brainerd	B. Armstrong	Brainerd.
Midland Creamery Co.....	Neutral .....	.....	.....	.....	.....
Maple Grove Creamery.....	Brainerd	Carl E. Carlson.....	Brainerd Route 1.	Axel L. Anderson.....	Brainerd.

DAKOTA COUNTY.

Vermillion Creamery Co.....	Vermillion	V. F. Rother.....	Vermillion	Geo. Byers	Vermillion.
Greenvale Co-operative Dairy Association	Northfield	O. H. Shirley.....	Northfield	O. H. Nelson	Northfield.
Farmington Creamery	Farmington	F. O. Biddle.....	Minnesota Lake	G. M. Fjetland.....	Farmington.
Lakeville Creamery	Lakeville	M. J. Lenihan	Lakeville	G. A. Miller.....	Lakeville.

INDEX

STREETS		COUNTY		COUNTY		COUNTY	
Street	Range	Section	Range	Section	Range	Section	Range
Abbas Ave., N.	100-729	20	100-729	20	100-729	20	100-729
Adams Ave., N.	100-730	20	100-730	20	100-730	20	100-730
Adams Ave., S.	100-731	20	100-731	20	100-731	20	100-731
Adams Ave., W.	100-732	20	100-732	20	100-732	20	100-732
Adams Ave., E.	100-733	20	100-733	20	100-733	20	100-733
Adams Ave., S.W.	100-734	20	100-734	20	100-734	20	100-734
Adams Ave., S.E.	100-735	20	100-735	20	100-735	20	100-735
Adams Ave., N.W.	100-736	20	100-736	20	100-736	20	100-736
Adams Ave., N.E.	100-737	20	100-737	20	100-737	20	100-737
Adams Ave., S.W.	100-738	20	100-738	20	100-738	20	100-738
Adams Ave., S.E.	100-739	20	100-739	20	100-739	20	100-739
Adams Ave., N.W.	100-740	20	100-740	20	100-740	20	100-740
Adams Ave., N.E.	100-741	20	100-741	20	100-741	20	100-741
Adams Ave., S.W.	100-742	20	100-742	20	100-742	20	100-742
Adams Ave., S.E.	100-743	20	100-743	20	100-743	20	100-743
Adams Ave., N.W.	100-744	20	100-744	20	100-744	20	100-744
Adams Ave., N.E.	100-745	20	100-745	20	100-745	20	100-745
Adams Ave., S.W.	100-746	20	100-746	20	100-746	20	100-746
Adams Ave., S.E.	100-747	20	100-747	20	100-747	20	100-747
Adams Ave., N.W.	100-748	20	100-748	20	100-748	20	100-748
Adams Ave., N.E.	100-749	20	100-749	20	100-749	20	100-749
Adams Ave., S.W.	100-750	20	100-750	20	100-750	20	100-750
Adams Ave., S.E.	100-751	20	100-751	20	100-751	20	100-751
Adams Ave., N.W.	100-752	20	100-752	20	100-752	20	100-752
Adams Ave., N.E.	100-753	20	100-753	20	100-753	20	100-753
Adams Ave., S.W.	100-754	20	100-754	20	100-754	20	100-754
Adams Ave., S.E.	100-755	20	100-755	20	100-755	20	100-755
Adams Ave., N.W.	100-756	20	100-756	20	100-756	20	100-756
Adams Ave., N.E.	100-757	20	100-757	20	100-757	20	100-757
Adams Ave., S.W.	100-758	20	100-758	20	100-758	20	100-758
Adams Ave., S.E.	100-759	20	100-759	20	100-759	20	100-759
Adams Ave., N.W.	100-760	20	100-760	20	100-760	20	100-760
Adams Ave., N.E.	100-761	20	100-761	20	100-761	20	100-761
Adams Ave., S.W.	100-762	20	100-762	20	100-762	20	100-762
Adams Ave., S.E.	100-763	20	100-763	20	100-763	20	100-763
Adams Ave., N.W.	100-764	20	100-764	20	100-764	20	100-764
Adams Ave., N.E.	100-765	20	100-765	20	100-765	20	100-765
Adams Ave., S.W.	100-766	20	100-766	20	100-766	20	100-766
Adams Ave., S.E.	100-767	20	100-767	20	100-767	20	100-767
Adams Ave., N.W.	100-768	20	100-768	20	100-768	20	100-768
Adams Ave., N.E.	100-769	20	100-769	20	100-769	20	100-769
Adams Ave., S.W.	100-770	20	100-770	20	100-770	20	100-770
Adams Ave., S.E.	100-771	20	100-771	20	100-771	20	100-771
Adams Ave., N.W.	100-772	20	100-772	20	100-772	20	100-772
Adams Ave., N.E.	100-773	20	100-773	20	100-773	20	100-773
Adams Ave., S.W.	100-774	20	100-774	20	100-774	20	100-774
Adams Ave., S.E.	100-775	20	100-775	20	100-775	20	100-775
Adams Ave., N.W.	100-776	20	100-776	20	100-776	20	100-776
Adams Ave., N.E.	100-777	20	100-777	20	100-777	20	100-777
Adams Ave., S.W.	100-778	20	100-778	20	100-778	20	100-778
Adams Ave., S.E.	100-779	20	100-779	20	100-779	20	100-779
Adams Ave., N.W.	100-780	20	100-780	20	100-780	20	100-780
Adams Ave., N.E.	100-781	20	100-781	20	100-781	20	100-781
Adams Ave., S.W.	100-782	20	100-782	20	100-782	20	100-782
Adams Ave., S.E.	100-783	20	100-783	20	100-783	20	100-783
Adams Ave., N.W.	100-784	20	100-784	20	100-784	20	100-784
Adams Ave., N.E.	100-785	20	100-785	20	100-785	20	100-785
Adams Ave., S.W.	100-786	20	100-786	20	100-786	20	100-786
Adams Ave., S.E.	100-787	20	100-787	20	100-787	20	100-787
Adams Ave., N.W.	100-788	20	100-788	20	100-788	20	100-788
Adams Ave., N.E.	100-789	20	100-789	20	100-789	20	100-789
Adams Ave., S.W.	100-790	20	100-790	20	100-790	20	100-790
Adams Ave., S.E.	100-791	20	100-791	20	100-791	20	100-791
Adams Ave., N.W.	100-792	20	100-792	20	100-792	20	100-792
Adams Ave., N.E.	100-793	20	100-793	20	100-793	20	100-793
Adams Ave., S.W.	100-794	20	100-794	20	100-794	20	100-794
Adams Ave., S.E.	100-795	20	100-795	20	100-795	20	100-795
Adams Ave., N.W.	100-796	20	100-796	20	100-796	20	100-796
Adams Ave., N.E.	100-797	20	100-797	20	100-797	20	100-797
Adams Ave., S.W.	100-798	20	100-798	20	100-798	20	100-798
Adams Ave., S.E.	100-799	20	100-799	20	100-799	20	100-799
Adams Ave., N.W.	100-800	20	100-800	20	100-800	20	100-800
Adams Ave., N.E.	100-801	20	100-801	20	100-801	20	100-801
Adams Ave., S.W.	100-802	20	100-802	20	100-802	20	100-802
Adams Ave., S.E.	100-803	20	100-803	20	100-803	20	100-803
Adams Ave., N.W.	100-804	20	100-804	20	100-804	20	100-804
Adams Ave., N.E.	100-805	20	100-805	20	100-805	20	100-805
Adams Ave., S.W.	100-806	20	100-806	20	100-806	20	100-806
Adams Ave., S.E.	100-807	20	100-807	20	100-807	20	100-807
Adams Ave., N.W.	100-808	20	100-808	20	100-808	20	100-808
Adams Ave., N.E.	100-809	20	100-809	20	100-809	20	100-809
Adams Ave., S.W.	100-810	20	100-810	20	100-810	20	100-810
Adams Ave., S.E.	100-811	20	100-811	20	100-811	20	100-811
Adams Ave., N.W.	100-812	20	100-812	20	100-812	20	100-812
Adams Ave., N.E.	100-813	20	100-813	20	100-813	20	100-813
Adams Ave., S.W.	100-814	20	100-814	20	100-814	20	100-814
Adams Ave., S.E.	100-815	20	100-815	20	100-815	20	100-815
Adams Ave., N.W.	100-816	20	100-816	20	100-816	20	100-816
Adams Ave., N.E.	100-817	20	100-817	20	100-817	20	100-817
Adams Ave., S.W.	100-818	20	100-818	20	100-818	20	100-818
Adams Ave., S.E.	100-819	20	100-819	20	100-819	20	100-819
Adams Ave., N.W.	100-820	20	100-820	20	100-820	20	100-820
Adams Ave., N.E.	100-821	20	100-821	20	100-821	20	100-821
Adams Ave., S.W.	100-822	20	100-822	20	100-822	20	100-822
Adams Ave., S.E.	100-823	20	100-823	20	100-823	20	100-823
Adams Ave., N.W.	100-824	20	100-824	20	100-824	20	100-824
Adams Ave., N.E.	100-825	20	100-825	20	100-825	20	100-825
Adams Ave., S.W.	100-826	20	100-826	20	100-826	20	100-826
Adams Ave., S.E.	100-827	20	100-827	20	100-827	20	100-827
Adams Ave., N.W.	100-828	20	100-828	20	100-828	20	100-828
Adams Ave., N.E.	100-829	20	100-829	20	100-829	20	100-829
Adams Ave., S.W.	100-830	20	100-830	20	100-830	20	100-830
Adams Ave., S.E.	100-831	20	100-831	20	100-831	20	100-831
Adams Ave., N.W.	100-832	20	100-832	20	100-832	20	100-832
Adams Ave., N.E.	100-833	20	100-833	20	100-833	20	100-833
Adams Ave., S.W.	100-834	20	100-834	20	100-834	20	100-834
Adams Ave., S.E.	100-835	20	100-835	20	100-835	20	100-835
Adams Ave., N.W.	100-836	20	100-836	20	100-836	20	100-836
Adams Ave., N.E.	100-837	20	100-837	20	100-837	20	100-837
Adams Ave., S.W.	100-838	20	100-838	20	100-838	20	100-838
Adams Ave., S.E.	100-839	20	100-839	20	100-839	20	100-839
Adams Ave., N.W.	100-840	20	100-840	20	100-840	20	100-840
Adams Ave., N.E.	100-841	20	100-841	20	100-841	20	100-841
Adams Ave., S.W.	100-842	20	100-842	20	100-842	20	100-842
Adams Ave., S.E.	100-843	20	100-843	20	100-843	20	100-843
Adams Ave., N.W.	100-844	20	100-844	20	100-844	20	100-844
Adams Ave., N.E.	100-845	20	100-845	20	100-845	20	100-845
Adams Ave., S.W.	100-846	20	100-846	20	100-846	20	100-846
Adams Ave., S.E.	100-847	20	100-847	20	100-847	20	100-847
Adams Ave., N.W.	100-848	20	100-848	20	100-848	20	100-848
Adams Ave., N.E.	100-849	20	100-849	20	100-849	20	100-849
Adams Ave., S.W.	100-850	20	100-850	20	100-850	20	100-850
Adams Ave., S.E.	100-851	20	100-851	20	100-851	20	100-851
Adams Ave., N.W.	100-852	20	100-852	20	100-852	20	100-852
Adams Ave., N.E.	100-853	20	100-853	20	100-853	20	100-853
Adams Ave., S.W.	100-854	20	100-854	20	100-854	20	100-854
Adams Ave., S.E.	100-855	20	100-855	20	100-855	20	100-855
Adams Ave., N.W.	100-856	20	100-856	20	100-856	20	100-856
Adams Ave., N.E.	100-857	20	100-857	20	100-857	20	100-857
Adams Ave., S.W.	100-858	20	100-858	20	100-858	20	100-858
Adams Ave., S.E.	100-859	20	100-859	20	100-859	20	100-859
Adams Ave., N.W.	100-860	20	100-860	20	100-860	20	100-860
Adams Ave., N.E.	100-861	20	100-861	20	100-861	20	100-861
Adams Ave., S.W.	100-862	20	100-862	20	100-862	20	100-862
Adams Ave., S.E.	100-863	20	100-863	20	100-863	20	100-863
Adams Ave., N.W.	100-864	20	100-864	20	100-864	20	100-864
Adams Ave., N.E.	100-865	20	100-865	20	100-865	20	100-865
Adams Ave., S.W.	100-866	20	100-866	20	100-866	20	100-866
Adams Ave., S.E.	100-867	20	100-867	20	100-867	20	100-867
Adams Ave., N.W.	100-868	20	100-868	20	100-868	20	100-868
Adams Ave., N.E.	100-869	20	100-869	20	100-869	20	100-869
Adams Ave., S.W.	100-870	20	100-870	20	100-870	20	100-870
Adams Ave., S.E.	100-871	20	100-871	20	100-871	20	100-871
Adams Ave., N.W.	100-872	20	100-872	20	100-872	20	100-872
Adams Ave., N.E.	100-873	20	100-873	20	100-873	20	100-873
Adams Ave., S.W.	100-874	20	100-874	20	100-874	20	100-874
Adams Ave., S.E.	100-875						

* Indicates only one side of Street shown.

INSURANCE MAPS of

BRAINERD

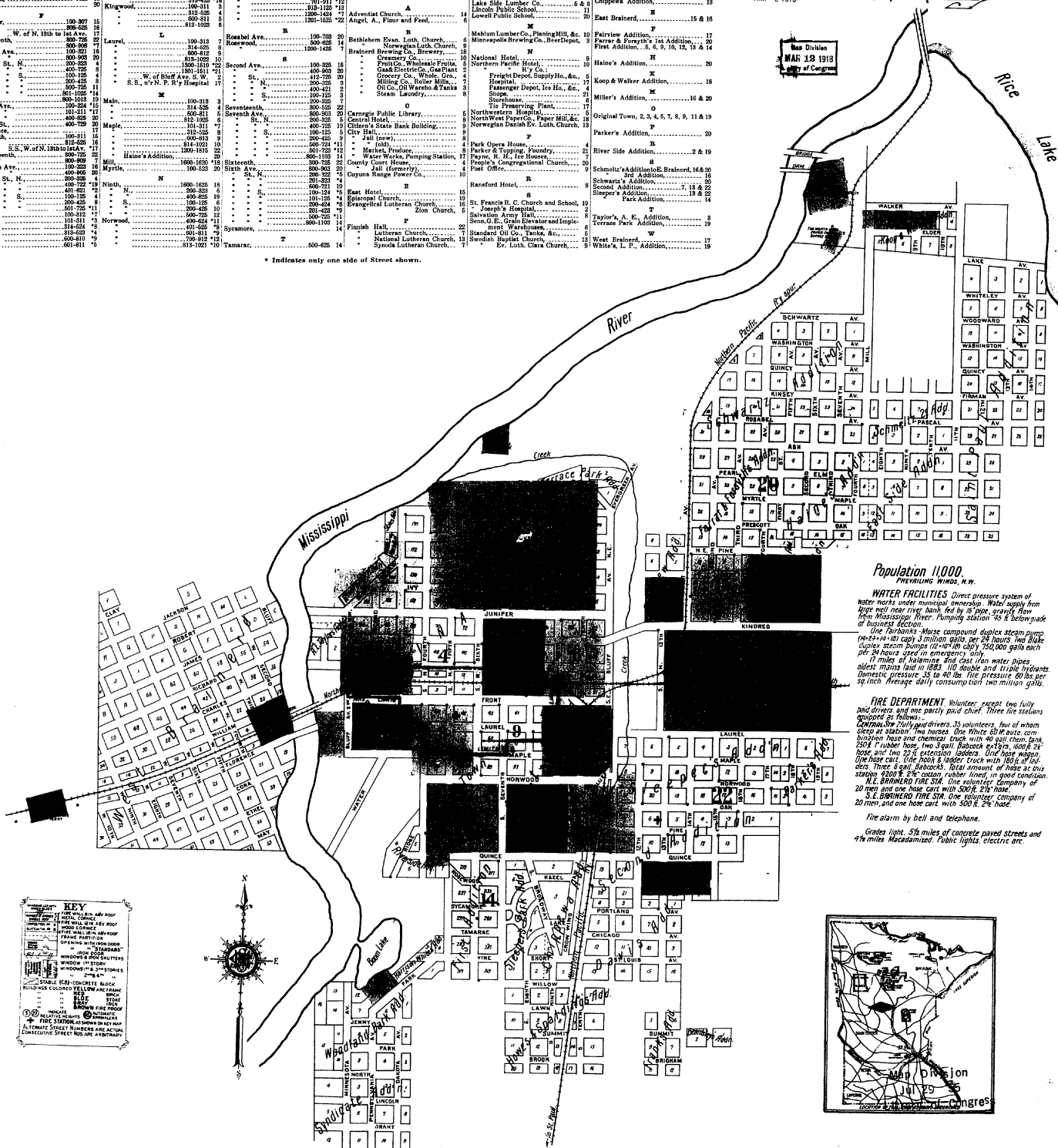
MINNESOTA CROW WING COUNTY

11 BROADWAY NEW YORK

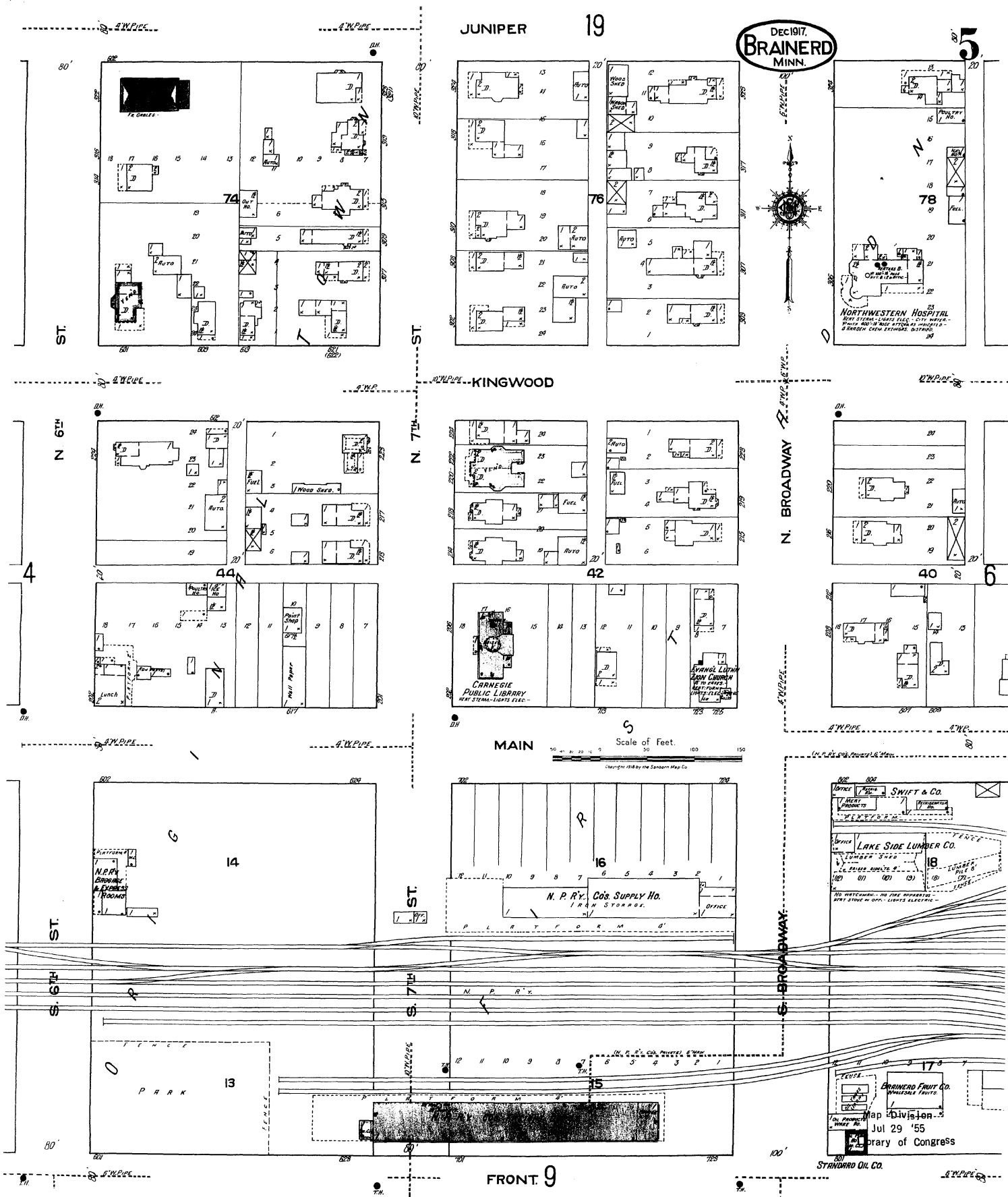
Scale 50 ft. to an inch.

Dec. 1917

Copyright 1918 by the Sanborn Map Co.







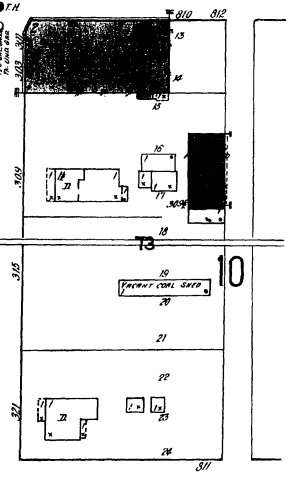
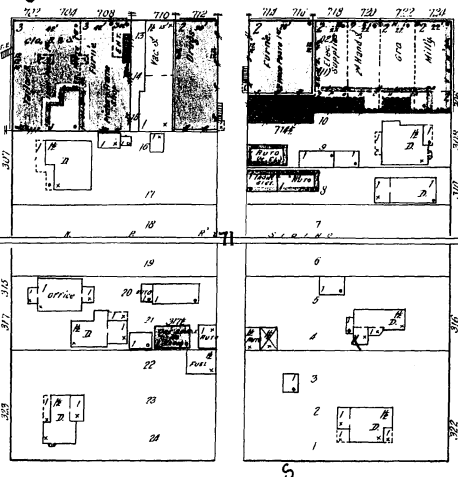
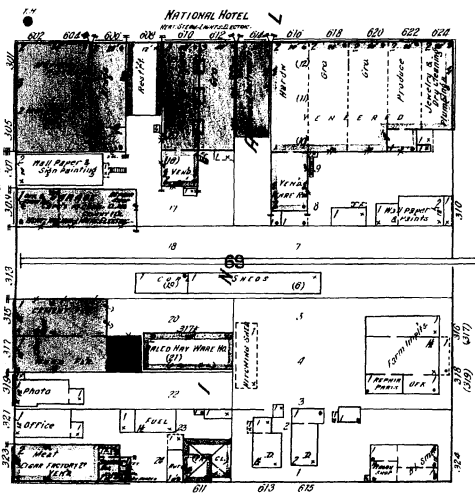
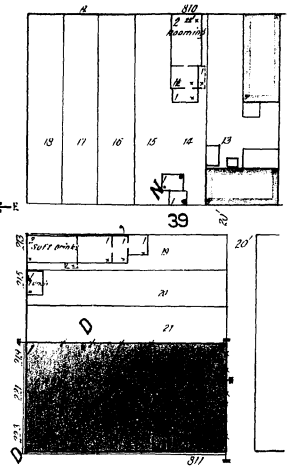
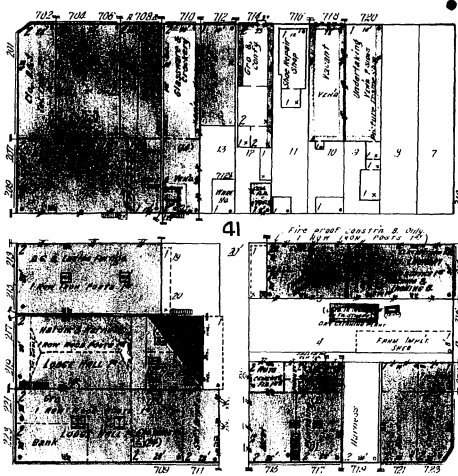
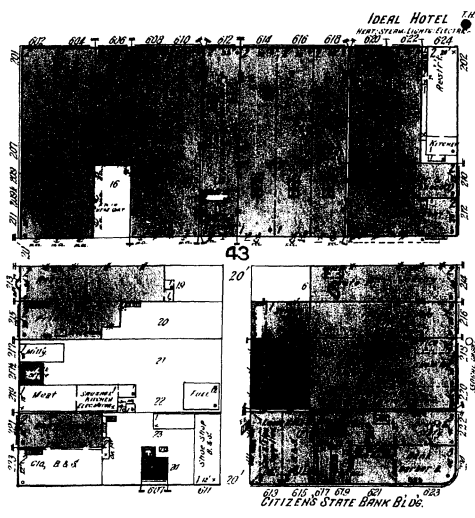


5

FRONT

DEC. 1917
BRainerd
MINN.

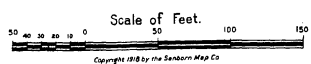
9



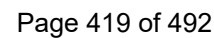
LAUREL

MAPLE

NORWOOD



Map Division
Jul 29 '55
Library of Congress



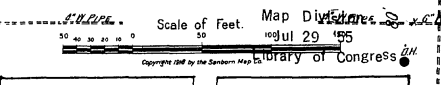
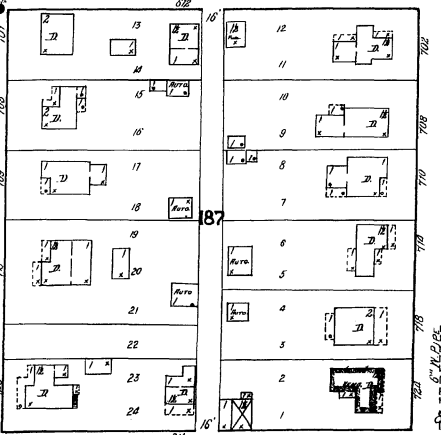
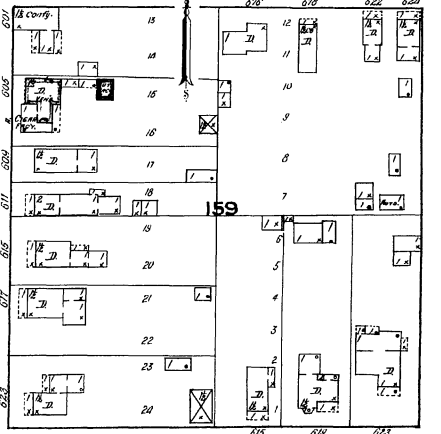
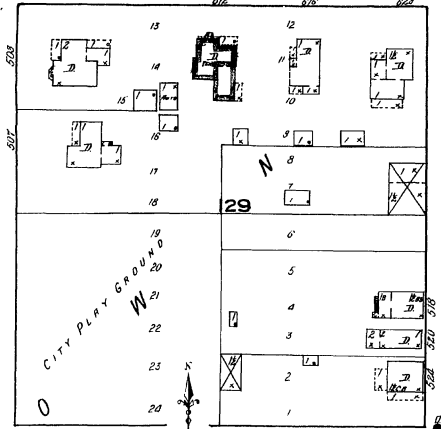
NORWOOD

DEC 1917
BRainerd
MINN.

OAK

PINE

QUINCE

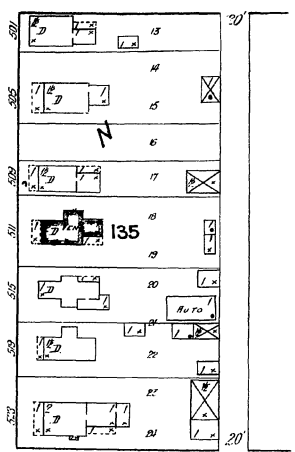
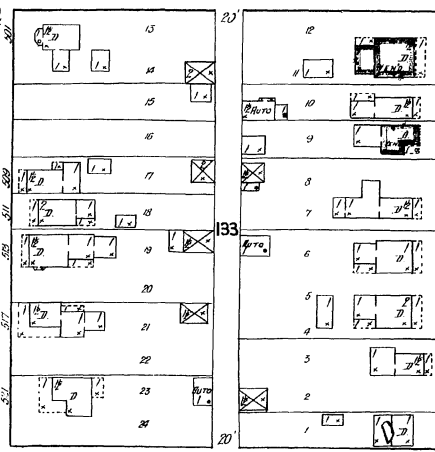
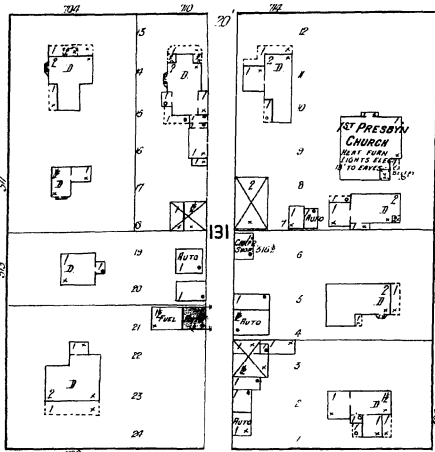


9

NORWOOD

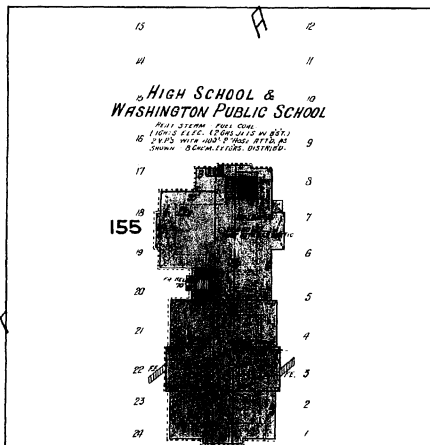
DEC. 1917.
BRAINERD
MINN.

12

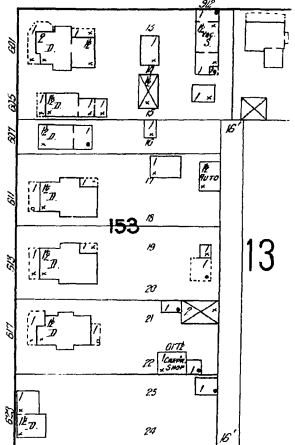


OAK

S. BROADWAY



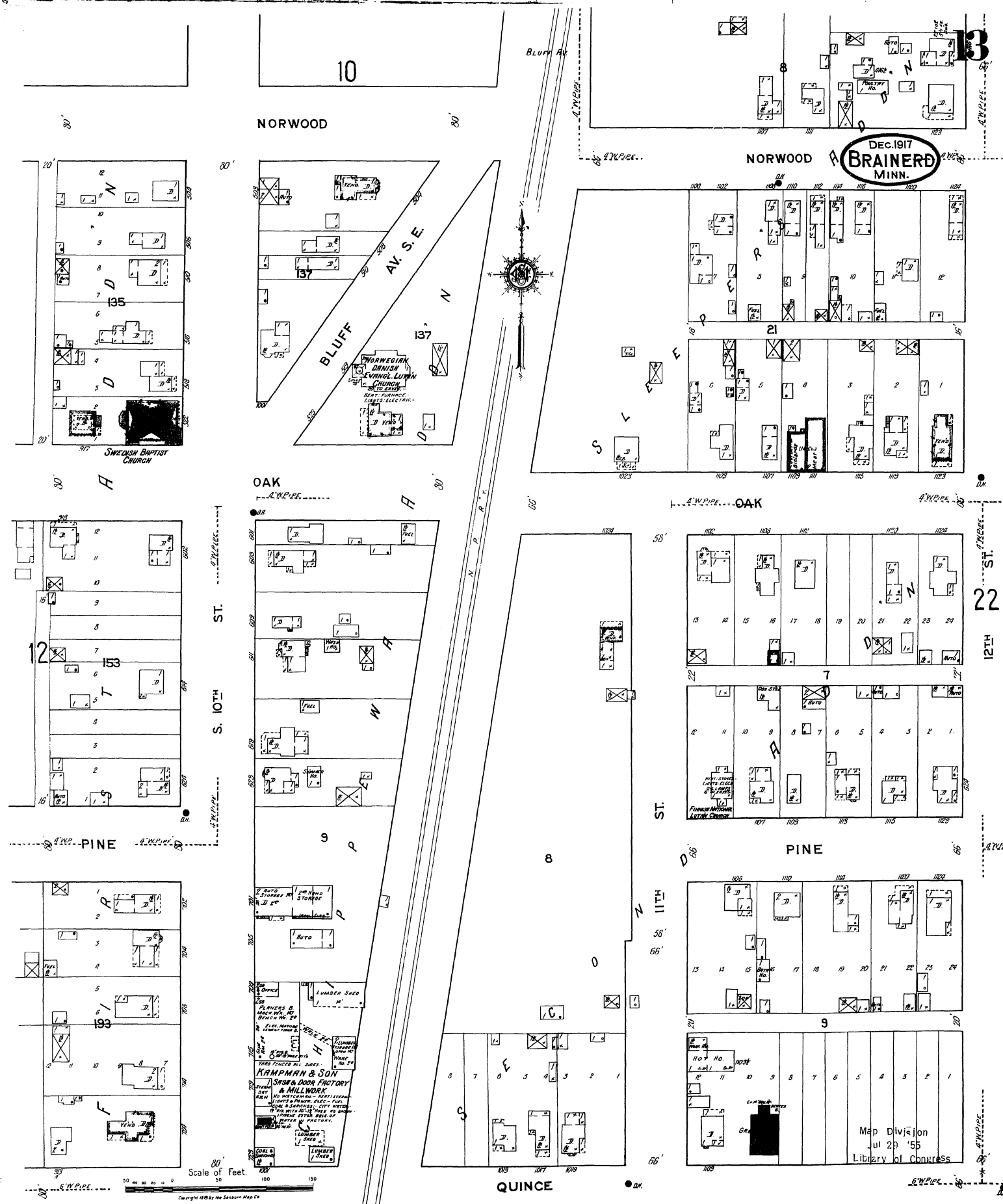
S. 9TH ST.

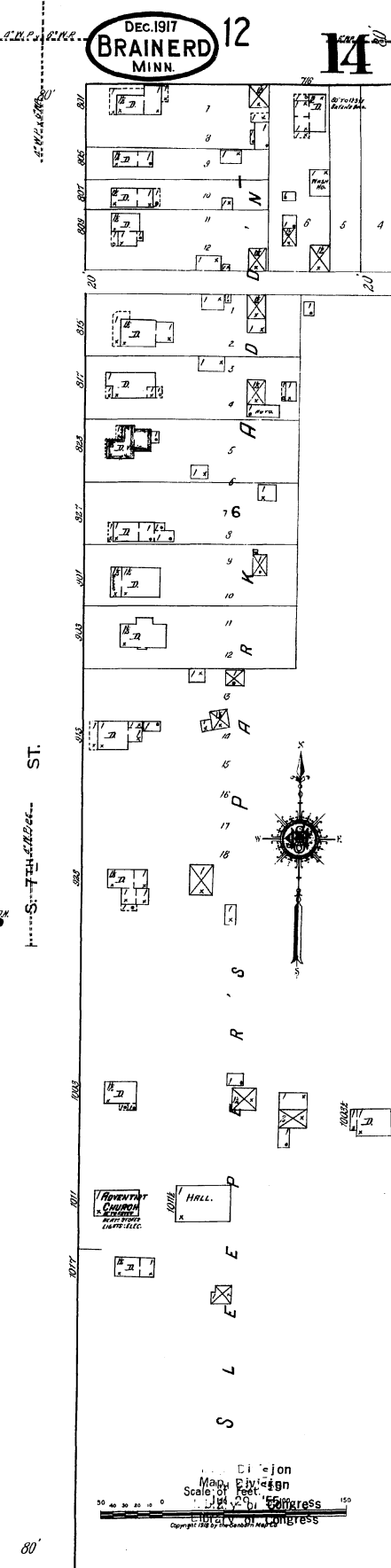
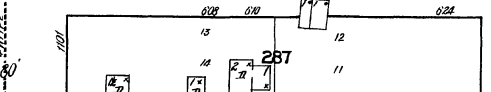
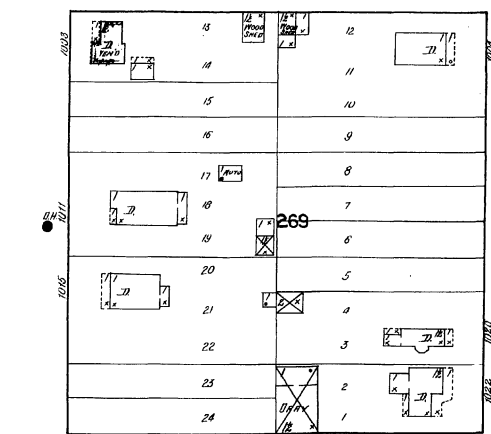
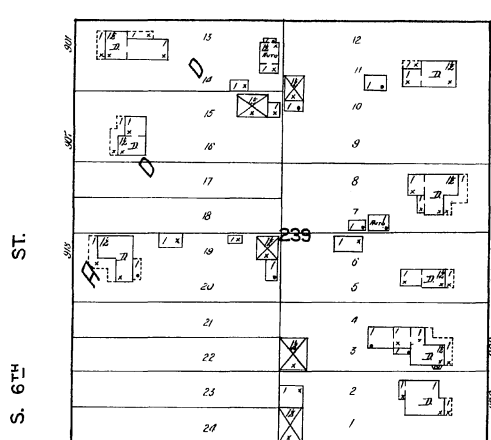
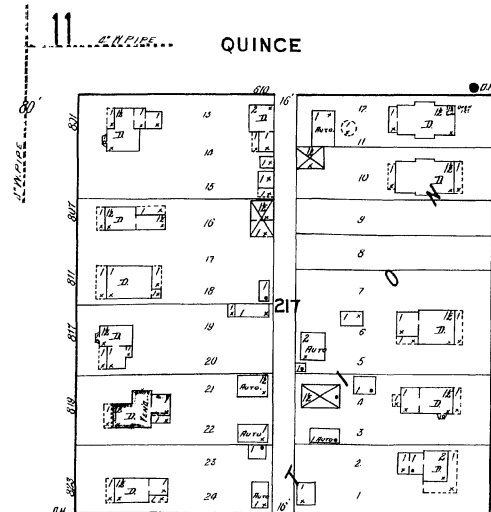
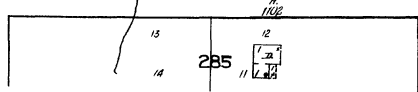
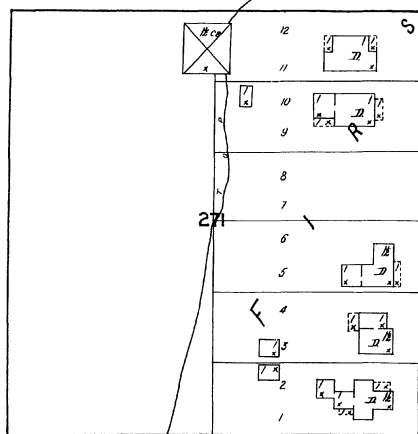
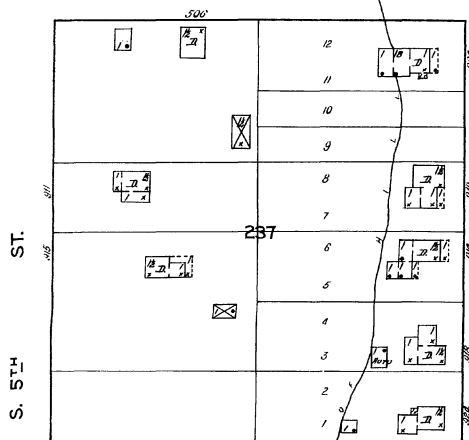
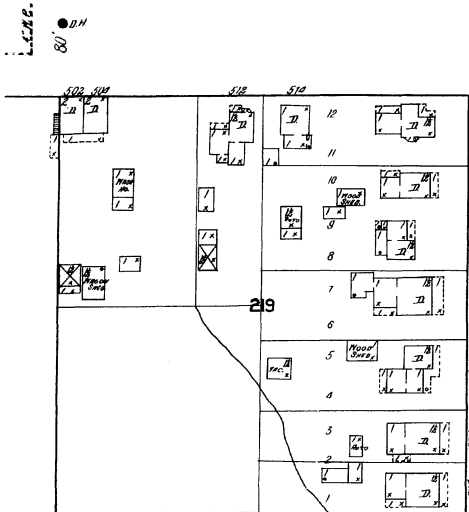


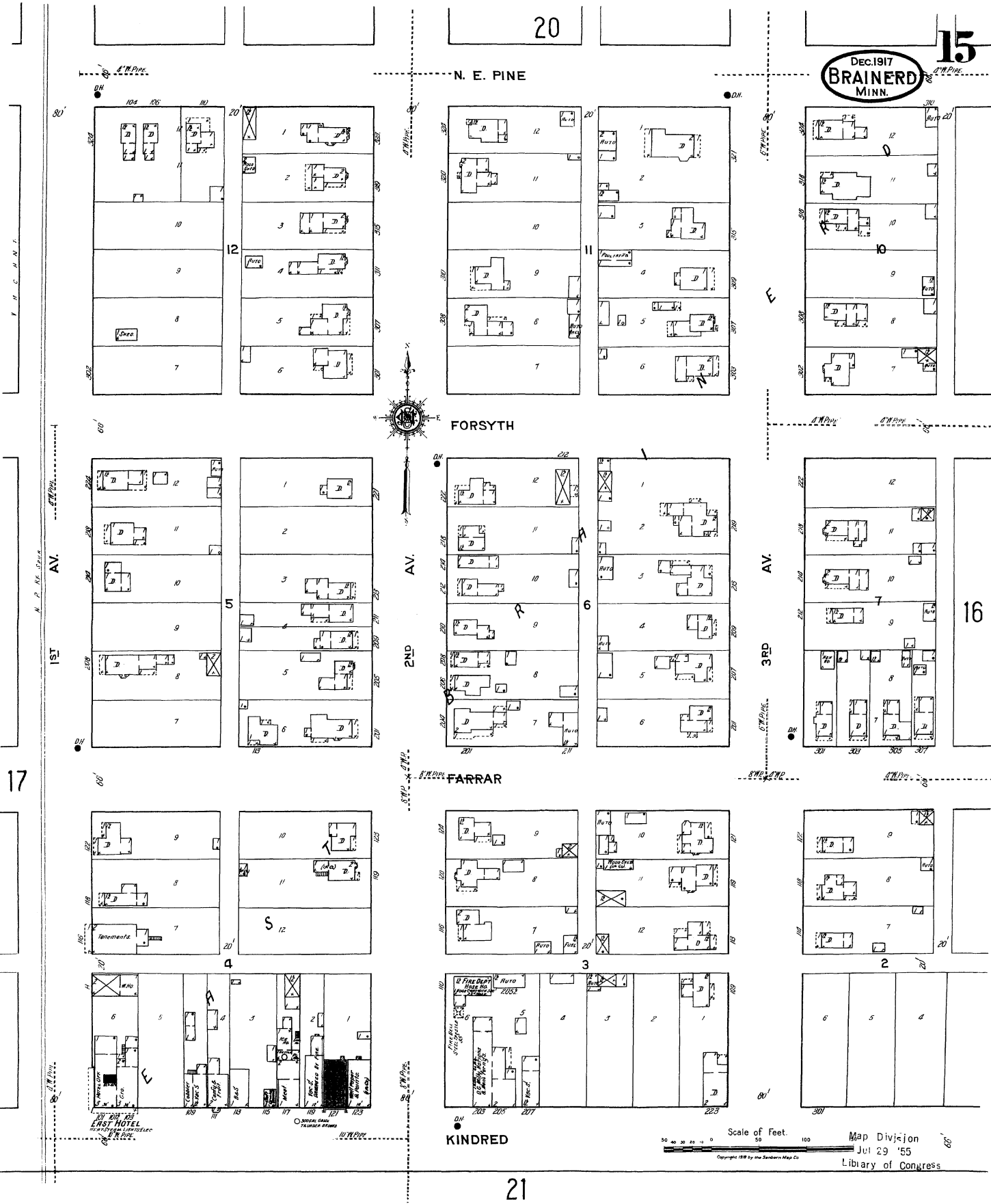
PINE

QUINCE

Scale of Feet.
0 50 100 150
Copyright 1918 by the Sanborn Map Co.Map Division
JUL 29 1955
Library of Congress







20

16

DEC. 1917
BRainerd
MINN.

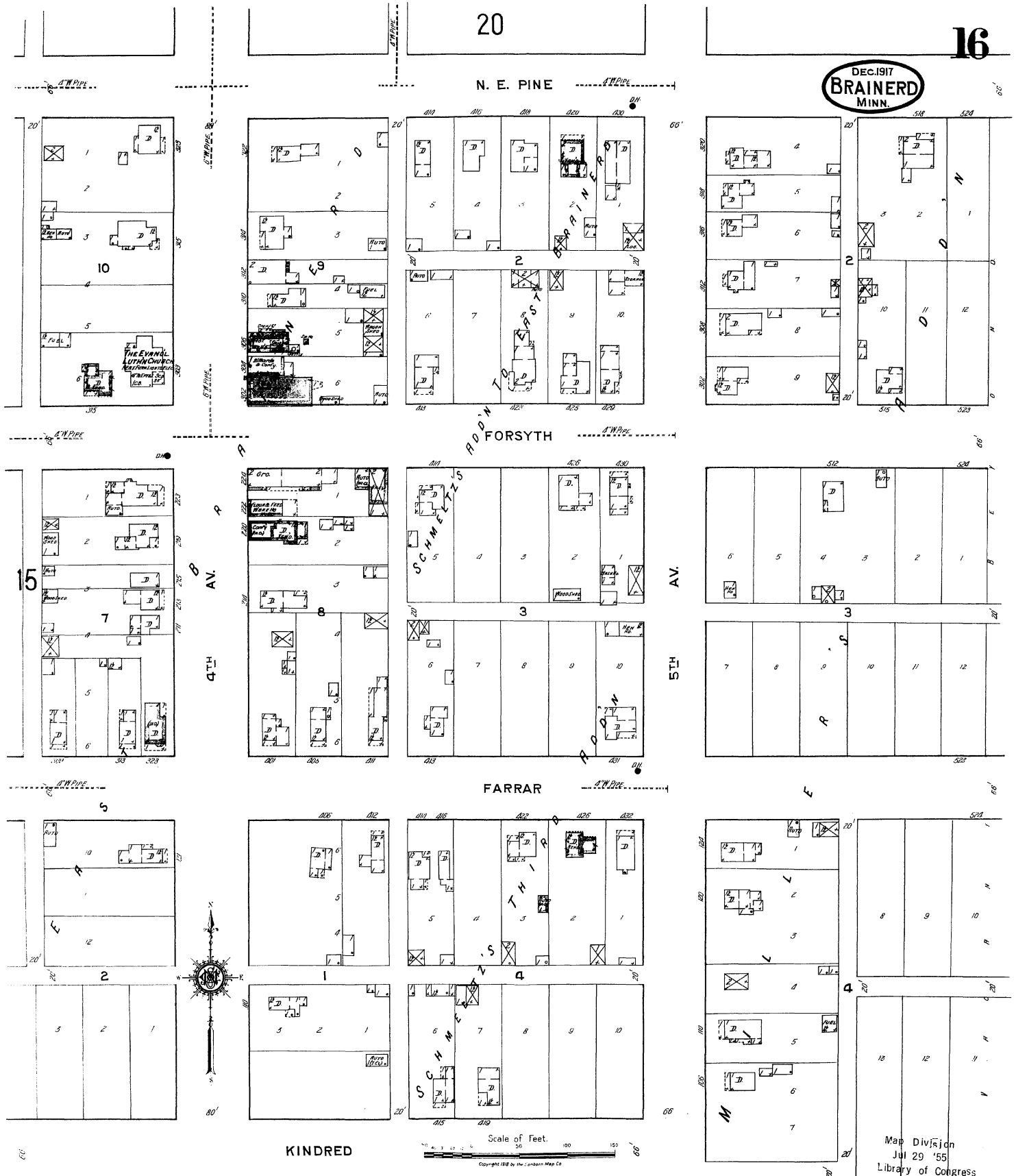
N. E. PINE

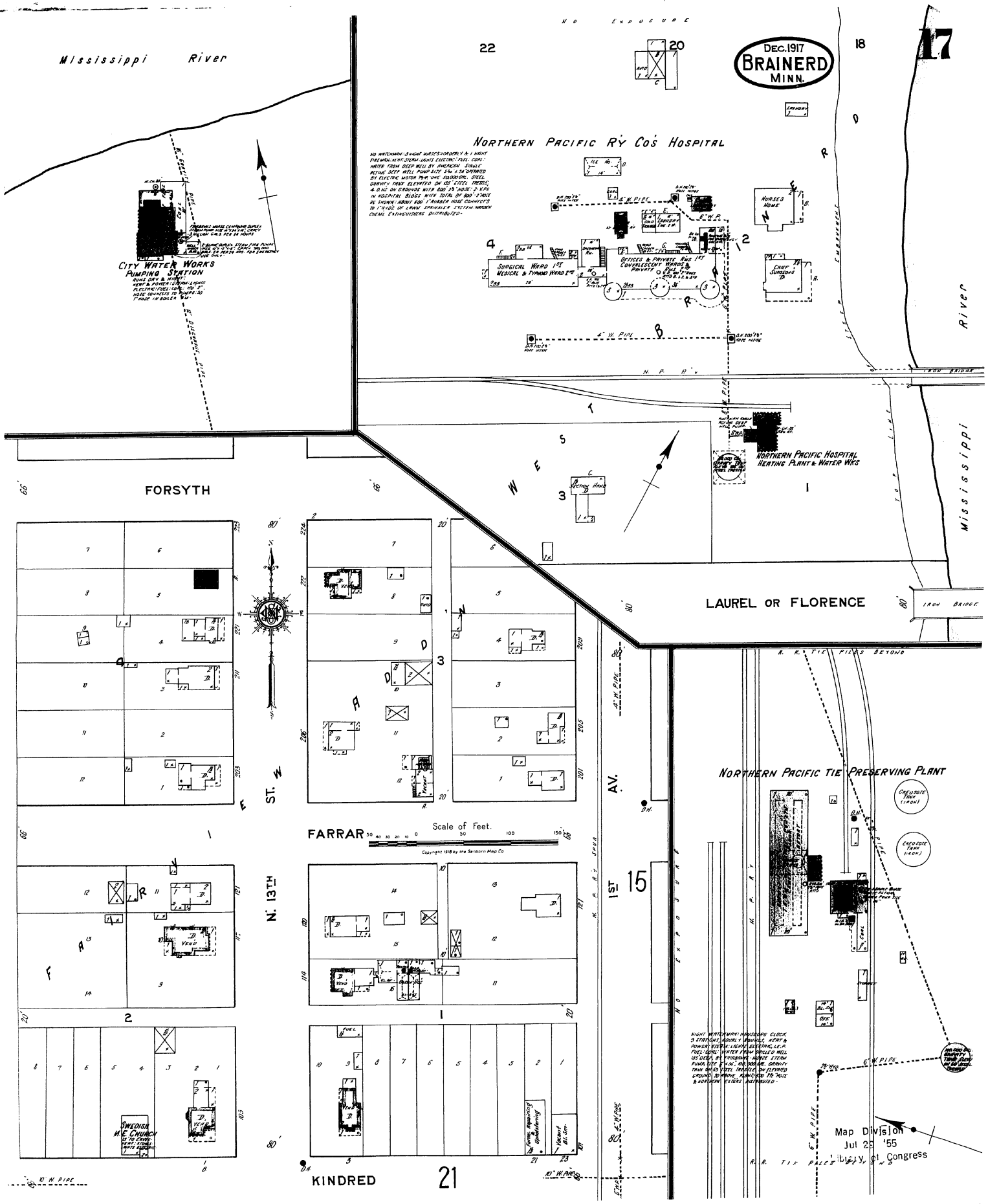
FORSYTH

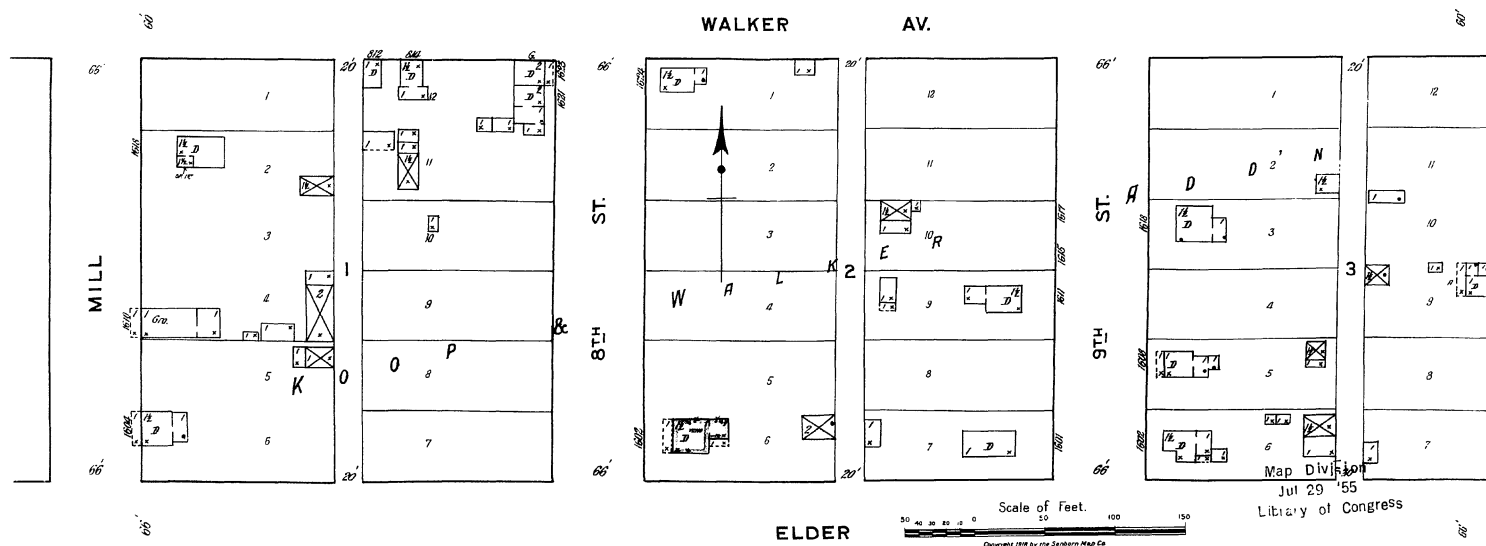
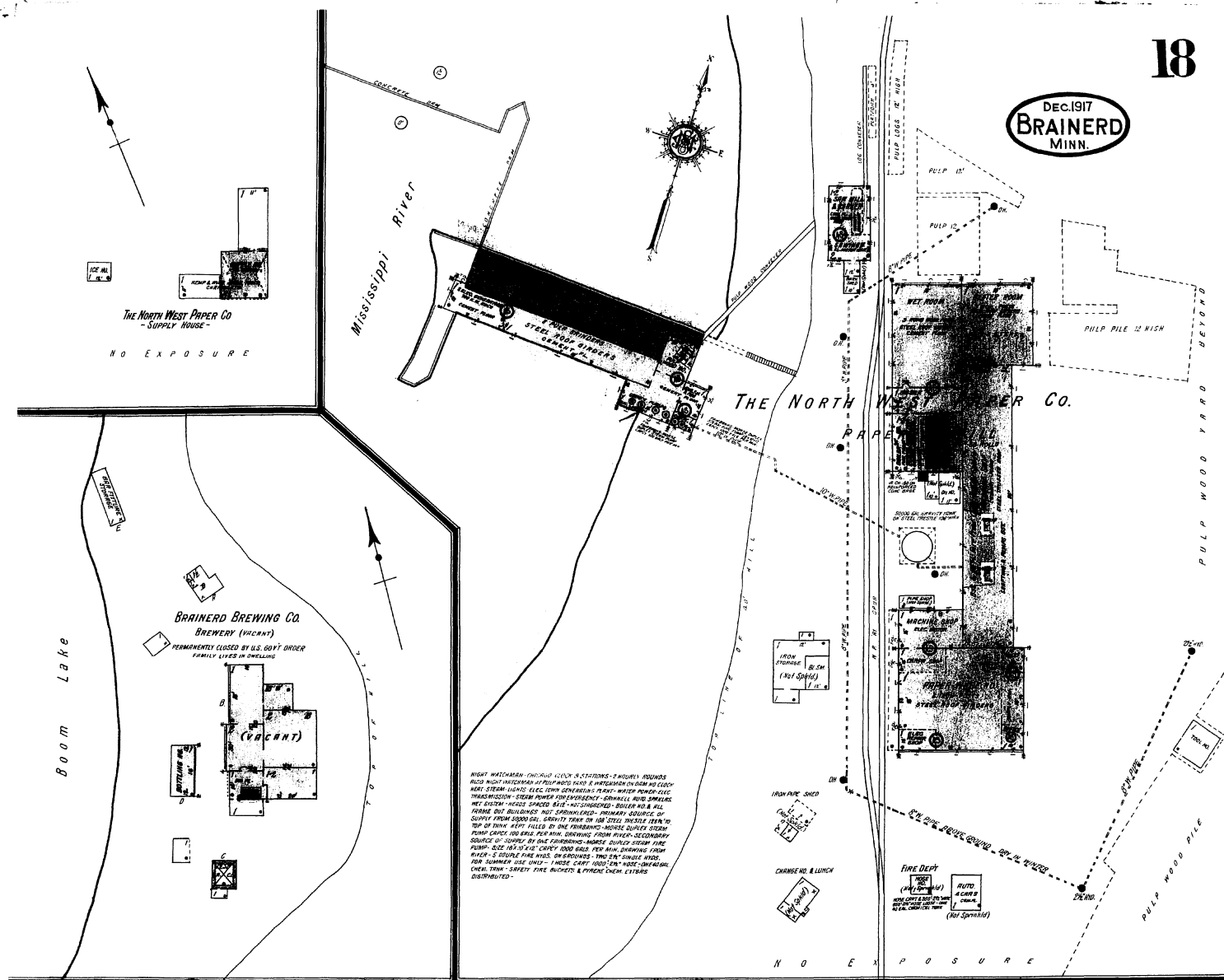
FARRAR

KINDRED

21







Unique Well Number

232347

County

Crow Wing

Quad

Brainerd

Quad Id

211C

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

MINNESOTA STATUTES CHAPTER 1031

Entry Date

1992/07/23

Update Date

2014/05/22

Received Date

Well Name

BRAINERD 3

Well T

Township

Range

Dir

Section

Subsection

Field Located

MDH

45

31

W

36

Elevation

1179.00

ft.

well and contact address

CITY OF BRAINERD - 3

BRAINERD

MN

Description

Color

Hardness

From

To (ft.)

FINE SAND

RED

0

60

COARSE SAND

GRAY

60

65

COARSE SAND W/ PEBBLES

GRAY

65

80

GRAVEL

80

115

COARSE SAND W/ PEBBLES

GRAY

MEDIUM

115

122

COARSE SAND

GRAY

MEDIUM

122

125

Remarks

First Bedrock

Aquifer

Quat. Water Table Aquifer

Last Strat

Depth to Bedrock

ft.

Well Depth

Depth Completed

Date Well Completed

125.00

ft

125.00

ft

1939/00/00

Drillhole Angle

Drilling Method

Drilling Fluid

Well Hydrofractured?

YES

NO

From

ft. to

Use

community supply(municipal)

Casing

Type

Steel (black or low

Drive Shoe?

YES

NO

Hole Diameter (in.)

Diameter

16

Depth

73

16.00

in. from

0.00

to

73.00

ft.

lbs/ft

Screen

Yes

Open Hole(ft.)

From

to

Make

Type

Diamter

Slot

Length

Set

Static Water Level

18.00

ft.

land surface

Date measured

1936/00/00

Pumping Level (below land surface)

ft. after

hrs. pumping

g.p.m.

Wellhead Completion

Pitless adapter manufacturer

Model

Casing Protection

12 in. above grade

At-grate (Environmental Wells and Borings ONLY)

Basement offset

Grouting Information

Well grouted?

YES

NO

NOT SPECIFIED

Nearest Known Source of Contamination

feet

Direction

Type

Well disinfected upon completion?

YES

NO

Pump

Not Installed

Date Installed

Manufacture's name

Model number

HP

Volts

Length of drop pipe

Material

Capacity

g.p.m

Type

Abandoned Wells

Does property have any not in use and not sealed well(s)?

YES

NO

Variance

Was a variance granted from the MDH for this well?

YES

NO

Well Contractor Cerfication

License Business Name

Lic. or Reg No.

Name of Driller

Date

HE-01205-07 (Rev. 2/9

County Well Index v.5

REPORT

Printed on

4/19/2019

Unique Well Number		County		MINNESOTA DEPARTMENT OF HEALTH		Entry Date	
403973		Crow Wing		WELL AND BORING RECORD		1992/07/23	
		Quad Brainerd		MINNESOTA STATUTES CHAPTER 1031		Update Date	
		Quad Id 211C				2014/03/10	
						Received Date	
Well Name BRAINERD 8				Well Depth		Depth Completed	
Township Range Dir Section Subsection Field Located MDH						Date Well Completed	
45 31 W 36 BDBBBB Elevation 1208.00 ft.				195.00 ft		187.00 ft 1984/09/13	
well and contact address CITY OF BRAINERD				Drillhole Angle			
				Drilling Method Non-specified Rotary			
				Drilling Fluid		Well Hydrofractured?	
						☐ YES ☐ NO	
				From		ft. to	
Use community supply(municipal)							
Description Color Hardness From To (ft.)				Casing Type Steel (black or low Drive Shoe? ☐ YES ☒ NO		Hole Diameter (in.)	
				Diameter 16 Depth 144			
				16.00 in. from 0.00 to 144.00 ft. 62.58 lbs/ft			
SAND BROWN V.SOFT 0 30				Screen Yes		Open Hole(ft.) From to	
				Make JOHNSON		Type stainless steel	
				Diamter Slot Length Set			
				16.00 70 45 144 ft. to 189 ft.			
				Static Water Level			
				77.00 ft.		land surface Date measured 1984/09/11	
				Pumping Level (below land surface)			
				129.00 ft. after		31.00 hrs. pumping 1750.00 g.p.m.	
Remarks				Wellhead Completion			
				Pitless adapter manufacturer		Model	
				☐ Casing Protection		☒ 12 in. above grade	
				☐ At-grate (Environmental Wells and Borings ONLY)		☐ Basement offset	
				Grouting Information			
				Well grouted? ☒ YES ☐ NO ☐ NOT SPECIFIED			
				Material neat cement		From 0.0 To 142.0 ft. 7.72 Cubic yards	
				Nearest Known Source of Contamination			
				_____ feet		Direction _____ Type	
				Well disinfected upon completion? ☐ YES ☐ NO			
				Pump			
				☐ Not Installed		Date Installed _____	
				Manufacture's name _____			
				Model number _____		HP _____ Volts _____	
				Length of drop pipe _____		Material _____ Capacity _____ g.p.m	
				Type _____			
				Abandoned Wells			
				Does property have any not in use and not sealed well(s)? ☐ YES ☐ NO			
				Variance			
				Was a variance granted from the MDH for this well? ☐ YES ☐ NO			
				Well Contractor Certification			
				Ervin Well Co.		65252	
				License Business Name		Lic. or Reg No.	
				ERVIN, D			
First Bedrock				Aquifer		Quat. Water Table Aquifer	
Last Strat				Depth to Bedrock		ft.	
County Well Index v.5				REPORT		Printed on 4/19/2019	
				Name of Driller		Date	
						HE-01205-07 (Rev. 2/99)	



Municipal Gap Filling Partnership

CLIMAVISION.COM | TARA.GOOD@CLIMAVISION.COM



OUR MISSION

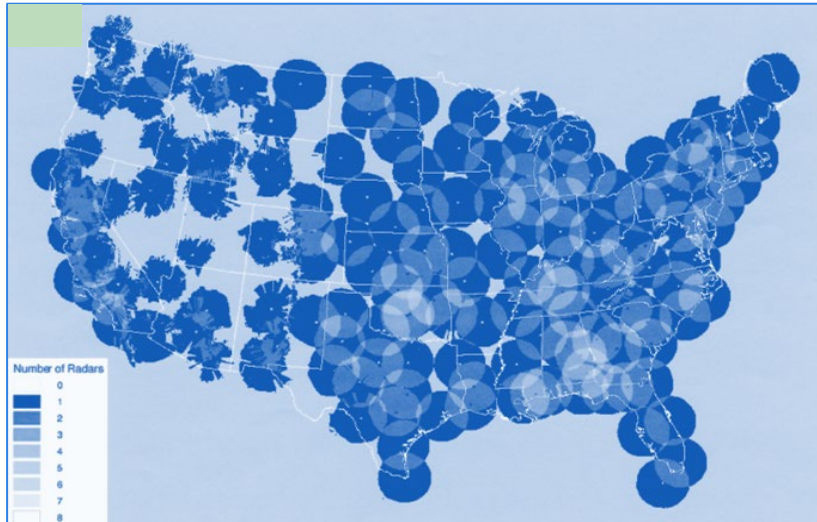
We fill gaps in traditional weather surveillance to help **better prepare** and **respond** to increasingly volatile weather patterns.

Lack of Coverage in Lower-level

You are located in the center of a low-level weather gap.

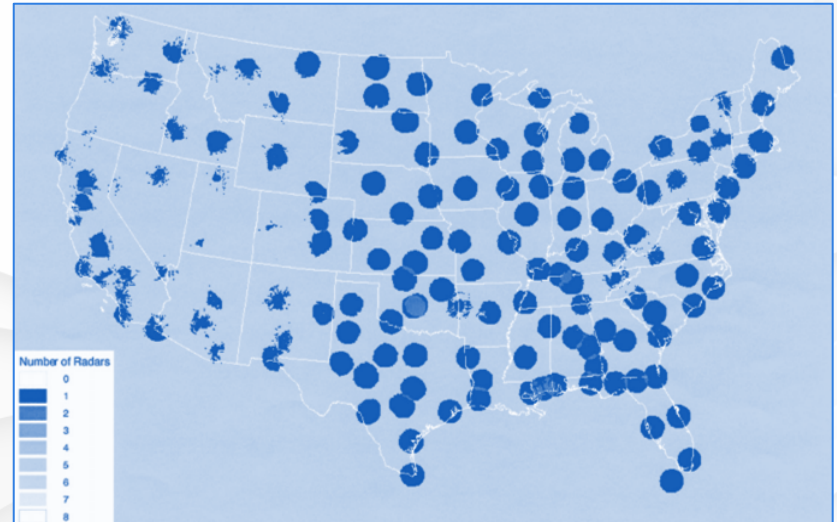
UPPER-LEVEL ATMOSPHERE:

Coverage 3km Above Ground Level is Comprehensive...



LOWER-LEVEL ATMOSPHERE:

..but Coverage ≤1km Above Ground Level is Lacking

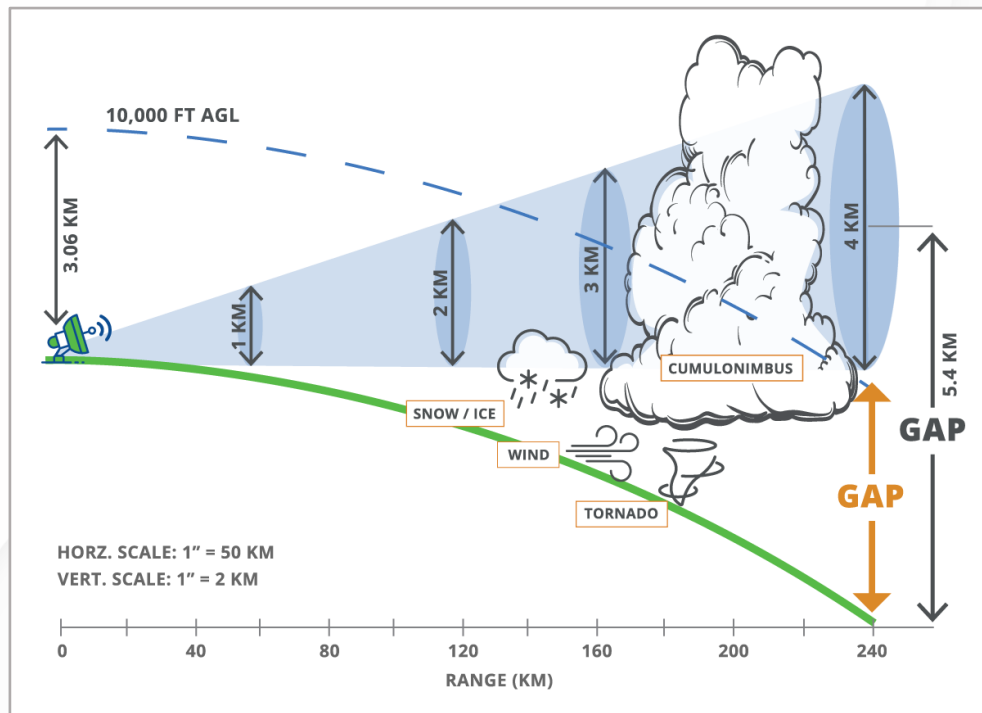


Credit: American Meteorological Society

What is the Cause for These Gaps?

Low Level Gaps

- The combination of the curvature of the earth and the angle at which radars are tilted upward results in blind spots in the lower level of the atmosphere, where most volatile weather events occur.
- Our compact, high-res radar fills these blind spots for better flash flood warnings, tornado observations, and improved forecast modeling.

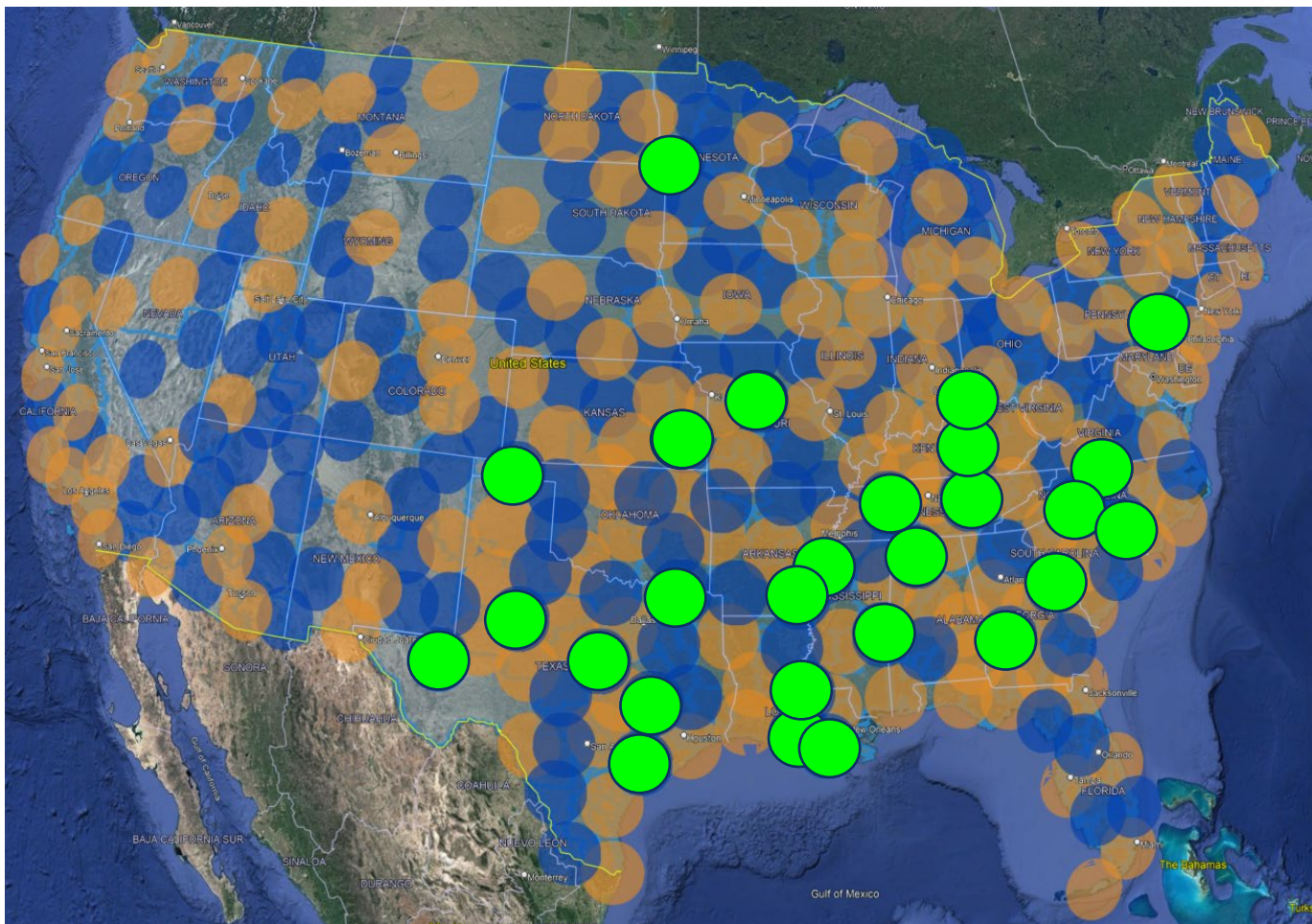


Operational Fleet & Plan

As of June 18, 2024

-  NEXRAD at 4,000ft AGL
-  Planned Climavision site
-  Operational (27)

**200 radars once complete*



Public/Private Partnership

What are we proposing?

Municipal Partner to Provide Location for Radar

Climavision is looking for permission to place the radar on your existing infrastructure.

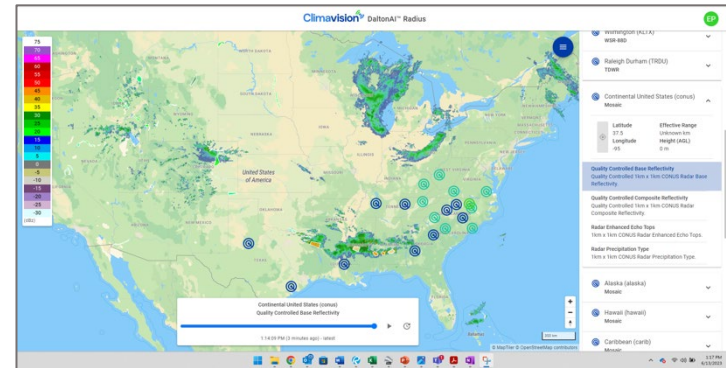
A no-cost lease agreement is proposed, which outlines the county's access to the data and Climavision's access to the site. It also protects the municipality from any liability, cost, maintenance, or ownership of the radar.



Nearby
Lexington
Manufacturing

Climavision To Provide Data Access

In exchange for a location for the radar, Climavision would provide the municipality with access to a live radar viewer which can be accessed via a URL. This data can be used by anyone within the county who works for the government - school boards, EMA, fire, police, and city/county leadership are common examples. This data is sold to others, but would be free for you.

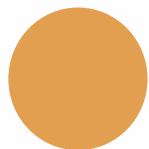


Gaps in Your Region

These circles represent ~60 mile radius in coverage.

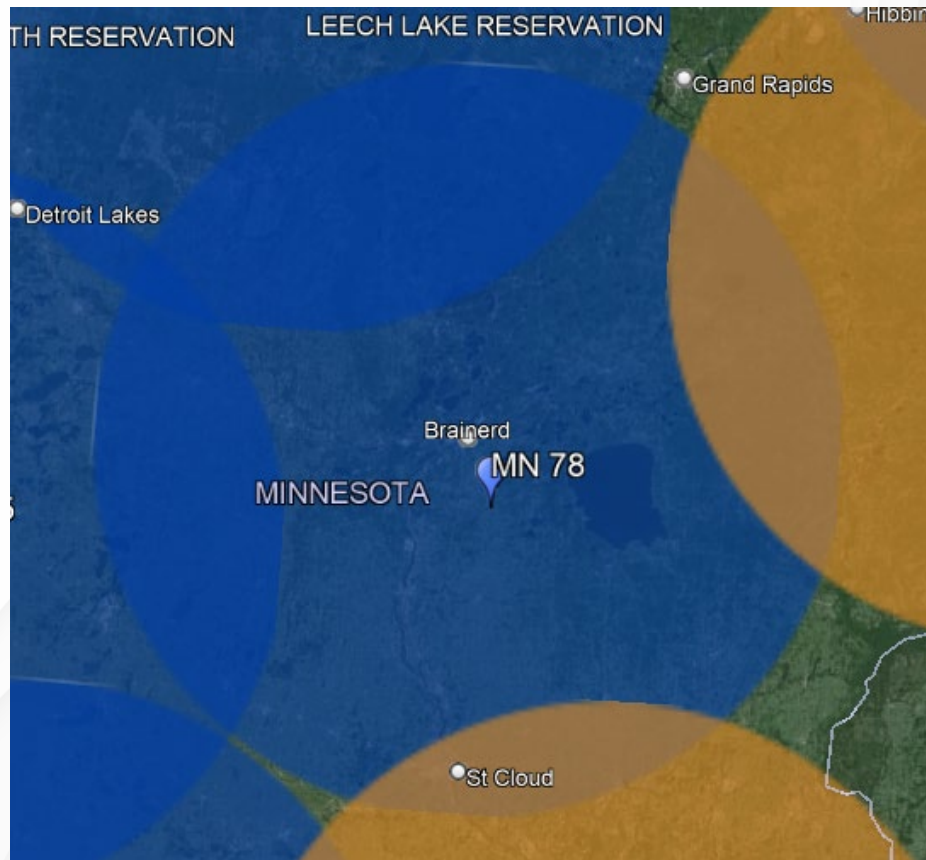


WEATHER GAP



NWS COVERAGE

4k feet and below



MN78 is an internal naming convention/label for your site. The label is not always perfectly centered.

Climavision[®] Our Business Model

Unique Solution

We front the cost of the radar and then monetize data access for many industries. This allows us to pay for the technology and provide the data back to our community partners for free.

Radar-as-a-Service

Removes the costly infrastructure burden of owning, maintaining, and operating your own system and allows more entities to benefit from additional weather surveillance information.



Media



Insurance



Government



Agriculture



Energy & Utilities



Drones & Advanced
Aerial Mobility



Aviation



Transportation

Round-the-Clock Operations

Designed to Keep Radars Online, Minimize Downtime, Maximize Coverage, Capability, Equity, and Continuity

Standard Client SLA – System Restored Within 72 Hours

24/7 Monitoring

- HW monitoring auto scales with network
- Runs 24/7 – alerts at any system “burp”
- Web-based – transportable

Dedicated Science/Tech

- Cloud-hosted backend
- Ongoing, real-time data quality analysis
- Continuous improvement/innovation

Field Team

- Dedicated field teams ready for deployment within 24-48 hours
- On-call local and regional teams

Spares Depot

- Stocked warehouse of all consumable and critical life components
- On-hand inventory for common, expected, and catastrophic failures
- Designed for quick return to service – 72 hours

Hardware/Software Monitoring



Status and Alerting





02



Climavision  **Installation Details**

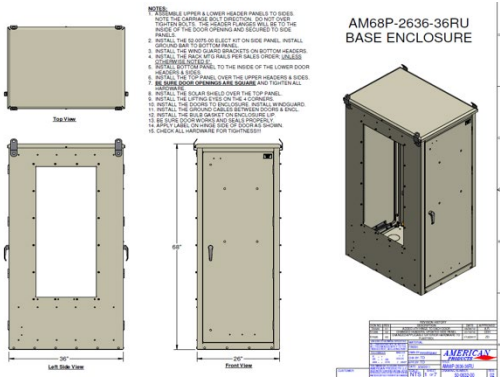
Platform and Cabinet Specs

RADAR PLATFORM



Radar platform is 12'x10' and represents the footprint of the radar. The legs are adjustable and can be fully extended up to 7ft. Includes lightning rod and aircraft warning lights

CONTROL CABINET

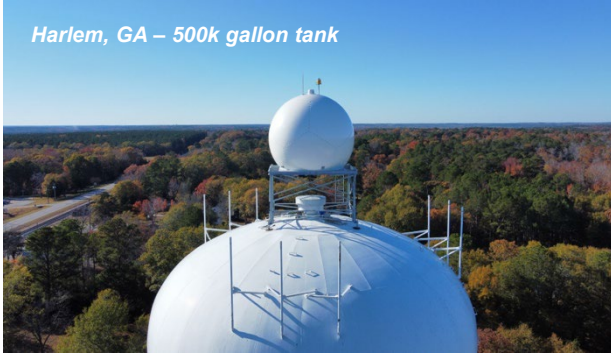


GENERATOR (10kw)



Recent Installations

Harlem, GA – 500k gallon tank



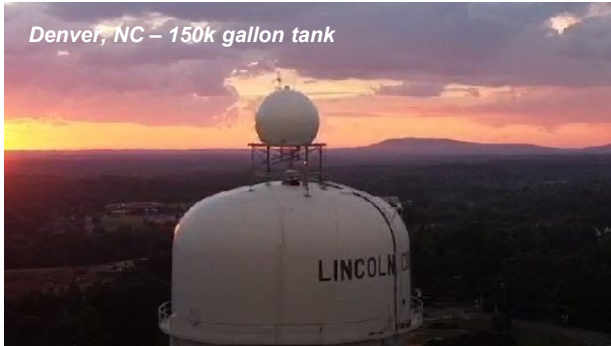
Wendell, MN – 50k gallon tank



St. Mary Parish, LA Courthouse



Denver, NC – 150k gallon tank



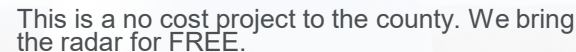
Snyder, TX – 500k gallon tank



Millersville University – 1m gallon tank



THE 'FINE PRINT'



Climavision owns, maintains, and assumes all liability on the radar.

We are licensed by the FCC.

The radar is an X-Band Radar which operates on a very high frequency, 9200 - 9700mhz. It produces high-res data across a 60-mile radius.

We conduct a structural analysis and do a full engineering work up before touching your property.

We coordinate all civil works ahead of time, electric, comms, and nat gas/propane being the primary ones.

Radar installation takes about seven days, two of which are considered “construction” days.

Real-time radar data will be available to city/county officials (ex: police, fire, EMA, school board)

03

Climavision

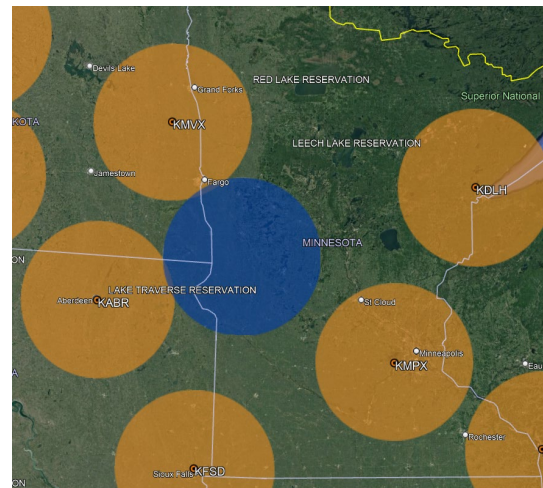


Gap-Filling Case Studies

Wendell, MN Snow – Jan.

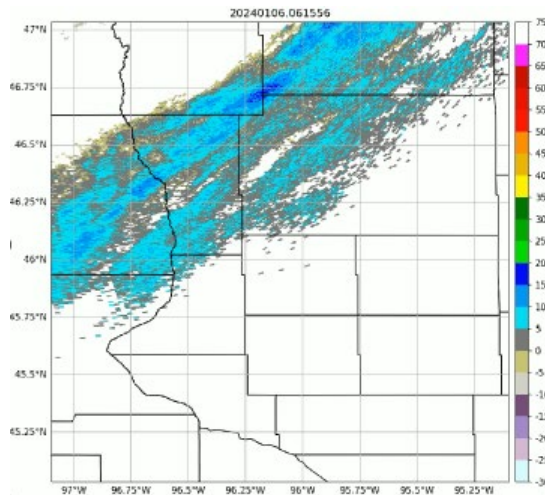
January 6, 2024

Climavision's Wendell radar captured snow for several hours on January 6th. There was notable snowfall caught by Climavision's radar for both Traverse and Big Stone counties that was missed by NEXRAD radar, as well as for Grant and surrounding counties. High resolution by Climavision is also showcased in the radar loop below.

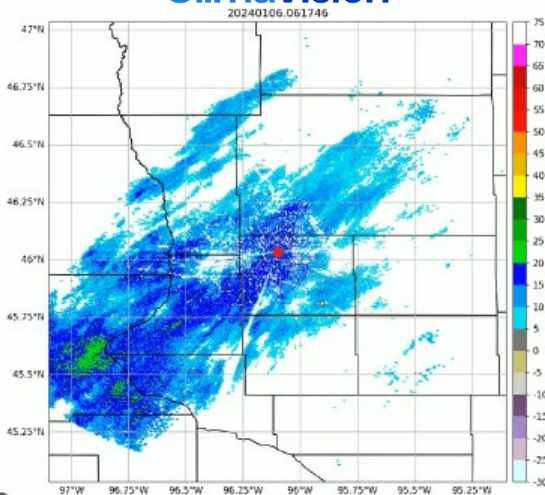


Climavision's radar in Wendell, MN sits in a prominent weather radar gap. The two closest NEXRAD radars sit over 100 miles away in North Dakota and South Dakota. The radar beams from KDMX and KAMP sit at over 12,000 ft AGL over Wendell. Now the system is live and in the hands of the Weather Forecasting Offices in the area, they can "see" weather that was previously missed.

KDMX – NEXRAD



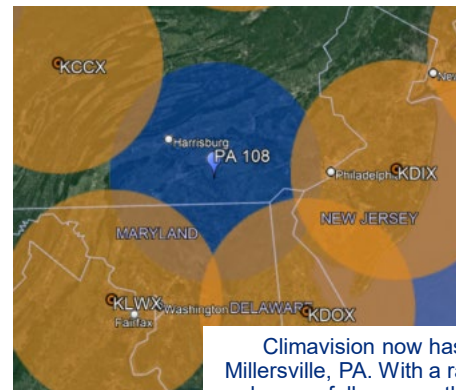
Climavision



Pennsylvania Snow Squalls

January 14, 2024

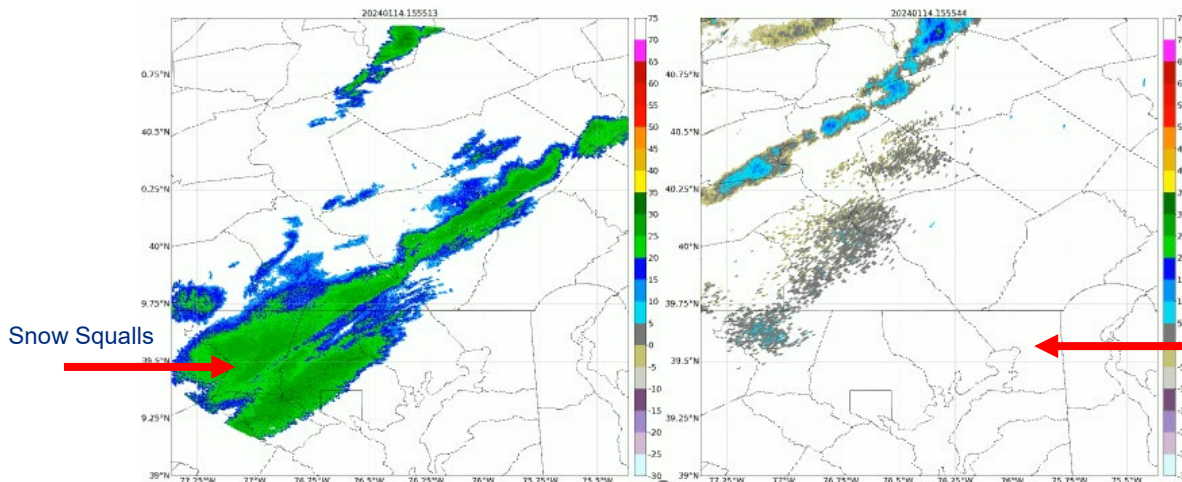
On January 14th, several warnings were issued for snow squalls across southeastern Pennsylvania. Climavision radars were able to clearly detect these events while the nearest NEXRAD radars overshot some of the snow bands that occurred. The nearby Weather Forecasting Offices (WFO's) now have this information through a limited access. In the image below, Climavision's radar in Millersville shows superior continued tracking of the snow squalls as they continued eastward.



Climavision now has a live system in Millersville, PA. With a range of 60 miles, the radar now fully covers the "gap" area in blue. The nearest NEXRAD radar to Millersville is KLWX in Sterling, VA which has a radar beam height of ~8,300 ft AGL followed by KCCC, ~9.8k ft AGL, and KDIX ~10k ft AGL. Climavision's radar can see from 150 ft AGL and up, better detecting weather phenomena near the surface and showcasing the power of a supplemental weather radar network. With both data sets, we have a better chance of protecting people and minimizing the detrimental and costly impacts of volatile weather, which often occurs in these lower levels.

Climavision

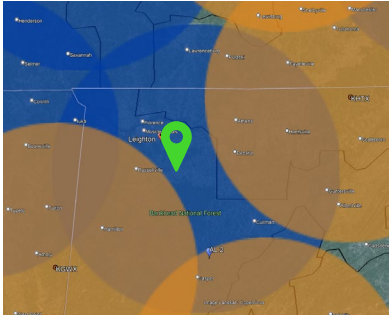
NEXRAD KCCC – State College, PA



North Alabama Tornado

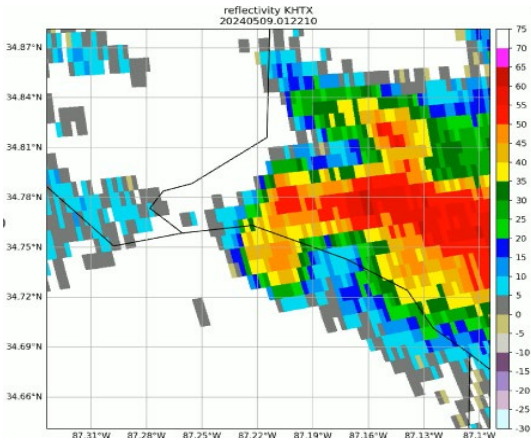
May 9, 2024

On May 9th, 2024, a large EF3 tornado touched down about 17 miles to the north/northwest of a gap-filling radar system located in Moulton, Alabama. NWS-Huntsville performed a storm survey and was determined that the tornado was an EF3 with a maximum peak wind of 136 mph. Because of its proximity to the storm event and lower elevation, the supplemental system captured the hook signature 5 minutes before the nearest NEXRAD system.

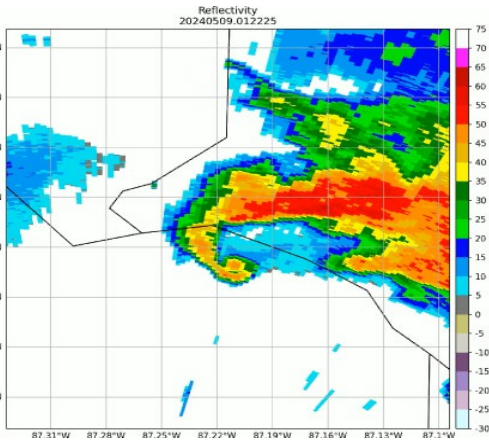


Radar location: ~984ft AGL
KHTX: ~4,900ft AGL

KHTX NEXRAD Reflectivity



Supplemental System Reflectivity



Storm Track

V002



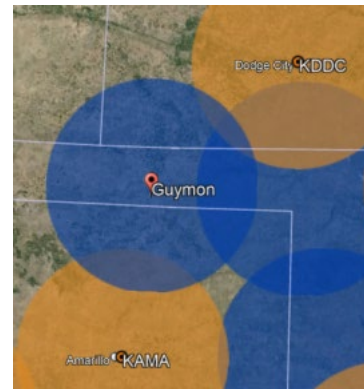
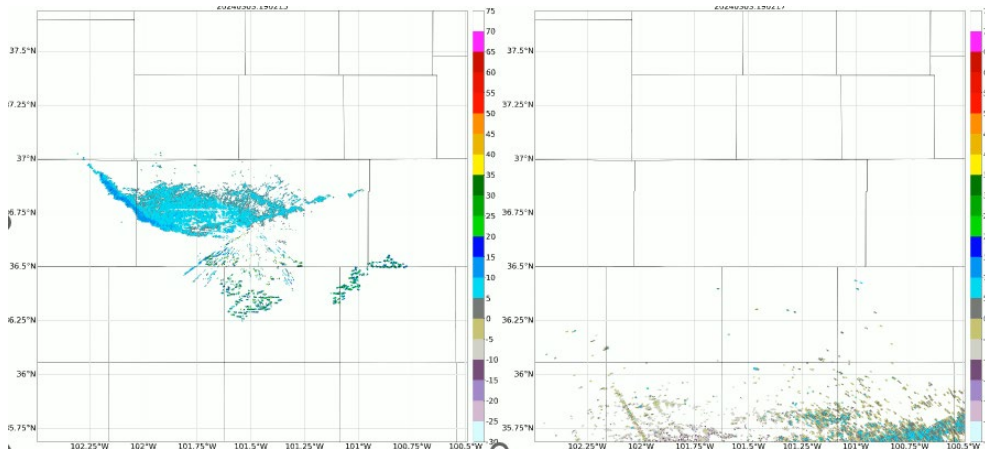
Oklahoma Fire

March 3, 2024

At the beginning of March, several blazes were burning across Oklahoma and Texas, fueled by dry conditions and high winds. One of these fires occurred near Climavision's radar site in Guymon, Oklahoma. Nearby NEXRAD radars did not pick up on the smoke, but Climavision's radar was able to detect smoke plumes across the OK Panhandle.

Climavision

KAMA – Amarillo, TX



The next nearest radars to Guymon, Oklahoma are in Amarillo, TX and KDDC in Dodge City, KS. Their respective beam heights over Guymon are:
KAMA ~8.3k ft AGL
KDDC ~10.8k ft AGL



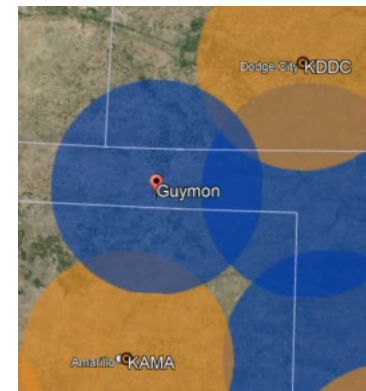
Photo of neighboring fires on the Texas panhandle
Courtesy of Brandon Sullivan, Climavision VP of Product

Climavision

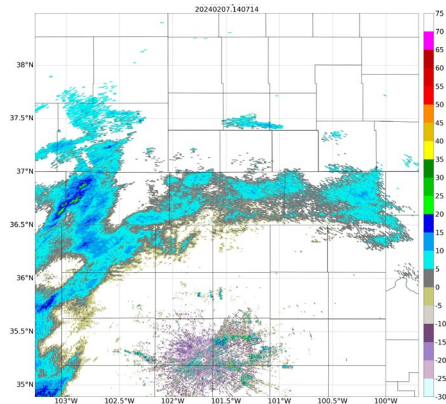
Oklahoma Overshooting Precipitation

February 7, 2024

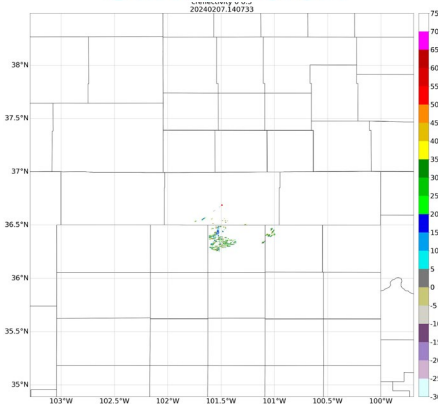
In areas surrounding Guymon, Oklahoma on February 7th, the nearest NEXRAD radars detected precipitation that did not align with the ground truth. Climavision's Guymon radar did not detect but a slight occurrence of rain reaching the ground. The radar images below are of all radars scanning at 0.5 degrees.



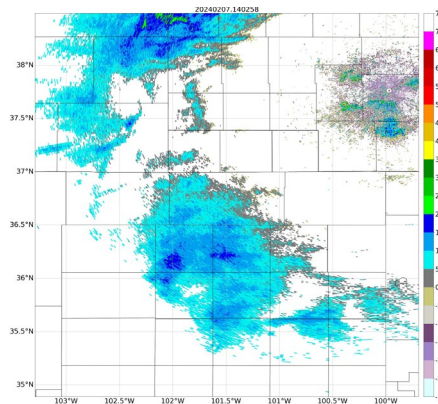
KAMA – Amarillo, TX



Climavision



KDDC – Dodge City, KS



The next nearest radars to Guymon, Oklahoma are in Amarillo, TX and KDDC in Dodge City, KS. Their respective beam heights over

Guymon are:

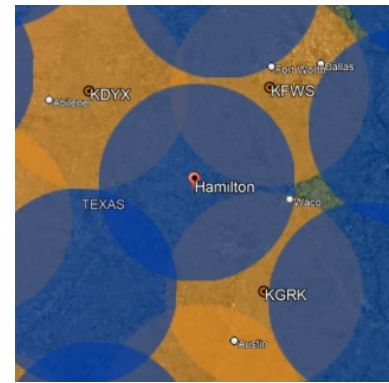
KAMA ~8.3k ft AGL

KDDC ~10.8k ft AGL

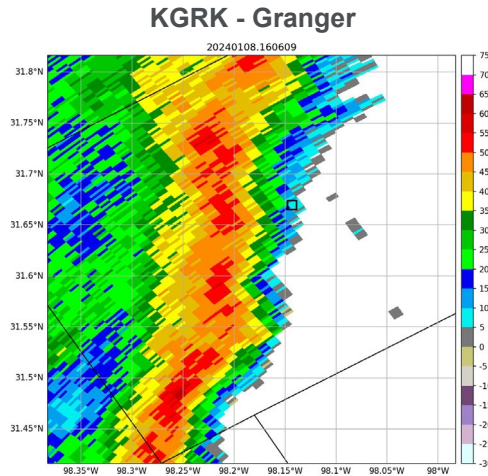
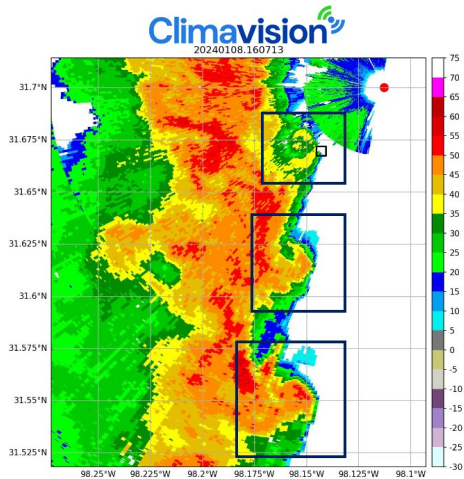
Hamilton, TX Wind Damage

January 8, 2024

On January 8th, damage was sustained by the Hamilton Municipal Airport in Hamilton, Texas. No warnings were issued, and the SPC did not receive any wind or tornado reports, but damage at the airport is evidence of a strong storm. Climavision's reflectivity indicates front reflectivity notches (highlighted w/ navy boxes). Working in conjunction with the radial velocity from Granger, one would be able to determine the beginning stages of rotation in these locations.



Climavision's radar in Hamilton is in a prime location to detect weather phenomena just above ground level at the Hamilton Municipal Airport. Next nearest radar beam heights above Hamilton are:
KFWS ~ 6,300 ft AGL
KGRK ~ 6,800 ft AGL
KDAY ~ 7,400 ft AGL



Credit: City of Hamilton Administration, Ryan Polster

**Brainerd Public Utilities
BPU Commission Unfinished Business
June 25, 2024**

A. Hydro Generation/Automation (1/31/23)

Barr Engineering and staff continue work related to procurement of two generators at the hydro facility.

B. Current Unposted Employment Positions at BPU

The below positions were authorized in October 2023 by City Council. The date below is when the positions were recommended by Commission. The City Council and the IBEW #31 Union are still negotiating the salaries for these positions:

- Business Office Support Specialist (5/30/23)
- Facilities Custodian (5/30/23)
- Journeyman Electrician (7/25/23)
- Journeyman Lineman (11/28/23)

C. Schedule of Authority Roles of Commission and Council in Operation of BPU (10/31/23)

Was presented at the joint session between council and commission, and no adjustments were made. A future meeting will be discussed to discuss potential partnership agreement.

D. Development of Plan to be Carbon Free by 2040 (10/31/23)

BPU is subject to the State's Renewable Energy Standard (RES). The RES will require BPU to either generate or procure sufficient electricity generated by an eligible energy technology (solar, wind, hydroelectric, or biomass) to retail customers of BPU that is equivalent to at least 25% of total retail electric sales to retail customers by 2025 and 55% by 2035. In addition to the RES BPU must generate or procure sufficient electricity generated from a carbon-free energy technology (technology that generates electricity without emitting carbon dioxide) that will be 100% by 2040. AEP (American Electric Power) amendments have provided the requirement to date.

E. Rewrite of Brainerd City Code Section 705 – Water System (6/27/23)

The process of rewriting Section 705 has begun.

F. Lead Service Line (LSL) Inventory Assessment (9/26/23)

Work continues mapping of the public water system. Identification of types of materials used in water service lines along with inventory process is required to be completed and submitted to the Minnesota Department of Health before October 16, 2024. Total cost to replace on complete service line could cost as much as \$44,000 per service. Mapping and communications have been continual as staff schedule time to ensure all are entered on the mapping software and schedule any in-home visits or review with customer as needed.

G. Wellhead Protection Plan (WHPP) (7/25/23)

Continue to work with Minnesota Rural Water Association and Bolton & Menk on completing WHPP Part 2 Amendment by July 1, 2024 (extended 1 month for BPU). Final materials were discussed at a final meeting on April 25, and a presentation will be provided at June's meeting. Schedule moving forward is to provide the plan to other Local units of government by May 3 for comment to be received by July 3. Review of comments from the other government units to be considered in the middle of July with a public hearing to be held around July 15. Final plan submission will then be around July 19, which is prior to the deadline of August 1, 2024.

- H. Electric Transmission Service to Brainerd (1/31/23)
Continue to work on scheduling a meeting with Minnesota Power to discuss capacity constraints imposed on BPU by MP on transmission line serving Brainerd.
- I. Crypto Mining Activity (7/1/22)
JFK current mining load is approximately 22 MWs. VCV's contract expired on March 22, 2024, with a new purchase agreement approved at the April commission meeting, 15MWs required by December of 2024 for this contract.
- J. Corrosion Control Plan to Minnesota Department of Health (10/31/23)
A plan was submitted to the Minnesota Department of Health by November 6, 2023, describing the intended plan for dealing with copper corrosion. The plan approval was received January 26, 2024. BPU also sent a brochure to all water customers describing important information about copper in drinking water as required by MDH. A corrosion control video has been posted to the website for informational purposes of this treatment plan. An update to the brochure that was sent in was sent out with March and April billing and has been posted to the website. Education is ongoing.
- K. Credit Card Transaction Fees (01/30/2024)
Continued discussion and research occurring with Global Payments representatives, Tyler, Nuvei and Bremer Bank. Staff have had further discussions with potential processing vendors and have found that the initial savings presented did not include the portal options and changing away from Tyler causes effects to the customer portal that have not been fully determined at this time.
- L. Reclamation and Backwash Project (2/27/2024)
Planning and construction meetings are ongoing with Bolton & Menk. Sizing and placement of the tank have been discussed and are being vetted. Project is continuing as scheduled.
- M. Distributed Energy Resources (DER) Website Updates (2/27/24)
During the March commission meeting website updates were presented related to the electric generation options, development continues for those items to go live. Lead Copper Corrosion Rule (LCCR) has been identified by staff as the priority at the present time and this project has been put on hold, LCCR is due to federal regulators by October.
- N. Customer Communications Policy (2/27/24)
The customer communications policy is still being drafted as the process for after-hours communication is currently in the implementation phase.
- O. Joint Committee for Parking and Car Chargers (4/30/24)
Update to be provided in July, meetings are occurring the week of this meeting.
- P. Water Wastewater 20-year Feasibility Quote (4/30/24)
Staff have reached out for the respective quotes from multiple agencies, responses have been received, and are being evaluated for presentation at next months meeting.

Daniel Loch

Subject: BPU Project Update - April/May 2024

See below for an update on the projects we are working on:

Water Reclamation:

1. Preliminary engineering memo is complete and has been sent out on 5/29/2024. Please let me know if you have any questions on the memo or final design concepts. This memo is the baseline for the design. We will plan to reference this memo during design.
2. We have our design team starting on final design of the system.
3. In reviewing the project with our design team, we will be updating the building layout to include a mechanical room for a water heater and tempering valve (required for the chemical storage eyewash) and for a 4" water service. The plan is to tap into the 16" main to the North zone and run a 4" service into the new mechanical room for the potable and non-potable water systems.
4. Barr Engineering has indicated they would like to do an onsite walkthrough with Brent to review electrical items. They will get me a schedule and I'll check with you to verify dates.
5. **Schedule update**
 - **By end of July 2024:** DOLI plumbing submittal for plumbing approval (this process can take up to 12 weeks to compete. Average DOLI review time is 12 weeks
 - **By end of July 2024:** MDH submittal for review and approval by MDH
 - August 2024: Utility to review plans and specs and authorize advertisement on Quest
 - August/September 2024: Final plans and specs due and ready for bidding
 - **September or October (Depending on MDH and DLI approval): Advertise project on Quest**
 - Late September/October 2024: Open bids
 - October - November 2024: Begin construction and review submittals

Water Treatment O&M

1. Draft O&M is 80% complete. Going through review process and QA/QC.
2. We have sent over the backwashing procedures for current backwash operations.
3. Will be adding additional language to the report for provisions on how to handle emergency situations such as boil orders etc.
4. No additional trips to the site scheduled at this time. Currently have conducted 2 trips.
5. Schedule:
 - July 2024 – Draft O&M to BPU to review
 - July/August 2024 – Final O&M to BPU

Wellhead Protection Plan

1. No current action items.

Lead Service Line Inventory

1. [@Trent Hawkinson](#) please let me know when you want to discuss getting people together to assist with addressing the unknown service lines. We can discuss getting additional staff to help with the inventory.
2. I would like to sit down at some point and get BPU thoughts on the 10-year replacement plan and work on developing the plan together.

Please reach out with any questions.

Thanks,

Morgan Salo, P.E.

Principal Environmental Engineer **Bolton & Menk, Inc.**

Daniel Loch

Subject: Directional Drilling Forcemain River Crossing

Subject: Directional Drilling Forcemain River Crossing

Hi Charlie

I met with Mike Urban on Friday to discuss the Brainerd and Baxter Sides

Brainerd

1. Air release manhole- new casting has been installed
2. There is water in the bottom of the air release manhole. The contractor believes this is from water draining into the structure through the lid. They regraded around the casting.
3. They secured vent pipe with additional concrete. Painted vent pipe. Provide screen at end of vent pipe.
4. The Brainerd access road has been rutted up in some areas.
 - a. There is a numerous areas where there is 1 ½" rock covering the road.
 - b. Except for the rutted up areas the road is fairly solid.
 - c. We discussed some options for the Access Road. I will estimate some costs.

Install black dirt on access road, seed, and mulch,

Leave access road as is and install black dirt around air release manhole area, seed and mulch.

Repair soft spots in access road, seed and mulch areas on access road that are not covered with 1 ½" rock, provide black dirt around the air release manhole area, seed, and mulch.

I have some pictures of the access road or we could meet out there to look at the existing road.

Baxter

1. The mill and overlay portion of Eagle Ridge Drive has been milled.
2. Not sure of the schedule of paving. Suppose to be Tuesday June 18, 2024
3. Paving of access road to occur at the same time.

Thank You

Bill

William Westerberg, PE

Civil Engineer

218-316-3651

7804 Industrial Park Road

Baxter, MN 56425

WIDSETH

Widseth.com

50 Best Places to Work (*Prairie Business Magazine, 2023*)



Public Utilities Commission

Agenda Request

MEETING DATE: June 25, 2024

TITLE OF ITEM: Fee Schedule

ACTION REQUESTED: Approve/Deny Motion

ESTIMATED TIME (MIN): 2

SUBMITTED BY: Danny Loch, Finance Manager

PRESENTER: Danny Loch, Finance Manager

SUMMARY OF ISSUE: Attached is the proposed updated fee schedule for 2024. This schedule shows the 2023 rates compared to the proposed 2024 rates. The electric rates were approved at a previous meeting. In the past, annually the Commission has adjusted the meter rates annually for the change in the cost to purchase each meter. The proposed schedule is updated for the increase in cost of each water meter size.

At the last meeting, a discussion began related to re-connection fees. Re-connection/administrative fees have been charged on disconnected accounts for many years and is not abnormal for the industry. These fees are charged after customers have been notified twice (three times with physical door hanger in the cold weather rule months) of pending disconnection for non-payment, or if there is a failed payment arrangement and the service is disconnected. These fees in the past years have produced \$32k to \$37k in annual revenue. Staff time associated with these same arrangements and notices is more than double this revenue. Often these fees are paid by assistance and not directly from the customer themselves.

ALTERNATIVE, OPTIONS, EFFECTS ON OTHERS/COMMENTS: The increase in bulk water rates, and hourly personnel costs reflect increases in inflationary costs seen.

RECOMMENDED ACTION/MOTION: Staff recommend approving the attached fee schedule with the updated rates for 2024.

FINANCIAL IMPACT:

**BRAINERD PUBLIC UTILITIES
SCHEDULE OF FEES**

Proposed June 25, 2024

Disconnect/Reconnect Electricity

7:00 a.m. - 3:00 p.m. (dropping lines, meter maintenance, etc)	No Charge
After hours Emergency Disconnect/Reconnect	No Charge
Temporary Service-If line is extended additional fees could be incurred	\$150.00
7:00 a.m. - 3:00 p.m. - Foreclosures & Disconnected Delinquent Accounts	\$50.00

Special Events

Service Charge (Additional charges could be incurred)	\$150.00
Electric Meter Charge for each meter	\$24.50
kWh charge	\$0.10437

Turn Off/On Water

7:00 a.m - 3:00 p.m.	No Charge
After hours Emergency Turn Off	No Charge
7:00 a.m. - 3:00 p.m. - Foreclosures & Disconnected Delinquent Accounts	\$50.00

Tampering With Meter

Tampering Fee	\$350.00
Additional Reconnect Fee	\$50.00
3 month average deposit	Varies

New Water Service-1" (main to curb stop) RESTORATION IS OWNER'S RESPONSIBILITY

Total Costs Incurred

Water Main Tap

3/4" or 1" plus materials	\$300.00
1 1/2" or 2" plus materials	\$600.00

Water Transmitter

\$140.00

Water Meters

3/4" Iperl	\$235.00
1" Iperl	\$325.00
1 1/2" Omni-C2	\$1,935.00
2" Omni-C2	\$2,235.00
3" Omni-C2	\$2,820.00
4" Omni T2	\$4,910.00

Bulk Water Sales

Service Charge	\$19.30
Charge per 1,000 gallons	\$4.10
Hydrant Meter Deposit - (Refundable)	\$1,000.00

Pole Attachments - annually per pole

\$7.00

Security Lights - monthly per light

\$12.50 + sales tax

No charge to install if installed on existing pole

Oversize Loads

Under \$500 estimate	Full estimate before move
Over \$500 estimate	\$500 + 50% of est. cost over \$500

BPU Equipment and Employees

Hourly Rate Per Employee	\$70/hr	annual increase of 1% per year
After Hours Hourly Rate Per Employee	\$90/hr	1.5 times hourly rate
Materials	Materials + 20% & sales tax	
Truck	\$100/day	
Backhoe	\$45/hr	
Generator	\$950/day + fuel	

**BRAINERD PUBLIC UTILITIES
SCHEDULE OF FEES**

	<u>As of January 1, 2023</u>	<u>Proposed June 25, 2024</u>	<u>Change 2023 to 2024</u>
<u>Disconnect/Reconnect Electricity</u>			
7:00 a.m. - 3:00 p.m. (dropping lines, meter maintenance, etc)	No Charge	No Charge	
After hours Emergency Disconnect/Reconnect	No Charge	No Charge	
Temporary Service-If line is extended additional fees could be incurred	\$150.00	\$150.00	
7:00 a.m. - 3:00 p.m. - Foreclosures & Disconnected Delinquent Accounts	\$50.00	\$50.00	
After 3:00 p.m., Weekends, & Holidays-	\$150.00	\$0.00	(\$150.00)
<u>Special Events</u>			
Service Charge (Additional charges could be incurred)	\$150.00	\$150.00	
Electric Meter Charge for each meter	\$24.25	\$24.50	\$0.25
kWh charge	\$0.1030	\$0.10437	\$0.00137
<u>Turn Off/On Water</u>			
7:00 a.m - 3:00 p.m.	No Charge	No Charge	
After hours Emergency Turn Off	No Charge	No Charge	
7:00 a.m. - 3:00 p.m. - Foreclosures & Disconnected Delinquent Accounts	\$50.00	\$50.00	
After 3:00 p.m., Weekends, & Holidays-	\$150.00	\$0.00	(\$150.00)
<u>Tampering With Meter</u>			
Tampering Fee	\$350.00	\$350.00	
Additional Reconnect Fee	\$50.00	\$50.00	
3 month average deposit	Varies	Varies	
<u>Check Meter Reading (1 free within 12 mos - per customer)</u>	\$25.00	\$0.00	(\$25.00)
<u>New Water Service-1" (main to curb stop) RESTORATION IS OWNER'S RESPONSIBILITY</u>	Total Costs Incurred	Total Costs Incurred	
<u>Water Main Tap</u>			
3/4" or 1" plus materials	\$300.00	\$300.00	
1 1/2" or 2" plus materials	\$600.00	\$600.00	
<u>Water Transmitter</u>	\$140.00	\$140.00	
<u>Water Meters</u>			
3/4" Iperl	\$225.00	\$235.00	\$10
1" Iperl	\$310.00	\$325.00	\$15
1 1/2" Omni-C2	\$1,875.00	\$1,935.00	\$60
2" Omni-C2	\$2,150.00	\$2,235.00	\$85
3" Omni-C2	\$2,740.00	\$2,820.00	\$80
4" Omni T2	\$4,755.00	\$4,910.00	\$155
<u>Bulk Water Sales</u>			
Service Charge	\$15.65	\$19.30	\$3.65
Charge per 1,000 gallons	\$2.70	\$4.10	\$1.40
Hydrant Meter Deposit - (Refundable)	\$1,000.00	\$1,000.00	
<u>Pole Attachments - annually per pole</u>	\$7.00	\$7.00	
<u>Security Lights - monthly per light</u>	\$12.00 + sales tax	\$12.50 + sales tax	
No charge to install if installed on existing pole			
<u>Oversize Loads</u>			
Under \$500 estimate	Full estimate before move	Full estimate before move	
Over \$500 estimate	\$500 + 50% of est. cost over \$500	\$500 + 50% of est. cost over \$500	
<u>BPU Equipment and Employees</u>			
Hourly Rate Per Employee	\$60/hr	\$70/hr	\$10 annual increase of 1% per year
After Hours Hourly Rate Per Employee	\$90/hr	\$90/hr	\$105 increase per above
Materials	Materials + 20% & sales tax	Materials + 20% & sales tax	
Truck	\$100/day	\$100/day	
Backhoe	\$45/hr	\$45/hr	
Generator	\$950/day + fuel	\$950/day + fuel	



Public Utilities Commission Agenda Request

MEETING DATE: June 25, 2024

TITLE OF ITEM: Artificial Intelligence Use Discussion

ACTION REQUESTED: Discussion Item

ESTIMATED TIME (MIN): 2

SUBMITTED BY: Danny Loch, Finance Manager

PRESENTER: Danny Loch, Finance Manager, Patrick Wussow, Interim Public Utilities Director

SUMMARY OF ISSUE: During continuing education, over the past months, it has been noted about the increased use and advancements in artificial intelligence and its use within governmental entities. It has been recommended by the League of Minnesota Cities that a policy be enacted by municipal entities. Staff would like to recommend the League of Minnesota Cities policy that is attached be recommended to City council for adoption.

" Employees may use low-risk data with Artificial Intelligence (AI) technology to perform their work. Low-risk data is defined by Minnesota Statutes Chapter 13 as "public" and is intended to be available to the public. If you are unsure whether the data you enter into AI applications is classified as public data, consult your City's responsible authority or designee prior to using AI technologies. All data created with the use of AI is to be retained according to the City's records retention schedule. "

Additionally, staff would like to pursue options as it relates to frequently asked questions on the website and explore the potential of A.I. being used in responding to common customer questions.

ALTERNATIVE, OPTIONS, EFFECTS ON OTHERS/COMMENTS: In a pole fo the staff within the utility A.I. has been utilized to assist with writing letters or emails to customers when writers block sets in, or in creating social media posts or re-wording items. Attached are two examples.

RECOMMENDED ACTION/MOTION: Staff recommend presenting the League of Minnesota Cities verbiage on use of A.I. to City council based on workshops and continuing education received, and permission to explore the use of A.I responding to customer inquires in web-based applications.

FINANCIAL IMPACT:

AI Prompt:

Write a letter thanking and supporting Minnesota Rural Water for their support for assisting Brainerd Public Utilities in their wellhead protection project, water main breaks, and lead and copper corrosion

ChatGPT

[Your Name] [Your Address] [City, State, Zip Code] [Email Address] [Phone Number] [Today's Date]

[Recipient's Name] Minnesota Rural Water [Address] [City, State, Zip Code]

Dear [Recipient's Name],

I am writing to express my sincere gratitude to Minnesota Rural Water for the invaluable support provided to Brainerd Public Utilities in our recent initiatives concerning wellhead protection, water main breaks, and the mitigation of lead and copper corrosion. Your organization's expertise and assistance have been instrumental in ensuring the success of these critical projects.

The collaboration between Brainerd Public Utilities and Minnesota Rural Water has not only strengthened our ability to provide safe and reliable water services to our community but has also enhanced our understanding of best practices in water management and infrastructure maintenance.

Your team's guidance and support during the wellhead protection project have been particularly commendable. By helping us implement comprehensive strategies to safeguard our groundwater sources, you have played a vital role in preserving the long-term viability of our water supply and protecting the health and well-being of our residents.

Additionally, I want to extend my appreciation for your prompt response and assistance during water main breaks. Your swift action and expertise have minimized disruptions to our service delivery and enabled us to swiftly address infrastructure issues, ensuring minimal inconvenience to our customers.

Moreover, your assistance in addressing lead and copper corrosion within our distribution system underscores your commitment to promoting public health and environmental stewardship. By helping us implement effective corrosion control measures, you have contributed significantly to reducing potential health risks associated with drinking water and ensuring compliance with regulatory standards.

In conclusion, I want to express my deepest gratitude to Minnesota Rural Water for your unwavering support and collaboration. Your dedication to assisting water utilities like ours is truly commendable, and we look forward to continuing our partnership in the future.

Thank you once again for your outstanding support.

Sincerely,

[Your Name]
[Your Position]
Brainerd Public Utilities



BRAINERD PUBLIC UTILITIES

8027 Highland Scenic Rd • P.O. Box 373 • Brainerd, Minnesota 56401
Business Office: 218.829.8726 ■ Repair Service: 218.829.2193
www.bpu.org

Aaron Meyer
Minnesota Rural Water Association
217 12th Ave SE
Elbow Lake, MN 56531

Dear Mr. Meyer and Team,

I am writing to express my sincere gratitude to Minnesota Rural Water for the invaluable support provided to Brainerd Public Utilities in our recent initiatives concerning our wellhead protection, water main break, and the mitigation of lead and copper corrosion. Your organization's expertise and assistance have been instrumental in ensuring the success of these critical projects.

The collaboration between Brainerd Public Utilities and Minnesota Rural Water has not only strengthened our ability to provide safe and reliable water services to our community in the surrounding City of Brainerd and Baxter but has also enhanced our understanding of best practices in water management and infrastructure maintenance.

Your team's guidance and support during the wellhead protection project have been particularly commendable. By helping us implement comprehensive strategies to safeguard our groundwater sources, you have played a vital role in preserving the long-term viability of our water supply and protecting the health and well-being of our residents.

Additionally, I want to extend my appreciation for your prompt response and assistance during the water main break. Your swift action and expertise have minimized disruptions to our service delivery and enabled us to swiftly address infrastructure issues, ensuring minimal inconvenience to our customers.

Moreover, your assistance in addressing lead and copper corrosion within our distribution system underscores your commitment to promoting public health and environmental stewardship. By helping us implement effective corrosion control measures, you have contributed significantly to reducing potential health risks associated with drinking water and ensuring compliance with regulatory standards.

In conclusion, I want to express my deepest gratitude to Minnesota Rural Water for your unwavering support and collaboration. Your dedication to assisting water utilities like ours is truly commendable, and we look forward to continuing our partnership in the future.

Thank you once again for your outstanding support.

Sincerely,

Charlie Gammon
Water/Wastewater Manager
Brainerd Public Utilities

AI Prompt:

Help write a Staff memo on a process change that the service center doors will be getting new alarm keypads and that key card access will be the only way to access the doors, Add to this memo that the data center will begin limited access on this same date

MEMO

To: All Staff From: [Your Name], [Your Position] Date: [Date]

Subject: Process Change - New Alarm Keypads, Key Card Access, and Limited Access to Data Center

Dear Team,

I hope this memo finds you well. I am writing to inform you about an upcoming process change at the service center.

Starting [Date], we will be installing new alarm keypads on all service center doors. As part of this change, access to the doors will be restricted to key card entry only. This means that using your key card will be the sole method for accessing the service center premises.

In addition to this, I'd like to inform you that on the same date, the data center will begin limited access. This means that access to the data center will also be restricted, and only authorized personnel will be allowed entry. Key card access will be required for entry into the data center as well.

These decisions have been made to enhance the security of our facilities and ensure that only authorized personnel can access sensitive areas. Key card access provides a more secure and efficient way of managing entry, helping us maintain a safe working environment for everyone.

Please make sure to carry your key card with you at all times, as it will be required for entry into both the service center and the data center. If you encounter any issues with your key card or have any questions about the new process, please don't hesitate to contact [Contact Person/Department].

Thank you for your cooperation as we implement these important changes. Your commitment to maintaining a secure environment is greatly appreciated.

Best regards,

[Your Name] [Your Position]



BRAINERD PUBLIC UTILITIES

8027 Highland Scenic Rd • P.O. Box 373 • Brainerd, Minnesota 56401
Business Office: 218.829.8726 ■ **Repair Service:** 218.829.2193
www.bpu.org

Memorandum

To: All Staff
From: Danny Loch
cc: Aaron Andersen, Todd Wicklund, Trent Hawkinson, Charlie Gammon
Date: March 11, 2024
Re: Process Change - New Alarm Keypads, Key Card/FOB Access, and Limited Access to Data Center

Dear Team,

I hope this memo finds you well. I am writing to inform you about an upcoming security change at the service center.

Starting the week of March 16, 2024, we will be installing new alarm keypads on all service center doors. As part of this change, access to the doors will be restricted to key card/fob entry only. This means that using your key card/fob will be the sole method for accessing the service center premises. Including the entry way and data center.

In addition, I'd like to inform you the data center will begin limited access. This means that access to the data center will also be restricted, and only authorized personnel will be allowed entry.

These decisions have been made to enhance the security of our facilities and ensure that only authorized personnel can access sensitive areas. Key card/fob access provides a more secure and efficient way of managing entry and helping us maintain a safe working environment for everyone.

Please make sure to always carry your key card/fob with you, as it will be required for entry into both the service center and the data center. If you encounter any issues with your key card/fob or have any questions about the new security change, please don't hesitate to contact Aaron or myself.

Thank you for your cooperation as we implement these important changes. Your commitment to maintaining a secure environment is greatly appreciated.



Public Utilities Commission Agenda Request

MEETING DATE: June 25, 2024

TITLE OF ITEM: Consider Resolution Approving Central Business District Incentive Policy

AGENDA: Public Utilities

ACTION REQUESTED: Adopt Resolution

SUBMITTED BY: Danny Loch, Finance Manager

DEPARTMENT: Community Development

PRESENTER: James Kramvik, Community
Development Director

ESTIMATED TIME (MIN):

SUMMARY OF ISSUE: See attached memo and policy.

ALTERNATIVE, OPTIONS, EFFECTS ON OTHERS/COMMENTS:

RECOMMENDED ACTION/MOTION:

FINANCIAL IMPACT:

MEMO



TO: BPU Commission

FROM: James Kramvik, Community Development Director

DATE: June 25th, 2024

RE: Review Central Business District Incentive Policy

INTRODUCTION

The EDA held a workshop on June 28th, 2023, to discuss additional economic incentive programs for the City of Brainerd. Exploring additional incentive programs is a goal of the 2023-2024 framework plan for the EDA. At the workshop, BLAEDC provided a report on comments from their 2022 BR&E interviews and a few comments centered around providing incentives or programs for the businesses that are not located in the downtown area of Brainerd.

UTILITY INFRASTRUCTURE

The Community Development Director, Public Works Director, and Public Utilities Director discussed the Commercial Corridor District and the potential for mixed-use development. The CC District does not currently allow for mixed-use or residential development. However, there are numerous benefits for allowing mixed-use development in the CC District such as creating complete neighborhoods, expanding areas for residential development, and making redevelopment financially viable for a potential developer. The Washington Street reconstruction project will increase utility capacity in the CC District and future residential development will not have an impact on the new infrastructure. The Public Works Director and Public Utilities Director did not see any issue with extending the River to Rail District or to allow future residential development in this area as the River to Rail District forgives all SAC and WAC permit charges. The

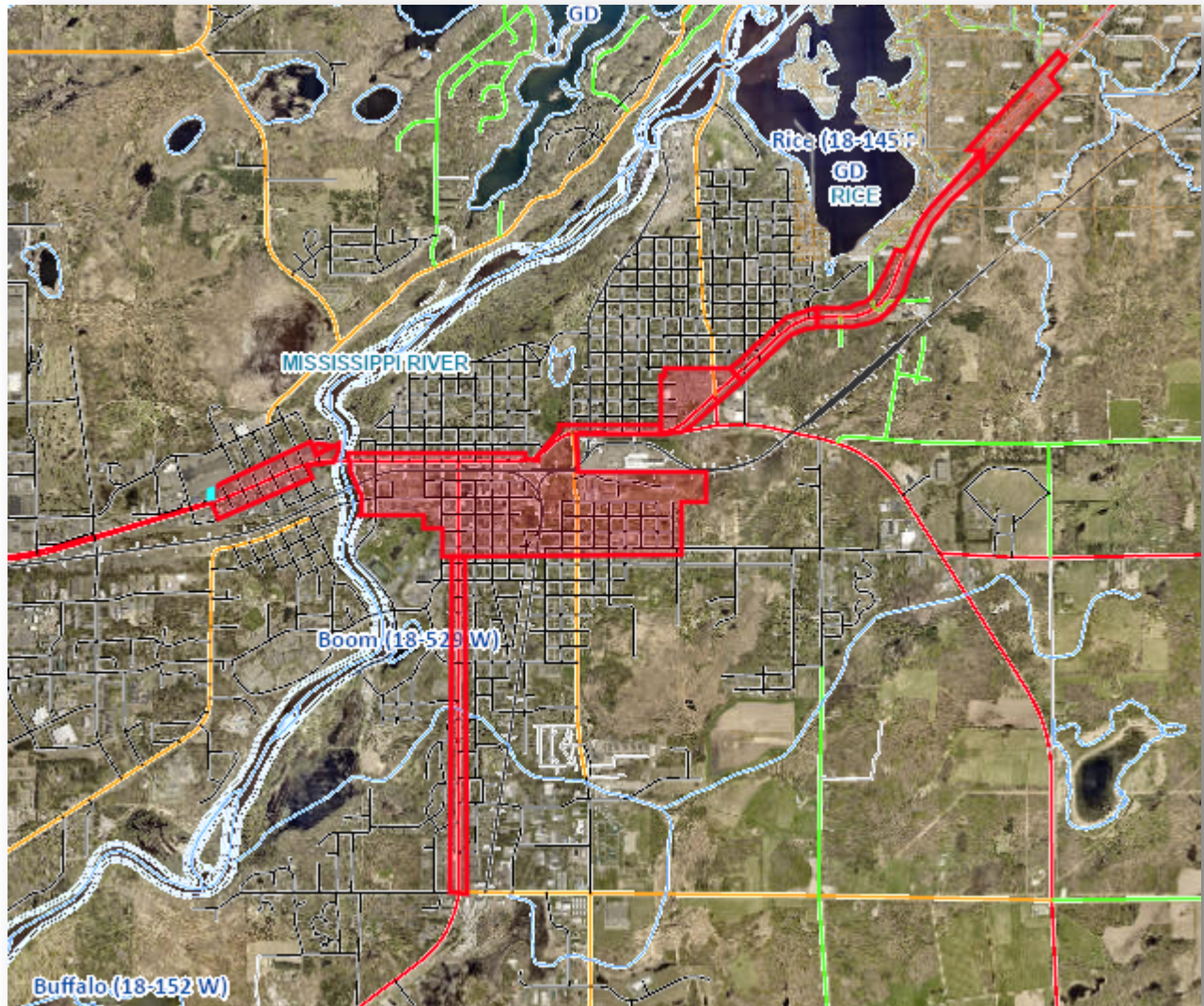
Planning Commission will consider mixed-use development in the CC District after conclusion of the short-term rental ordinance and cannabis dispensary ordinance.

Brainerd Public Utilities has voiced concern about adding additional incentive districts beyond the expansion of Washington Street, as the SAC and WAC could be used for large infrastructure projects.

CENTRAL BUSINESS DISTRICT INCENTIVE POLICY

At the April 4th, 2024 EDA meeting, the Board discussed options to expand the incentive district further than what staff originally proposed. At the June 6th EDA meeting the Board recommended the Central Business District Incentive Policy include all properties along Washington St/ Hwy 210 from the Eastern limits of the City to the Western limits of the City and South 6th Street to Buffalo Hills Ln East. The program would align with the original River to Rails District Incentive Policy which waives all SAC and WAC fees and would expire in 2029. In addition to the SAC and WAC fees the policy waives all building permit fees for projects with a valuation of \$150,000 or less.

CENTRAL BUSINESS DISTRICT MAP



DISTRICT OPTIONS

1. Recommend approval the proposed Central Business District Map with the same incentives as the River to Rail District.
2. Separate the map into zones and only waive SAC and WAC in the original River to Rail District.

City of Brainerd, Minnesota

River to Rail Initiative

Incentives Policy

1. Policy Introduction

The River to Rail initiative focuses on the area of Brainerd, Minnesota bound by the Mississippi River on the west, the Northern Pacific Center on the East, Oak Street on the south, and Washington Street on the north. In recent years, momentum to revitalize the core downtown of Brainerd has been building due to the hard work of several organizations including the City of Brainerd, the Brainerd HRA, the Brainerd Lakes Area Chamber of Commerce, the Brainerd Lakes Area Economic Development Corporation, Sourcewell, and the Region 5 Development Commission. While this momentum has been taking place, these organizations along with entrepreneurs and developers have been working together to create a shared vision for this core area of Brainerd now known as the River to Rail Initiative.

2. Policy Purpose and Need

Generally, the City of Brainerd City Council finds it necessary and advantageous to outline specific policy decisions it has made for the River to Rail corridor as it relates to potential development incentives that developers or entrepreneurs can tap into as resources to complete important projects within the River to Rail corridor. The incentives in this policy provide baseline guidance to staff, City Council members, developers, entrepreneurs, and economic development agencies about what options are available to promote development, re-development, and economic vibrancy to the corridor.

This policy is not intended to be an exhaustive list of all the City of Brainerd is willing to make available for potential investors within the corridor, nor is it meant to mean that the City will not consider these same incentives in other areas of the community, rather it is meant to be a trial run at an economic development policy that provides as a guiding document for potential investors that want to develop or re-develop areas within the corridor, and may be expanded in the future to include all of Brainerd upon success stories shared due to this policy.

3. Policy Statement

The following incentives, based upon City Council action, are available for use within the River to Rail corridor and may vary due to project construction costs as outlined further in this policy:

- Waiving of City Building Permit Fees (not including State of Minnesota surcharge). This does not waive the requirement to obtain a permit, but rather just the fee.
- Waiving of Sewer and Water Availability Charges (SAC and WAC)
- Tax-Increment Financing
- Tax Abatement
- Parking Assistance
- Land Acquisition

These listed incentives do not limit potential investors from tapping into other resources available within the community for financial assistance including the following list:

- City of Brainerd/Brainerd HRA Revolving Loan Fund
- Brainerd HRA Small Cities Development Program (SCDP) Grants
- Brainerd Lakes Area Economic Development Corporation Unified Fund Loans
- Brainerd Public Utilities Economic Development Electric Rate Reduction if applicable based on load capacity.
- Opportunity Zone Assistance
- New Market Tax Credits
- State and Federal Historic Tax Credits

Waiving of City Building Permit Fees

Generally, the Brainerd City Council has elected to waive City building permit and inspection fees for all construction projects less than \$150,000 in total construction costs. This does not waive the requirement to obtain a permit or the ability for investors that exceed this threshold the ability to see reduction or waiver of fees during the development or re-development negotiation process. This does not include a waiver of the State of Minnesota surcharge, which is a requirement of all building permits within the City.

Waiving of Sewer and Water Availability Charges (SAC and WAC)

The City of Brainerd City Council has elected to waive all sewer and water availability charges (SAC and WAC charges) within the River to Rail Corridor, as identified in the introduction.

Tax-Increment Financing (TIF)

Generally, tax-increment financing (TIF) is available for construction projects in excess of \$1,000,000 total construction costs, however, upon the proof of need shown by the investor that the development would not occur without the assistance of tax-increment financing, the Brainerd City Council is willing to negotiate the term and amount of increment with said investor. All tax-increment financing applications must be approved by the Brainerd City Council, upon completion of negotiations.

Tax Abatement

Tax abatement may be considered if tax increment financing is not an option because the project doesn't qualify under state law or the project is not in excess of \$1,000,000.

- Tax abatement will be considered on the new proposed value created, not the land or buildings' existing or "base" value (base being a definition related to tax increment financing).
- Tax abatement will be considered only if the County is requested to participate, although the city's provision of abatement is not contingent upon the County agreeing to participate.
- The Council will carefully deliberate abatement requests that ask for the maximum amount and term, only agreeing to provide abatements for the

maximum amount and term where the developer can support the request with evidence of special need, or the proposal is for a project that is a high priority for the Council.

- Although not required by State law, abatement projects will be required to meet the “but-for” test as defined in the Tax Increment Financing statute.

Parking Assistance

Generally, the Brainerd City Council is willing to negotiate parking needs of the proposed development to come to a mutually beneficial parking solution to serve both the new investment and other areas within the River to Rail corridor.

Land Acquisition

The Brainerd City Council continues to seek opportunities to acquire blighted property and make the property marketable for future investment including the razing of old structures, beautifying said property, or any other means to make property marketable and attractive to potential investors.

4. Policy Conclusion

It is the intent of this policy to assist investors and entrepreneurs to make small or large investments in the River to Rail corridor and to inform on the potential incentives available to promote incremental or large changes within this core area of Brainerd.

The incentives and funding mechanisms presented in this policy are all negotiable during the development agreement process, and the City of Brainerd City Council has indicated is not tied to any specific threshold of development for each incentive. This list is to provide for opportunities for incentives and is not intended to close the door on any development request or proposal.

Term

This policy shall be reviewed after a period of ten (10) years to evaluate its effectiveness. It shall be reviewed, amended, renewed, ore revoked after that review.

Adopted July 2, 2019

River to Rail Economic Incentive Policy



Organizations, local government, entrepreneurs and developers, working together have created a shared vision, now known as the Rail to River Initiative. The vision is to build on the current momentum to revitalize Brainerd's community district and create a strategic narrative that encourages planning and new private sector investment for the future. Individuals and businesses that choose to invest in this area may receive assistance with planning, financing, and securing permits.

River to Rail Economic Incentive Policy

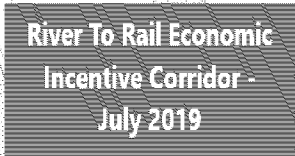
As of July 1, 2019, all City permit fees, plan review fees and any SAC and WAC fees for construction projects with a valuation less than \$150,000 will be waived.

- The State of Minnesota surcharge will continue to be applied to all projects located in the River to Rail Corridor.

Any property owner or contractor who fails to obtain a permit will be denied the economic incentive and be charged an investigative fee, which is equal to the original cost of the permit.

River to Rail Economic Incentive Corridor - (Map on other side)

The project area boundaries are as one-half block north of Washington street to one-half block south of Oak street; from the Mississippi River to 19th Street SE.





BRAINERD PUBLIC UTILITIES

8027 Highland Scenic Rd • P.O. Box 373 • Brainerd, Minnesota 56401

Business Office: 218.829.8726 ■ **Repair Service:** 218.829.2193

www.bpu.org

Memorandum

To: Brainerd Public Utilities Commission

From: Patrick Wussow, Interim Public Utilities Director

Date: June 18, 2024

Re: June 2024 Monthly Update

Attended Economic Development Authority (EDA) meeting June 6, 2024 (at request of Community Development Director) and City Council meeting on June 3rd and 17th. VCV land purchased was discussed at the EDA meeting. I understand the Interim use permit for VCV will be discussed at the City Council level in July.

Roberts Property update – Three separate phone calls with Mr. Roberts. No legal description has been received from Roberts for the private sewer line on the land BPU has proposed purchasing. June 17th I was informed that their attorney will be contacting Joe Langel by the end of the day June 18th. I will follow up after the June 19th holiday.

Attended joint meeting between Parks and BPU. Following up with Rotary and reviewing their master plan and discussions on next steps. Staff will review plans and costs. Insurance comments from presenter is raising concerns at the Park Commission. The City's insurance is through the League of MN Cities. City's IT and Police have been included in discussions to make sure equipment meets minimum standards for security purposes and it is capable to tie into existing PD system. Discussed requirements with AEP related to adding additional solar projects.

I attended portions of the MNSERB conference held in Baxter at Arrow wood and the MMUA Legislative update also in Baxter.

Working on clarifying completed performance evaluations. Other priorities have moved this project back, I have met with almost all employees.

Working on reviewing VCV Crypto mining permits, ownership, development plans and answering questions from attorney's, residents, and staff. Only recently confirmed new company is licensed to conduct business in Minnesota. Staff is reviewing recently received plans for necessary equipment to start building. VCV has asked staff to price and then secure necessary items like transformers. After price and equipment availability is finalized, the list will be shared with new Ancheng. Payment will be required before we proceed with purchasing.

City of Brainerd Strike Contingency Plan

Executive Summary

The City of Brainerd has developed a comprehensive contingency plan to provide uninterrupted services and protect public safety when the City faces the potential of a labor strike due to ongoing negotiations with a union. A well-prepared strike plan considers legal, ethical, and security aspects while ensuring effective communication and adaptability.

1. **Pre-Strike Preparation:** minimum of 4 weeks

This phase begins when mediation is filed and in anticipation of strike activity. The primary purpose of this phase is to outline operational needs and options as well as security measures during a strike.

- **When can a Strike Occur:** Unions may strike after the existing contract has expired and the union/employer have been in mediation for 45 days
- **Review and update Strike Contingency Plan**
 - Assess vulnerabilities and risks related to the strike
 - Prioritize services and determine if any services can cease during a strike
 - Resource Allocation
- **Staffing and Cross-Training:** Talent management to replace workers to maintain operational efficiency
 - Update Standard Operation Procedures (SOPs)
 - Identify critical roles (e.g., lineworkers, water/wastewater plant operators, and snowplow operators)
 - Cross-train non-union staff to fill essential positions during the strike
 - Contact former employees, other municipalities as well as private vendors and contractors to assist during the strike
- **Develop Contingency Strategies:** Have backup plans to sustain operations
- **Update all Employee/Vendor/Public Communication Documents**
- **Determine what Best and Last Offer to the Union could be**
- **Inform City and County Emergency Services of potential strike**
- **Timeline:**
 - Provide a high-level timeline for implementing the strike plan
 - Include milestones, deadlines, and critical events
- **Financial Projections:** Be prepared to provide:
 - Estimated strike-related costs
 - Potential revenue loss
 - Highlight key financial metrics

2. **Union Files for Strike:**

This phase begins when Union submits Notice to Bureau of Mediation Services (BMS) regarding Intent to Strike (strike cannot occur within 10 days) and continues until a strike occurs.

- **Finalize details:** Vendors/retirees/etc. for coverage
- **Distribute notices to all employees:** Info distributed to union employees that are considering a strike, supervisory staff and all other employees

- **Finalize a plan to coordinate security measures:** Employee access to facilities (electronic and keys), computers, email, etc.
- **Finalize Public Notice and messaging:** See Media Relations Strategy section
- **Coordinate efforts:** With law enforcement and other relevant agencies

3. **Strike Operations:** Ongoing until resolution

This phase begins when Strike begins and continues until a strike settlement has been achieved. The primary purpose of this phase is to ensure the continuity of operations with the minimal amount of disruption and to take those actions necessary to support the negotiating position of the City.

- **Monitor picket lines and access points**
- **Ensure the safety of employees, visitors, and property**
- **Effective Communication:**
 - Stakeholder Engagement: Engaging with unions, employees, and the community
 - Timely Information Dissemination: Clear communication channels are crucial during strikes
- **Document incidents and maintain accurate records**

4. **Post-Strike Recovery:** 2 weeks

This phase of the operation begins with the announcement of a strike settlement and continues for approximately two weeks. The primary purpose of this phase is to transition back to a normal security posture in a smooth manner.

- **Evaluate the effectiveness of security measures during the strike**
- **Debrief security personnel and address any issues**
- **Transition back to normal operations once the strike ends**

Strike Contingency Plan: It is essential to avoid common pitfalls that can hinder its effectiveness. Here are some pitfalls to steer clear of:

1. **Lengthy, Overly Detailed Plans:** Developing plans that cover every conceivable condition or address every minor detail can overwhelm those responsible for execution.
2. **Assuming Staff Is Well Trained:** Don't assume that all staff members know how to respond during a strike. Regular training and drills are crucial to ensure everyone is prepared.
3. **Communication During an Event:** Effective communication is vital. Establish clear channels for disseminating information during a strike to avoid confusion and delays.
4. **Relying on Outdated Plans:** An outdated strike preparedness plan poses legal and financial risks. Regularly review and update the Strike Contingency Plan to align with current threats and organizational changes.
5. **Assuming External Help Will Always Arrive:** While external support is valuable, don't solely rely on it. Develop internal strategies and backup plans to handle strike-related challenges.

Media Relations Strategy

Purpose

The media relations section aims to proactively manage interactions with journalists, reporters, and media outlets during a labor strike. Effective media communication helps control the narrative, maintain public trust, and minimize misinformation.

Key Components

1. **Spokesperson Designation:**
 - Identify a designated spokesperson authorized to communicate with the media
 - Ensure they are well-versed in strike-related matters and company policies
2. **Media Monitoring and Rapid Response:**
 - Monitor news outlets, social media, and industry-specific platforms
 - Respond promptly to media inquiries, providing accurate information
3. **Message Consistency:**
 - Develop key messages aligned with the organization's stance
 - Train all relevant staff on consistent messaging
4. **Press Releases and Statements:**
 - Prepare press releases for major strike-related events (e.g., strike commencement, negotiations)
 - Issue statements promptly to address developments
5. **Media Training:**
 - Conduct media training sessions for key personnel
 - Teach effective interview techniques, staying on message, and handling tough questions

Benefits

- **Controlled Narrative:** Proactive media engagement prevents misinformation
- **Positive Perception:** Transparent communication fosters public understanding
- **Crisis Management:** Preparedness minimizes reputational damage

HR Director's Report to BPU Commission

June 20, 2024

Personnel:

- Two BPU Department employees were off from work intermittently this past month for non-work-related medical issues.
- Our fifth Mediation session with the IBEW Public Utility Union took place on June 4th. During that mediation session, the Union requested that Mayor Badeaux, Council member Johnson and I provide a presentation of our wage proposal. That presentation was made on June 13th.
- The City and USW (Hydro) Union reached an agreement to recognize Juneteenth as a paid holiday in 2024 in exchange for one floating holiday.
- The City and IBEW (Public Utility) Union did not reach an agreement regarding Juneteenth; therefore, the 2024 Juneteenth holiday will be unpaid unless the employee utilizes their leave for that day.
- Our Strike Contingency Work Group has been working diligently over the last month to prepare us for a strike by any bargaining unit. City Administrator Broyles provided a 3-page Executive Summary to the City Council at their June 17th meeting and it has been attached to this report as well.
- On May 29th the City Council conducted a Special Meeting to discuss the City's response to the petition that was filed with the Bureau of Mediation Services (BMS) for certification of a Brainerd Public Utilities Managers and Supervisors Association. There have been multiple emails back and forth between the City and BMS answering questions pertaining to each position. We have not received a final unit determination from BMS at this time.

Public Utilities Director Position:

GMP Consultants received 12 applications for our Public Utilities Director position. Mr. Weldon from GMP met with the Public Utility Director Work Group on June 20th to review the candidates. Four individuals were selected to proceed to the interview process and interviews will be held on July 10th. Also on that day, Interim Public Utilities Director Wussow will organize a tour of our Public Utilities Department facilities to the candidates. One candidate is from out-of-state; therefore, the Work Group decided to assist with travel and one night of lodging expense for the candidates.

Performance Evaluation Work Group:

The Performance Evaluation Work Group has not met since our initial meeting at the end of April due to other pressing issues. We plan to start meeting again towards the end of June to continue the review of our current Performance Evaluation Process as well as the forms currently used. As stated in the May HR Director's Report, the Work Group has determined that any formal adjustments to our process will not be implemented until after the 2023-2024 Performance Evaluations are completed. This decision was made due to the fact that we are halfway through the current Eval timeframe, and employees should be working on both the quarterly talks and frameworks at this time.

Wellness Committee:

Our May Wellness Event was a "Walk in the Park" on May 29 at Kiwanis Park. We had a great turnout and all were able to enjoy the beautiful weather!

On June 6th we celebrated Donut Day and the Wellness Committee provided all Departments with donuts from the Senior Center! A huge thank you to Officer Jay Personius for coordinating the event.

Our July Wellness Event will be "Planning for Retirement... It's a BIG DILL!" presentation by MSRS Representative Scott Elwood on July 11th. He will be going over our Health Care Savings and Deferred Compensation Plans during his presentation. He has also offered to host one-on-one meetings throughout the day so employees are able to go over their own information and ask any questions they may have.



BRAINERD PUBLIC UTILITIES

8027 Highland Scenic Rd • P.O. Box 373 • Brainerd, Minnesota 56401

Business Office: 218.829.8726 ■ *Repair Service:* 218.829.2193

www.bpu.org

Brainerd Public Utilities Finance Managers Report June 25, 2024

Financial Reports

January, see attached. Feb – May financial statements have been delayed with the preparation of the audit, and strike force work, Feb – May financial statements should be available at the next commission meeting. Attached cash basis budget information is included. Relating to last month's audit discussion, the finance committee approved the audit after seeing the final documents.

Water Treatment Facility Reclamation and Backwash Project

Meetings have occurred with Bolton & Menk (BMI) and on-going funding discussions related to the project and financing with the state. The project is progressing on schedule. In conjunction with the discussions with BMI bonding and capital planning conversations have begun with the city finance department.

Wellhead Protection Plan

The final meeting for the plan was held on April 25. The plan has been submitted for the 60-day public comment period. As of the writing of this report, no comments have been received. Angie Smith and Morgan Salo, of BMI will present the report during the meeting.

Credit Card Transaction Fees

This project is ongoing. As we prepare our quotes and receive additional information it is noted that the quotes received are not comparable or would provide the same level of service we receive presently i.e. if we change providers our customers are unable to see their usage online. Staff are considering the options received and will be working with the finance committee when information is available. Look to schedule a meeting the month of July.

Streetlighting Project

Work has begun on the streetlighting cost analysis project and determinations related to streetlight billing. Current project phase is collecting information and determining cost options for personnel and truck use rates by hour for use by Utility Financial Solutions. Staff will have recommendations on updated rates and costing when the Streetlight Cost study is completed. Status is paused as the 210 project lighting requirements are worked through and awaiting solution options to be included in the study.

Water/Wastewater Cost Studies

The cost studies for water/wastewater have begun and are in the process of collecting data for Utility Financial Solutions.

Crypto Mining Customers

At the May 28, meeting Commissioner Johnson asked for the opportunity cost of crypto mining operations not reaching the 15 MW. For a 31-day month the revenue lost is approx. \$43,000 with current rates and assumptions of 15MWh. If assumptions grew to 25MWh the forgone revenue would equate to approx. \$71,400.



Monthly Financial Report January 2024

**BRAINERD PUBLIC UTILITIES
COMPARISON OF OPERATING RESULTS
FOR THE ONE MONTH PERIOD ENDED JANUARY 31, 2024 AND 2023**

	2024		2023	
	Amount	Percent of Sales	Amount	Percent of Sales
OPERATING REVENUE				
Department				
Electric	2,412,438	78.8%	1,849,152	79.2%
Water	379,091	12.4%	242,605	10.4%
Wastewater	270,528	8.8%	244,236	10.5%
Total Operating Revenue	<u>3,062,057</u>	<u>100.0%</u>	<u>2,335,993</u>	<u>100.0%</u>
OPERATING EXPENSES				
Salaries and Wages	568,285	18.6%	623,355	26.7%
Purchased Power	1,717,530	56.1%	940,189	40.2%
Purchased Services	154,982	5.1%	188,716	8.1%
Other Charges	78,146	2.6%	68,721	2.9%
Employee Benefits	163,898	5.4%	200,745	8.6%
Insurance and Bonds	31,367	1.0%	27,684	1.2%
Depreciation and Amortization	441,154	14.4%	415,800	17.8%
Total Operating Expenses	<u>3,155,362</u>	<u>103.0%</u>	<u>2,465,210</u>	<u>105.5%</u>
OPERATING INCOME (LOSS)	<u>(93,305)</u>	<u>-3.0%</u>	<u>(129,217)</u>	<u>-5.5%</u>
NONOPERATING REVENUE				
Interest Revenue - Investments	133,353	4.4%	47,756	2.0%
Interest Revenue - Notes Receivable	8,900	4.4%	9,500	2.0%
Bond Premium	12,210	0.3%	14,529	0.4%
Bond Issuance Costs	-	0.4%	-	0.6%
Interest Expense - Bonds	126,034	0.0%	(73,992)	0.0%
Local Option Sales Tax	(60,400)	-2.0%	94,000	4.0%
Other	4,566	0.1%	6,400	0.3%
Total Nonoperating Revenue	<u>224,663</u>	<u>7.6%</u>	<u>98,193</u>	<u>9.4%</u>
INCOME (LOSS) BEFORE OPERATING TRANSFERS TO THE CITY	131,358	4.3%	(31,024)	-1.3%
TRANSFERS TO THE CITY	<u>(62,649)</u>	<u>-2.0%</u>	<u>(65,269)</u>	<u>-2.8%</u>
CHANGE IN NET ASSETS	<u>\$ 68,709</u>	<u>2.2%</u>	<u>\$ (96,293)</u>	<u>-4.1%</u>

BRainerd PUBLIC UTILITIES
COMBINING STATEMENT OF NET POSITION BY DEPARTMENT
JANUARY 31, 2024 AND 2023

	Electric	Water	Wastewater Treatment	Totals	
				2024	2023
ASSETS					
UTILITY PLANT					
Construction in Progress	\$ 2,496,999	\$ 136,879	\$ 2,917,208	\$ 5,551,086	\$ 6,954,643
Right-to-Use	421,686	20,146	20,146	461,978	461,978
In Service	48,070,611	38,116,959	39,581,432	125,769,002	115,325,934
Total Investment in Utility Plant	50,989,296	38,273,984	42,518,786	131,782,066	122,742,555
Less: Accumulated Depreciation	(25,765,369)	(15,676,371)	(21,271,135)	(62,712,875)	(57,432,213)
Net Utility Plant	25,223,927	22,597,613	21,247,651	69,069,191	65,310,342
CASH AND INVESTMENTS					
<u>Nonrestricted</u>	4,916,292	(1,657,265)	4,594,212	7,853,239	9,708,081
<u>Restricted</u>					
Customer Deposits	487,050	-	-	487,050	342,424
City of Brainerd Contribution	132,293	-	-	132,293	65,874
Conservation Incentive Program	422,210	-	-	422,210	250,714
Water and Sewer Accessibility Charges	-	676,964	7,138	684,102	568,207
Construction Bond Proceeds	-	-	-	-	1,860,281
Debt Service Reserve	1,117,250	1,542,503	2,139,825	4,799,578	4,319,118
Total Restricted Cash and Investments	2,158,803	2,219,467	2,146,963	6,525,233	7,406,618
Total Cash and Investments	7,075,095	562,202	6,741,175	14,378,472	17,114,699
CURRENT ASSETS					
Accounts Receivable	3,557,905	537,510	722,145	4,817,560	3,911,655
Interest Receivable	15,106	3,098	14,152	32,356	24,610
Inventory	1,816,779	139,980	-	1,956,759	1,543,296
Prepaid Expenses	171,299	9,778	23,227	204,304	231,831
Total Current Assets	5,561,089	690,366	759,524	7,010,979	5,711,392
OTHER ASSETS					
Bonds and Notes Receivable	-	-	3,710,923	3,710,923	3,330,334
Interest Receivable - Notes Receivable	-	-	43,700	43,700	48,400
Service Territory Acquisitions, Net of Accumulated Amortization	210,183	-	-	210,183	237,483
Deferred Outflows of Resources	630,567	210,190	210,190	1,050,947	1,733,920
Investment in Solar Generation Facility	662,073	-	-	662,073	567,000
Total Other Assets	1,502,823	210,190	3,964,813	5,677,826	5,917,137
Total Assets	39,362,934	24,060,371	32,713,163	96,136,468	94,053,570
LIABILITIES AND NET ASSETS					
NET POSITION					
Net Investment in Capital Assets	19,800,311	10,957,532	9,908,577	40,666,420	36,949,989
Restricted	-	1,679,112	5,755,351	7,434,463	6,459,602
Unrestricted	6,711,275	(1,816,419)	4,266,286	9,161,142	12,020,857
Total Net Position	26,511,586	10,820,225	19,930,214	57,262,025	55,430,448
LONG-TERM LIABILITIES					
Revenue Bonds Payable	4,500,000	10,140,000	2,487,400	17,127,400	15,606,600
PFA Construction Loan Payable	-	-	6,870,000	6,870,000	8,455,000
Compensated Absences	720,064	312,782	197,101	1,229,947	1,364,820
Other Postemployment Benefit Obligation	219,726	73,241	73,241	366,208	384,493
Net Pension Liability	2,043,276	681,092	681,092	3,405,460	4,926,260
Deferred Inflows of Resources	781,983	260,661	260,661	1,303,305	210,995
Capital Lease Payable	374,705	4,606	4,606	383,917	410,702
Revenue Bond Premium	44,974	685,195	110,487	840,656	876,201
Total Long-Term Liabilities	8,684,728	12,157,577	10,684,588	31,526,893	32,235,071
CURRENT LIABILITIES					
Accounts Payable	1,652,316	9,357	-	1,661,673	1,357,672
Revenue Bonds Payable	1,040,000	805,000	79,200	1,924,200	1,920,600
PFA Construction Loan Payable	-	-	1,585,000	1,585,000	1,536,000
Capital Lease Payable	17,937	5,280	5,280	28,497	28,497
Payable to City of Brainerd	132,293	19,550	228,425	380,268	291,193
Conservation Incentive Program Payable	422,210	-	-	422,210	250,714
Accrued Expenses					
Salaries and Withholding Taxes	211,639	103,805	61,359	376,803	347,884
Sales Taxes	177,227	2,968	-	180,195	96,767
Bond Interest	25,948	136,609	139,097	301,654	216,300
Customer Deposits	487,050	-	-	487,050	342,424
Total Current Liabilities	4,166,620	1,082,569	2,098,361	7,347,550	6,388,051
Total Liabilities	12,851,348	13,240,146	12,782,949	38,874,443	38,623,122
Total Liabilities and Net Position	\$ 39,362,934	\$ 24,060,371	\$ 32,713,163	\$ 96,136,468	\$ 94,053,570

BRAINERD PUBLIC UTILITIES
COMBINING STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION BY DEPARTMENT
FOR THE ONE MONTH PERIOD ENDED JANUARY 31, 2024, 2023, AND 2022

	January 31, 2024				Totals	
	Electric	Water	Wastewater Treatment	Total	January 31,	
					2023	2022
OPERATING REVENUES						
Utility Revenues	\$ 2,410,095	\$ 244,841	\$ 199,709	\$ 2,854,645	\$ 2,248,266	\$ 2,275,905
Other Operating Revenue	2,343	134,250	70,819	207,412	87,727	82,259
Total Operating Revenue	2,412,438	379,091	270,528	3,062,057	2,335,993	2,358,164
OPERATING EXPENSES						
Purchased Power	1,717,530	-	-	1,717,530	940,189	1,250,716
Production/Generation						
Salaries and Wages	28,992	56,463	44,910	130,365	164,681	106,215
Operations and Maintenance	878	16,026	61,679	78,583	93,662	72,119
Employee Benefits	8,700	13,285	11,246	33,231	39,432	35,308
Other Charges	-	-	895	895	612	6,015
Total Generation/Production Expenses	38,570	85,774	118,730	243,074	298,387	219,657
Distribution						
Salaries and Wages	182,118	74,412	12,428	268,958	311,812	139,079
Operations and Maintenance	15,220	10,457	11,727	37,404	41,167	38,345
Employee Benefits	19,011	12,008	3,182	34,201	55,959	45,496
Other Charges	5,999	13,134	-	19,133	13,504	2,762
Total Distribution Expenses	222,348	110,011	27,337	359,696	422,442	225,682
General and Administrative						
Salaries and Wages	105,950	32,347	30,665	168,962	146,862	114,613
Operations and Maintenance	26,440	6,247	6,308	38,995	53,887	28,974
Insurance and Bonds	18,407	4,608	8,352	31,367	27,684	21,646
Employee Benefits	70,323	14,488	11,655	96,466	105,354	39,102
Other Charges	38,039	9,830	10,249	58,118	54,605	33,686
Total Gen. and Admin. Expenses	259,159	67,520	67,229	393,908	388,392	238,021
Depreciation and Amortization	190,114	105,170	145,870	441,154	415,800	432,300
Total Operating Expenses	2,427,721	368,475	359,166	3,155,362	2,465,210	2,366,376
NET OPERATING INCOME (LOSS)	(15,283)	10,616	(88,638)	(93,305)	(129,217)	(8,212)
NONOPERATING REVENUE (EXPENSE)						
Interest Revenue - Investments	33,107	6,700	93,546	133,353	47,756	(79,720)
Sale of Renewable Energy Credits	-	-	-	-	-	-
Bond Premium	1,008	10,490	712	12,210	14,529	18,199
Interest Revenue - Notes Receivable	-	-	8,900	8,900	9,500	10,500
Local Option Sales Tax	-	-	126,034	126,034	94,000	96,390
Interest Expense - Bonds	(10,800)	(24,900)	(24,700)	(60,400)	(73,992)	(76,694)
Other	-	-	4,566	4,566	6,400	14,797
Total Nonoperating Revenue (Expense)	23,315	(7,710)	209,058	224,663	98,193	(16,528)
INCOME BEFORE CAPITAL CONTRIBUTIONS AND TRANSFERS	8,032	2,906	120,420	131,358	(31,024)	(24,740)
TRANSFERS TO THE CITY	(62,649)	-	-	(62,649)	(65,269)	(68,222)
CHANGE IN NET POSITION	\$ (54,617)	\$ 2,906	\$ 120,420	\$ 68,709	\$ (96,293)	\$ (92,962)

BRainerd PUBLIC UTILITIES
COMBINING STATEMENT OF NET POSITION FOR ELECTRIC DEPARTMENT
JANUARY 31, 2024 AND 2023

	January 31, 2024			
	Generation	Distribution	Total	2023
ASSETS				
UTILITY PLANT				
Construction in Progress	\$ 807,521	\$ 1,689,478	\$ 2,496,999	\$ 1,234,131
Right-to-Use	-	421,686	421,686	421,686
In Service	7,737,334	40,333,277	48,070,611	46,153,452
Total Investment in Utility Plant	8,544,855	42,444,441	50,989,296	47,809,269
Less: Accumulated Depreciation	(2,575,921)	(23,189,448)	(25,765,369)	(23,512,300)
Net Utility Plant	5,968,934	19,254,993	25,223,927	24,296,969
CASH AND INVESTMENTS				
Nonrestricted	(3,853,395)	8,769,687	4,916,292	5,441,176
Restricted				
Customer Deposits	-	487,050	487,050	342,424
City of Brainerd Contribution	-	132,293	132,293	65,874
Conservation Incentive Program	-	422,210	422,210	250,714
Debt Service Reserve	686,750	430,500	1,117,250	1,117,250
Total Restricted Cash and Investments	686,750	1,472,053	2,158,803	1,776,262
Total Cash and Investments	(3,166,645)	10,241,740	7,075,095	7,217,438
CURRENT ASSETS				
Accounts Receivable	-	3,557,905	3,557,905	2,767,808
Interest Receivable	-	15,106	15,106	7,465
Inventory	-	1,816,779	1,816,779	1,385,281
Prepaid Expenses	5,393	165,906	171,299	159,374
Total Current Assets	5,393	5,555,696	5,561,089	4,319,928
OTHER ASSETS				
Service Territory Acquisitions, Net of Accumulated Amortization	-	210,183	210,183	237,483
Deferred Outflows of Resources	105,093	525,474	630,567	1,040,352
Investment in Solar Generation Facility	-	662,073	662,073	567,000
Total Other Assets	105,093	1,397,730	1,502,823	1,844,835
Total Assets	2,912,775	36,450,159	39,362,934	37,679,170
LIABILITIES AND NET ASSETS				
Net Investment in Capital Assets	2,593,960	17,206,351	19,800,311	17,907,220
Unrestricted	(4,052,791)	10,764,066	6,711,275	6,606,965
Total Net Position	(1,458,831)	27,970,417	26,511,586	24,514,185
LONG-TERM LIABILITIES				
Revenue Bonds Payable	3,095,000	1,405,000	4,500,000	5,540,000
Compensated Absences	79,651	640,413	720,064	859,732
Other Postemployment Benefit Obligation	36,622	183,104	219,726	230,697
Net Pension Liability	340,546	1,702,730	2,043,276	2,955,756
Deferred Inflows of Resources	130,330	651,653	781,983	126,597
Capital Lease Payable	-	374,705	374,705	391,055
Revenue Bond Premium	44,974	-	44,974	58,757
Total Long-Term Liabilities	3,727,123	4,957,605	8,684,728	10,162,594
CURRENT LIABILITIES				
Accounts Payable	-	1,652,316	1,652,316	952,616
Revenue Bonds Payable	605,000	435,000	1,040,000	1,040,000
Capital Lease Payable	-	17,937	17,937	17,937
Payable to City of Brainerd	-	132,293	132,293	65,874
Conservation Incentive Program Payable	-	422,210	422,210	250,714
Accrued Expenses				
Salaries and Withholding Taxes	20,431	191,208	211,639	207,302
Sales Taxes	-	177,227	177,227	94,024
Bond Interest	19,052	6,896	25,948	31,500
Customer Deposits	-	487,050	487,050	342,424
Total Current Liabilities	644,483	3,522,137	4,166,620	3,002,391
Total Liabilities	4,371,606	8,479,742	12,851,348	13,164,985
Total Liabilities and Net Position	\$ 2,912,775	\$ 36,450,159	\$ 39,362,934	\$ 37,679,170

BRAINERD PUBLIC UTILITIES
STATEMENT OF REVENUE, EXPENSES, AND CHANGES IN NET POSITION - ELECTRIC DEPARTMENT
FOR THE ONE MONTH PERIOD ENDED JANUARY 31, 2024, 2023, AND 2022

	January 31, 2024			Variance With Budget - Positive (Negative)	Year to Date January 31,	
	Current Month	Year to Date	Budget		2023	2022
OPERATING REVENUES						
<u>Utility Revenues</u>						
Residential	\$ 598,428	\$ 598,428	\$ 580,000	\$ 18,428	\$ 651,901	\$ 631,804
Commercial	824,707	824,707	885,000	(60,293)	872,391	842,475
Medium/Large Commercial	185,463	185,463	229,000	(43,537)	190,532	235,417
Industrial	690,401	690,401	300,000	390,401	5,319	30,594
City of Brainerd	31,789	31,789	30,200	1,589	32,148	-
BPU	79,307	79,307	65,000	14,307	81,335	81,269
Total Utility Revenue	2,410,095	2,410,095	2,089,200	320,895	1,833,626	1,821,559
<u>Other Operating Revenue</u>						
Penalties	13,118	13,118	8,500	4,618	10,919	9,433
Other	(10,775)	(10,775)	8,200	(18,975)	4,607	(1,426)
Total Other Operating Revenue	2,343	2,343	16,700	(14,357)	15,526	8,007
Total Operating Revenue	2,412,438	2,412,438	2,105,900	306,538	1,849,152	1,829,566
OPERATING EXPENSES						
<u>Purchased Power</u>						
All Other Customers	1,055,932	1,055,932	703,800	(352,132)	911,266	1,250,716
Solar Generation - Airport	14,044	14,044	60,000	45,956	24,979	-
Crypto Mining Customers	647,554	647,554	509,200	(138,354)	3,944	-
Total Purchased Power Expense	1,717,530	1,717,530	1,273,000	(444,530)	940,189	1,250,716
<u>Generation</u>						
Salaries and Wages	28,992	28,992	12,800	(16,192)	60,685	44,876
Operations and Maintenance	878	878	3,300	2,422	1,459	899
Employee Benefits	8,700	8,700	4,300	(4,400)	14,080	14,350
Other Charges	-	-	500	500	-	2,856
Depreciation	27,400	27,400	27,200	(200)	27,200	26,800
Total Generation Expenses	65,970	65,970	48,100	(17,870)	103,424	89,781
<u>Distribution</u>						
Salaries and Wages	182,118	182,118	134,200	(47,918)	224,687	95,144
Operations and Maintenance	15,220	15,220	38,200	22,980	18,047	11,869
Employee Benefits	19,011	19,011	39,000	19,989	38,440	29,547
Other Charges	5,999	5,999	4,700	(1,299)	6,915	2,762
Depreciation and Amortization	147,500	147,500	142,700	(4,800)	142,500	143,000
Total Distribution Expenses	369,848	369,848	358,800	(11,048)	430,589	282,322
<u>General and Administrative</u>						
Salaries and Wages	105,950	105,950	71,900	(34,050)	85,031	67,204
Operations and Maintenance	26,440	26,440	42,400	15,960	32,792	18,308
Insurance and Bonds	18,407	18,407	18,900	493	17,220	13,588
Employee Benefits	70,323	70,323	36,900	(33,423)	57,925	20,898
Other Charges	38,039	38,039	33,000	(5,039)	37,756	22,785
Depreciation and Amortization	15,214	15,214	14,100	(1,114)	10,900	14,400
Total Gen. and Admin. Expenses	274,373	274,373	217,200	(57,173)	241,624	157,183
Total Operating Expenses	2,427,721	2,427,721	1,897,100	(530,621)	1,715,826	1,780,002
NET OPERATING INCOME	(15,283)	(15,283)	208,800	(224,083)	133,326	49,564
NONOPERATING REVENUE						
Interest Revenue - Investments	33,107	33,107	800	32,307	20,228	(30,059)
Interest Expense - Bonds	(10,800)	(10,800)	(13,067)	2,267	(14,970)	(14,570)
Sale of Renewable Energy Credits	-	-	-	-	-	-
Bond Premium	1,008	1,008	1,100	(92)	1,456	1,396
Gain on Disposal of Capital Assets	-	-	100	(100)	-	7,797
Total Nonoperating Revenue	23,315	23,315	(11,067)	34,382	6,714	(35,436)
INCOME BEFORE TRANSFERS TO THE CITY	8,032	8,032	197,733	(189,701)	140,040	14,128
TRANSFERS TO THE CITY	(62,649)	(62,649)	(68,000)	5,351	(65,269)	(68,222)
CHANGE IN NET POSITION	<u>\$ (54,617)</u>	<u>\$ (54,617)</u>	<u>\$ 129,733</u>	<u>\$ (184,350)</u>	<u>\$ 74,771</u>	<u>\$ (54,094)</u>

BRAINERD PUBLIC UTILITIES
OPERATING STATISTICS - ELECTRIC DEPARTMENT
FOR THE ONE MONTH PERIOD ENDED JANUARY 31, 2024, 2023, AND 2022

	KWH SOLD			REVENUE			AVERAGE REVENUE PER KWH		
	PERIOD ENDED JANUARY 31,			PERIOD ENDED JANUARY 31,			PERIOD ENDED JANUARY 31,		
	2024	2023	2022	2024	2023	2022	2024	2023	2022
Residential	4,950,298	5,397,485	5,567,431	\$ 598,428	\$ 651,901	\$ 631,805	\$ 0.1209	\$ 0.1208	\$ 0.1135
Commercial	3,352,384	3,467,306	3,701,575	824,707	872,391	842,475	0.2460	0.2516	0.2276
Medium/Large Commercial	5,203,024	5,539,454	5,866,545	185,463	190,532	235,417	0.0356	0.0344	0.0401
Industrial	5,783,570	3,861	-	690,401	5,319	-	0.1194	1.3776	#DIV/0!
City of Brainerd	198,090	191,329	197,632	31,789	32,148	30,594	0.1605	0.1680	0.1548
BPU	715,224	723,570	795,583	79,307	81,335	81,269	0.1109	0.1124	0.1022
Total	<u>20,202,590</u>	<u>15,323,005</u>	<u>16,128,766</u>	<u>\$ 2,410,095</u>	<u>\$ 1,833,626</u>	<u>\$ 1,821,560</u>	<u>\$ 0.1193</u>	<u>\$ 0.1197</u>	<u>\$ 0.1129</u>
% Change From Previous Year	<u>31.84%</u>	<u>-5.00%</u>	<u>NA</u>	<u>31.44%</u>	<u>0.66%</u>	<u>NA</u>	<u>-0.31%</u>	<u>5.96%</u>	<u>NA</u>

	% TO TOTAL - KWH			% TO TOTAL - REVENUE			TOTAL METERS IN SERVICE		
	PERIOD ENDED JANUARY 31,			PERIOD ENDED JANUARY 31,			PERIOD ENDED JANUARY 31,		
	2024	2023	2022	2024	2023	2022	2024	2023	2022
Residential	24.50%	35.22%	34.52%	24.83%	35.55%	34.68%	6,944	6,926	6,873
Commercial	16.59%	22.63%	22.95%	34.22%	47.58%	46.25%	1,223	1,223	1,263
Medium/Large Commercial	25.75%	36.15%	36.37%	7.70%	10.39%	12.92%	66	67	67
City of Brainerd	0.98%	1.25%	1.23%	1.32%	1.75%	1.68%	36	37	33
Industrial	3.54%	0.03%	0.00%	28.65%	0.29%	0.00%	1	1	-
BPU	3.54%	4.72%	4.93%	3.29%	4.44%	4.46%	39	38	38
Total	<u>74.91%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>8,309</u>	<u>8,292</u>	<u>8,274</u>
% Change From Previous Year							<u>0.21%</u>	<u>0.22%</u>	<u>NA</u>

BRAINERD PUBLIC UTILITIES
STATEMENT OF REVENUE, EXPENSES, AND CHANGES IN NET POSITION - WATER DEPARTMENT
FOR THE ONE MONTH PERIOD ENDED JANUARY 31, 2024, 2023, AND 2022

	January 31, 2024			Variance	Year to Date	
	Current	Year to	Budget	With Budget -	January 31,	
	Month	Date		Positive	2023	2022
				(Negative)		
OPERATING REVENUES						
<u>Utility Revenues</u>						
Residential	\$ 127,067	\$ 127,067	\$ 140,200	\$ (13,133)	\$ 127,028	\$ 123,635
Commercial	103,246	103,246	122,500	(19,254)	91,320	142,636
City of Brainerd	7,730	7,730	11,500	(3,770)	7,307	7,203
BPU	6,798	6,798	8,000	(1,202)	5,167	4,095
Total Utility Revenue	244,841	244,841	282,200	(37,359)	230,822	277,569
<u>Other Operating Revenue</u>						
Penalties	2,470	2,470	1,700	770	1,886	1,653
Other	131,780	131,780	1,850	129,930	9,897	9,556
Total Other Operating Revenue	134,250	134,250	3,550	130,700	11,783	11,209
Total Operating Revenue	379,091	379,091	285,750	93,341	242,605	288,778
OPERATING EXPENSES						
<u>Production</u>						
Salaries and Wages	56,463	56,463	45,200	(11,263)	54,302	24,916
Operations and Maintenance	16,026	16,026	22,800	6,774	22,189	13,728
Employee Benefits	13,285	13,285	14,700	1,415	14,196	11,160
Other Charges	-	-	50	50	-	-
Depreciation	15,200	15,200	22,300	7,100	22,200	22,600
Total Production Expenses	100,974	100,974	105,050	4,076	112,887	72,404
<u>Distribution</u>						
Salaries and Wages	74,412	74,412	49,800	(24,612)	85,425	31,832
Operations and Maintenance	10,457	10,457	24,950	14,493	12,359	13,303
Employee Benefits	12,008	12,008	16,600	4,592	14,270	11,610
Other Charges	13,134	13,134	1,350	(11,784)	6,571	-
Depreciation	85,400	85,400	69,000	(16,400)	67,900	69,000
Total Distribution Expenses	195,411	195,411	161,700	(33,711)	186,525	125,745
<u>General and Administrative</u>						
Salaries and Wages	32,347	32,347	25,200	(7,147)	31,852	24,034
Operations and Maintenance	6,247	6,247	16,950	10,703	10,097	6,488
Insurance and Bonds	4,608	4,608	5,700	1,092	5,833	3,858
Employee Benefits	14,488	14,488	13,300	(1,188)	24,763	9,556
Other Charges	9,830	9,830	7,850	(1,980)	7,713	5,565
Depreciation	4,570	4,570	4,000	(570)	3,500	5,200
Total Gen. and Admin. Expenses	72,090	72,090	73,000	910	83,758	54,701
Total Operating Expenses	368,475	368,475	339,750	(28,725)	383,170	252,850
NET OPERATING INCOME (LOSS)	10,616	10,616	(54,000)	64,616	(140,565)	35,928
NONOPERATING REVENUE						
Interest Revenue - Investments	6,700	6,700	800	5,900	2,613	(2,078)
Local Option Sales Tax - Baxter	-	-	29,100	(29,100)	-	-
Bond Premium	10,490	10,490	12,300	(1,810)	12,137	16,001
Bond Issuance Costs	-	-	-	-	-	-
Interest Expense - Bonds	(24,900)	(24,900)	(25,200)	300	(28,514)	(28,189)
Gain on Disposal of Capital Assets	-	-	-	-	-	-
Total Nonoperating Revenue	(7,710)	(7,710)	17,000	(24,710)	(13,764)	(14,266)
CHANGE IN NET POSITION	\$ 2,906	\$ 2,906	\$ (37,000)	\$ 39,906	\$ (154,329)	\$ 21,662

**BRAINERD PUBLIC UTILITIES
OPERATING STATISTICS - WATER DEPARTMENT
FOR THE ONE MONTH PERIOD ENDED JANUARY 31, 2024, 2023, AND 2022**

	GALLONS SOLD			REVENUE			AVERAGE PER 1,000 GALLONS		
	PERIOD ENDED JANUARY 31,			PERIOD ENDED JANUARY 31,			PERIOD ENDED JANUARY 31,		
	2024	2023	2022	2024	2023	2022	2024	2023	2022
Residential	11,614,502	12,101,408	11,987,530	127,067	127,028	123,634	\$ 10.94	\$ 10.50	\$ 10.31
Commercial	14,732,539	13,257,981	13,143,017	117,222	103,794	97,410	7.96	7.83	7.41
City of Baxter	-	-	21,400,000	552	-	56,524	#DIV/0!	-	-
Total	<u>26,347,041</u>	<u>25,359,389</u>	<u>46,530,547</u>	<u>\$ 244,841</u>	<u>\$ 230,822</u>	<u>\$ 277,568</u>	<u>\$ 9.29</u>	<u>\$ 9.10</u>	<u>\$ 5.97</u>
% Change From Previous Year	<u>3.89%</u>	<u>-45.50%</u>	<u>NA</u>	<u>6.07%</u>	<u>-16.84%</u>	<u>NA</u>	<u>2.10%</u>	<u>52.58%</u>	<u>NA</u>

	% TO TOTAL - GALLONS			% TO TOTAL - REVENUE			TOTAL METERS IN SERVICE		
	PERIOD ENDED JANUARY 31,			PERIOD ENDED JANUARY 31,			PERIOD ENDED JANUARY 31,		
	2024	2023	2022	2024	2023	2022	2024	2023	2022
Residential	44.08%	47.72%	25.76%	51.90%	55.03%	44.54%	4,064	4,047	4,062
Commercial	55.92%	52.28%	28.25%	47.88%	44.97%	35.09%	852	849	800
City of Baxter	0.00%	0.00%	45.99%	0.23%	0.00%	20.36%	1	1	1
Total	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>4,917</u>	<u>4,897</u>	<u>4,863</u>
% Change From Previous Year							<u>0.41%</u>	<u>0.70%</u>	<u>NA</u>

BRAINERD PUBLIC UTILITIES
STATEMENT OF REVENUE, EXPENSES, AND CHANGES IN NET POSITION - WASTEWATER TREATMENT DEPARTMENT
FOR THE ONE MONTH PERIOD ENDED JANUARY 31, 2024, 2023, AND 2022

	January 31, 2023			Variance With Budget - Positive (Negative)	Year to Date January 31,	
	Current Month	Year to Date	Budget		2023	2022
OPERATING REVENUES						
<u>Utility Revenues</u>						
Residential	\$ 128,391	\$ 128,391	\$ 125,500	\$ 2,891	\$ 122,357	\$ 118,905
Commercial	71,318	71,318	68,350	2,968	61,461	57,872
Total Utility Revenue	199,709	199,709	193,850	5,859	183,818	176,777
<u>Other Operating Revenue</u>						
Penalties	3,309	3,309	2,300	1,009	2,473	2,516
Reimbursement of Expenses - Baxter	66,613	66,613	62,000	4,613	57,381	59,369
Other	897	897	500	397	564	1,159
Total Other Operating Revenue	70,819	70,819	64,800	6,019	60,418	63,044
Total Operating Revenue	270,528	270,528	258,650	11,878	244,236	239,821
OPERATING EXPENSES						
<u>Treatment</u>						
Salaries and Wages	44,910	44,910	34,400	(10,510)	49,694	36,423
Operations and Maintenance	61,679	61,679	80,650	18,971	70,014	57,492
Employee Benefits	11,246	11,246	12,100	854	11,156	9,798
Other Charges	895	895	3,300	2,405	612	3,159
Depreciation	119,200	119,200	118,000	(1,200)	117,000	124,900
Total Treatment Expenses	237,930	237,930	248,450	10,520	248,476	231,772
<u>Lift Stations</u>						
Salaries and Wages	12,428	12,428	12,100	(328)	1,700	12,103
Operations and Maintenance	11,727	11,727	15,800	4,073	10,761	13,173
Employee Benefits	3,182	3,182	4,400	1,218	3,249	4,339
Other Charges	-	-	200	200	18	-
Depreciation	23,000	23,000	22,400	(600)	22,200	22,700
Total Collection Expenses	50,337	50,337	54,900	4,563	37,928	52,315
<u>General and Administrative</u>						
Salaries and Wages	30,665	30,665	23,600	(7,065)	29,979	23,374
Operations and Maintenance	6,308	6,308	11,400	5,092	10,998	4,177
Insurance and Bonds	8,352	8,352	6,400	(1,952)	4,631	4,200
Employee Benefits	11,655	11,655	12,900	1,245	22,666	8,649
Other Charges	10,249	10,249	8,800	(1,449)	9,136	5,337
Depreciation and Amortization	3,670	3,670	2,900	(770)	2,400	3,700
Total Gen. and Admin. Expenses	70,899	70,899	66,000	(4,899)	79,810	49,437
Total Operating Expenses	359,166	359,166	369,350	10,184	366,214	333,524
NET OPERATING LOSS	(88,638)	(88,638)	(110,700)	22,062	(121,978)	(93,703)
NONOPERATING REVENUE						
Interest Revenue - Investments	93,546	93,546	4,500	89,046	24,915	(47,583)
Interest Revenue - Notes Receivable	8,900	8,900	7,700	1,200	9,500	10,500
Interest Expense - Bonds	(24,700)	(24,700)	(30,300)	5,600	(30,508)	(33,935)
Bond Premium	712	712	700	12	936	802
Local Option Sales Tax - Brainerd	126,034	126,034	122,700	3,334	94,000	96,390
Local Option Sales Tax - Baxter	-	-	6,100	(6,100)	-	-
Federal Grant Revenue - Build America Bond	4,566	4,566	5,200	(634)	6,400	7,000
Gain (Loss) on Disposal of Capital Assets	-	-	-	-	-	-
Total Nonoperating Revenue	209,058	209,058	116,600	92,458	105,243	33,174
CHANGE IN NET POSITION	<u>\$ 120,420</u>	<u>\$ 120,420</u>	<u>\$ 5,900</u>	<u>\$ 114,520</u>	<u>\$ (16,735)</u>	<u>\$ (60,529)</u>

**BRAINERD PUBLIC UTILITIES
OPERATING STATISTICS - WASTEWATER TREATMENT DEPARTMENT
FOR THE ONE MONTH PERIOD ENDED JANUARY 31, 2024, 2023, AND 2022**

	GALLONS PROCESSED			REVENUE			AVERAGE PER 1,000 GALLONS		
	PERIOD ENDED JANUARY 31,			PERIOD ENDED JANUARY 31,			PERIOD ENDED JANUARY 31,		
	2024	2023	2022	2024	2023	2022	2024	2023	2022
Residential	11,546,949	12,033,333	11,984,173	\$ 128,391	\$ 122,357	\$ 118,906	\$ 11.12	\$ 10.17	\$ 9.92
Commercial	13,433,275	12,316,810	12,425,798	71,318	61,461	57,871	5.31	4.99	4.66
City of Baxter	18,528,000	17,775,000	17,802,000	66,613	57,381	59,369	3.60	3.23	3.33
Total	<u>43,508,224</u>	<u>42,125,143</u>	<u>42,211,971</u>	<u>\$ 266,322</u>	<u>\$ 241,199</u>	<u>\$ 236,146</u>	<u>\$ 6.12</u>	<u>\$ 5.73</u>	<u>\$ 5.59</u>
% Change From Previous Year	<u>3.28%</u>	<u>-0.21%</u>	<u>NA</u>	<u>10.42%</u>	<u>2.14%</u>	<u>NA</u>	<u>6.91%</u>	<u>2.35%</u>	<u>NA</u>
	% TO TOTAL - GALLONS			% TO TOTAL - REVENUE			TOTAL METERS IN SERVICE		
	PERIOD ENDED JANUARY 31,			PERIOD ENDED JANUARY 31,			PERIOD ENDED JANUARY 31,		
	2024	2023	2022	2024	2023	2022	2024	2023	2022
Residential	26.54%	28.57%	28.39%	48.21%	50.73%	50.35%	4,048	4,034	4,037
Commercial	30.88%	29.24%	29.44%	26.78%	25.48%	24.51%	832	824	774
City of Baxter	42.59%	42.20%	42.17%	25.01%	23.79%	25.14%	1	1	1
Total	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>4,881</u>	<u>4,859</u>	<u>4,812</u>
% Change From Previous Year							<u>0.45%</u>	<u>0.98%</u>	<u>NA</u>



Packet Summary Budget Report

Group Summary

For Fiscal: 2024 Period Ending: 06/30/2024

Account Typ...	Original YTD Budget	Current YTD Budget	Period Activity	Fiscal Activity	Variance Favorable (Unfavorable)	Percent Remaining
Fund: 1 - ELECTRIC						
Revenue	12,635,743.68	12,635,743.68	1,573,157.05	13,395,842.66	760,098.98	6.02 %
Expense	11,641,741.44	11,641,741.44	1,648,755.12	11,868,610.96	-226,869.52	-1.95 %
Fund: 1 - ELECTRIC Surplus (Deficit):	994,002.24	994,002.24	-75,598.07	1,527,231.70	533,229.46	-53.64 %
Fund: 2 - WATER						
Revenue	1,966,912.92	1,966,912.92	155,810.20	1,594,391.87	-372,521.05	18.94 %
Expense	2,188,824.12	2,188,824.12	126,141.43	1,248,618.15	940,205.97	42.95 %
Fund: 2 - WATER Surplus (Deficit):	-221,911.20	-221,911.20	29,668.77	345,773.72	567,684.92	255.82 %
Fund: 3 - WASTEWATER TREATMENT						
Revenue	2,432,326.68	2,432,326.68	220,519.90	2,884,676.72	452,350.04	18.60 %
Expense	2,396,940.84	2,396,940.84	74,279.71	1,033,423.18	1,363,517.66	56.89 %
Fund: 3 - WASTEWATER TREATMENT Surplus (Deficit):	35,385.84	35,385.84	146,240.19	1,851,253.54	1,815,867.70	-5,131.62 %
Fund: 4 - HYDRO DAM						
Revenue	6,597.36	6,597.36	0.00	1,007.70	-5,589.66	84.73 %
Expense	222,510.96	222,510.96	29,705.13	323,518.11	-101,007.15	-45.39 %
Fund: 4 - HYDRO DAM Surplus (Deficit):	-215,913.60	-215,913.60	-29,705.13	-322,510.41	-106,596.81	-49.37 %
Report Surplus (Deficit):	591,563.28	591,563.28	70,605.76	3,401,748.55	2,810,185.27	-475.04 %

Water sales are down compared to budget as sprinkling has not occurred to date. With the weather and start of the season this is lower than budgeted, however expect to swing opposite direction through September. Typical for this time of year.

Wastewater expenses are under budget due to internal sales not being upto date, will be corrected with the completion of the next few month financial statements.

Hydro Dam expense are over budget due to retirement payments and avoided cost benefits being under anticipated, internal entry to be corrected with the completion of the upcoming financial statements.

Fund Summary

Fund	Original YTD Budget	Current YTD Budget	Period Activity	Fiscal Activity	Variance Favorable (Unfavorable)
1 - ELECTRIC	994,002.24	994,002.24	-75,598.07	1,527,231.70	533,229.46
2 - WATER	-221,911.20	-221,911.20	29,668.77	345,773.72	567,684.92
3 - WASTEWATER TREATMENT	35,385.84	35,385.84	146,240.19	1,851,253.54	1,815,867.70
4 - HYDRO DAM	-215,913.60	-215,913.60	-29,705.13	-322,510.41	-106,596.81
Report Surplus (Deficit):	591,563.28	591,563.28	70,605.76	3,401,748.55	2,810,185.27



BRAINERD PUBLIC UTILITIES

8027 Highland Scenic Rd • P.O. Box 373 • Brainerd, Minnesota 56401

Business Office: 218.829.8726 ■ **Repair Service:** 218.829.2193

www.bpu.org

Brainerd Public Utilities Operations Managers Updates June 25, 2024

Rotary Park Solar Joint Meeting:

Additional conversations and discussions are ongoing with Rotarians and the desired location and needs for the park. The joint park meeting had requested numbers and data for the park for the June 25th meeting, the numbers, data and needs are not available for the time of this report. Ongoing conversations have been occurring with the Rotarians and BPU is awaiting results of an updated solar model from the consultant who presented at the joint meeting.

Water Tower Maintenance (State Hospital):

The State Hospital water tower went back into service on June 14th after inspection and cleaning. The final report will be available for commission upon completion.

South 7th Reconstruction Project

South 7th reconstruction project continues to go well despite all the rainfall. Two water service lines were found to be leaking on the 700 block of South 7th. These leaks were on the customer's side. Both services are scheduled to be repaired by private contractor.

Lead Copper Rule Update as of 6-14-2024

Completed Inventory Status:

Not Done / Not Done (Red) – 128

BPU Not Done / Customer Done (Yellow) – 304

BPU Done / Customer Not Done (Blue) – 876

Done / Done (Green) – 3658

Materials of Completed:

Lead: BPU- 0 Customer- 0

Galvanized Requiring Replacement: BPU- 66 Customer- 775

Non-Lead: BPU- 4463 Customer- 3177

Unknown: BPU- 6 Customer- 11

Electric Department Maintenance:

A switch pole was installed on the 558 distribution circuit to allow load transferring from nearby 548 circuit, ensuring balancing for overall system loading without service interruptions to customers.

2024 Pole Inspection Report

Line crews finished the remaining "priority" pole change outs from results of the Star Energy pole audit 2024. And continue to work on "reject" pole change outs and line maintenance.

Mutual Aid:

4 linemen (2 crews) responded to Crow Wing Power's (CWP) mutual aid request to assist in outage restorations on 6-13-2024. CWP had over 4,000 meters out in this storm. BPU reported no outages during this event.

OUTAGE REPORT May 2024

Location	Date	Meter s	Time	Cause	Solution
100 block Kingwood	8-May	1	63 min	Bad secondary connectors	Replaced with new connectors
Mckay Rd.	16-May	6	7 min	scheduled, pole change out (rotten pole)	Installed new pole
cr 117 and 45 intersection	17-May	0	N/A	truck hit overhead BPU fiber line (box in the air)	Replaced 200' new fiber Installed new transformer on 3 phase bank
400 block S 5th	26-May	1	41 min	trans. Low voltage on one leg.	
200 block S 10th	30-May	1	13 min	Bad secondary connectors	Installed new connectors



BRAINERD PUBLIC UTILITIES

8027 Highland Scenic Rd • P.O. Box 373 • Brainerd, Minnesota 56401

Business Office: 218.829.8726 ■ **Repair Service:** 218.829.2193

www.bpu.org

Brainerd Public Utilities Wastewater Managers Report June 25, 2024

Lift stations

Ongoing maintenance of wet wells, backup floats and generator testing, for the 17 lift stations. Replaced Controller at SW6th Lift station and returned Baxter's spare controller.

Wastewater treatment plant

On-call operator tested Wastewater Treatment Facility and lift stations SCADA alarms. Equipment maintenance is ongoing.

Biosolids

Suspended land application of biosolids due to weather.

Lab

Received MPCA Wastewater Compliance Evaluation Inspection and MPCA staff has determined that all corrective actions have been completed. Sent May Electronic Daily Monitoring Report. Sampled influent and effluent for copper twice and sent to Minnesota Valley Testing Lab. On going Mercury Minimization Plan, Copper Minimization Plan. Ongoing delegation with Brainerd Significant Industrial Users and Categorical Industrial Users.

Drinking Water

Collected MDHs 15 required drinking water samples throughout the Brainerd distribution system for coliform and e-coli. Continue on-site testing for Total Chlorine, Free Chlorine, Phosphate, as required. Sampled 12 coliform and e-coli at the water plant in addition to the standard testing on-site of the Total Chlorine, Free Chlorine, Phosphate. Sampled St. Hospital water tower for coliform and e-coli, and Total Chlorine. Responded to 3 residential drinking water concerns. Flushed hydrants on 2400 block of Hillcrest Drive, 1300 block of 11th Ave NE. Distributed 60 scheduled Lead and Copper bottles to residents in the program. Bottles were delivered to RMB Laboratory on May 24th and 30th. Water plant and wastewater operators toured Mystic Lake and Blaine water plants on June 21st.

River crossing

Finalizing landscaping on the Baxter side and completing the road project on the Brainerd side of the Mississippi River.

Generators

Test ran Evergreen Lift, Main Lift, SW6th Lift, portable 25KW, 150KW, 45KW and both plant generators. Added fuel where needed.

Personal

Brad Knapp and Eric Klein attended two-day Lab school in Duluth. 2 callouts. June 4th for security door, June 5th for 3 lift stations without power, pumped down 10th & 0 street lift station with portable 25kw due to high wet well level.



BRAINERD PUBLIC UTILITIES

8027 Highland Scenic Rd • P.O. Box 373 • Brainerd, Minnesota 56401

Business Office: 218.829.8726 ■ **Repair Service:** 218.829.2193

www.bpu.org

Brainerd Public Utilities Water Production Department Report June 25, 2024

May 2024 Water Pumping Statistics

Water pumped to North distribution system was 34.041 MG for an average of 1.098 MGD. Water pumped to South distribution system was 5.757 MG for an average of 0.186 MGD. Chemical usage averages for the month: 2.3 gallons of fluoride per day, 6.93 gallons of caustic soda per day, 3.96 gallons of orthophosphate per day, 18.94 pounds of chlorine per day. Went through 5 filter backwash events while using an average of 0.539 MG for each event.

Baxter Public Works

Notification from Baxter Public Works on June 11, 2024 that a 2nd procedure for a well rehabilitation was underway and they needed to supply their water demand with the interconnect.

Wells

Water levels and pumping performance staying stable during weekly evaluation events. Flow meters for wells 4 and 6 are currently out of order. Efforts are being made by the manufacturer to come up with a solution. Had a visit from Flow Control Automation representatives to look at well and filtration plant piping in order to be able to give us a quote for flow meter replacement. Project for well automatic start and stop was initiated through the efforts of Brent Yaunick, BPU Maintenance Electrician, and InControl SCADA integrator. The system they created works great.

Filtration Plant

Operating efficiently; all controls and valve operators functioning properly. BPU staff worked on telephone alarm notifications for emergency conditions that may occur in the filtration plant.

Booster Pump Stations

Riverside booster station and Lum Park booster station continue to operate effectively. Frequent chlorine concentration analysis shows the liquid chlorine injection pumps are functioning well. Variable frequency drives for pumps 2 and 3 were replaced with new units by Quality Flow Systems.

Bolton and Menk consulting for Water Plant Operations and Maintenance Manual

Follow-up visit from Bolton and Menk staff to clarify backwash procedure guidelines are proper and accurate. We were given a rough draft of the document, and it looks good, just needs a few edits.

2.0 MG Ground Storage Reservoir Construction Project punch list items

Magney construction staff made a visit to work on the rainwater ponding areas of the roof. They cut shallow channels in the surface to drain the water to the gutter collection areas.

Filtration Plant Tour

Had a tour of the filtration plant with a handful of people from the Productive Alternatives company on June 4, 2024.

Water Plant Operation

Operations of the water plant have moved to automated operations allowing staff to convert to day operation similar to the rest of BPU. June 17th and 18th operations cut the 11-7 shift overnight, Wednesday June 19th allowed rotational rounds, with day operation 7 to 3:30 after the 19th. I want to commend staff on their assistance in this transition.